Tucson Iron & Metal
Tucson, Arizona

Contraband Incinerator

Pima County Air Quality Permit 127,
Expires 04/21/15

Particulate/SO_2
Compliance Test Report
Test Dates: 06/05-06/17

RECEIVED BY
PIMA COUNTY
JUN 28 2017
DEPARTMENT OF
ENVIRONMENTAL QUALITY

By:

Energy and Environmental Measurement Corporation (EEMC)
Fully accredited ASTM/STAC, February 6, 2015

3730 N. Pellegrino Drive, Tucson, Arizona 85749
Phone: (520) 749-2167 Fax: (520) 749-3582
EEMCorp@comcast.net

2751 Enterprise Ave., Ste. 2, Billings, Montana 59102
Phone: (406) 252-4450 Fax: (406) 252-6350

Tucson Iron & Metal
Tucson, Arizona

Contraband Incinerator

Pima County Air Quality Permit 127,
Expires 04/21/15

Particulate/SO_2
Compliance Test Report
Test Dates: 06/05-06/17

By:

Energy and Environmental Measurement Corporation (EEMC)
Fully accredited ASTM/STAC, February 6, 2015

3730 N. Pellegrino Drive, Tucson, Arizona 85749
Phone: (520) 749-2167 Fax: (520) 749-3582
EEMCorp@comcast.net

2751 Enterprise Ave., Ste. 2, Billings, Montana 59102
Phone: (406) 252-4450 Fax: (406) 252-6350

ED_005878_00000226-00002

TABLE OF CONTENTS

Title Page
Table of Contents
Review and Certification (Endorsement) Page
Field Observation Sheet (Source/Test Team Contact Information)

Test Discussion Including:
- **Introduction**
- **Test Chronolog**
- **Test Methods/Procedures**
- **Units of Reporting**
- **Equipment Descriptions**
- **Comments**
- **Results**
- **References**

Tabulated:
- **Compliance Statement/Permit Excerpts**
- **Emission Data Summaries**
- **Stack Parameters/Diagrams/Pictures**

- **Field Data and Calculations:**
  - **Particulate/ SO_2/Gas Flow/Moisture**
  - **O_2/CO_2 Logger**

- **TIM Daily Operating Log/ERA Reporting Form**
- **Equipment Calibration**
- **Instrument Specifications**
- **Q. C. Outlines/Train Schematics/Test Method References**

ED_005878_00000226-00003

REVIEW AND CERTIFICATION

By EEMC Personnel:

All work, calculations, other activities, tasks performed and documented in this report were carried out under my (Team Leader/QSTI) direction and supervision. This test project conforms to EEMC's Quality Manual and to the requirements of ASTM D-7036.

Date 6/21/17

Matthew Nurimba
Environmental Project Manager

I have reviewed all testing details, calculations, results, conclusions and other appropriate written material contained herein, and hereby certify that the presented material is authentic and accurate.

Date 6/21/17

Ed Wadington

By Company Personnel:

I have reviewed the information being submitted in its entirety and based on information and belief formed after reasonable inquiry, I certify that the statements and information contained in this submittal are true, accurate, and complete.

Date _____

Signature

Name (Printed)

Title

Company

FIELD OBSERVATION SHEET

Test Dates:	**06/05/17**
Pima County	**Air Quality Permit 127, Expires 04/21/15**
Company Name:	**Tucson Iron & Metal**
Mailing Address:	**4484 East Tennessee Street** **Tucson, Arizona 85714**
Source Tested:	**Contraband Incinerator**
Company Contacts:	**Dan Butwinski - Site Foreman**
Phone:	**(520) 884-1554**
	Gary Kippur - Owner
Phone:	**(520) 884-1554**
Fax:	**(520) 884-0860**
Email:	**gary@tucsoniron.net**
Observers and Affiliation:	**Mark Rogers, Pima County DEQ** **Dustin Fitzpatrick, Pima County DEQ**
EEMC Field Team:	
Team Leader:	**Matt Nurimba, QSTI**
Analyzers:	**Matt Nurimba, QSTI**
Meter Box Operator:	**Joanne Sufi, QSTI**
Stack Technicians:	**John Bustin**

Energy and Environmental Measurement Corporation (EEMC)

3730 N. Pellegrino Drive, Tucson, Arizona 85749
Phone: (520) 749-2167 Fax: (520) 749-3582
EEMCorp@comcast.net

2751 Enterprise Ave., Ste. 2, Billings, Montana 59102
Phone: (406) 252-4450 Fax: (406) 252-6350

INTRODUCTION

Tucson Iron & Metal contracted with Energy and Environmental Measurement Corporation (EEMC) to conduct a series of compliance emission tests on their Contraband Incinerator System (CIS). The purpose of this report is to outline the sampling and analytical methods employed, report field/laboratory data, and provide test results as outlined in the protocol submitted 03/18/16.

TEST CHRONOLOG

Date/Time	Run	Location	Test Description(s)
06/05/17			
13:05-14:40	1-Gases	CIS	EPA Method 3A
15:22-16:58	2-Gases	CIS	EPA Method 3A
13:05-14:40	1-PT/ SO_2	CIS	EPA Methods 1-5, 6
15:22-16:58	2-PT/ SO_2	CIS	EPA Methods 1-5, 6
06/06/17			
09:10-10:42	3-Gases	CIS	EPA Method 3A
09:10-10:42	3-PT/ SO_2	CIS	EPA Methods 1-5, 6

TEST PROCEDURES

Schematics of the sampling trains are included in the Test Methods section.

$SO_2/O_2/CO_2$ Emissions Testing

A total of three ninety-minute emission tests were conducted for EPA Method 3A and 6[1] standard procedures were employed as outlined below.

CO_2/O_2 Emissions

EPA Method 3A[1] was employed for determination of stack gas CO_2/O_2 concentrations. The stack gases were extracted from the stream and conveyed to Servomex 1440 Carbon Dioxide and Servomex 1400 Oxygen analyzers. Protocol calibration gases were utilized for instrument span checks. Zero was checked with zero N_2 gas. Results were recorded via an integrating/computer logger on a one-minute basis. A full span of 0-19.49% CO_2 and 0-20.99% O_2 was utilized.

Particulate/SO_2 Emission Tests

EPA Methods 1-4, 5, 6[1] was employed for determination of stack flue gas particulate, SO_2 concentration and mass loss. The sample train consisted of a quartz glass button-hook nozzle followed by a heated glass-lined pitobe assembly (S-type pitot tube and a Type K thermocouple) leading to a heated EPA Type A quartz fiber filter (~248 ± 25°F). The filtered gases were then pulled through four Greenberg-Smith impingers (1st - 2nd 100 ml 3% H_2O_2, 3-empty, 4- silica gel). The filtered and dried gases were then pulled, via an umbilical cord, to a dry meter box for gas volume metering.

ED_005878_00000226-00006

TEST PROCEDURES -continued
$SO_2/O_2/CO_2$ Emissions Testing -continued
Particulate/SO_2 Emission Tests - continued
Upon completion of the test run, moisture was determined via gravimetric analysis of the impinger liquid gain. Resultant particulate and SO_2 samples were recovered from the train on site, and removed to the EEMC Tucson, Arizona laboratory for analysis, titration and reporting.

Units of Reporting
The data is reported with the following units:

1) Particulate
   - gr/dscf - grains per dry standard cubic foot (@ 68 °F and 29.92 "Hg)
   - gr/dscf @ 7% O_2 - grains per dry standard cubic foot (@ 68 °F and 29.92 "Hg) and corrected to 7% oxygen
   - gr/dscf @ 12% O_2 - grains per dry standard cubic foot (@ 68 °F and 29.92 "Hg) and corrected to 12% oxygen
   - lb/hr - pounds per hour
2) SO_2
   - lb/hr - pounds per hour
   - ppmvd - parts per million without moisture
   - ppmvd @ 7% O - parts per million without moisture corrected to 7% oxygen
3) Gas Flow
   - FPS - feet per second
   - AWCFM - actual wet cubic feet per minute
   - SDCFH - standard* dry cubic feet per hour, (*@ 68 °F and 29.92 "Hg)
   - Temperature- °F - degrees Fahrenheit
   - Moisture - %v - percent on a volume basis
4) CO_2/O_2 - %vd - percent on a volume basis without moisture

EQUIPMENT DESCRIPTIONS
General Description
The Pima County Department of Environmental Quality (PDEQ) air quality operating permit #127 allows operation of a contraband incinerator located on the site of the Tucson Iron and Metal (TIM) recycling facility. Local law enforcement authorities store contraband marijuana and narcotics as evidence in criminal enforcement actions. Once the evidence is no longer needed, law enforcement requires destruction of the contraband. The TIM incinerator is used to destroy contraband limited to marijuana, cocaine, heroin, methamphetamine, wood, paper, burlap fabric and associated wrapping materials. The contraband is delivered to the site by law enforcement and TIM staff operates the incinerator. The exhaust from the contraband incinerator will be cleaned by adsorbent injection followed by a baghouse prior to discharge to the atmosphere (see flow diagram in section tabulated Stack Parameters).

ED_005878_00000226-00007

EQUIPMENT DESCRIPTIONS -continued

General Description - continued

The pending PDEQ Title V permit #127
renewal application proposes an increase in the narcotics feed rate to 30 lb/hr and the addition of an adsorbent (sodium bicarbonate or Trona) injection system for additional pollution control. All incinerator process off-gases are to be controlled by an afterburner, the use of good combustion practices, a Trona or sodium carbonate sorbent injection system for additional control of sulfur dioxide (SO_2) emissions, and a baghouse on the exhaust for particulate matter emissions control. (the incineration unit definition is in NSPS EEEE, Section 60.2977)

Control Equipment Description

TIM's Contraband Incinerator System (CIS) typically operates about 2 to 3 days per week on a schedule coordinated with C&BP or other law enforcement agency under contract with the company.

The TIM CIS unit is subject to a requirement to measure and record the concentrations of oxygen (O_2) in the incinerator exhaust using a continuous emissions monitoring system (CEMS). The concentration of oxygen must be maintained above 4.0%, 1-hour average.
The contraband to be fed into the CIS unit is primarily combustible carbonaceous vegetative material that upon thermal oxidation is broken down into carbon dioxide (CO_2) and water (H_2O) along with minor amounts of other products of combustion (POC) such as nitrogen oxides (NO_x), particulate matter (PM_{10}), volatile organic compounds (VOCs), hydrogen chloride (HCl) and sulfur dioxide (SO_2). Narcotics and plastic wrapping materials may contain mineral and/or chlorinated compounds, which contribute to ash, HCl and SO_2 formation. Occasionally sulfur compounds such as grease or oil coating the packaging, which upon incineration, are emitted as PM_{10} and SO_2. The proposed contraband feed rate limitation (no more than 2,000 lb/hr of marijuana and 30 lb/hr of narcotics) restricts the available amount of chemical constituents that result in POC from the combustion process.

Maintaining a minimum of 1,400 °F in the secondary combustion chamber (the afterburner), whenever contraband is introduced into the primary combustion chamber, is technically sufficient to assure complete combustion of any partial combustion products in the effluent from the primary combustion chamber.

The induction blower configuration of the baghouse system with fresh air makeup vents built into the incinerator exhaust ductwork is balanced to allow the exhaust ductwork system to operate under negative pressure. Fresh air drawn into the exhaust duct allows the cooling of the hot incinerator exhaust before its introduction into the baghouse for protection of the filter fabric from thermal degradation. Monitoring pressure drop across the filter media by the OSWI unit operator, as specified by the manufacturer for proper fabric filter cleaning, assures maintenance of particulate emissions control efficiency in the system.

ED_005878_00000226-00008

EQUIPMENT DESCRIPTIONS -continued

Control Equipment Description -continued

In summary, the control equipment monitored:

- Completion of the Contraband Incineration Log for each day of testing
- Temperature of gas entering the baghouse (°F)
- Baghouse pressure drop (inches of water)
- Trona feed rate (lb/hr)
- Incinerator outlet oxygen concentration (%)
- Ash bin separation incidents:
  - time each incident occurs
  - duration of each incident (minutes)
  - afterburner chamber temperature at the end of each incident (°F)
  - amount of material recovered during each incident for re-incineration (pounds)

The feed rates were determined by a calculation based upon the total weight of contraband delivered by the law enforcement agency specified on the agency's manifest divided by the maximum feed rate (up to 2000 lb/hour) to determine the minimum amount of time that the incineration of the entire amount took. Contraband is delivered in cardboard boxes or bags that are roughly 30 lbs each and the CIS unit operator assured as uniform a feed rate on an hourly basis as possible, which did not exceed 2000 lb/hour, by sorting the waste delivered onto the feed conveyor over the course of the burn.

COMMENTS

This test series was conducted for PT/SO_2 emissions evaluation. No deviations from protocol or methods were conducted. The ERA Audit Sample Results are included in the Equipment Calibration Section of this report.

RESULTS

This report contains summarizations of all pertinent sampling and analytical results. Field/laboratory data/calculations are included as tabulated. Example calculations are included in the field data/calculations sections. The gas stream and Cyclonic flow were checked on a prior test for species stratification and cyclonic. No significant stratification was found. Cyclonic flow was evaluated and found acceptable. There were no testing or environmental conditions observed that would have affected the test results.

REFERENCES

[1] 40CFR60, App. A, Methods 1-5, 3A and 6, 2016

ED_005878_00000226-00009

COMPLIANCE STATEMENT
Tucson Iron & Metal
Tucson, Arizona

Pima County Air Quality Permit 127, expires 04/21/15
Source: Contraband Incinerator System
06/05-06/17

Particulate Matter

Emission Standard	Measured Emissions	Compliance
0.08 gr/dscf @ 12% CO_2*	0.07 @ 12% CO_2	Pass
0.013 gr/dscf @ 7% O_2 (Filterable)**	0.009 gr/dscf @ 7% O_2	Pass

Species	Emission Standard	Measured Emissions	
SO_2	3.1 ppm @ 7% O_2**	0.0 ppmvd @ 7% O_2	Pass

* PCDEQ permit 127
** 40CFR60, Subpart EEEE

ED_005878_00000226-00010

August 4, 2015

By E-MAIL:
gary@tucsoniron.net

Gary Kippur, President
Tucson Iron and Metal
P.O. Box 28898
Tucson, Arizona 85726

RE: Air Quality Operating Permit Renewal Application for Tucson Iron and Metal (Permit #127)

Dear Mr. Kippur,

Pursuant to Pima County Code (PCC) 17.12.165.E.5, the Pima County Department of Environmental Quality (PDEQ), has determined that additional information is required to support your permit renewal application submitted September 9, 2014.

Based on the discussion at our last meeting on June 22, 2015, we focused on the applicability of the New Source Performance Standards (NSPS) for Other Solid Waste Incineration Units (OSWI) (40 CFR Subpart EEEE), on your Tucson facility operations. PDEQ contacted the following EPA office for guidance:

Fuel and Incineration Group
Sector Policies and Program Division,
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency

EPA has determined that the operation of a privately owned incineration unit that combusts contraband is not excluded from the applicable NSPS rule. Under the current NSPS OSWI rule, a privately owned unit(s) combusting contraband would be required to obtain a title V permit and comply with the emission limitations and other requirements of the OSWI rule.

PDEQ is hereby notifying you that an updated permit application to reflect the applicability of 40 CFR Part 60, Subpart EEEE rule is required for your Tucson facility. You must meet the operating limits established by the rule within 180 days.

If you would like to discuss this issue with PDEQ or the above EPA office, please contact me at 724-7341 and we can set up a meeting or conference call.

Sincerely,

Rupesh Patel

Rupesh Patel
Air Permit Manager

CC: Steve Kippur, Manager, Tucson Iron and Metal: steve@amcepmetals.com

ED_005878_00000226-00011

PIMA COUNTY DEPARTMENT OF ENVIRONMENTAL QUALITY

33 N. Stone Avenue, Suite 700 · Tucson, Arizona 85701 · Phone: (520) 243-7400

AIR QUALITY OPERATING PERMIT

(As required by Title 17.12, Article II, Pima County Code)

ISSUED TO

TUCSON IRON & METAL

4484 EAST TENNESSEE STREET
TUCSON, ARIZONA 85701

This air quality operating permit does not relieve applicant of responsibility for meeting all air pollution regulations

THIS PERMIT ISSUED SUBJECT TO THE SPECIFIC CONDITIONS IDENTIFIED IN THIS PERMIT.

PDEQ PERMIT NUMBER **127** PERMIT CLASS **II**

PERMIT ISSUED **APRIL 22, 2010** EXPIRES **APRIL 21, 2015**

REVISED **APRIL 28, 2011**

Mukonde Chama P.E., Air Permits Supervisor, PDEQ

SIGNATURE TITLE

ED_005878_00000226-00012

PERMIT SUMMARY

Tucson Iron and Metal (TIM) is a metal recycling facility located at 4484 East Tennessee Street, Tucson, Arizona. Permitted activities which produce air emissions include a secondary aluminum sweater and a incinerator.

The secondary aluminum sweat furnace is used exclusively to reclaim aluminum scrap. The incinerator is used to destroy materials that are limited to: *marijuana, cocaine, methamphetamine, pharmaceuticals, wood, paper, burlap/fabric and associated wrapping.*

For the purposes of this permit, "pharmaceutical" means any chemical product, vaccine or allergenic (including any product with the primary purpose to dispense or deliver a chemical product, vaccine or allergenic), not containing a radioactive component, that is intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease or injury in man or other animals; or any chemical product, vaccine or allergenic (including any product with the primary purpose to dispense or deliver a chemical product, vaccine or allergenic), not containing a radioactive component, that is intended to affect the structure or function of the body in man or other animals. This definition includes products such as transdermal patches, and oral delivery devices such as gums or lozenges. This definition does not include sharps or other infectious or biohazardous waste, dental amalgams, medical devices not used for delivery or dispensing purposes, equipment, contaminated personal protective equipment or contaminated cleaning materials.

This operating permit is the second five-year permit issued to TIM, the Permittee. Potential emissions resulting from the facility operations include NO_X, VOC, HAPs, PM_{10}, SO_X and CO. This facility is a true minor source for all pollutants.

The following emission rates are for reference purposes only and are not intended to be enforced by direct measurement unless otherwise noted in the Specific Conditions of this permit.

Pollutant	Potential Emissions* (Tons per Year)
Nitrogen Oxides (NO_X)	6.16
Carbon Monoxide (CO)	71.22
Volatile Organic Compounds (VOC)	4.49
Particulate Matter (as PM_{10})	1.07
Sulfur Oxides (SO_2 + SO_3)	26.22
Hazardous Air Pollutants (HAPs – total)	< 1.0

* Emissions extrapolated from stack test data dated 10/09/2007 and AP-42 Chapter 1, Section 4, Natural Gas Combustion.

All requirements of this permit that are Federally Enforceable or Material Permit Conditions are specifically indicated as such.

Section A

Specific Conditions for NESHAP Affected Equipment

The provisions of Section A apply to the Aluminum Sweat Furnace identified in Table 1 of Attachment 2. Unless otherwise identified, all conditions in this Section are **Federally Enforceable Conditions.**

A. Emission Limitations and Standards

1. Dioxin/Furan (D/F) Standard

   The Permittee must not discharge or cause to be discharged from the aluminum sweat furnace to the atmosphere emissions in excess of 0.80 nanogram (ng) of D/F TEQ[1] emissions per dscm (3.5 x 10^{-10} gr per dscf) at 11 percent oxygen (O_2). [40 CFR 63.1505(f)(2)]

2. Fuel Limitation Standard

   The Permittee shall fire the aluminum sweat furnace exclusively with pipeline quality natural gas. [PCC 17.12.190.B]
   [Locally Enforceable & Material Permit Condition]

B. Monitoring Requirements

1. Afterburner Operation

   a. The aluminum sweat furnace afterburner shall be operated in accordance with the Operation, Maintenance and Monitoring (OM&M) Plan in B.3 of the Monitoring Requirements. [40 CFR 63.1506(h)(2)]

   b. The Permittee is not required to conduct a performance test to demonstrate compliance with the emission standard of A.1 of this Section, provided that the Permittee operates and maintains an afterburner with a design residence time[2] of 0.8 seconds or greater and maintains the 3-hr block average operating temperature of the afterburner at or above 1600°F. [40 CFR 63.1505(f)(1) & 40 CFR 63.1506(h)(1)]
   [Material Permit Condition]

2. Afterburner Monitoring

   a. The Permittee must install, calibrate, maintain, and operate a device to continuously monitor and record the operating temperature of the afterburner consistent with the requirements for continuous monitoring systems in subpart A of 40 CFR 63. [40 CFR 63.1510 (g)(1)]

   b. The temperature monitoring device must meet each of these performance and equipment specifications: [40 CFR 63.1510 (g)(2)]

      i. The temperature monitoring device must be installed at the exit of the combustion zone of the afterburner; [40 CFR 63.1510 (g)(2)(i)]

[1] D/F means dioxin /furan. *TEQ* means the international method of expressing toxicity equivalents for dioxins and furans as defined in "Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs) and 1989 Update" (EPA-625/3-89-016), available from the National Technical Information Service (NTIS).
[2] See Technical Support Document for the definition of Residence Time (Section VI.G).

i. Process and control device parameters to be monitored to determine compliance, along with established operating levels or ranges as applicable for the sweat furnace and afterburner; [40 CFR 63.1510(b)(1)]

ii. A monitoring schedule for the sweat furnace and afterburner; [40 CFR 63.1510(b)(2)]

iii. Procedures for the proper operation and maintenance of the sweat furnace and afterburner; [40 CFR 63.1510(b)(3)]

iv. Procedures for the proper operation and maintenance of monitoring devices used to determine compliance with the emission limitation in A.1 of this Section, including calibration and certification of accuracy of each monitoring device, at least once every 6 months, according to the manufacturer's instructions; [40 CFR 63.1510(b)(4) & 40 CFR 63.1510(b)(4)(i)]

v. Procedures for monitoring the aluminum sweat furnace process and afterburner parameters, including procedures for annual inspections of afterburners, and if applicable, the procedure to be used for determining charge/feed (or throughput) weight if a measurement device is not used; [40 CFR 63.1510(b)(5)]

vi. Corrective actions to be taken when the aluminum sweat furnace process or operating parameters or afterburner parameters deviate from the value or range established by B.3.a.i of this Section, including: [40 CFR 63.1510(b)(6)]

(A). Procedures to determine and record the cause of a deviation or excursion, and the time the deviation or excursion began and ended; and [40 CFR 63.1510(b)(6)(i)]

(B). Procedures for recording the corrective action taken, the time corrective action was initiated, and the time/date corrective action was completed. [40 CFR 63.1510(b)(6)(ii)]

vii. A maintenance schedule for the aluminum sweat furnace process and afterburner that is consistent with the manufacturer's instructions and recommendations for routine and long-term maintenance. [40 CFR 63.1510(b)(7)]

b. Based on the results from requirements under B.3 of this Section, the Control Officer may require that the Permittee make changes to the OM&M plan if the Control Officer or Administrator finds that the plan: [40 CFR 63.1510(b)]

i. Does not address a deficiency that has occurred;

ii. Fails to provide for the proper operation of, the affected source, the air pollution control techniques, or the control system and process monitoring equipment during a malfunction in a manner consistent with good air pollution control practices; or;

iii. Does not provide adequate procedures for correcting malfunctioning process equipment, air pollution control techniques, monitoring equipment or other deficiency's as quickly as practicable.

c. If the Permittee determines that any other revisions of the OM&M plan are necessary, such revisions will not become effective until the Permittee submits a description of the changes and a revised plan incorporating them to the Control Officer. [40 CFR 63.1510(b)]

C. Recordkeeping Requirements

1. Operational Log

The Permittee record the results of the required monitoring on the Aluminum Sweat Furnace according to the approved OM&M plan and the Start-up, Shutdown and Malfunction Plan (SSM). [PCC 17.12.185 A.4]

[Locally Enforceable Condition]

2. Afterburner Temperature Log

The Permittee shall maintain records of 15-minute block average afterburner operating temperature, including any period when the average temperature in any 3-hour block period falls below the compliant operating parameter value with a brief explanation of the cause of the excursion and the corrective action taken. The Permittee shall also maintain records of annual afterburner inspections. [40 CFR 63.1517(b)(2)]

3. Record Retention

The Permittee must retain each record for at least 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. The most recent 2 years of records must be retained at the facility. The remaining 3 years of records may be retained off site. [40 CFR 63.1517(a)(1)]

4. Other Recordkeeping Requirements

See Additional Permit Requirements.

D. Reporting Requirements [PCC 17.12.185 A.5]

1. Startup, Shutdown, and Malfunction Plans (SSM)

The Permittee shall develop and implement a written plan as described in 40 CFR 63.6(e)(3) that contains specific procedures to be followed for operating and maintaining the source during periods of startup, shutdown, and malfunction, and a program of corrective action for malfunctioning process and air pollution control equipment used to comply with the standard. The Permittee shall also keep records of each event as required by 40 CFR 63.10(b) and record and report if an action taken during a startup, shutdown, or malfunction is not consistent with the procedures in the plan as described in 40 CFR 63.6(e)(3). In addition to the information required in 40 CFR 63.6(e)(3), the plan must include: [40 CFR 63.1516 (a)]

a. Procedures to determine and record the cause of the malfunction and the time the malfunction began and ended; and, [40 CFR 63.1516 (a)(1)]

b. Corrective actions to be taken in the event of a malfunction of aluminum sweat furnace or the afterburner, including procedures for recording the actions taken to correct the malfunction or minimize emissions. [40 CFR 63.1516 (a)(2)]

Section B

Specific Conditions for the Incinerator

The provisions of Section B apply to the Incinerator identified in Table 2 of Attachment 2.

A. Emission Limitations and Standards [PCC 17.12.185.A.2]

1. Operating Hour Limitation

Permittee shall limit the hours of operation of the incinerator to daylight hours between the times of official sunrise and sunset. [PCC 17.16.170.A]
[Material Permit Condition]

2. Emissions Limitation

Emissions from the incinerator stack shall not exceed 0.08 grains per cubic foot (0.18 grams/m^3), based on dry flue gas at standard conditions, corrected to 12 percent CO_2.
[PCC 17.16.170.C.1 & PCC 17.16.510.B]
[Material Permit Condition]

3. Operation and Maintenance

a. Permittee shall operate and maintain the incinerator in accordance with the approved operation and maintenance plan detailed in B.3 of this Section. [PCC 17.12.220.B]

b. All emissions from the incinerator (operating in either batch or rotary mode) must pass through the baghouse and exhaust out of the stack. The incinerator, baghouse, cooling towers and associated ductwork must be maintained and operated using good modern practices.
[PCC 17.12.185.A.2]
[Material Permit Condition]

c. The incinerator shall be operated in a manner that minimizes production of fugitive emissions.
[PCC 17.12.185.A.2]
[Material Permit Condition]

4. Process Limitation

Permittee shall not incinerate any substance other than marijuana, cocaine, metamphetamine, pharmaceuticals, wood, paper, burlap/fabric and associated wrapping. In no instance shall the Permittee use any other combustion material (other than that above) to facilitate burning. The Permittee may use propane gas to ignite or sustain the incineration process.

5. Opacity Limitation

Permittee shall not cause, allow, or permit to be emitted into the atmosphere, smoke, fumes, gases, particulate matter or other gas-borne material which exceeds 20 percent opacity. [PCC 17.16.170.B]
[Federally Enforceable Condition]

6. Emissions and Opacity Limitation Exemption

The incineration process shall be exempt from the emission and opacity requirements described in subsections A.2 and A.5 of this Section respectively for not more than 30 seconds in any 60-minute period. [PCC 17.16.170.E]

4. If the Control Officer determines that the operation and maintenance plan, detailed in B.2 of this Section, failed to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the Permittee shall revise the operation and maintenance plan within 30 days after such an event occurs.

5. At all times, including periods of startup, shutdown, and malfunction, the Permittee shall operate and maintain the incinerator operations in a manner consistent with good air pollution control practices, consistent with the operation and maintenance plan required by B.2 of this Section.

C. Recordkeeping Requirements [PCC 17.12.185 A.4]

1. The Permittee shall record all monitoring results during start up, operation and shut down of the incinerator as detailed in the incinerator operation and maintenance plan.

2. The Permittee shall record all malfunctions/defects during start up, operation and shutdown of the incinerator (if none then the record shall state none).

3. All records shall be retained for a minimum of five years and shall be made available to the Control Officer upon request.

D. Reporting Requirements [PCC 17.12.185 A.5]

The Permittee shall report to the Control Officer any emissions in excess of the limits established by this permit. [PCC 17.12.040]

E. Testing Requirements [PCC 17.20.010]

1. The incinerator shall be tested for compliance with the mass emission limit in A.2 of this Section at least once during the permit term.

2. The reference methods in 40 CFR 60, Appendix A, shall be used to determine compliance with the mass emission standard as follows: [PCC 17.16.170 G.1]

   a. Method 4 and 5 for the concentration of particulate matter and the associated moisture content;

   b. Method 1 for sample and velocity traverses;

   c. Method 2 for velocity and volumetric flow rate;

   d. Method 3 for gas analysis and calculation of excess air, using the integrated sampling technique.

3. For Method 5, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be 0.85 dscm (30.0 dscf) except that smaller sampling times or sample volumes, when necessitated by process variables or other factors, may be approved by the Control Officer. [PCC 17.16.170.G.2]

4. EPA Test Method 9 may be used to monitor compliance with the opacity standard in A.5 of this Section. [PCC 17.20.010]

ADDITIONAL PERMIT REQUIREMENTS

I. Compliance with Permit Conditions [PCC 17.12.185.A.7.a & b]

A. The Permittee shall comply with all conditions of this permit including all applicable requirements of Arizona air quality statutes and the air quality rules. Any permit noncompliance constitutes a violation of the Arizona Revised Statutes and is grounds for enforcement action; for permit termination, revocation and reissuance, or revision; or for denial of a permit renewal application. In addition, noncompliance with any federally enforceable requirement constitutes a violation of the Clean Air Act.

B. The Permittee shall report to the Control Officer any emissions in excess of the limits established by this permit. The report shall be in 2 parts as specified below: [PCC 17.12.185.A.5 & PCC 17.12.040]

1 Notification by telephone or facsimile within 24 hours of the time the Permittee first learned of the occurrence of excess emission that includes all available information pursuant to PCC 17.12.040.B. To report excess emissions call **520-243-7400** or fax to **520-838-7432.**

2. Detailed written notification by submission of an excess emissions report within 72 hours of the notification in I.B.1 above. Send to **PDEQ 33 N. Stone Avenue, Suite 700, Tucson, Arizona 85701.**

C. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. The permit does not convey any property rights of any sort, or any exclusive privilege to the permit holder.

E. The Permittee shall pay fees to the Control Officer pursuant to PCC 17.12.510. [PCC 17.12.185.A.9 & PCC 17.12.510]

II. Permit Revision, Reopening, Revocation and Reissuance, or Termination for Cause [PCC 17.12.185.A.7.c]

The permit may be revised, reopened, revoked and reissued, or terminated for cause pursuant to PCC 17.12.270. The filing of a request by the Permittee for a permit revision, revocation and reissuance, or termination; or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

III. Duty To Provide Information [PCC 17.12.165.G & PCC 17.12.185.A.7.e]

A. The Permittee shall furnish to the Control Officer, within a reasonable time, any information that the Control Officer may request in writing to determine whether cause exists for revising, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the Permittee shall also furnish to the Control Officer copies of records required to be kept by the permit. For information claimed to be confidential, the Permittee shall furnish a copy of such records to the Control Officer along with a claim of confidentiality.

B. If the Permittee has failed to submit any relevant facts or if the Permittee has submitted incorrect information in the permit application, the Permittee shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information.

IV. Severability Clause [PCC 17.12.185.A.6]

The provisions of this permit are severable. If any provision of this permit is held invalid, the remainder of this permit shall not be affected thereby.

ATTACHMENT 2

EQUIPMENT LIST

Type of Equipment	Maximum Rated Capacity	Fuel(s)	Make	Model	Serial Number	Date of Manufacture
Aluminum Sweat Furnace	5 MMBtu	Natural Gas	Al-Jon	AS-990	94980	1984
Rotary Incinerator	20,000 lbs/day	Natural Gas	Kipco	1A	001	2005
Batch Incinerator	8000 lbs/day	Natural Gas	Hoover (Custom)	N/A	N/A	Unknown
Baghouse	35,000 CFM	Electricity	OSA Sheet Metal	D-774B	N/A	1977
Baghouse	50,000 CFM	Electricity	Industrial Accessories Company	120BHT-A3-364-60S	N/A	Unknown
Afterburner	2.8 MM Btu	Natural Gas	Mideo	Indinamite Burners	N/A	Unknown

Tucson Iron & Metal
Contraband Incinerator
SO_2 Compliance Summary

Tucson, Arizona
06/05/17

Time	Run	ADCFM	DSCFH	Ts °F	Ps "Hg	H_2O %v	SO_2 ppmvd	SO_2 ppmva	SO_2 lb/hr	SO_2 ppmvd @ 7% O_2	O_2 %vd	V/M ft^3/ lbmole
13:05-14:40	1-Gases	32,941.7	1,309,800.5	263.5	27.169	3.96	0.0	0.0	0.0	0.0	17.91	581.37
15:22-16:58	2-Gases	31,169.8	1,243,353.7	261.3	27.174	3.70	0.0	0.0	0.0	0.0	18.28	581.37
09:10-10:42	3-Gases	31,122.7	1,240,541.8	262.8	27.210	3.77	0.0	0.0	0.0	0.0	18.46	581.37
Mean 1-3 Cmp 1		**31,744.7**	**1,264,565.3**	**262.5**	**27.184**	**3.81**	**0.0**	**0.0**	**0.0**	**0.0**	**18.20**	**581.37**

Gas flow from concurrent particulate runs

Run 1 Example Calculations:

Two methods for calculating SO_2 lb/hr:

1) Using Gas Laws (same as Method 7E and 10)

SO_2 lb/hr =(0.000060*ADCFM*ppmvd*MW SO_2)/(V/M)

SO_2 lb/hr = 0.00

MW SO_2 = 64

2) Using EPA Method 6:

SO_2 lb/hr = =(SO_2 lb/dscf)*(dscf/hr)

0.00

SO_2 lb/dscf= =(0.00007061*N*Ml Ba^{++})/(dscf)

0.00E+00

Convert ppmvd to ppmvd @ 7% O_2

SO_2 ppmvd @ 7% O_2 = (13.9/(20.9-17.91%vO_2))*(0.0 SO_2 ppmvd)

= 0.0 ppmvd @ 7% O_2

ED_005878_00000226-00021

Tucson Iron & Metal
Contraband Incinerator
Tucson, Arizona
PT/O_2/CO_2 Emission Data
06/05-06/17

Run	Time	CO_2	O_2
		%vd	
1-Gases	13:05-14:40	2.34	17.91
2-Gases	15:22-16:58	2.02	18.28
3-Gases	09:10-10:42	2.14	18.46
Mean		**2.17**	**18.22**

Gas Stream Characteristics						
Run	**Time**	**AWCFM**	**ADCFM**	**DSCFH**	**T_s, °F**	**H_2O %v**
1-PTSO2	13:05-14:40	34,300.0	32,941.7	1,309,800.5	263.5	3.96
2-PTSO2	15:22-16:58	32,367.4	31,169.8	1,243,353.7	261.3	3.70
3-PTSO2	09:10-10:42	32,342.0	31,122.7	1,240,541.8	262.8	3.77
Mean		**33,003.1**	**31,744.7**	**1,264,565.3**	**262.5**	**3.81**

Run	Time	Particulate			
		gr/dscf	gr/dscf @	gr/dscf @	lb/hr
			12% CO_2	7% O_2	
1-PTSO2	13:05-14:40	0.0031	0.0159	0.0144	0.58
2-PTSO2	15:22-16:58	0.0011	0.0065	0.0058	0.20
3-PTSO2	09:10-10:42	0.0012	0.0067	0.0068	0.21
Mean		**0.0018**	**0.0097**	**0.0090**	**0.33**

Example Run1:

Concentration at 12% CO_2 =(gr/dscf)(12/%CO_2)

gr/dscf @12% CO_2 =(gr/dscf)(12/%CO_2)

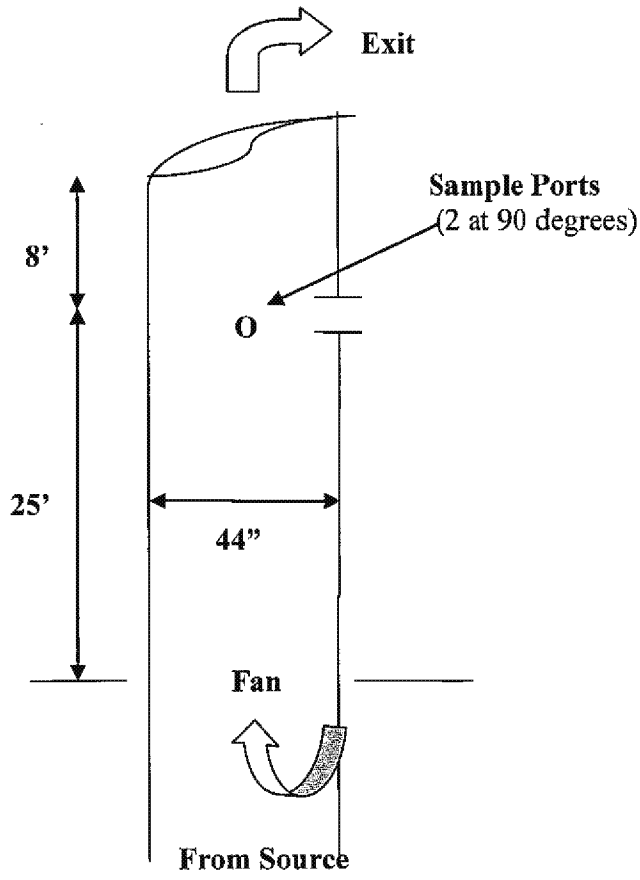
0.0159

Concentration at 7% O_2 =(gr/dscf)(20.9-7.0)/(20.9-%O_2)

gr/dscf @7% O_2 =(gr/dscf)(20.9-7.0)/(20.9-%O_2)

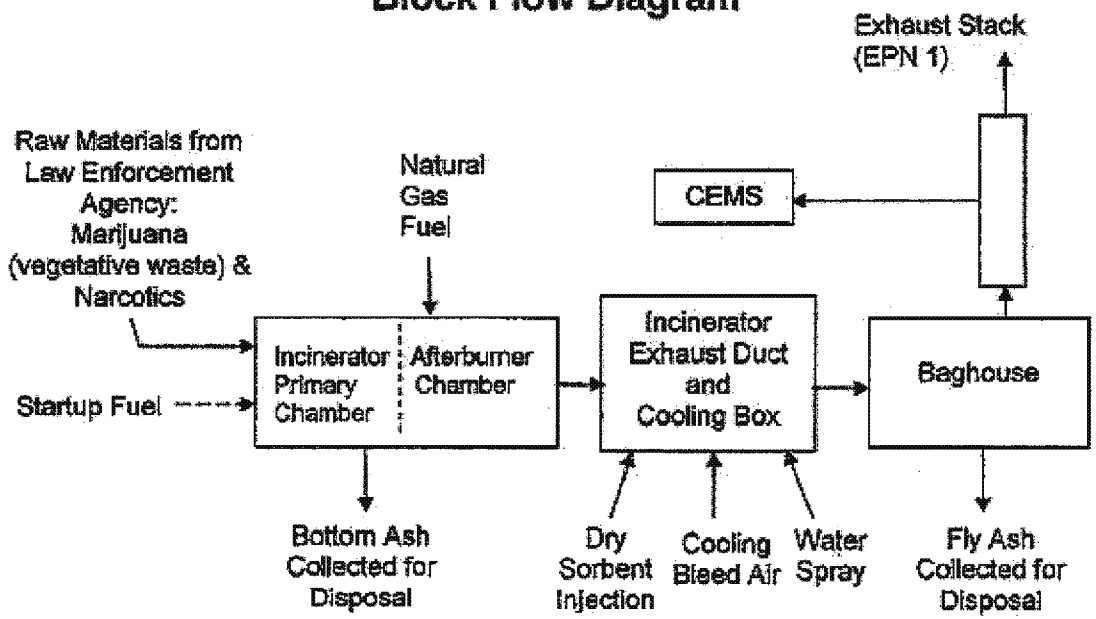
0.0144

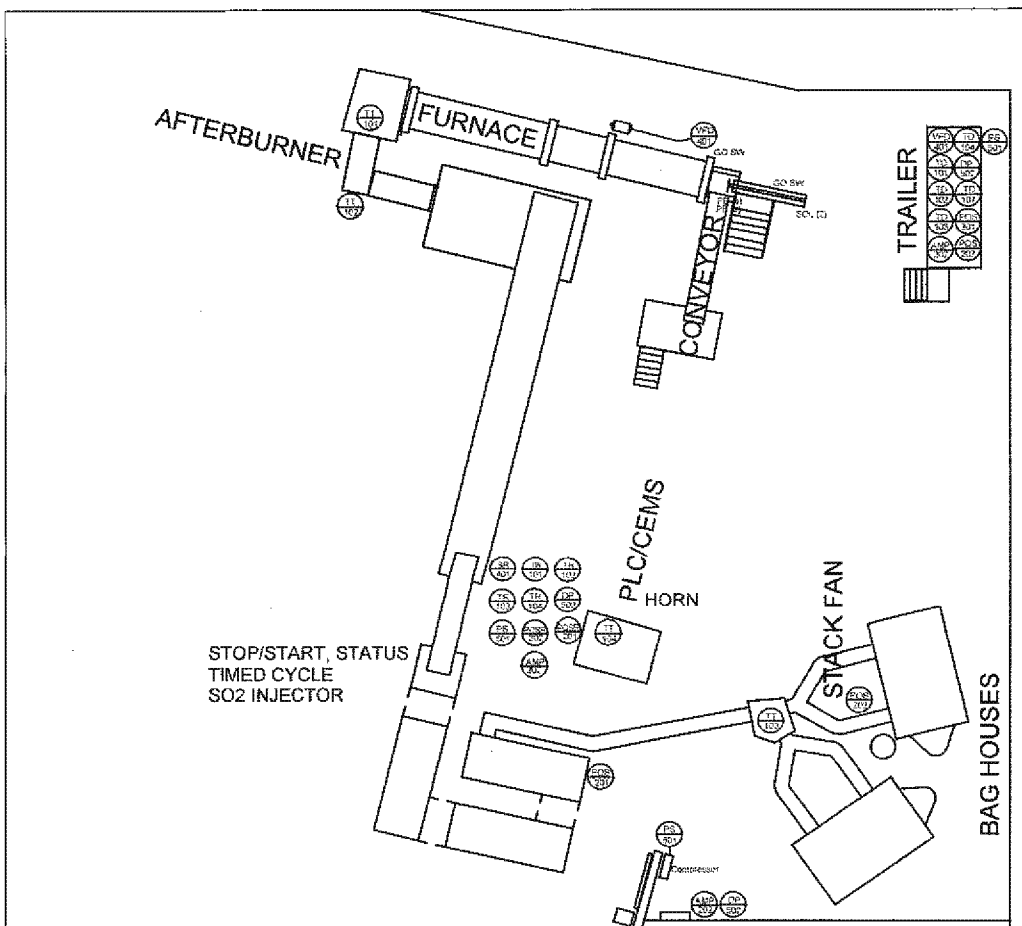
STACK PARAMETERS
Tucson Iron and Metal
Incinerator Stack Baghouse



ED_005878_00000226-00023

Tucson Iron & Metal
Block Flow Diagram





N

LEGEND
TT - Temperture Transmitter
CV - Control Valve
WV - Water Valve
TD - Temperture Display
TR - Temperture Recorder
CVD - Control Valve Display
SP - Speed Recorder
VR - Valve Position Recorder
VFD - Variable Frequency Drive
POS - Position Accuator with 2 LS's

STOP/START, STATUS CONTROLS FOR
FAN (2) ASH BLOWER,
AND (2) SCREW CONVEYORS

06/05-06/17 Tucson Iron & Metal

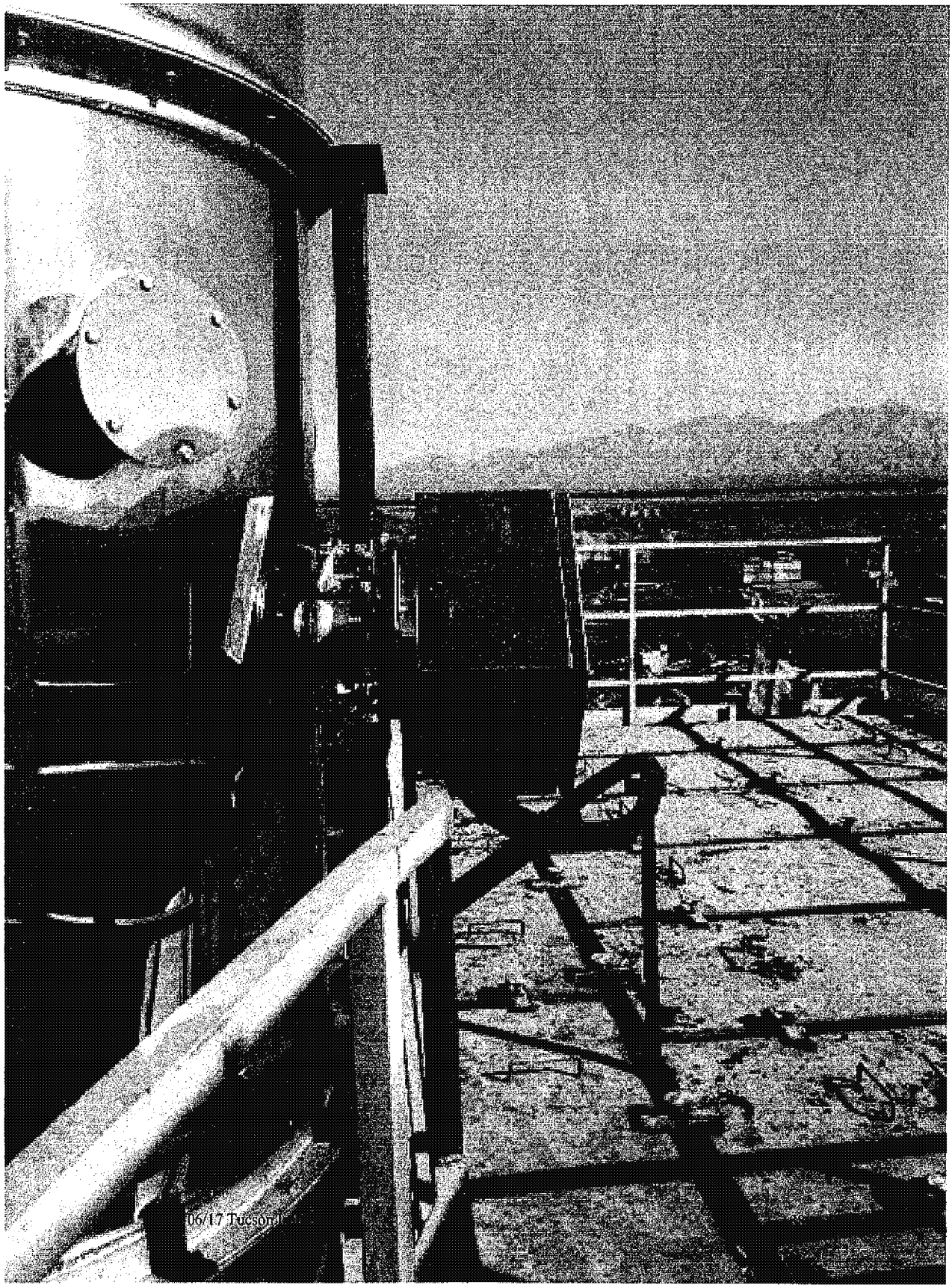
REV. NO.	REVISIONS	BY	DATE	REFERENCE DRAWINGS	DRAWN BY	DATE
1	Reposition Dilution Air Damper	B B	10/26/16			
2	Reposition Afterburner and add South Bag house TC	B B	11/4/16			
3						
4						
5						
					B.Baker	05/16/2016

AMCEP

4484 E. Tennessee St. Tucson, AZ
Instrumentation

36

SCALE: NONE | SHEET NUMBER: 1 of 1 | DRAWING NUMBER: 705


06/17 Tucson

EPA Method 3A
Carbon Dioxide/Oxygen/Example Calculation

EEMC

COMPANY NAME: Tucson Iron & Metal	RUN: 1- Gases
PLANT LOCATION: Tucson, AZ	TEST DATE: 6/5/17
SOURCE TESTED: Contraband Incinerator	

Calculate the "Calibration Corrected CO_2 Value", C_{GAS} - EPA Reference Method 3A

C_{GAS} = $(C_{Mean} - C_O)[C_{MA}/(C_M - C_O)]$
C_{GAS} = corrected gas concentration, CO_2 %vd

C_{Mean} = average gas % from analyzer
C_{Mean} = 2.381 ②

C_O = average of initial and final (post) system bias calibration check for zero calibration gas
C_O = (0.1 % ①Initial Bias + 0.1 % ①Post Bias)/2 = 0.1 % ①
C_{MA} = actual concentration of upscale calibration gas
C_{MA} = 10.99 ①% (Tank Value)
C_M = average of initial and final (post) system bias calibration check for upscale calibration gas
C_M = (10.8 %①Initial Bias + 10.8 % ① Post Bias)/2 = 10.8 % ①

C_{GAS} = (2.381 C_{Mean} - 0.1 C_O)[10.99 C_{MA}/(10.8 C_M - 0.1 C_O)]
= 2.34 ①

Calculate the "Calibration Corrected O_2 Value", C_{GAS} - EPA Reference Method 3A

C_{GAS} = $(C_{Mean} - C_O)[C_{MA}/(C_M - C_O)]$
C_{GAS} = corrected gas concentration, O_2 %vd

C_{Mean} = average gas % from analyzer
C_{Mean} = 18.09

C_O = average of initial and final (post) system bias calibration check for zero calibration gas
C_O = (0 % ①Initial Bias + 0 % ①Post Bias)/2 = 0.0 % ①
C_{MA} = actual concentration of upscale calibration gas
C_{MA} = 10.94 ①% (Tank Value)
C_M = (11.3 %①Initial Bias + 10.8 % ① Post Bias)/2 = 11.05 % ①

C_{GAS} = (18.09 C_{Mean} - 0.0 C_O)[10.94 C_{MA}/(11.05 C_M - 0.0 C_O)]
= 17.91 ①

EEMCFILES/ReportResources/Forms: Revised 01/22/14 jll

Emission Data
EPA Methods 3A

Client:	**Tucson Iron & Metal**	**Run:**	**1-Gases**
Location:	**Tucson, Arizona**	**Time:**	**13:05-14:40**
Source:	**Contraband Incinerator**	**Date:**	**06/05/17**

	Time	O_2 %vd	CO_2 %vd		Time	O_2 %vd	CO_2 %vd
1	13:05	17.72	2.81	36	13:40	17.92	2.54
2	13:06	17.73	2.78	37	13:41	17.89	2.57
3	13:07	17.76	2.71	38	13:42	18.02	2.47
4	13:08	17.86	2.61	39	13:43	17.95	2.50
5	13:09	17.93	2.50	40	13:44	17.92	2.53
6	13:10	17.95	2.50	41	13:45	17.90	2.54
7	13:11	17.90	2.50	42	13:46	17.90	2.54
8	13:12	17.90	2.50	43	13:47	17.94	2.53
9	13:13	17.90	2.53	44	13:48	17.96	2.48
10	13:14	17.87	2.53	45	13:49	18.01	2.44
11	13:15	17.84	2.59	46	13:50	18.02	2.44
12	13:16	17.91	2.54	47	13:51	18.01	2.43
13	13:17	17.97	2.45	48	13:52	17.97	2.47
14	13:18	18.04	2.41	49	13:53	18.17	2.33
15	13:19	18.08	2.36	50	13:54	18.45	2.28
16	13:20	17.97	2.46	51	13:55	18.65	2.13
17	13:21	17.81	2.59	52	13:56	18.64	2.15
18	13:22	17.87	2.53	53	13:57	18.39	2.23
19	13:23	17.94	2.48	54	13:58	18.33	2.22
20	13:24	17.97	2.44	55	13:59	18.44	2.10
21	13:25	17.94	2.46	56	14:00	18.39	2.14
22	13:26	17.91	2.50	57	14:01	18.40	2.11
23	13:27	18.03	2.42	58	14:02	18.32	2.22
24	13:28	17.86	2.55	59	14:03	18.35	2.28
25	13:29	17.99	2.43	60	14:04	18.22	2.44
26	13:30	17.95	2.50	61	14:05	18.29	2.24
27	13:31	18.08	2.40	62	14:06	18.33	2.17
28	13:32	18.00	2.44	63	14:07	18.45	2.06
29	13:33	17.90	2.58	64	14:08	18.26	2.17
30	13:34	17.90	2.57	65	14:09	18.19	2.27
31	13:35	17.91	2.57	66	14:10	18.34	2.16
32	13:36	17.96	2.50	67	14:11	18.30	2.20
33	13:37	17.87	2.59	68	14:12	18.25	2.25
34	13:38	17.95	2.52	69	14:13	18.30	2.18
35	13:39	17.94	2.54	70	14:14	18.38	2.11

ED_005878_00000226-00028

Client:	**Tucson Iron & Metal**	**Run:**	**1-Gases**
Source:	**Contraband Incinerator**	**Date:**	**06/05/17**

Instrument Calibration Checks

ACE (≤2% span or 0.5 ppmvd)	SB_i/SB_f (≤5% span or 0.5 ppmvd)	D (≤3% span or 0.5 ppmvd)

O_2 Instrument

ACE	Time	Value, C_v	Resp., C_{Dir}	ACE	CS:	20.99 %vd
(Calibration	11:08	0.00	0.00	0.0 %		
Error Tests)	11:18	10.94	10.92	-0.1 %		
	11:13	20.99	21.00	0.0 %		
SB_i	**Time**	**Resp, C_{Dir}**	**Resp, C_s**	**SB_i**		
(Initial System	11:22	0.00	0.00	0.0 %		
Bias Check)	11:25	10.92	11.30	1.8 %		
SB_f	**Time**	**Resp, C_{Dir}**	**Resp, C_s**	**SB_f**		**D $\|SB_f - Sb_i\|$ *Drift***
(Post System	14:46	0.00	0.00	0.0 %		0.0
Bias Check)	14:49	10.92	10.80	-0.6 %		2.4

CO_2 Instrument

ACE	Time	Value, C_v	Resp., C_{Dir}	ACE	CS:	19.49 %vd
(Calibration	11:08	0.00	0.10	0.5 %		
Error Tests)	11:18	10.99	10.84	-0.8 %		
	11:13	19.49	19.53	0.2 %		
SB_i	**Time**	**Resp, C_{Dir}**	**Resp, C_s**	**SB_i**		
(Initial System	11:22	0.10	0.10	0.0 %		
Bias Check)	11:25	10.84	10.80	-0.2 %		
SB_f	**Time**	**Resp, C_{Dir}**	**Resp, C_s**	**SB_f**		**D $\|SB_f - Sb_i\|$ *Drift***
(Post System	14:46	0.10	0.10	0.0 %		0.0
Bias Check)	14:49	10.84	10.80	-0.2 %		0.0

Data From Concurrent Traverse:		**Calculations:**	
P_s	27.169 "Hg	**Averages:**	
Gas Flow	32,941.7 adcfm	O_2	18.090 %vd
Avg. Temp, T_s	263.5 °F	CO_2	2.381 %vd
	723.5 °A (°R)		
NO_x Molecular Wt.	46	Calibration Corrected Values:	
CO Molecular Wt.	28	O_2	17.91 %vd
		CO_2	2.34 %vd
cu.ft/lb-mole			
Act Conditions	581.374 ft^3/lbmole		

ED_005878_00000226-00029

Client:	Tucson Iron & Metal	Run:	2-Gases
Source:	Contraband Incinerator	Date:	06/05/17

	Time	O_2 %vd	CO_2 %vd
71	16:32	18.24	2.24
72	16:33	18.23	2.24
73	16:34	18.30	2.19
74	16:35	18.39	2.14
75	16:36	18.34	2.15
76	16:37	18.33	2.17
77	16:38	18.34	2.16
78	16:39	18.46	2.06
79	16:40	18.51	2.03
80	16:41	18.51	2.03
81	16:42	18.44	2.09
82	16:43	18.60	1.94
83	16:44	18.53	2.00
84	16:45	18.66	1.89
85	16:46	18.68	1.90
86	16:47	18.59	1.95
87	16:48	18.62	1.94
88	16:49	18.65	1.91
89	16:50	18.62	1.95
90	16:51	18.77	1.77
91	16:52	18.88	1.71
92	16:53	18.87	1.72
93	16:54	18.89	1.69
94	16:55	18.88	1.69
95	16:56	18.84	1.73
96	16:57	18.82	1.74
97	16:58	18.99	1.60

	O_2 %vd	CO_2 %vd
Averages:	18.460	2.063

Instrument Response Times:

	Zero	High
O_2	38	38 seconds
CO_2	35	35 seconds

ED_005878_00000226-00030

Emission Data
EPA Methods 3A

Client:	**Tucson Iron & Metal**	**Run:**	**3-Gases**
Location:	**Tucson, Arizona**	**Time:**	**09:10-10:42**
Source:	**Contraband Incinerator**	**Date:**	**06/06/17**

	Time	O_2 %vd	CO_2 %vd		Time	O_2 %vd	CO_2 %vd
1	09:10	18.18	2.30	36	09:45	18.36	2.17
2	09:11	18.14	2.30	37	09:46	18.33	2.18
3	09:12	18.15	2.34	38	09:47	18.21	2.29
4	09:13	18.11	2.30	39	09:48	18.35	2.21
5	09:14	18.19	2.30	40	09:49	18.31	2.24
6	09:15	18.19	2.30	41	09:50	18.30	2.24
7	09:16	18.23	2.27	42	09:51	18.36	2.18
8	09:17	18.36	2.15	43	09:52	18.38	2.15
9	09:18	18.44	2.10	44	09:53	18.38	2.17
10	09:19	18.32	2.19	45	09:54	18.36	2.16
11	09:20	18.10	2.39	46	09:55	18.20	2.30
12	09:21	18.13	2.36	47	09:56	18.22	2.29
13	09:22	18.17	2.31	48	09:57	18.22	2.28
14	09:23	18.31	2.20	49	09:58	18.17	2.33
15	09:24	18.36	2.14	50	09:59	18.10	2.40
16	09:25	18.29	2.20	51	10:00	18.16	2.40
17	09:26	18.36	2.14	52	10:01	18.14	2.40
18	09:27	18.30	2.20	53	10:02	18.12	2.40
19	09:28	18.36	2.17	54	10:03	18.17	2.37
20	09:29	18.33	2.18	55	10:04	18.19	2.36
21	09:30	18.28	2.22	56	10:05	18.28	2.23
22	09:31	18.30	2.20	57	10:06	18.21	2.28
23	09:32	18.30	2.20	58	10:07	18.18	2.33
24	09:33	18.33	2.18	59	10:08	18.24	2.27
25	09:34	18.30	2.23	60	10:09	18.29	2.23
26	09:35	18.14	2.35	61	10:10	18.30	2.23
27	09:36	18.18	2.31	62	10:11	18.30	2.21
28	09:37	18.10	2.40	63	10:12	18.32	2.20
29	09:38	18.12	2.38	64	10:13	18.25	2.27
30	09:39	18.18	2.32	65	10:14	18.29	2.26
31	09:40	18.20	2.30	66	10:15	18.26	2.26
32	09:41	18.16	2.35	67	10:16	18.21	2.30
33	09:42	18.19	2.31	68	10:17	18.27	2.28
34	09:43	18.24	2.27	69	10:18	18.27	2.27
35	09:44	18.28	2.26	70	10:19	18.40	2.18

ED_005878_00000226-00031

Client:	**Tucson Iron & Metal**	**Run:**	**3-Gases**
Source:	**Contraband Incinerator**	**Date:**	**06/06/17**

Instrument Calibration Checks

ACE (≤2% span or 0.5 ppmvd)	SB_i/SB_f (≤5% span or 0.5 ppmvd)	D (≤3% span or 0.5 ppmvd)

O_2 Instrument

ACE	Time	Value, C_v	Resp., C_{Dir}	ACE	CS:	20.99 %vd
(Calibration	6:31	0.00	-0.03	-0.1 %		
Error Tests)	6:40	10.94	10.93	0.0 %		
	6:38	20.99	21.08	0.4 %		
SB_i	**Time**	**Resp, C_{Dir}**	**Resp, C_s**	**SB_i**		
(Initial System	6:50	-0.03	-0.01	0.1 %		
Bias Check)	6:53	10.93	10.90	-0.1 %		
SB_f	**Time**	**Resp, C_{Dir}**	**Resp, C_s**	**SB_f**		**D $\lvert SB_f - Sb_i \rvert$ *Drift***
(Post System	10:46	-0.03	0.00	0.1 %		0.0
Bias Check)	10:49	10.93	10.81	-0.6 %		0.5

CO_2 Instrument

ACE	Time	Value, C_v	Resp., C_{Dir}	ACE	CS:	19.49 %vd
(Calibration	6:31	0.00	0.10	0.5 %		
Error Tests)	6:40	10.99	10.70	-1.5 %		
	6:38	19.49	19.50	0.1 %		
SB_i	**Time**	**Resp, C_{Dir}**	**Resp, C_s**	**SB_i**		
(Initial System	6:50	0.10	0.20	0.5 %		
Bias Check)	6:53	10.70	10.70	0.0 %		
SB_f	**Time**	**Resp, C_{Dir}**	**Resp, C_s**	**SB_f**		**D $\lvert SB_f - Sb_i \rvert$ *Drift***
(Post System	10:46	0.10	0.11	0.1 %		0.4
Bias Check)	10:49	10.70	10.70	0.0 %		0.0

Data From Concurrent Traverse:		**Calculations:**	
P_s	27.169 "Hg	**Averages:**	
Gas Flow	32,941.7 adcfm	O_2	18.317 %vd
Avg. Temp, T_s	263.5 °F	CO_2	2.211 %vd
	723.5 °A (°R)		
NO_x Molecular Wt.	46	Calibration Corrected Values:	
CO Molecular Wt.	28	O_2	18.46 %vd
		CO_2	2.14 %vd
cu.ft/lb-mole			
Act Conditions	581.374 ft^3/lbmole		

Tucson Iron & Metal
Contraband Incinerator **Tucson, Arizona**
EEMC Computer Logger O_2/CO_2 **06/05/17**
06/06/17

Time	O_2 %vd	CO_2 %vd	Comments (Calibrations; Tank/Instrument IDs; Run Times)
11:07	11.07	4.17	06/05/17
11:08	0.00	0.10	**O_2 Tank IDs:**
11:09	0.00	0.10	SA1863 @ 10.94 %vd; Exp. 06/29/24
11:10	-0.02	0.10	SA15470 @ 20.99 %vd; Exp. 05/12/23
11:11	0.35	0.12	O_2 Instrument: Servomex 1400
11:12	20.52	ND	
11:13	21.00	19.53	**CO_2 Tank IDs:**
11:14	21.00	19.60	SA1863 @ 10.99 %vd; Exp. 06/29/24
11:15	21.00	19.56	SA15470 @ 19.49 %vd; Exp. 05/12/23
11:16	20.95	19.40	CO_2 Instrument: Servomex 1440
11:17	11.92	ND	
11:18	10.92	10.84	ND = No Data
11:19	15.66	6.01	
11:20	20.61	0.18	
11:21	0.26	0.10	
11:22	0.00	0.10	
11:23	0.62	0.57	
11:24	10.83	10.73	
11:25	10.89	10.80	
11:26	14.14	7.45	
11:27	20.84	0.20	
13:03	17.66	3.24	
13:04	17.73	2.81	
13:05	17.72	2.81	Begin Run 1 PT/SO2
13:06	17.73	2.78	
13:07	17.76	2.71	
13:08	17.86	2.61	
13:09	17.93	2.50	
13:10	17.95	2.50	
13:11	17.90	2.50	
13:12	17.90	2.50	
13:13	17.90	2.53	
13:14	17.87	2.53	
13:15	17.84	2.59	
13:16	17.91	2.54	
13:17	17.97	2.45	
13:18	18.04	2.41	
13:19	18.08	2.36	
13:20	17.97	2.46	
13:21	17.81	2.59	

ED_005878_00000226-00033

Tucson Iron & Metal
Contraband Incinerator **Tucson, Arizona**
EEMC Computer Logger O_2/CO_2 **06/05/17**
06/06/17

Time	O_2 %vd	CO_2 %vd	Comments (Calibrations; Tank/Instrument IDs; Run Times)
14:02	18.32	2.22	
14:03	18.35	2.28	
14:04	18.22	2.44	
14:05	18.29	2.24	
14:06	18.33	2.17	
14:07	18.45	2.06	
14:08	18.26	2.17	
14:09	18.19	2.27	
14:10	18.34	2.16	
14:11	18.30	2.20	
14:12	18.25	2.25	
14:13	18.30	2.18	
14:14	18.38	2.11	
14:15	18.40	2.10	
14:16	18.32	2.17	
14:17	18.14	2.30	
14:18	18.10	2.31	
14:19	18.00	2.40	
14:20	17.98	2.43	
14:21	18.03	2.42	
14:22	17.97	2.46	
14:23	18.00	2.40	
14:24	18.06	2.38	
14:25	18.02	2.40	
14:26	18.03	2.40	
14:27	18.02	2.40	
14:28	18.01	2.40	
14:29	18.00	2.42	
14:30	18.09	2.37	
14:31	18.17	2.25	
14:32	18.27	2.17	
14:33	18.30	2.19	
14:34	18.30	2.20	
14:35	18.24	2.23	
14:36	18.20	2.24	
14:37	18.34	2.14	
14:38	18.32	2.10	
14:39	18.51	2.00	
14:40	18.47	2.03	End Run 1 PT/SO2
14:41	18.44	2.07	

Tucson Iron & Metal
Contraband Incinerator **Tucson, Arizona**
EEMC Computer Logger O_2/CO_2 **06/05/17**
06/06/17

Time	O_2 %vd	CO_2 %vd	Comments (Calibrations; Tank/Instrument IDs; Run Times)
15:51	18.53	1.97	
15:52	18.68	1.87	
15:53	18.80	1.71	
15:54	18.78	1.75	
15:55	18.69	1.86	
15:56	18.55	1.96	
15:57	18.50	2.00	
15:58	18.42	2.06	
15:59	18.54	1.95	
16:00	18.45	2.04	
16:01	18.48	2.00	
16:02	18.66	1.86	
16:03	18.76	1.76	
16:04	18.68	1.83	
16:05	18.75	1.77	
16:06	18.78	1.74	
16:07	18.73	1.82	
16:08	18.80	1.75	
16:09	18.85	1.70	
16:10	18.80	1.75	
16:11	18.82	1.73	
16:12	18.59	1.91	
16:13	18.74	1.80	
16:14	18.80	1.78	
16:15	18.62	1.90	
16:16	18.62	1.91	
16:17	18.57	1.98	
16:18	18.34	2.15	
16:19	18.35	2.13	
16:20	18.18	2.30	
16:21	18.20	2.26	
16:22	18.10	2.30	
16:23	18.12	2.30	
16:24	18.17	2.30	
16:25	18.16	2.28	
16:26	18.17	2.25	
16:27	18.23	2.23	
16:28	18.35	2.14	
16:29	18.25	2.24	
16:30	18.23	2.24	
16:31	18.17	2.31	
16:32	18.24	2.24	

ED_005878_00000226-00035

Tucson Iron & Metal
Contraband Incinerator **Tucson, Arizona**
EEMC Computer Logger O_2/CO_2 **06/05/17**
06/06/17

Time	O_2 %vd	CO_2 %vd	Comments (Calibrations; Tank/Instrument IDs; Run Times)
06:34	21.10	19.86	
06:35	21.10	19.90	
06:36	21.10	19.90	
06:37	21.09	19.65	
06:38	21.08	19.50	
06:39	14.71	ND	
06:40	10.93	10.70	
06:41	11.00	10.60	
06:42	11.01	10.60	
06:43	10.97	10.43	
06:44	11.00	10.50	
06:45	11.24	10.50	
06:46	10.92	10.80	
06:47	10.91	10.80	
06:48	10.89	10.76	
06:49	9.40	1.85	
06:50	-0.01	0.20	
06:51	-0.01	0.20	
06:52	7.43	7.29	
06:53	10.90	10.70	
06:54	13.26	8.26	
06:55	20.88	0.24	
09:08	18.30	2.21	
09:09	18.15	2.30	
09:10	18.18	2.30	Begin Run 3 PT/SO2
09:11	18.14	2.30	
09:12	18.15	2.34	
09:13	18.11	2.30	
09:14	18.19	2.30	
09:15	18.19	2.30	
09:16	18.23	2.27	
09:17	18.36	2.15	
09:18	18.44	2.10	
09:19	18.32	2.19	
09:20	18.10	2.39	
09:21	18.13	2.36	
09:22	18.17	2.31	
09:23	18.31	2.20	
09:24	18.36	2.14	
09:25	18.29	2.20	
09:26	18.36	2.14	
09:27	18.30	2.20	

ED_005878_00000226-00036

Tucson Iron & Metal
Contraband Incinerator **Tucson, Arizona**
EEMC Computer Logger O_2/CO_2 **06/05/17**
06/06/17

Time	O_2 %vd	CO_2 %vd	Comments (Calibrations; Tank/Instrument IDs; Run Times)
10:10	18.30	2.23	
10:11	18.30	2.21	
10:12	18.32	2.20	
10:13	18.25	2.27	
10:14	18.29	2.26	
10:15	18.26	2.26	
10:16	18.21	2.30	
10:17	18.27	2.28	
10:18	18.27	2.27	
10:19	18.40	2.18	
10:20	18.61	2.00	
10:21	18.82	1.81	
10:22	18.93	1.71	
10:23	19.05	1.61	
10:24	18.93	1.70	
10:25	18.81	1.82	
10:26	18.67	1.94	
10:27	18.65	1.94	
10:28	18.50	2.10	
10:29	18.41	2.14	
10:30	18.30	2.28	
10:31	18.25	2.30	
10:32	18.30	2.24	
10:33	18.25	2.30	
10:34	18.23	2.27	
10:35	18.20	2.30	
10:36	18.24	2.30	
10:37	18.33	2.19	
10:38	18.48	2.07	
10:39	18.60	2.00	
10:40	18.53	2.03	
10:41	18.50	2.10	
10:42	18.51	2.06	End Run 3 PT/SO2
10:43	18.29	2.22	
10:44	18.21	2.28	
10:45	2.69	0.96	
10:46	0.00	0.11	
10:47	-0.01	0.10	
10:48	7.80	7.62	
10:49	10.81	10.70	
10:50	13.97	7.46	
10:51	20.80	0.21	

ED_005878_00000226-00037

EPA Methods 1-5
Gas Flow/Moisture/Particulate/Example Calculation

COMPANY NAME: Tucson Iron & Metal RUN: 1 / P1 SO_2
PLANT LOCATION: Tucson, AZ TEST DATE: 6/5/17
SOURCE TESTED: Contraband Incinerator

Pm"Hg = 27.15 Pb"Hg + (1.08 ΔH "H_2O/13.6) = 27.229 "Hg (3)

Ps"Hg = 27.15 Pb"Hg + (0.26 Static "H_2O/13.6) = 27.169 "Hg (3)

1) Vm (std) = (53.772 Vm) (17.65) (0.9976 Y) $\left(\frac{27.229\ Pm"Hg}{548.6\ Tm°A}\right)$ = 46.993 dscf

(3) (2) (1) (3)

2) Vw (std) = (0.04707) (41.2 ml) = 1.939 scf (3)

3) Bws = $\left(\frac{1.939\ scf}{1.939\ scf + 46.993\ dscf}\right)$ = 0.0396 Bws x 100 = 3.96 %H_2O

(3) (3) (4) (2)

4) Vm (actual) = $\left(\frac{(0.9976\ Y)(53.772\ Vm)}{(1 - 0.0396\ Bws)}\right)\left(\frac{723.5\ Ts°A}{548.6\ Tm°A}\right)\left(\frac{27.229\ Pm"Hg}{27.169\ Ps"Hg}\right)$ = 73.825 awcf

(1) (3) (3)

5) Md = 0.44 (2.34 %CO_2) + 0.32 (17.91 %O_2) + 0.28 (79.75 % N_2+%CO) = 29.09 lb/lb mole

A B 100-(A+B) (2)

6) Ms = (29.09 Md lb/lb mole) (1 - 0.0396 Bws) + (18 x 0.0396 Bws) = 28.65 lb/lb mole (2)

7a) Area = (3.1416) (3.667 ft./2) ^{2} = 10.561 sq. ft.

diameter (3) (3)

7b) ~~Area = (ft.) (ft.) = sq. ft.~~

~~(3) (3) (3)~~

8) Vs = (85.49)(0.84 cp)(0.789 Avg. SQRT ΔP) $\left(\sqrt{\frac{723.5\ Ts°A}{(27.169\ Ps"Hg)(28.65\ Ms_lb/lbmole)}}\right)$ = 54.13 fps

(3) (4) (2)

9a) AWCFM = (54.13 fps) (10.561 sq. ft.) (60 sec/min) = 34,300 AWCFM (1)

9b) ADCFM = (34,300 AWCFM) (1 - .0396 Bws) = 32,941.7 ADCFM (1)

EPA Methods 1-4, 6
Gas Flow/Mositure/Sulfur Dioxide/ Example Calculation

EEMC

COMPANY NAME: Tucson Iron & Metal RUN: 1/PT SO_2
PLANT LOCATION: Tucson, AZ TEST DATE: 6/5/17
SOURCE TESTED: Contraband - Incinerator

10a) Qsw = 3600 (54.13 fps) (10.561 sq. ft.) $\left(\frac{528^\circ A}{723.5\ Ts^\circ A}\right)\left(\frac{27.169\ Ps''Hg}{29.92''Hg}\right)$ = 1,363,807.3 wscf/hr (1)

10b) Qsd = (1 - 0.0396 Bws) (1,363,807.3 wscf/hr) = 1,309,800.5 dscf/hr
(4) (1)

Normality (N) = 0.0103

ml Ba^{++} = 0.0

11) Concentration SO_2 - ppmvd

$$\text{ppmvd} = \frac{(0.0\ \text{ml Ba++})(32)(0.0103\ \text{N})(13.29)}{(46.993\ \text{Vm std, dscf})} = 0.0\ \text{ppmvd}$$

12) Concentration SO_2 - ppmva

ppmva = (0.0 ppmvd)(1 - 0.0396 Bws) = 0.0 ppmva

13) Concentration (Cd) SO_2 - lb/dscf

$$\text{lb/dscf} = \frac{(7.061\times10^{-5})(0.0\ \text{ml Ba}^{++})(0.0103\ \text{N})}{(46.993\ \text{Vm std, dscf})} = 0.0\ \text{lb/dscf}$$

14) Emissions - lb/hr

lb/hr = (0.0 lb/dscf)(1,309,800.5 dscf/hr) = 0.0 lb/hr

Client:	**Tucson Iron & Metal**	**Run:**	**1-PTSO2**
Source:	**Contraband Incinerator**	**Date:**	**06/05/17**

Field Data Input: (Continued)

Traverse Data			
Barometric Pressure, P_b	27.15 "Hg	Method 3A	
Static Pressure	0.26 "H_2O	CO_2 Average	2.34 %vd
Pitot Factor, cp	·0.84	O_2 Average	17.91 %vd
Moisture Data			
Meter Cal Factor	0.9976 Y	Stack Dimensional Data:	
Total Test Time	90.0 min	Circular	
Sample Time Interval	4.5 min	Diameter	3.667 ft
Meter Volume, V_m	53.772 dcf	Rectangular	
Water Volume	41.2 ml (g)	Width	0.000 ft
Nozzle Diameter, Nz	0.215 sq.in.	Length	0.000 ft
Nozzle Area	0.000252 sq.ft.	Stack Area	10.561 sq.ft.
Wt. Particulate Collected	0.0094 grams	SO_2 Analysis Titration	
		Normality Ba^{++} Solution	0.0103 N
		Vol. Ba^{++} Solution	0.0 ml

Field Data Averages/Calculations

Meter		Stack	
ΔH	1.08 "H_2O	$\sqrt{Dp}$	0.7819 "H_2O
Temperature, T_m	88.6 °F	Temperature, T_s	263.5 °F
Temperature, T_m	548.6 °A (°R)	Temperature, T_s	723.5 °A (°R)
Pressure, P_m	27.229 "Hg	Pressure, P_s	27.169 "Hg
EPA Method 4 Meter Box Capture		EPA Method 2 Stack Gas Flowrate:	
Standard Volume, $V_{m(std)}$	46.993 dscf	Velocity, V_s	54.13 fps
Actual Volume, $V_{m(actual)}$	73.825 awcf	Volume (actual conditions)	34,300.0 awcfm
			32,941.7 adcfm
EPA Method 4 Gas Stream Moisture		Volume (std. Conditions)	1,363,807.3 wscf/hr
Moisture Vapor, $Vw_{(std)}$	1.939 scf	(@ 68 °F & 29.92 "Hg)	1,309,800.5 dscf/hr
Moisture, B_{ws}	0.0396		
Percent Moisture	3.96 %v	Particulate Emissions:	
		Concentration, C_s	0.0031 gr/dscf
EPA Method 3 Gas Density		Concentration, gr/awcf	0.0020 gr/awcf
Dry, M_d	29.09 lb/lb-mole	Mass Emissions	0.58 lb/hr
Wet, M_s	28.65 lb/lb-mole		
		SO_2 Emissions	
Percent Isokinetic	100.3 %	Dry Basis	0.0 ppmvd
		Wet Basis	0.0 ppmva
		SO_2 Concentration	0.00E+00 lb/dscf
		Mass Emissions	0.00 lb/hr

MOISTURE DETERMINATION

EEMC

Company Name:	Tucson Iron And Metal	**Run:**	1
Plant Location:	Contraband Incinerator	**Test Date:**	6/5/17
Source Tested:	Tucson, AZ	**Start Time:**	
Weighed By:	JS	**Balance Level:** ✓	**Balance Zeroed:** ✓ **End Time:**

Impinger caddy color Yellow

WEIGHT (Grams)

		Liquid Appearance: (clear, cloudy, dark etc.)		
Impinger 1: (3% H_2O_2)				
Final Weight:	726.5		Filter ID:	1-A
Initial Weight:	704.3		Probe Length:	5'
Weight Gain:	+22.2	clear	Probe Material:	SS
Impinger 2: (3% H_2O_2)				1102179
Final Weight:	674.8			
Initial Weight:	669.7			
Weight Gain:	+5.1	clear		
Impinger 3:				
Final Weight:	615.1			
Initial Weight:	612.2			
Weight Gain:	+2.9	clear		
Impinger 4: (if applicable)				
Final Weight:				
Initial Weight:				
Weight Gain:				
Impinger 5: (if applicable)				
Final Weight:				
Initial Weight:				
Weight Gain:				
Silica Gel Impinger:				
Final Weight:	981.6			
Initial Weight:	970.6			
Weight Gain:	+11.0			

Silica Gel Spent (please circle) Yes (No)

Total Mass of Water Captured: 41.2 grams (ml)

Notes

EEMCFILES/ReportResources/Forms:Revised 09/02/16 jl

EPA Methods 1-5, 6
Field Data and Calculations
SO_2/Particulate/Gas Flow/Moisture

Client:	**Tucson Iron & Metal**	**Run:**	**2-PTSO_2**
Location:	**Tucson, Arizona**	**Time:**	**15:22-16:58**
Source:	**Contraband Incinerator**	**Date:**	**06/05/17**

Sampling Data				Traverse Data			
Time min.	Meter ft^3	ΔH "H_2O	Meter T_m °F	Traverse Point	Dp "H_2O	Stack T_s °F	$\sqrt{Dp}$
4.5	484.980	0.50	92	1	0.30	258	0.548
9.0	486.900	0.75	92	2	0.42	259	0.648
13.5	489.100	0.75	92	3	0.44	260	0.663
18.0	491.400	0.75	92	4	0.44	260	0.663
22.5	493.700	0.80	93	5	0.45	262	0.671
27.0	496.000	1.05	93	6	0.61	261	0.781
31.5	498.700	1.15	93	7	0.65	261	0.806
36.0	501.500	1.15	93	8	0.65	261	0.806
40.5	504.300	1.10	94	9	0.62	260	0.787
45.0	507.000	1.05	94	10	0.60	260	0.775
4.5	509.700	0.85	94	1	0.48	260	0.693
9.0	512.110	0.92	94	2	0.52	259	0.721
13.5	514.600	0.82	94	3	0.46	257	0.678
18.0	516.950	0.75	94	4	0.43	258	0.656
22.5	519.200	1.30	94	5	0.74	261	0.860
27.0	522.200	1.25	95	6	0.72	266	0.849
31.5	525.150	1.25	95	7	0.70	268	0.837
36.0	528.050	1.15	94	8	0.67	267	0.819
40.5	530.900	1.05	94	9	0.61	264	0.781
45.0	533.600	0.95	95	10	0.54	264	0.735
	536.150						

ED_005878_00000226-00042

FIELD DATA

EEMC

Company Name: TUCSON IRON + METALS — Run: 2-Pt/SO2
Plant Location: TUCSON AZ — EPA Method/Test: 1-4,5,6 — Date: 6/5/17
Source Tested: CONTRABAND INCINERATOR — Start Time: 1522
Meter Box Operator: (W) — Technician: JB — End Time: 1658

Equipment/Identification Checks:

Pitots Pre: ✓ Post: ✓ — Pitot: 1102179 Factor: 0.84 — Nozzle: 6D — Circle one: GLASS | SS
Pitots Pre: ✓ Post: ✓ — Meter Box ID: SB-2 — Nozzle Diameter: 0.215
Orsat Sampling System: NA — Y Factor: 0.9976 ΔH@: 1.876 — Probe Thermocouple ID:
Tedlar Bag: NA — Train/Leak Test Vacuum, ("Hg): Pre: 15 Post: 9 — Probe: 1102179
Thermocouple @ 90 °F — Train/Leak Rate (ft³/min): Pre: 0.001 Post: 0.001 — Filter Box Id: 2
Barometric Pressure("Hg): 27.15 — Stack Dimensions: 44"
Static Pressure("H₂O): + .33 — Total Test Time: 90 min. — Filter Number: 8A

Sample Point	Time (min)	Dry Gas Meter Reading (ft³)	Pitot Reading ΔP ("H₂O)	Meter ΔH	Meter Temp Tm(°F) IN	Meter Temp Tm(°F) OUT	Pump Vacuum ("Hg)	Filter Box (°F)	Imp Exit (°F)	Stack Temp Ts(°F)	Probe Temp (°F)
1	4.5	484.98	0.30	0.50	92	92	3	245	55	258	250
2	9	486.90	0.42	0.75	92	92	3	245	56	259	251
3	13.5	489.10	0.44	0.75	92	92	3	237	57	260	247
4	18	491.40	0.44	0.75	92	92	3	237	57	260	236
5	22.5	493.70	0.45	0.80	93	93	3	248	57	262	235
6	27	496.00	0.61	1.05	93	93	4	242	57	261	241
7	31.5	498.70	0.65	1.15	93	93	4	238	57	261	241
8	36	501.50	0.65	1.15	93	93	4	237	57	261	242
9	40.5	504.30	0.62	1.10	93	93	4	240	57	260	246
10	45	507.00	0.60	1.05	94	94	4	240	57	260	247
1	4.5	509.70	0.48	0.85	94	94	4	243	51	260	251
2	9	512.11	0.52	0.92	94	94	4	244	52	259	252
3	13.5	514.60	0.46	0.82	94	94	4	251	52	257	250
4	18	516.95	0.43	0.75	94	94	4	255	52	258	250
5	22.5	519.20	0.74	1.30	94	94	4	248	52	261	244
6	27	522.20	0.72	1.25	95	95	4	250	53	266	246
7	31.5	525.15	0.70	1.25	95	95	4	250	54	268	247
8	36	528.05	0.67	1.15	94	94	4	246	54	267	247
9	40.5	530.90	0.61	1.05	94	94	4	249	55	264	248
10	45	533.60	0.54	0.95	95	95	4	250	56	264	251
		536.150									
		51.170									

EEMCFILES/ReportResources/Forms:Revised 10/14/14 kam

PARTICULATE LABORATORY DATA

EEMC

COMPANY NAME: Tucson Iron & Metal RUN: 2-pt.
PLANT LOCATION: Tucson, AZ TEST DATE: 6/5/17
SOURCE TESTED: Incinerator Bll.

Particulate Catch

Beaker/Dish # 2-pt. ($\bar{X}$ = 4.4676)

Description Probe/Wash

Final Weight 4.4676/4.4675

Tare Weight 4.4643 Very light

Net Weight .0033 Black Specks

Filter Catch

Filter # 2-pt. ($\bar{X}$ = .2781)

Final Weight .2780/.2783/.2781

Tare Weight .2780

Net Weight .0001 None Visible

Beaker/Dish # _____

Description _____

Final Weight _____ _____ _____

Tare Weight _____

Net Weight _____

Beaker/Dish # _____

Description _____

Final Weight _____ _____ _____

Tare Weight _____

Net Weight _____

Beaker/Dish # _____

Description _____

Final Weight _____ _____ _____

Tare Weight _____

Net Weight _____

Acetone Wash Volume

_____ ml

Probe and Cyclone Residue .0033 g. - .0002 g. Blank = .0031 g.

Impinger Residue ____ g. - ____ g. Blank = ____ g.

EPA Method (Filter, Probe & Cyclone Residue) = .0032 g.

Particulate Weight (including Impingers) = ____ g.

Notes: _____

Client: Tucson Iron & Metal **Run:** 3-PTSO2
Source: Contraband Incinerator **Date:** 06/06/17

Field Data Input: (Continued)

Traverse Data			
Barometric Pressure, P_b	27.23 "Hg	Method 3A	
Static Pressure	-0.27 "H_2O	CO_2 Average	2.14 %vd
Pitot Factor, cp	0.84	O_2 Average	18.46 %vd
Moisture Data			
Meter Cal Factor	0.9976 Y	Stack Dimensional Data:	
Total Test Time	90.0 min	Circular	
Sample Time Interval	4.5 min	Diameter	3.667 ft
Meter Volume, V_m	49.873 dcf	Rectangular	
Water Volume	37.2 ml (g)	Width	0.000 ft
Nozzle Diameter, Nz	0.215 sq.in.	Length	0.000 ft
Nozzle Area	0.000252 sq.ft.	Stack Area	10.561 sq.ft.
Wt. Particulate Collected	0.0035 grams	SO_2 Analysis Titration	
		Normality Ba^{++} Solution	0.0103 N
		Vol. Ba^{++} Solution	0.0 ml

Field Data Averages/Calculations

Meter		Stack	
ΔH	0.95 "H_2O	$\sqrt{Dp}$	0.7382 "H_2O
Temperature, T_m	77.1 °F	Temperature, T_s	262.8 °F
Temperature, T_m	537.1 °A (°R)	Temperature, T_s	722.8 °A (°R)
Pressure, P_m	27.300 "Hg	Pressure, P_s	27.210 "Hg
EPA Method 4 Meter Box Capture		EPA Method 2 Stack Gas Flowrate:	
Standard Volume, $V_{m(std)}$	44.635 dscf	Velocity, V_s	51.04 fps
Actual Volume, $V_{m(actual)}$	69.809 awcf	Volume (actual conditions)	32,342.0 awcfm
			31,122.7 adcfm
EPA Method 4 Gas Stream Moisture		Volume (std. Conditions)	1,289,142.5 wscf/hr
Moisture Vapor, $Vw_{(std)}$	1.751 scf	(@ 68 °F & 29.92 "Hg)	1,240,541.8 dscf/hr
Moisture, B_{ws}	0.0377		
Percent Moisture	3.77 %v	Particulate Emissions:	
		Concentration, C_s	0.0012 gr/dscf
EPA Method 3 Gas Density		Concentration, gr/awcf	0.0008 gr/awcf
Dry, M_d	29.08 lb/lb-mole	Mass Emissions	0.21 lb/hr
Wet, M_s	28.66 lb/lb-mole		
		SO_2 Emissions	
Percent Isokinetic	100.6 %	Dry Basis	0.0 ppmvd
		Wet Basis	0.0 ppmva
		SO_2 Concentration	0.00E+00 lb/dscf
		Mass Emissions	0.00 lb/hr

MOISTURE DETERMINATION

EEMC

Company Name: Tucson Iron & Metal		**Run:** 3	
Plant Location: Tucson, Az		**Test Date:** 6/6/7	
Source Tested: Contraband Incinerator		**Start Time:**	
Weighed By: JS	**Balance Level:** ✓	**Balance Zeroed:** ✓	**End Time:**

Impinger caddy color Yellow

WEIGHT (Grams)

		Liquid Appearance: (clear, cloudy, dark etc.)		
Impinger 1: (100 ml. H_2O_2)				
Final Weight:	735.7		Filter ID:	15 A
Initial Weight:	715.6		Probe Length:	5'
Weight Gain:	20.1 ✓	clear	Probe Material:	SS
Impinger 2: (100 ml. H_2O_2)				
Final Weight:	678.0			
Initial Weight:	674.5 ✓			
Weight Gain:	+3.5 ✓	clear		
Impinger 3:				
Final Weight:	618.5			
Initial Weight:	617.2 ✓			
Weight Gain:	+1.3 ✓	clear		
Impinger 4: (if applicable)				
Final Weight:				
Initial Weight:				
Weight Gain:				
Impinger 5: (if applicable)				
Final Weight:				
Initial Weight:				
Weight Gain:				
Silica Gel Impinger:				
Final Weight:	993.3	**Silica Gel Spent** (please circle)		
Initial Weight:	981.0 ✓			
Weight Gain:	+12.3 ✓	Yes / (No)		

Total Mass of Water Captured: +37.2 ✓ grams (ml)

Notes

EEMCFILES/ReportResources/Forms:Revised 09/02/16 jl

EEMC

SO_2 ANALYSIS TITRATION

COMPANY NAME: Tim DATE: 6/5/17
SOURCE TESTED: Contraband Incinerator Normality $Ba(ClO_4)_2$: 0.0103

Run #	Total Volume	Dilution:	
1	400	—	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:
20	0.0 0.0	0.0	0.0

Run #	Total Volume	Dilution:	
2	400	—	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:
	0	0	0

Run #	Total Volume	Dilution:	
3	400	—	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:
	0	0	0

Run #	Total Volume	Dilution:	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:

Run #	Total Volume	Dilution:	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:

Run #	Total Volume	Dilution:	
BLANK	20 ml	—	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:
20 ml.	0.0 0.0		0.0

Run #	Total Volume	Dilution:	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:

Run #	Total Volume	Dilution:	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:

Run #	Total Volume	Dilution:	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:

Run #	Total Volume	Dilution:	
Aliquot (ml.)	Ba++ (ml.)	Blank (ml.)	Total Titration:

WorldDrive01:\Forms\Forms\SO2 Analysis Titration1.xls
Revised 06/25/07 jmf

DAILY OPERATORS LOG FOR INCINERATOR

DATE: 6/5/17 OPERATOR FULL NAME: Don Bukowinski

DAILY INSPECTION REPORT

BURN TYPE - ROTARY OR BATCH (CIRCLE ONE)		BAGHOUSE INSPECTED		BAGS REPAIRED OR REPLACED		REFRACTORY INSPECTED		DUCTWORK INSPECTED		MOTORS/ BEARINGS INSPECTED		BEARINGS GREASED		MISC. DEFICIENCIES NOTED (RECORDED ON REPAIR REPORT)	
		YES	NO			YES	NO	YES	NO	YES	NO				
R	B	REPAIRS		YES	NO	REPAIRS		REPAIRS		REPAIRS		YES	NO	YES	NO
		YES	NO			YES	NO	YES	NO	YES	NO			VISIBLE EMISSIONS CHECKED (AT LEAST 2 TIMES DURING BURN)	
TIME (START TIME IS COINCIDENT WITH MATERIAL INSPECTION)		TYPE OF MATERIAL		TOTAL TIME OF OPERATION		WEIGHT		CALCULATED DAILY FEED RATE		INITIAL MAGNAHELIC READING		MAGNAHELIC READINGS CHECKED (AT LEAST 2 TIMES DURING BURN)		1ST 4 HOURS	2nd 4 HOURS
														YES / NO	YES / NO
Start Time	Shut-down Time	CIRCLE ALL THAT APPLY		4.66		8,760		1879 lbs Per HR		1.7		1ST 4 HOURS	2nd 4 HOURS	EMISSIONS PRESENT	
												YES / NO	YES / NO	YES / NO	YES / NO
12:20	5:00	MARIJUANA								REPAIRS		4.5	5.1	IF YES CORRECTIVE ACTION ENTERED ON MALFUNCTION REPORT	
		COCAINE								YES / NO					
		METHAM-PHETAMINE		FUGITIVE EMISSIONS CHECKED (AT LEAST 2 TIMES DURING BURN)				EMISSIONS PRESENT							
		WOOD						1ST 4 HOURS	2nd 4 HOURS						
		PAPER						YES / NO	YES / NO						
		BURLAP/ FABRIC						IF YES CORRECTIVE ACTION ENTERED ON MALFUNCTION REPORT							
		ASSOCIATED WRAPPING		1ST 4 HOURS	2nd 4 HOURS										
				YES / NO	YES / NO										

ED_005878_00000226-00048

ERA
A Waters Company

Matthew Nurimba
EEMC, Bison Engineering
3730 N Pellegrino Dr
Tucson, AZ 85749
USA

060817J Final Report

TM

Stationary Source Audit Program

Project # :060817J

ERA
A Waters Company

Recipient Type	Report Recipient	Contact	Project ID
Agency	AZ-Pima County DEQ(SSAS) 33 N Stone Ave Suite 700 Tucson, AZ 85701 USA	Dustin Fitzpatrick dustin.fitzpatrick@pima.gov Phone: 520-724-7322	
Facility	Tucson Iron & Metal 4484 E Tennessee St Tucson, AZ 85714 USA	Gary Kippur gary@tucsoniron.net Phone: 520-884-1554	
Lab	EEMC, Bison Engineering 3730 N Pellegrino Dr Tucson, AZ 85749 USA	Matthew Nurimba eemcorp@comcast.net Phone: 520-729-2167	
Tester	EEMC, Bison Engineering 3730 N Pellegrino Dr Tucson, AZ 85749 USA	Ed Wadington eemcorp@comcast.net Phone: (520) 749-2167	TIM

ERA
A Waters Company

Final Report Results For Laboratory EEMC, Bison Engineering

16341 Table Mountain Pkwy • Golden, CO 80403 • 800.372.0122 • 303.431.8454 • fax 303.421.0159 • www.eraqc.com
06/05-06/17 Tucson Iron & Metal

Project # : 060817J

060817J Evaluation Final Complete Report

A Waters Company

Matthew Nurimba
EEMC, Bison Engineering
3730 N Pellegrino Dr
Tucson, AZ 85749
520-729-2167

EPA ID: **Not Reported**
ERA Customer Number: **E144081**

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Sulfur Dioxide in Impinger Solution (cat# 1443, lot# 060817J) Study Dates: 06/08/17 - 06/13/17									
4010	Sulfur dioxide	mg/dscm	80.0	76.0	64.6 - 87.4	Acceptable	EPA 6 2000	6/13/2017	

ED_005878_00000226-00052

EQUIPMENT CALIBRATION
Tucson Iron & Metal
06/05-06/17

1) Meter Box
SB-2
12/05/16 @ 0.9976 (Full Profile)
06/26/17 @ 1.001 (@ 1.70 "H_2O Delta H and 13.0 "Hg Vacuum)

2) Thermocouples (SB-2 and Dial Thermometers)
The thermocouples and dial thermometers were calibrated prior to and after the test series. Results are included in this section.

3) Pitot Tube (1102179)
The pitot tubes are manufactured by EEMC to meet 0.84 pitot coefficient requirements. Results included in this section.

4) Barometer (aneroid)
The aneroid barometer was calibrated with a mercury wall barometer prior to and after the test series. Results are included in this section.

5) $SO_2/CO_2/O_2$
EPA Protocol 1 Calibration gases were utilized for calibration of the instruments. N_2 zero gas was employed. Pre and post calibrations are included with each test run. Copies of the span gas certifications are included in this section. Please note Q.C. sheets for a description of calibration procedures.

6) Nozzle (6D)
Quartz glass, button-hook nozzle checked with Precise Starrett expanding micrometer and micro-calipers. Results are included in this section.

7) ERA Audit Samples
Audit samples were submitted for SO_2.

EEMC maintains its test equipment on a continuing and 'as needed' basis. As required by its ASTM-STAC certification maintenance records are available upon request. In addition all test equipment is pre and post checked prior to each field project including calibrations as provided in each of its test reports. Certified calibration equipment documents are maintained as per manufacturers requirements and also can be provided upon request.

ED_005878_00000226-00053

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

Certificate of Calibration

METHOD 5 PRE-TEST CONSOLE CALIBRATION

Meter Console Information

Model #: XC-522
Serial #: 1602002
DGM Model #: S-110
DGM Serial #: 1503533

Calibration Conditions

Bar. Pressure (in Hg): 30.00
Ambient Temp (°F): 75.6
Relative Humidity (%): 53
Altitude (ft): 414.0
Altitude Correction Factor (in): -0.414
Corrected Bar. Pressure (in Hg): 29.59

Factors/Conversions

Std Temp (R): 527.67
Std Press (in Hg): 29.92
K_1 (R/in Hg): 17.636

Reference Equipment

WTM Model: AL-20 WTM Serial: 11AE6
WTM Cal. Due Date: Dec-16 Gamma: 0.9999
WTM Thermometer: Hg

Bison Engineering-AZ

Test Meter (DGM)

Run Time (min)	Orifice ΔH (in H_2O)	Volume (cubic feet) Initial	Final	Total	Outlet Temp (°F) Initial	Final
θ	P_m	V_{mi}	V_{mf}	V_m	t_{mi}	t_{mf}
5.0	5.0	10.005	16.303	6.298	76	77
6.0	3.0	22.105	27.958	5.853	77	78
7.0	2.0	27.958	33.520	5.562	78	79
10.0	1.0	33.520	39.090	5.570	79	80
15.0	0.5	16.303	22.105	5.802	77	77

Reference Meter

Meter Pressure (in H_2O)	Volume (cubic feet) Initial	Final	Total	Outlet Temp (°F) Initial	Final
P_b	V_{wi}	V_{wf}	V_w	t_{wi}	t_{wf}
2.5	120.990	127.210	6.220	69	69
2.5	132.910	138.650	5.740	69	69
2.0	138.650	144.100	5.450	69	69
1.9	144.100	149.550	5.450	69	69
1.8	127.210	132.910	5.700	69	69

Standardized Data

Test Meter Std. Volume	Std. Flow Rate	Reference Meter Std. Volume	Std. Flow Rate
Vm_{std} (ft^3)	Qm_{std} (ft^3/min)	Vw_{std} (ft^3)	Qw_{std} (ft^3/min)
6.20513	1.241	6.17646	1.235
5.72769	0.955	5.69700	0.950
5.41941	0.774	5.40516	0.772
5.40374	0.540	5.40383	0.540
5.64803	0.377	5.65031	0.377

Calibration Results

Correction Factor Value (Y)	Variation (ΔY)	Flow Rate, Std & Corr	ΔH@ (in H_2O) 0.75 SCFM ΔH@	Variance ΔΔH@
0.9954	-0.002	1.235	1.839	-0.038
0.9946	-0.003	0.950	1.853	-0.024
0.9974	0.000	0.772	1.857	0.019
1.0000	0.002	0.540	1.886	0.010
1.0004	0.003	0.377	1.947	0.071
0.9976	= Y Avg.		1.876	= ΔH@ Avg.

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +- 0.02.

Note: For $\Delta H_@$, orifice pressure differential that equates to 0.75cfm (0.0212m^3/min) at standard temperature and pressure, acceptable tolerance of individual values from the average is +-0.2inches (5.1mm) H_2O.

Pass/Fail Result: Pass

The instruments listed and described on this certificate have been calibrated against standards traceable to the National Institute of Standards and Technology (N.I.S.T.).

Technician: Eric Waters Signature: [signature] Date: 12/5/16

Meter Box Calibration Orifice Method
APEX INSTRUMENTS 522 Series
English Meter Box Units, English K' Factor

Meter Box:	SB-2	
Calibration Date:	06/26/17	
Barometric Pressure:	27.32	" Hg
Theoretical Critical Vacuum:	12.85	" Hg

CRITICAL ORIFICE READINGS			AMBIENT TEMPERATURE			
ΔH (" H_2O)	Orifice Serial #	K' Orifice Coefficient	Initial (°F)	Final (°F)	Average (°F)	Temp (°R)
1.70	63	0.584	87.8	88.1	88.0	548.0
1.70	63	0.584	88.1	88.9	88.5	548.5
1.70	63	0.584	89.0	89.5	89.3	549.3

CONVERSION FACTORS

1 mm Hg =	0.13330	kPa
1 cm =	0.39370	inch
1 mm =	0.03937	inch
1 ft^3 =	28.32	liters

DRY GAS METER READINGS										
Time (min)	Volume Initial (ft^3)	Volume Final (ft^3)	Volume Total (ft^3)	Initial Temps. Inlet (°F)	Initial Temps. Outlet (°F)	Final Temps. Inlet (°F)	Final Temps. Outlet (°F)	Avg. Temp. Overall (°R)	Avg. Outlet (°R)	Actual Vacuum (" Hg)
6.60	419.294	424.297	5.003	86.0	86.0	86.0	86.0	546.0	546.0	**13.0**
6.47	424.297	429.304	5.007	86.0	86.0	87.0	87.0	546.5	546.5	**13.0**
6.47	429.304	434.311	5.007	87.0	87.0	87.0	87.0	547.0	547.0	**13.0**

THERMOCOUPLE CALIBRATION

EEMC

Date: 5\23\17
Ambient Temperature: 87.6 °F
Calibrator: JS

Thermocouple No.: SB2
Barometric Pressure: 27.23 "Hg
Type of Calibration system used: Omega

Reference Point No. [a]	Reference Thermocouple Temperature °F	°C	Thermocouple Potentiometer Temperature °F	°C	Difference [b]
1	50	10.0	50		0
2	100	37.8	100		0
3	150	65.6	150		0
4	200	93.3	201		0.5
5	250	121.1	251		0.4
6	300	148.9	301		0.33
7	350	176.7	350		0
8	400	204.4	399		0.25
9	450	232.2	448		0.44
10	500	260.0	498		0.4
11	550	287.8	549		0.18
12	600	315.6	600		0
13	650	343.3	651		0.15
14	700	371.1	701		0.14
15	750	398.9	750		0
16	800	426.7	800		0
17	850	454.4	850		0

[a] Every 30°C (50°F) for each reference point
[b] [(Ref. Temp: °C + 273) - (Test Therm. Temp: °C +273)] / (Ref. Temp. °C + 273) x 100 < 1.5%

EEMCFILES/ReportResources/Forms: Revised 03/09/15 jll

SAMPLE TRAIN TEMPERATURE CALIBRATION DATA
DIAL THERMOMETERS

Ref. No. SB2 Standard: Glass Thermometer ✓

Date 5/24/17

PRE-TEST

Thermometer	Boiling Water	Ambient	Acceptable Range
	210	82	+/- 2°F
Impinger (Yellow)	209	81	
Impinger (Gray)	209	81	

Date 6/26/17

POST-TEST

Thermometer	Boiling Water	Ambient	Acceptable Range
	210	89.3	+/- 2°F
Impinger (Yellow)	209	88.2	
Impinger (Gray)	209	88.1	

EEMCFILES/ReportResources/Forms: Revised 08/24/12 jll

EEMC

BAROMETER CALIBRATION

DATE	Hg BAROMETER READING	ANEROID BAROMETER	DIFFERENCE
6/26/17	27.32	27.31	.01

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000079878

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE PHOENIX HUB
3918 W LINCOLN ST
PHOENIX AZ 850095

Praxair Order Number: 31104203
Customer P. O. Number: 05508627
Customer Reference Number:

Fill Date: 5/5/2015
Part Number: NI CD20O3E-AS
Lot Number: 109512507
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:		5/12/2023	NIST Traceable
Cylinder Number:		SA15470	Analytical Uncertainty:
19.49	%	CARBON DIOXIDE	± 0.2 %
20.99	%	OXYGEN	± 0.3 %
	Balance	NITROGEN	

Certifcation Information: *Certification Date:* 5/12/2015 *Term:* 96 Months *Expiration Date:* 5/12/2023

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

O2 responses have been corrected for CO2 interference.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON DIOXIDE

Requested Concentration: 20 %
Certified Concentration: 19.49 %
Instrument Used: Horiba VIA-510 S/N 2807014
Analytical Method: NDIR
Last Multipoint Calibration: 4/24/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC156146
Ref. Std. Conc: 19.79%
Ref. Std. Traceable to SRM # : 2745
SRM Sample # : 9-C-38
SRM Cylinder # : CAL016135

First Analysis Data:							Date: 5/12/2015
Z:	0	R:	19.79	C:	19.49	Conc:	19.483
R:	19.8	Z:	0	C:	19.5	Conc:	19.493
Z:	0	C:	19.5	R:	19.8	Conc:	19.493
UOM:	%			Mean Test Assay:			19.49 %

Second Analysis Data:							Date:
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			0 %

2. Component: OXYGEN

Requested Concentration: 21 %
Certified Concentration: 20.99 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 4/30/2015

Reference Standard Type: GMIS
Ref. Std. Cylinder # : SA16022
Ref. Std. Conc: 19.90%
Ref. Std. Traceable to SRM # : 2659a
SRM Sample # : 71-E-19
SRM Cylinder # : FF22331

First Analysis Data:							Date: 5/12/2015
Z:	0	R:	19.9	C:	20.99	Conc:	20.99
R:	19.9	Z:	0	C:	20.99	Conc:	20.99
Z:	0	C:	20.99	R:	19.9	Conc:	20.99
UOM:	%			Mean Test Assay:			20.99 %

Second Analysis Data:							Date:
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			0 %

Analyzed by: Matthew Angerer

Certified by: Ying Yu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.