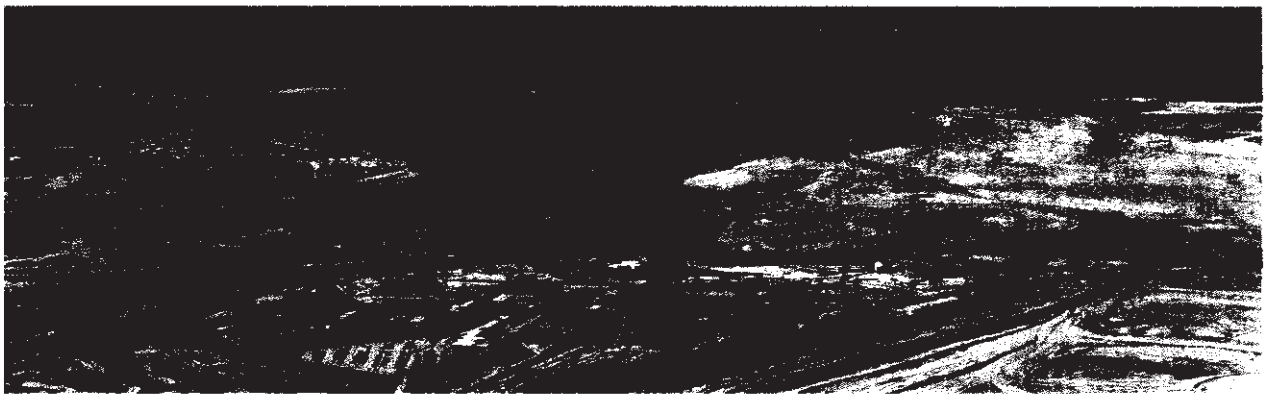

ASARCO Mission Complex
4201 W. Pima Mine Road
Sahuarita, AZ 85629

ASARCO Mission Complex Continuous Assurance Monitoring (CAM) Plan Document

Mission Title V Permit 2026

Version 1A
March 2008

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ASARCO Mission Complex
COMPLIANCE ASSURANCE MONITORING PLAN

BACKGROUND

Compliance assurance monitoring (CAM) is intended to provide a reasonable assurance of compliance with applicable requirements under the Clean Air Act (CAA) for Pollution Specific Emission Units (PSEU's) that rely on control device equipment to achieve compliance. CAM supports monitoring that provides a level of assurance that once control measures are installed that they are properly operated and maintained to achieve and support continued compliance with the applicable requirements. The CAM approach establishes monitoring for the purpose of: (1) documenting the control measures defined for operational verification, (2) defining the relative operating ranges of such devices, (3) defining excursions from the defined ranges; and (4) responding to the system operations and control parameters to minimize, eliminate and correct excursions.

SOURCES SUBJECT TO THE CAM REGULATION

CAM is applicable to sources that meet all of the following criteria:

- § 64.2(a) Unit is located at major source that is required to obtain Part 70 or 71 permit
- § 64.2(a)(1) Unit is subject to emission limitation or standard for the applicable pollutant
- § 64.2(a)(2) Unit uses a control device to achieve compliance (See § 64.1 for definition of control device.)
- § 64.2(a)(3) Potential precontrol emissions of applicable pollutant from unit are at least 100 percent of major source amount
- § 64.2(a)(b) Unit is not otherwise exempt

CAM APPLICABILITY REVIEW[1]

In order to determine the applicability of Part 64, sources that are subject to the CAM rule (Title V Permit holders), must estimate potential pre-control device emission rates for the regulated pollutant (§64.2). The two basic approaches to performing this estimate are based on: (1) the controlled potential to emit and the control device efficiency for the subject emissions unit; and/or (2) uncontrolled emission test data from measurements taken prior to the control device inlet or uncontrolled emission factors. For the applicability review for the Mission Complex, performance test data (controlled) and associate abatement control factors were used to estimate "uncontrolled emission rates." In the absence of any source test or performance data, AP-42 or manufacturer's data, where available were incorporated into the assessment process. The process followed:

1. Determined which sources were subject to an applicable emission standard, used a control device to meet that standard, and were not exempt from the CAM regulation;
2. Once those sources were established, the annual pre-control PTE was estimated based on available performance data (controlled) and control efficiency information for the specific abatement units;

[1] *For all sources, PM and PM_{10} are the only criteria pollutants for which an emission limitation or standard is applicable and a control device is used to achieve compliance and a calculation of potential precontrol emissions can be completed. Additionally, for all sources PM_{10} is considered to be at least 50% of PM. Therefore, PM is the limiting factor for determining if emissions are at least 100% of major threshold amount.*

3. Calculations were conducted for all sources that use a control device to determine which sources were greater than or equal to the PM10 Major Source threshold of 100 tpy, and therefore, subject to the CAM regulation; and
4. For those sources subject to CAM, ASARCO also verified that none of these sources were considered "large units" (i.e., had post-control PTE of at least 100% of the major source threshold).

The CAM applicability review identified PSEU's whose emissions were controlled by baghouses or wet scrubbers at the Mission Complex. As such, by developing these PSEU specific CAM plans, ASARCO has complied with all the applicable requirements of the CAM standard and will confirm compliance with the requirements of the aforementioned subparts as part of the semi-annual compliance certification as required by 40 CFR Part 70. ASARCO has developed their CAM plans after EPA's *Technical Guidance Document: Compliance Assurance Monitoring* (August 1998) and includes a complete plan program for the following sources and controls:

- Mission Circuit Operations - Fine Ore Bin
- Mission Circuit Operations - Mission Operations Primary Crusher System
- Mission Circuit Operations - Mission Operations Secondary & Tertiary Crusher System
- North Circuit Operations Primary & Secondary & Tertiary Crusher
- South Circuit Operations Primary Crusher System

Table 1 provided herein provides results of the applicability review that has identified the above sources as subject to CAM. Further defined in the table are the supporting data for the uncontrolled PTE calculations for these defined CAM sources.

IMPLEMENTATION

As CAM is implemented, operators of PSEU's will periodically review the monitoring data to determine if there is a need for additional measures to assure compliance with the applicable emission standards. If an excursion or exceedance is detected Asarco must implement corrective actions to return the PSEU and control system to normal operation and minimize the likelihood that similar excursions or exceedances would occur.

If it is determined that there was a failure to comply with an emission limit or standard for which the monitoring did not indicate an excursion or exceedance, or the results of a subsequent compliance test indicate that the indicator ranges must be **modified the regulation requires** the owner or operator of the emissions unit to notify the permitting authority promptly. If a permit revision is required, the owner or operator of the unit must identify proposed revisions to the CAM submittal and submit the proposed revisions to the permitting authority for approval prior to implementing the plan.

If excursions or exceedances continue for the PSEU, the source may be required to develop and implement a Quality Improvement Plan (QIP). When a QIP is required, owners or operators must develop and implement the QIP as quickly as possible and must notify the permitting authority if more than 180 days will be required for completing the improvements specified. If it is determined that the QIP was inadequate, the permitting authority also may require the source to modify the QIP.

Table 1 CAM Applicability Review; ASARCO Mission Complex Sources Identified as CAM Required

Reference	SSOPM-1	SSOPM 4-7	SSOPM-8-13	SSOPN 1, 2, 3	SSOPS-1
PERMIT UNIT ID	303-21	307-104, 105, 106, 107	311-E37, E38, E39, E40, E78, E79	362-5-3, 6-3, 7-3	10-108
Description	Primary Crusher	Secondary & Tertiary Crusher	Transfer to Fine Ore Bin	Primary & Secondary Crusher	Primary Crusher
Control Device	Ducon UW-4 Wet Scrubber Model Size 108	Ducon UW-4 Wet Scrubber Size 108	Wheelabrator Baghouse Units	Ducon UW-4 Wet Scrubber , Size 108	Ducon UW-4, Size 96, SN C70-356
NSPS (Y/N)	N	Y	Y	N	N
Annual (TPY)	20,075,000 (55,000 TPD)	5,746,560 (1968 TPH)	3,650,000 (2,500 TPH)	1,825,000 (15,000 TPD)	17,520,000 (48,000 TPD)
Data Source of Max Annual Throughput for Estimating PTE	Crusher capacity of 2290 tph (55,000 TPY)	Capacity of Feeders, Conveyors, & Tertiary Crushers; Divided by 3 of 4 scrubbers	2,500 tph Tripper Car (21.9MMTPY) capacity divided by 6 operating baghouse	Crusher Maximum Capacity of 15,000 TPD; divided by 3 operating scrubbers	Nominal Plant Maximum Capacity
% Control Efficiency	95%	95%	99%	95%	95%
Tested Controlled ER (lbs/hr)	1.300	0.907	0.169	2.650	2.000
Process Rate @ Testing (tph)	2,500	461	173	306	1,960
Controlled EF (lbs/ton)	0.00052	0.00197	0.00098	0.00865	0.00102
Uncontrolled EF (lbs/ton)	0.0104	0.0393	0.0975	0.1730	0.0204
Source of Emission Factor & Control Efficiency	Uncontrolled EF = Source Test/(1-Control Efficiency %). CEF = test 7/1997 (1.3 pph/ 2750 tph).	Uncontrolled EF = Avg. Source Test/(1-CE%). @ 1,383 TPH. 3 scrubbers operating, therefore throughput was 1383/3 or 461 TPH. Mean of all tests 0.907 PPH. Scrubber @ 95% control	Uncontrolled EF = Avg. Source Test/(1-CE%) 5/24/05 @ 1,040 TPH. 6 BH units; throughput was 1040/6 =173 TPH. Mean of all tests 0.257 PPH. BH efficiency @ 99% control	Uncontrolled EF = Avg. Source Test/(1-CE%). Rate @ 919 TPH; 3 scrubbers operating therefore throughput was 919/3 =306 TPH. Mean of all tests 2.65 PPH. Scrubber @ 95% control	Uncontrolled EF = Source Test/(1-Control Efficiency %). CEF = test 6/02/97; 7/10/97 5 (2.00pph @ 1,960 tph).
Est. Annual Uncontrolled (TPY)	104.39	213.06	177.94	157.88	178.78
Pre-control PTE at >100% of 100 TPY	YES	YES	YES	YES	YES

REPORTING AND RECORDKEEPING REQUIREMENTS FOR CAM

Section 64.9 specifies the reporting and recordkeeping requirements for CAM . Monitoring reports must be submitted and records must be maintained in accordance with § 70.6(a)(3)(iii). As an alternative to paper records, § 64.9(b)(2) allows owners and operators of affected units to maintain records on alternate media, such as microfilm, computer files, magnetic tape disks, or microfiche provided that the records are readily accessible and the use of such alternative media does not conflict with other recordkeeping requirements. The following summarizes the reporting and recordkeeping requirements for CAM.

a. MONITORING REPORT REQUIREMENTS

§ 64.9(a)(2)(I) Summary of the number, duration, and cause of excursions or exceedances and the corrective actions taken;

§ 64.9(a)(2)(ii) Summary of the number, duration, and cause of monitoring equipment downtime incidents, other than routine downtime for calibration checks

§ 64.9(a)(2)(iii) Description of the actions taken to implement a QIP, and, upon completion of the QIP, documentation that the plan was completed and reduced the likelihood of similar excursions or exceedances

b. COMPLIANCE CERTIFICATIONS

40 CFR §70.6(c)(5) (iii) defines the requirement that the compliance certification include the following information, as further cross referenced in PCC 17.12.220(A)(2)(c)

i The identification of each term or condition of the permit that is the basis of the certification;

ii The identification of the methods or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period. The methods and other means shall include, at a minimum, the methods, and means required under 17.12.180 (A) (3). If necessary, the owner or operator also shall identify any other material information that must be included in the certification to comply with section 113(c)(2) of the Act, which prohibits knowingly making a false certification or omitting material information;

iii The status of compliance with the terms and conditions of the permit for the period covered by the certification, including whether compliance during the period was continuous or intermittent. The certification shall be based on the methods or means designated in subsection (2)(c)(ii). The certification shall identify each deviation and take it into account in the compliance certification. For emission units subject to 40 CFR 64, the certification shall also identify as possible exceptions to compliance any period during which compliance is required and in which an excursion or exceedance defined under 40 CFR 64 occurred; and

iv Other facts the control officer may require to determine the compliance status of the source.

c. RECORDKEEPING REQUIREMENTS

§ 64.9(b) Records of monitoring data, monitor performance data, corrective actions taken, written QIP's, actions taken to implement a QIP, and other supporting information.

DEFINITIONS:

BH: Baghouse (Dust Control System)

CAM: Continuous Assurance Monitoring

Control Device is defined as a "control device" is defined as equipment other than inherent process equipment that is used to destroy or abate air pollutant(s) prior to discharge to atmosphere.

Data means the results of any type of monitoring or method, including the results of instrumental or non-instrumental monitoring, emission calculations, manual sampling procedures, recordkeeping procedures, or any other form of information collection procedure used in connection with any type of monitoring or method

Emission limit or standard is defined in § 64.1 to mean any applicable requirement that constitutes an emission limitation, emission standard, standard of performance, or means of emission limitation as defined under the Act.

Excursion is defined as a departure from an indicator range established for CAM under Part 64, consistent with any averaging period specified for averaging the results of the monitoring.

Exceedance is defined as a condition that is detected by CAM that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) are greater than (or less than, in the case of a percent reduction requirement) the applicable emission limitation or standard.

Major source means any stationary source (or any group of stationary sources that are located on one or more contiguous or adjacent properties, and are under common control of the same person (or persons under common control) belonging to a single major industrial grouping.

Monitoring means any form of collecting data on a routine basis to determine or otherwise assess compliance with emission limitations or standards. Recordkeeping may be considered monitoring where such records are used to determine or assess compliance with an emission limitation or standard (such as records of raw material content and usage, or records documenting compliance with work practice requirements).

Pollutant-specific emissions unit (PSEU) means an emissions unit considered separately with respect to each regulated air pollutant

QIP: Quality Improvement Plan

PLAN CONTENTS AND DEVELOPMENT

A series of five (5) separate CAM plans were developed for the Asarco Mission Complex under the Title V program. As a number of affected PSEU sources are inter-related based on the controls applied to support continued compliance, this plan includes common control information for operations, indicators, and indicator ranges for similar control devices. In addition to specific references developed from manufacturer's information for the continued assurance operations, each plan provides or makes reference to the following key plan aspects:

- Indicators to be monitored
- Methods and frequencies for collecting and averaging indicator measurements
- Ranges or designated conditions for each indicator -- or the process that will be used to establish the ranges and designated conditions
- Performance criteria and quality assurance activities required to obtain accurate and representative data
- Reasons and supporting justifications for any differences between the manufacturer's recommended performance specifications (this is how EPA is referring to the QA/QC requirements for the equipment used to monitor indicators) and those proposed in the CAM Plan
- A justification for the elements in each proposed CAM Plan

CAM PLANS DEVELOPED for ASARCO MISSION COMPLEX

The following CAM plans and have been developed and are provided herein for the ASARCO Mission facility:

CAM PLAN 1
ASARCO Mission Complex – North Circuit Operations Primary & Secondary & Tertiary Crusher)
SSOPN 1-3 (Equip ID #362-5-3; #362-6-3; #362-7-3)

CAM PLAN 2.
ASARCO Mission Complex – Mission Circuit Fine Ore Bin
SSOPM 8-13 (Equip ID #311-E37, E38, E39, E40, E78, E79)

CAM PLAN 3.
ASARCO Mission Complex – Mission Circuit Operations Primary Crusher System
SSOPM-1 #303-21

CAM PLAN 4.
ASARCO Mission Complex – Mission Circuit Operations Secondary & Tertiary Crusher System
SSOPM 4-7 #307-104, 105, 106, 107

CAM PLAN 5.
ASARCO Mission Complex – South Circuit Operations Primary Crusher System
SSOPS-1 #10-108

ASARCO MISSION COMPLEX
CAM PLAN 1.
NORTH CIRCUIT OPERATIONS (PRIMARY & SECONDARY & TERTIARY CRUSHER CAM PLAN

A. Background

1. PSEU Description

Ore that is transferred to the north circuit undergoes primary, secondary, and tertiary crushing. The primary, secondary, and tertiary crushers and associated transfer points at the north circuit result in particulate matter emissions less than 10 microns in diameter (PM_{10}). The Emission Unit includes a NICO Pan feeder (361-05), Grizzly (361-58), Allis Chalmers Jaw Crusher (361-2A), Belt Conveyor (361-07, 08, 42, 16, 40, 28, 30, 37, 29, 28) Double Deck Screens (361-24, 34, 36), and Symons Standard and Tertiary Crushers (361-26, 38). Dust from these operations are collected and ducted to three dynamic wet scrubbers to remove particulate matter (PM) emissions. ASARCO operates two (2) of the three (3) wet scrubbers at all times when the operations are active. The three scrubbers are connected to a common manifold; therefore, emissions from the units above are divided among the two operating wet scrubbers.

Identification:	Source ID's SSOPN 1-3 (Equip ID #362-5-3; #362-6-3; #362-7-3)
Operation:	North Circuit
Facility:	Asarco Mission Complex ; North Facility
Control Units for PSEU;	Ducon Wet Scrubbers
Location:	4201 W. Pima Mine Road Sahuarita, AZ 85629

2. Applicable Regulation, Emission Limit, and Pre-CAM Monitoring Requirements

Regulation:	Permit No.: 2026 PCC § 17.16.360 and SIP Rule 332 PCC § 17.16.040, PCC § 17.16.050, and SIP Rule 321 This process is not subject to 40 C.F.R. Part 60, Subpart LL
Emission Limits:	
Particulate matter:	Process weight rate ≤ 60,000 lb/hr $E = 3.59(\text{process weight rate})^{0.62}$ Process weight rate > 60,000 lb/hr $E = 17.31(\text{process weight rate})^{0.16}$
Opacity:	20%

3. Monitoring Requirements

a. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the change in pressure of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within +/- 1" H2O pressure and calibrated on an annual basis.

b. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the scrubbing liquid flow rate to the scrubber. The monitoring device must be certified by the manufacturer to be accurate within +/- 5% of the defined water flow rate and calibrated on an annual basis.

c. Record the pressure drop and water flow rate on a weekly basis.

d. Conduct a biweekly visual survey of visible emissions when in operation.

Controls:	Three (3) Size 108 Ducon Dynamic Wet Scrubbers (UW-4) Source ID's SSOPN 1-3 (Permit #362-5-3; #362-6-3; #362-7-3) Scrubber Efficiency rated at 95% (AP-42 11.24.3)

The three (3) Model 108 scrubbers control emissions t from the North Crusher operations through a common controlled manifold system. Two of the three scrubber systems operate at all times supporting parallel control to allow bringing one system off-line for maintenance.

As defined in the "Applicability Review (refer to Table 1)" the PSEU has a pre-control potential emissions of PM_{10} greater than 100 tons annually. Estimates are based on controlled stack test measurements and back-calculation of uncontrolled levels based on a conservative 95% removal efficiency and pro-rating process throughput to maximum potentials.

Controlled Emissions (based on stack test data):	2.65 lbs/hr (0.00865 lbs/ton) PM10 per scrubber
Uncontrolled Emissions;	0.1730 lbs/ton PTE:
Measured throughput During Testing	919 TPH / 2 operating scrubbers = 460 TPH/scrubber
Uncontrolled PTE	158 TPY
Uncontrolled > Major Source Threshold (Y/N):	YES

B. Monitoring Approach

Wet scrubbers use a liquid to remove pollutants from an exhaust stream. In particulate matter (PM) emission control applications, PM in the exhaust stream impact with the liquid droplets, are collected in the liquid, and are removed with the scrubbing liquid. The three main mechanisms by which wet scrubbers control PM emissions are: (1) impaction of the particle into the target droplet; (2) interception of the particle by the droplet; and (3) diffusion of the particle through the gas into the droplet. Collection efficiency tends to increase with particle size (for particles with diameters greater than 0.5 µm) and pressure differential across the scrubber. A wet scrubber's particle collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid. The most appropriate indicators to monitor depend upon a number of factors, including type of pollutant (PM or gaseous), scrubber design, and exhaust gas characteristics.

Based on these operational characteristics, and for PM control, the primary indicators of wet scrubber performance are pressure differential (measured as pressure drop across the scrubber system) and scrubber liquid flow rate. Wet scrubbers typically exhibit a relatively constant pressure differential, liquid flow, and gas flow. Common scrubber performance problems include: low gas flow rate; low liquid flow rate; poor liquid distribution; nozzle erosion or plugging; air in-leakage; and particle re-entrainment.

The key elements of the monitoring approach applied under CAM for the scrubber source is further defined in Attachment A, Table A-1 and Table A-2 for monitoring wet scrubber operations and assessing performance. Further information on justification of these indicators follows.

C. Justification

Following 40CFR64.4(b) elements to consider when defining the appropriate indicators and ranges are existing operations, similar monitoring requirements, as well as documented data based on historic records. As the CAM Plan for this PSEU is developed based upon regulatory monitoring requirements for many "like" or similar sources, and because the CAM Plan complies with the an appropriate existing monitoring requirement for these similar sources, the CAM Plan can be considered "presumptively acceptable," and no further justification is necessary. Nevertheless because performance data and recorded operating data further justifies the indicator decisions, these data are provided to support the selection of indicator ranges. If existing data is not available, performance testing will be required. Prior to conducting performance tests, a test plan and schedule to verify that the selected CAM parameters and indicator ranges as appropriate will be developed and approved.

1. Rationale for Selection of Performance Indicators

The scrubber pressure differential and water flow rate were selected because they are indicative of the overall operation and performance of wet scrubbers. Pressure drop provides an operational characteristic and indicator general performance and can be used as a relative measure of scrubber effectiveness. Based on the scrubber operational design, typical adequate water flow will support the mechanics of water contact to the inlet gas stream and affective performance.

2. Indicator Ranges

- Pressure drop across the scrubber is measured with a differential pressure gauge. It is operated continuously and recorded daily;
- Scrubber water flow is measured with a flow gauge indicator. It is operated continuously and manually recorded daily;

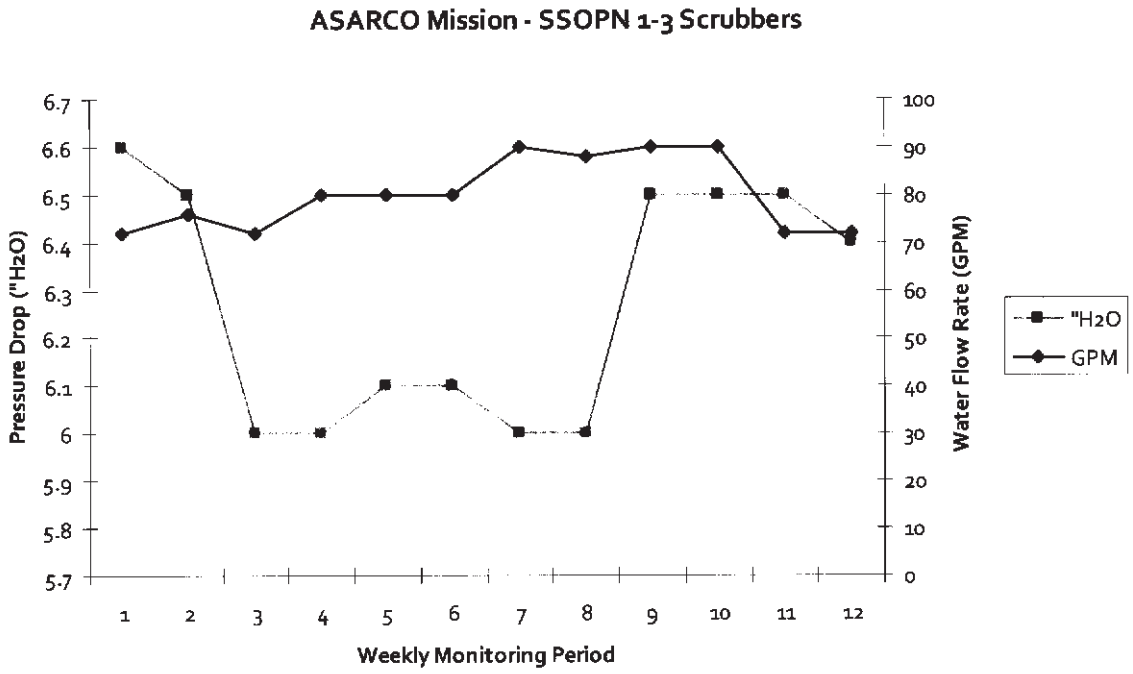
ASARCO currently monitors and records information for pressure drop and water flow for the operational scrubbers on a weekly basis. Incorporating the manufacturers recommended operational set points, and data documented from periodic performance testing Asarco has developed a relative acceptable operating range for each control device. As there can be inherent differences between each physical scrubber in place and variations in operations, an acceptable operating range has been established for each system. The functional range for these two indicators has been assigned a +/- 30% tolerance from the average obtained during the most recent performance test and recommended manufacturer's acceptable operational points.

Pressure Drop. An excursion is defined as a pressure drop greater than 10 in. H_2O. Excursions trigger an inspection and corrective action. Readings less than 3 inches H_2O require a system inspection and corrective action, if necessary. Operating level and acceptable ranges are established from stack test and operation data and can be adjusted as new data is developed and periodic testing, where required, is completed.

Scrubber Water Flow. An excursion is defined as a water flow rate outside the operating range of 50 to 120 gallons per minute. Excursions trigger an inspection and corrective action. The operating range is established from stack test and operation data.

In June, 1997, a performance test was performed on scrubber 362-5-3 under conditions of maximum emissions potential under anticipated operating conditions. The calculated emissions were 2.65 lb of particulate per hour. This is well within the permit limit. During testing the water flow was 110 gallons per minute and the pressure drop was 6" H_2O. A review of a representative snapshot of Asarco's historic weekly monitoring of the pressure drop and water flow correlates compliance with the particulate limit as illustrated below.

Period	Pressure dP (" H_2O)	Water Flow (GPM)	Period	Pressure dP (" H_2O)	Water Flow (GPM)
Week 1	**6.6**	**72**	**Week 7**	**6**	**90**
Week 2	**6.5**	**76**	**Week 8**	**6**	**88**
Week 3	**6**	**72**	**Week 9**	**6.5**	**90**
Week 4	**6**	**80**	**Week 10**	**6.5**	**90**
Week 5	**6.1**	**80**	**Week 11**	**6.5**	**72**
Week 6	**6.1**	**80**	**Week 12**	**6.4**	**72**



The recorded data indicated that the wet scrubber(s) can be operated at a wide range of differential pressure and water flow and support emissions below the standard. Table A-1 Parametrics for Monitoring Wet Scrubber Operations, Monitoring Approach for Wet Scrubbers, provides a tabulated and organized approach to the monitoring indicators and tolerances defined for these systems.

ASARCO MISSION COMPLEX
CAM PLAN 2.
MISSION CIRCUIT FINE ORE BIN CAM PLAN

A. Background

1. PSEU Description

Ore from the final crushing processes is conveyed to the Mission Mill and Fine Ore Bin where it is stored for further processing in the Mill/Concentrator. A 2,500 TPH Cimetta Engineering Tripper Car (M311-E45) distributes material evenly across a 48" belt conveyor (M307-E44) in the building to the fine ore bin. Emissions from the bin and the distribution of material from the tripper car are controlled by six (6) 3,400 cfm Wheelabrator pulse-jet baghouses (Source IDs SSOPM 8-13; Permit #M311-E37, E38, E39, E40, E78, E79. Under the current operating scenario, all baghouses are used in the dust control of the upper tripper car and belt area (commonly referred to as the Tripper Deck).

Identification:	Source ID's SSOPM 8-13 (Equip ID #311-E37, E38, E39, E40, E78, E79)
Operation:	Mission Circuit; Mission Concentrator
Control Units for PSEU;	Wheelabrator Baghouse
Facility:	Asarco Mission Complex ; Mission Facility
Location:	4201 W. Pima Mine Road Sahuarita, AZ 85629

2. Applicable Regulation, Emission Limit, and Pre-CAM Monitoring Requirements

Regulation:	Permit No.: 2026 40CFR60 Subpart LL, Part D
Emission Limits:	
Particulate matter:	< 0.05 grams per dry standard cubic meter
Opacity:	≤7% (at any stack except wet scrubbers); ≤10% process fugitives

3. Monitoring Requirements

a. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the change in pressure of the gas stream across baghouse. The monitoring device must be certified by the manufacturer to be accurate within +/- 1" H2O pressure and calibrated on an annual basis.

b. Establish a baseline opacity level for point sources;

c. Conduct a biweekly visual survey of visible emissions when in operation.

d. RM9 observations as necessary

Controls:	Six (6 Model 112-0 Wheelabrator Baghouse Source ID's SSOPM 8-13 (Equip ID #311-E-37, E38, E39, E40, E78, E79) Baghouse Efficiency rated at 99% (AP-42 11.24.3)

Based on current operations, the six (6) baghouses control emissions from the tripper deck belt and tripper car operation, when in operation and transferring ore to the Fine Ore Bins. All baghouses should be in operation when the tripper car is active and ore is being transferred.

As defined in the "Applicability Review (refer to Table 1)" the PSEU has a pre-control potential emissions of PM_{10} greater than 100 tons annually. Estimates are based on controlled average test results for these baghouses, and back-calculation of uncontrolled levels based on a conservative 99% removal efficiency and pro-rating process throughput to maximum potentials. The estimation basis was with all systems operating.

Controlled Emissions (based on stack test data):	0.169 lbs/hr (0.0098 lbs/ton) PM10 per baghouse
Uncontrolled Emissions;	0.09750 lbs/ton PTE:
Measured throughput During Testing	1040 TPH / 6 baghouses = 173 TPH/baghouse
Uncontrolled PTE	178 TPY
Uncontrolled > Major Source Threshold (Y/N):	YES

B. Monitoring Approach

The key elements of the monitoring approach are presented in Table A-3, Monitoring Approach for Baghouse Operations. Further information on justification of these indicators follows.

C. Justification

1. Rationale for Selection of Performance Indicators

Pressure differential and opacity were selected because they are indicative of the overall operation and performance of the baghouses. Pressure differential was selected since increases in pressure differential indicate fabric blinding or decreased permeability, while decreases in pressure differential indicate changes in operation. Opacity was selected since increases indicate process changes, changes in baghouse efficiency, or leaks.

2. Indicator Ranges – Pressure Differential

The range of pressure differential was selected based upon baseline historical monitoring data in addition to the parameter data obtained during particulate matter source testing. The baseline data were collected weekly during a three month period of normal operation when the emissions unit and associated control devices were properly operated and maintained. The baseline differential pressure data in inches of water column for each of the six baghouses is provided below.

ASARCO currently monitors and records information for pressure drop for the operational baghouses on a weekly basis. Incorporating the manufacturer's recommended operational set points, and data documented from periodic historical operations, coupled with periodic performance testing, a relative acceptable operating range is developed for the common baghouse units. As there can be inherent differences between each physical baghouse in place, variations in their operations, and situations that can be unique to any stage of the process along the tripper deck and ore composition, a wide operating range must be established within acceptable operating tolerances. The functional range for pressure drop is assigned a +/- 30% tolerance from

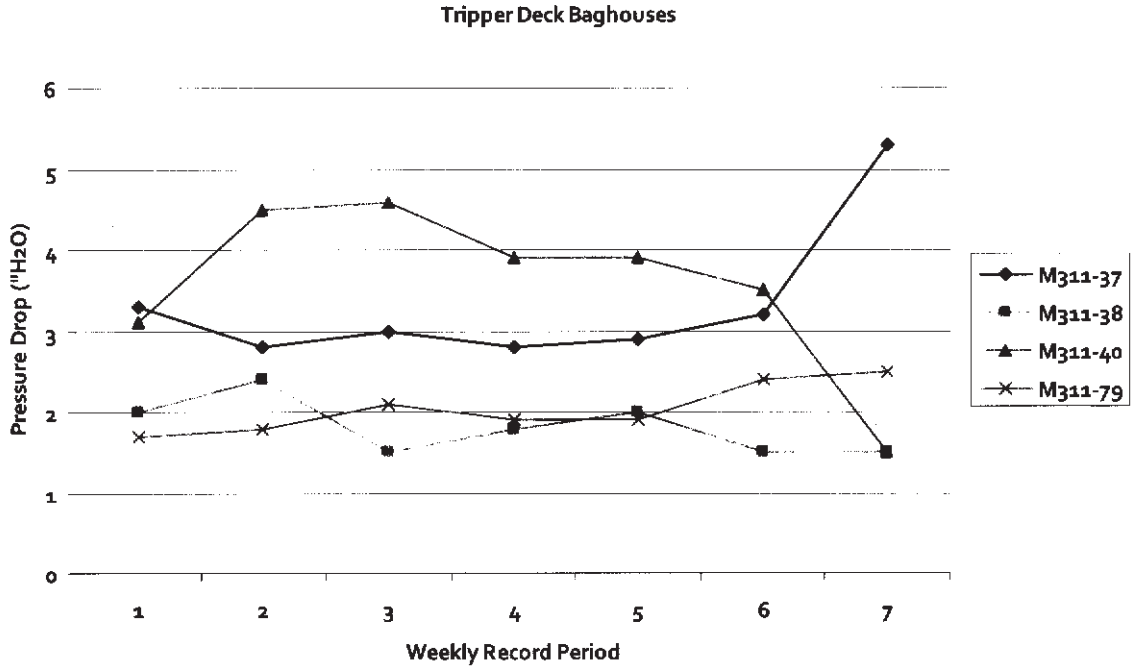
the average obtained during the most recent performance test and/or the trend and historical operations and documentation of acceptable operations.

Pressure Drop. An excursion is defined as a pressure drop greater than 7 in. H_2O. Excursions trigger an inspection and corrective action. Readings less than 1.0 in. H_2O require a system inspection and corrective action, if necessary. Operating level and acceptable ranges are established from stack test and operation data and can be adjusted as new data is developed and periodic testing, where required, is completed.

Performance testing has been performed on a number of baghouse systems associated with this source as part of the required permit cycle testing. All results fall within the permit limit. As actual BH operations data was limited, an historical review and representative snapshot period was collected to reconfirm the operational ranges defined for the system. This data are represented below.

Date	Source ID	Concentration	Emissions (#/hr)
06/06/97	**M311-E37**	**0.0164 gr/sdcf**	**0.40742**
07/21/98	**M311-E38**	**0.0024 gr/sdcf**	**0.12203**
07/22/98	**M311-E39**	**0.0029 gr/sdcf**	**0.15904**
07/23/98	**M311-E40**	**0.0006 gr/sdcf**	**0.03058**
07/24/98	***M311-E41**	**0.0050gr/sdcf**	**0.24519**
07/27/98	***M311-E42**	**0.0032gr/sdcf**	**0.15848**

*Note: Change in baghouse naming convention for M311-E41 and M311-E42 are M311-E78 and M311-E79, respectively. This naming is accurately identified in the AQ Permit and equipment list for the facility.



The recorded data indicated that the BH units can be operated at a wide range of differential pressure. Table A-3 Parametrics for Monitoring Baghouse Operations.

3. Indicator Ranges – Opacity

The proposed opacity indicator range (not to exceed the baseline opacity level) is based upon the monitoring requirements in the current Title V Operating Permit. Pursuant to the current Title V Permit, ASARCO conducted certified Method 9 observations on the baghouses while they were operating at normal representative working conditions to establish baseline opacity levels and submitted the results to PDEQ. The baseline opacity levels for the baghouses were less than 5%. Historical bi-weekly observations further indicate that the baseline opacity levels have not been exceeded.

The following monitoring and recordkeeping requirements, as defined in Part "B", Section II.C.3 of Asarco's current Title V permit (Number 2026), will be adopted as CAM for this operation;

a. Bi-weekly (Every Two Weeks) Monitoring Requirement

(1) A certified Method 9 observer shall conduct a bi-weekly visual survey of visible emissions from the Fine Ore Bin baghouse exhaust points (emissions points along side the building) when in operation.

(a) If the observer, during the visual survey, does not see a plume from the point source that on an instantaneous basis appears to exceed the baseline level, then the observer shall keep a record of the name of the observer, the date on which the observation was made, the location of the observation and results of the observation.

(b) If the observer sees a plume from the point source that on an instantaneous basis appears to exceed the baseline level, then the observer shall, if practicable, take a six-minute Method 9 observation of the plume.

(c) If the six-minute opacity of the plume is less than the baseline, then the observer shall make a record of the following:

i) Location, date, and time of the test; and

ii) The results of the Method 9 observation.

(d) If the six-minute opacity of the plume exceeds the baseline level but is less than the opacity standard, ASARCO shall adjust or repair the controls or equipment, as necessary, to reduce opacity to or below the baseline level. ASARCO shall make a record of the following:

i) Location, date, and time of the test; and

ii) The results of the Method 9 observation.

(e) If the six-minute opacity of the plume exceeds both the baseline level and the opacity standard, then ASARCO shall do the following:

i) Adjust or repair the controls or equipment to reduce opacity to or below the baseline level; and

ii) Report it as an excess emission for opacity.

(f) If corrective actions fail to reduce opacity to or below the baseline level, then ASARCO shall adopt the following course of action:

i) Document all corrective action; and

ii) Initiate procedures to re-establish the baseline within forty eight hours in accordance with subsection (h).

ASARCO shall conduct at least one Method 9 opacity test annually for each stack from the sources defined under this CAM plan. (Subject to the requirements of this section (Equip ID #311-E37, E38, E39, E40, E78, E79)

ASARCO MISSION COMPLEX
CAM PLAN 3.
MISSION CIRCUIT OPERATIONS PRIMARY CRUSHER SYSTEM CAM PLAN

A. Background

1. PSEU Description

Ore transported to the Mission Circuit is handled by the Mission Primary Crushing system that is supported by a Traylor 2290 TPH primary crusher (M303-E3), two (2) Stephens 1145 TPH Apron feeders (M303-E4, E3), and transfers to a 60" Belt Conveyor (M309-E1) Dust from these operations are collected and ducted to one Ducon Model 108 Dynamic Wet scrubber to control particulate matter (PM) emissions. The wet scrubber system is operated at all time the crushing and conveyance system is active.

Identification:	Source ID's SSOPM-1 #303-21
Operation:	Mission Circuit
Control Units for PSEU;	Ducon Wet Scrubber
Facility:	Asarco Mission Complex ; Mission Primary Crusher
Location:	4201 W. Pima Mine Road Sahuarita, AZ 85629

2. Applicable Regulation, Emission Limit, and Pre-CAM Monitoring Requirements

Regulation:	Permit No.: 2026 PCC § 17.16.360 and SIP Rule 332 PCC § 17.16.040, PCC § 17.16.050, and SIP Rule 321 This process is not subject to 40 C.F.R. Part 60, Subpart LL
Emission Limits:	
Particulate matter:	Process weight rate ≤ 60,000 lb/hr $E = 3.59(\text{process weight rate})^{0.62}$ Process weight rate > 60,000 lb/hr $E = 17.31(\text{process weight rate})^{0.16}$
Opacity:	20%

3. Monitoring Requirements

a. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the change in pressure of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within +/- 1" H2O pressure and calibrated on an annual basis.

b. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the scrubbing liquid flow rate to the scrubber. The monitoring device must be certified by the manufacturer to be accurate within +/- 5% of the defined water flow rate and calibrated on an annual basis.

c. Record the pressure drop and water flow rate on a weekly basis.

d. Conduct a biweekly visual survey of visible emissions when in operation.

Controls:	One (1) Size 108 Ducon Dynamic Wet Scrubber (UW-4) Source ID's SSOPM-1 (Permit #303-21) Scrubber Efficiency rated at 95% (AP-42 11.24.3)

The one (1) Ducon Model 108 scrubber controls emissions from the Primary Mission Crusher and Support Equipment operation through a series of take-up and area sweeps around the area equipment including but not limited to the (1) dump pocket, (2) crusher, (3) apron feeders, (4) and conveyor transfer. Additionally, water sprays are also in place to further support minimizing fugitive emissions from primary activity areas.

As defined in the "Applicability Review (refer to Table 1)" the PSEU has a pre-control potential emissions of PM_{10} greater than 100 tons annually. Estimates are based on controlled stack test measurements and back-calculation of uncontrolled levels based on a conservative 95% removal efficiency and pro-rating process throughput to maximum potentials.

Controlled Emissions (based on stack test data):	1.30 lbs/hr (0.00047 lbs/ton) PM10 per scrubber
Uncontrolled Emissions;	0.0095 lbs/ton PTE:
Measured throughput During Testing	2750 TPH
Uncontrolled PTE	~ 100 TPY*
Uncontrolled > Major Source Threshold (Y/N):	YES

** The back-calculated PTE based on the 1997 testing stack testing indicated a based on available process data in the report that the potential was >95 TPY, however due to limited detail of process documentation on the field testing and the potential's valve approaching this threshold, Asarco has decided to apply CAM to this unit. Future testing will confirm the overall status of this PSEU.*

B. Monitoring Approach

Wet scrubbers use a liquid to remove pollutants from an exhaust stream. In particulate matter (PM) emission control applications, PM in the exhaust stream impact with the liquid droplets, are collected in the liquid, and are removed with the scrubbing liquid. The three main mechanisms by which wet scrubbers control PM emissions are: (1) impaction of the particle into the target droplet; (2) interception of the particle by the droplet; and (3) diffusion of the particle through the gas into the droplet. Collection efficiency tends to increase with particle size (for particles with diameters greater than 0.5 μm) and pressure differential across the scrubber. A wet scrubber's particle collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid. The most appropriate indicators to monitor depend upon a number of factors, including type of pollutant (PM or gaseous), scrubber design, and exhaust gas characteristics.

Based on these operational characteristics, and for PM control, the primary indicators of wet scrubber performance are pressure differential (measured as pressure drop across the scrubber system) and scrubber liquid flow rate. Wet scrubbers typically exhibit a relatively constant pressure differential, liquid flow, and gas flow. Common scrubber performance problems include: low gas flow rate; low liquid flow rate; poor liquid distribution; nozzle erosion or plugging; air in-leakage; and particle re-entrainment.

The key elements of the monitoring approach applied under CAM for the scrubber source is further defined in Attachment A, Table A-1 and Table A-2 for monitoring wet scrubber operations and assessing performance. Further information on justification of these indicators follows.

C. Justification

Following 40CFR64.4(b) elements to consider when defining the appropriateness indicators and ranges are existing operations, similar monitoring requirements, as well as documented data based on historic records. As the CAM Plan for this PSEU is developed based upon regulatory monitoring requirements for many "like" or similar sources, and because the CAM Plan complies with the an appropriate existing monitoring requirement for these similar sources, the CAM Plan can be considered "presumptively acceptable," and no further justification is necessary. Nevertheless because performance data and recorded operating data further justifies the indicator decisions, these data are provided to support the selection of indicator ranges. If existing data is not available, performance testing will be required. Prior to conducting performance tests, a test plan and schedule to verify that the selected CAM parameters and indicator ranges as appropriate will be developed and approved.

1. Rationale for Selection of Performance Indicators

The scrubber pressure differential and water flow rate were selected because they are indicative of the overall operation and performance of wet scrubbers. Pressure drop provides an operational characteristic and indicates general performance and can be used as a relative measure of scrubber effectiveness. Based on the scrubber operational design, typical adequate water flow will support the mechanics of water contact to the inlet gas stream and affective performance.

2. Indicator Ranges

- Pressure drop across the scrubber is measured with a differential pressure gauge. It is operated continuously and recorded daily;
- Scrubber water flow is measured with a flow gauge indicator. It is operated continuously and manually recorded daily;

ASARCO currently monitors and records information for pressure drop and water flow for the operational scrubbers on a weekly basis. Incorporating the manufacturers recommended operational set points, and data documented from periodic performance testing, Asarco has developed a relative acceptable operating range for each control device. As there can be inherent differences between each physical scrubber in place and variations in operations, an acceptable operating range has been established for each system. The functional range for these two indicators has been assigned a +/- 30% tolerance from the average obtained during the most recent performance test and recommended manufacturer's acceptable operational points

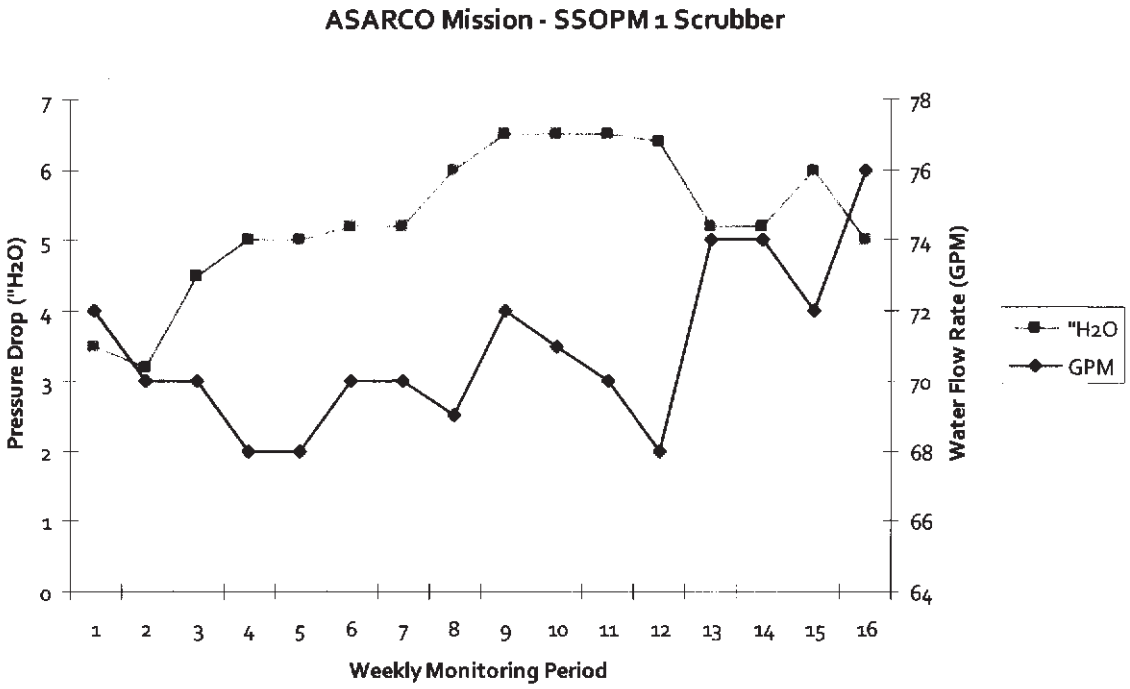
Pressure Drop. An excursion is defined as a pressure drop greater than 10 in. H_2O. Excursions trigger an inspection and corrective action. Readings less than 3 in. H_2O require a system inspection and corrective action, if necessary. Operating level and acceptable ranges are established from stack test and operation data and can be adjusted as new data is developed and periodic testing, where required, is completed.

Scrubber Water Flow. An excursion is defined as a water flow rate outside the operating range of 50 to 120 gallons per minute. Excursions trigger an inspection and corrective action. The operating range is established from stack test and operation data.

In June, 1997, a performance test was performed on the scrubber under conditions of maximum achievable feed (crushing) and representative system operating conditions. The calculated emissions were 1.3 lb of

particulate per hour (0.0068 gr/dscf). This is well within the permit limit. During testing the water flow was ~ 70 gallons per minute and the pressure drop was ~ 6" H_2O. A review of a representative snapshot of Asarco's historic weekly monitoring of the pressure drop and water flow correlates compliance with the particulate limit as illustrated below.

Period	Pressure dP (" H_2O)	Water Flow (GPM)	Period	Pressure dP (" H_2O)	Water Flow (GPM)
Week 1	3.5	72	**Week 9**	6.5	72
Week 2	3.2	70	**Week 10**	6.5	71
Week 3	4.5	70	**Week 11**	6.5	70
Week 4	5	68	**Week 12**	6.4	68
Week 5	5	68	**Week 13**	5.2	74
Week 6	5.2	70	**Week 14**	5.2	74
Week 7	5.2	70	**Week 15**	6	72
Week 8	6	69	**Week 16**	5	76



The recorded data indicated that the wet scrubber(s) can be operated at a wide range of differential pressure and water flow and support emissions below the standard. Table A-1 Parametrics for Monitoring Wet Scrubber Operations, Monitoring Approach for Wet Scrubbers, provides a tabulated and organized approach to the monitoring indicators and tolerances defined for these systems.

ASARCO MISSION COMPLEX
CAM PLAN 4.
MISSION CIRCUIT OPERATIONS SECONDARY & TERTIARY CRUSHER SYSTEM CAM PLAN

A. Background

1. PSEU Description

Ore is transported from the Coarse Ore Storage (Permit # WFOPM-1; Mission Stockpile) via two (42" Belt Conveyors (#M309-E2, E6), and feeds to (2) Svelda 1300 TPH Double Deck Screens (#M301-E1, E2), two (2) 1500 TPH Nordberg (Secondary) Crushers (#624-1,2) ,(2) Svelda 800 TPH Double Deck Screens (#M307-E5, E6), additional conveyance , three (3) 500 Ton Surge Bins, three (3) Syntron Vibratory Feeders, three (3) Tertiary Nordberg 656 TPH Crushers, additional (3) 656 TPH Double Deck Screens, where final crushed material is transported to the Mission Concentrator by a 2500TPH double deck Conveyor. Dust from these operations are ducted to common Surge bin and manifolded to a series of four (4) Ducon Model 108 Dynamic Wet scrubbers to control particulate matter (PM) emissions. Three (3) of the four (4) scrubber systems are operated at any given time supporting redundant control and allowing maintenance of a single system without affecting system operations.

Identification:	Source ID's SSOPM 4-7 #307-104, 105, 106, 107
Operation:	Mission Circuit
Control Units for PSEU;	Ducon Wet Scrubber
Facility:	Asarco Mission Complex ; Mission Secondary/Tertiary Crushers
Location:	4201 W. Pima Mine Road Sahuarita, AZ 85629

2. Applicable Regulation, Emission Limit, and Pre-CAM Monitoring Requirements

Regulation:	Permit No.: 2026 PCC § 17.16.360 40 C.F.R. Part 60, Subpart LL
Emission Limits:	
Emission Limits:	
Particulate matter:	< 0.05 grams per dry standard cubic meter
Opacity:	≤7% (at any stack except wet scrubbers); ≤10% process fugitives

3. Monitoring Requirements

e. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the change in pressure of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within +/- 1" H_2O pressure and calibrated on an annual basis.

f. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the scrubbing liquid flow rate to the scrubber. The monitoring device must be certified by the manufacturer to be accurate within +/- 5% of the defined water flow rate and calibrated on an annual basis.

g. Record the pressure drop and water flow rate on a weekly basis.

h. Conduct a biweekly visual survey of visible emissions when in operation.

Controls:	Four (4) Size 108 Ducon Dynamic Wet Scrubber (UW-4) Source ID's SSOPM-4, 5, 6, 7 (Permit #307-104, 105, 106, 107) Scrubber Efficiency rated at 95% (AP-42 11.24.3)

The four (4) Ducon Model 108 scrubber controls emissions from the above referenced sources supporting the Mission Secondary and Tertiary Crushing operations. Through a number of take-up points and directional flow, the exhaust is routed to a common manifold system that connects to the four scrubber systems. Operation of the scrubbers controls the overall emissions from the source. Additionally, water sprays are used, when required, to further support minimize fugitive emissions from primary activity areas. With the parallel and redundant configuration, 3 of 4 scrubbers are operational during active processes to control emissions.

As defined in the "Applicability Review (refer to Table 1)" the PSEU has a pre-control potential emissions of PM_{10} greater than 100 tons annually. Estimates are based on controlled stack test measurements and back-calculation of uncontrolled levels based on a conservative 95% removal efficiency and pro-rating process throughput to maximum potentials.

Controlled Emissions (based on stack test data):	0.91 lbs/hr (0.001977 lbs/ton) PM10 per scrubber
Uncontrolled Emissions;	0.0393 lbs/ton PTE:
Measured throughput During Testing	1383 TPH (controlled by 3 scrubbers = 461 TPH)
Uncontrolled PTE	~ 113 TPY
Uncontrolled > Major Source Threshold (Y/N):	YES

B. Monitoring Approach

Wet scrubbers use a liquid to remove pollutants from an exhaust stream. In particulate matter (PM) emission control applications, PM in the exhaust stream impact with the liquid droplets, are collected in the liquid, and are removed with the scrubbing liquid. The three main mechanisms by which wet scrubbers control PM emissions are: (1) impaction of the particle into the target droplet; (2) interception of the particle by the droplet; and (3) diffusion of the particle through the gas into the droplet. Collection efficiency tends to increase with particle size (for particles with diameters greater than 0.5 μm) and pressure differential across the scrubber. A wet scrubber's particle collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid. The most appropriate indicators to monitor depend upon a number of factors, including type of pollutant (PM or gaseous), scrubber design, and exhaust gas characteristics.

Based on these operational characteristics, and for PM control, the primary indicators of wet scrubber performance are pressure differential (measured as pressure drop across the scrubber system) and scrubber liquid flow rate. Wet scrubbers typically exhibit a relatively constant pressure differential, liquid flow, and gas flow. Common scrubber performance problems include: low gas flow rate; low liquid flow rate; poor liquid distribution; nozzle erosion or plugging; air in-leakage; and particle re-entrainment.

The key elements of the monitoring approach applied under CAM for the scrubber source is further defined in Attachment A, Table A-1 and Table A-2 for monitoring wet scrubber operations and assessing performance. Further information on justification of these indicators follows.

C. Justification

Following 40CFR64.4(b) elements to consider when defining the appropriate indicators and ranges are existing operations, similar monitoring requirements, as well as documented data based on historic records. As the CAM Plan for this PSEU is developed based upon regulatory monitoring requirements for many "like" or similar sources, and because the CAM Plan complies with the an appropriate existing monitoring requirement for these similar sources, the CAM Plan can be considered "presumptively acceptable," and no further justification is necessary. Nevertheless because performance data and recorded operating data further justifies the indicator decisions, these data are provided to support the selection of indicator ranges. If existing data is not available, performance testing will be required. Prior to conducting performance tests, a test plan and schedule to verify that the selected CAM parameters and indicator ranges as appropriate will be developed and approved.

1. Rationale for Selection of Performance Indicators

The scrubber pressure differential and water flow rate were selected because they are indicative of the overall operation and performance of wet scrubbers. Pressure drop provides an operational characteristic and indicates general performance and can be used as a relative measure of scrubber effectiveness. Based on the scrubber operational design, typical adequate water flow will support the mechanics of water contact to the inlet gas stream and affective performance.

2. Indicator Ranges

- Pressure drop across the scrubber is measured with a differential pressure gauge. It is operated continuously and recorded daily;
- Scrubber water flow is measured with a flow gauge indicator. It is operated continuously and manually recorded daily;

ASARCO currently monitors and records information for pressure drop and water flow for the operational scrubbers on a weekly basis. Incorporating the manufacturers recommended operational set points, and data documented from periodic performance testing, Asarco has developed a relative acceptable operating range for each control device. As there can be inherent differences between each physical scrubber in place and variations in operations, an acceptable operating range has been established for each system. The functional range for these two indicators has been assigned a +/- 30% tolerance from the average obtained during the most recent performance test and recommended manufacturer's acceptable operational points

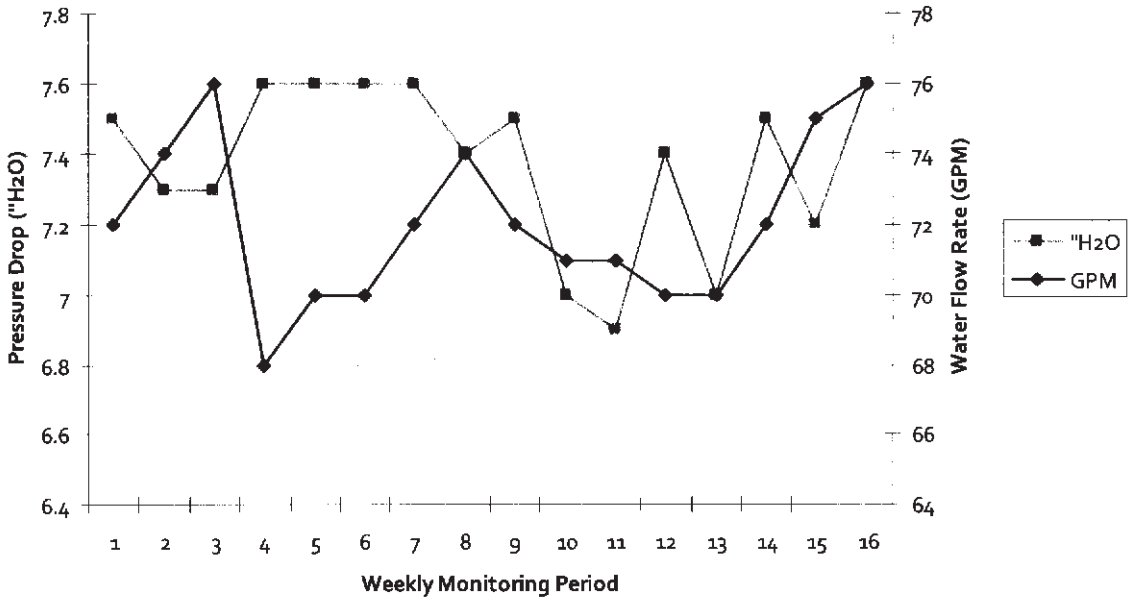
Pressure Drop. An excursion is defined as a pressure drop greater than 10 in. H_2O. Excursions trigger an inspection and corrective action. Readings less than 3 inches H_2O require a system inspection and corrective action, if necessary. Operating level and acceptable ranges are established from stack test and operation data and can be adjusted as new data is developed and periodic testing, where required, is completed.

Scrubber Water Flow. An excursion is defined as a water flow rate outside the operating range of 50 to 120 gallons per minute. Excursions trigger an inspection and corrective action. The operating range is established from stack test and operation data.

In December 1999 and April 2005, performance tests were performed on the scrubber under conditions of maximum achievable feed (crushing) and representative system operating conditions. The calculated emissions were 0.90 lb of particulate per hour (0.0147 gr/dscf). This is well within the permit limit. During testing the water flow was ~ 70 gallons per minute and the pressure drop was ~ 7" H_2O. A review of a representative snapshot of Asarco's historic weekly monitoring of the pressure drop and water flow correlates compliance with the particulate limit as illustrated below.

Period	Pressure dP (" H_2O)	Water Flow (GPM)	Period	Pressure dP (" H_2O)	Water Flow (GPM)
Week 1	**7.5**	**72**	**Week 9**	**7.5**	**72**
Week 2	**7.3**	**74**	**Week 10**	**7**	**71**
Week 3	**7.3**	**76**	**Week 11**	**6.9**	**71**
Week 4	**7.6**	**68**	**Week 12**	**7.4**	**70**
Week 5	**7.6**	**70**	**Week 13**	**7**	**70**
Week 6	**7.6**	**70**	**Week 14**	**7.5**	**72**
Week 7	**7.6**	**72**	**Week 15**	**7.2**	**75**
Week 8	**7.4**	**74**	**Week 16**	**7.6**	**76**

ASARCO Mission - SSOPM 4-7 Secondary/Tertiary Crushing ; Scrubber



The recorded data indicated that the wet scrubber(s) can be operated at a wide range of differential pressure and water flow and support emissions below the standard. Table A-1 Parametrics for Monitoring Wet Scrubber Operations, Monitoring Approach for Wet Scrubbers, provides a tabulated and organized approach to the monitoring indicators and tolerances defined for these systems.

ASARCO MISSION COMPLEX
CAM PLAN 5.
SOUTH CIRCUIT OPERATIONS PRIMARY CRUSHER SYSTEM CAM PLAN

A. Background

1. PSEU Description

Ore transported to the Mission South operations is handled by the South Circuit Primary Crushing system that is supported by a Allis-Chalmers 2000 TPH Gyratory Crusher (#10-101), NICO 2000 TPH 72" Apron Feeder (10-102), and 54" Belt Conveyor (10-103) that moves material to the Coarse Ore Storage. Dust from these front end crushing operations are collected and ducted to one Ducon Model 96 Dynamic Wet scrubber to control particulate matter (PM) emissions. The wet scrubber system is operated at all times when the crushing and conveyance system is active.

Identification:	Source ID's SSOPS-1 #10-108
Operation:	South Circuit
Control Units for PSEU;	Ducon Wet Scrubber
Facility:	Asarco Mission Complex ; Mission Primary Crusher
Location:	4201 W. Pima Mine Road Sahuarita, AZ 85629

2. Applicable Regulation, Emission Limit, and Pre-CAM Monitoring Requirements

Regulation:	Permit No.: 2026 PCC § 17.16.360 40 C.F.R. Part 60, Subpart LL [2]PCC § 17.12.220B South Mill Primary Crusher limited to 2000 TPH South Mill Omincone Crushers limited to 200 TPH
Emission Limits:	
Emission Limits:	
Particulate matter:	< 0.05 grams per dry standard cubic meter
Opacity:	≤7% (at any stack except wet scrubbers); ≤10% process fugitives

3. Monitoring Requirements

i. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the change in pressure of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within +/- 1" H2O pressure and calibrated on an annual basis.

j. Install, calibrate, maintain and operate a monitoring device for the continuous measurement of the scrubbing liquid flow rate to the scrubber. The monitoring device must be certified by the manufacturer to be accurate within +/- 5% of the defined water flow rate and calibrated on an annual basis.

k. Record the pressure drop and water flow rate on a weekly basis.

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[2] *Permitted limited capacities in place during periods when the Mission Crusher, or the secondary crusher, or the North primary crusher systems are off-line (Permit condition 2026 Part "B", Section I, G.*

l. Conduct a biweekly visual survey of visible emissions when in operation.

Controls: One (1) Size 96 Ducon Dynamic Wet Scrubber (UW-4)
Source ID's SSOPS-1 (Permit #10-108)
Scrubber Efficiency rated at 95% (AP-42 11.24.3)

The one (1) Ducon Model 96 scrubber controls emissions from the Primary South Crusher and Support Equipment operation through a series of take-up and area sweeps around the specific equipment including but not limited to the (1) dump pocket, (2) crusher, (3) apron feeder, (4) and belt conveyor transfer. Additionally, water sprays are also in place to further support minimizing fugitive emissions from primary activity areas.

As defined in the "Applicability Review (refer to Table 1)" the PSEU has a pre-control potential emissions of PM_{10} greater than 100 tons annually. Estimates are based on controlled stack test measurements and back-calculation of uncontrolled levels based on a conservative 95% removal efficiency and pro-rating process throughput to maximum potentials.

Controlled Emissions (based on stack test data):	2.0lbs/hr (0.00102 lbs/ton) PM10
Uncontrolled Emissions;	0.0204 lbs/ton PTE
Measured throughput During Testing	1960 TPH
Uncontrolled PTE	~ 180TPY
Uncontrolled > Major Source Threshold (Y/N):	YES

B. Monitoring Approach

Wet scrubbers use a liquid to remove pollutants from an exhaust stream. In particulate matter (PM) emission control applications, PM in the exhaust stream impact with the liquid droplets, are collected in the liquid, and are removed with the scrubbing liquid. The three main mechanisms by which wet scrubbers control PM emissions are: (1) impaction of the particle into the target droplet; (2) interception of the particle by the droplet; and (3) diffusion of the particle through the gas into the droplet. Collection efficiency tends to increase with particle size (for particles with diameters greater than 0.5 μm) and pressure differential across the scrubber. A wet scrubber's particle collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid. The most appropriate indicators to monitor depend upon a number of factors, including type of pollutant (PM or gaseous), scrubber design, and exhaust gas characteristics.

Based on these operational characteristics, and for PM control, the primary indicators of wet scrubber performance are pressure differential (measured as pressure drop across the scrubber system) and scrubber liquid flow rate. Wet scrubbers typically exhibit a relatively constant pressure differential, liquid flow, and gas flow. Common scrubber performance problems include: low gas flow rate; low liquid flow rate; poor liquid distribution; nozzle erosion or plugging; air in-leakage; and particle re-entrainment.

The key elements of the monitoring approach applied under CAM for the scrubber source is further defined in Attachment A, Table A-1 and Table A-2 for monitoring wet scrubber operations and assessing performance. Further information on justification of these indicators follows.

C. Justification

Following 40CFR64.4(b) elements to consider when defining the appropriateness indicators and ranges are existing operations, similar monitoring requirements, as well as documented data based on historic records. As the CAM Plan for this PSEU is developed based upon regulatory monitoring requirements for many "like" or similar sources, and because the CAM Plan complies with the an appropriate existing monitoring requirement for these similar sources, the CAM Plan can be considered "presumptively acceptable," and no further justification is necessary. Nevertheless because performance data and recorded operating data further justifies the indicator decisions, these data are provided to support the selection of indicator ranges. If existing data is not available, performance testing will be required. Prior to conducting performance tests, a test plan and schedule to verify that the selected CAM parameters and indicator ranges as appropriate will be developed and approved.

1. Rationale for Selection of Performance Indicators

The scrubber pressure differential and water flow rate were selected because they are indicative of the overall operation and performance of wet scrubbers. Pressure drop provides an operational characteristic and indicator general performance and can be used as a relative measure of scrubber effectiveness. Based on the scrubber operational design, typical adequate water flow will support the mechanics of water contact to the inlet gas stream and affective performance.

2. Indicator Ranges

- Pressure drop across the scrubber is measured with a differential pressure gauge. It is operated continuously and recorded daily;
- Scrubber water flow is measured with a flow gauge indicator. It is operated continuously and manually recorded daily;

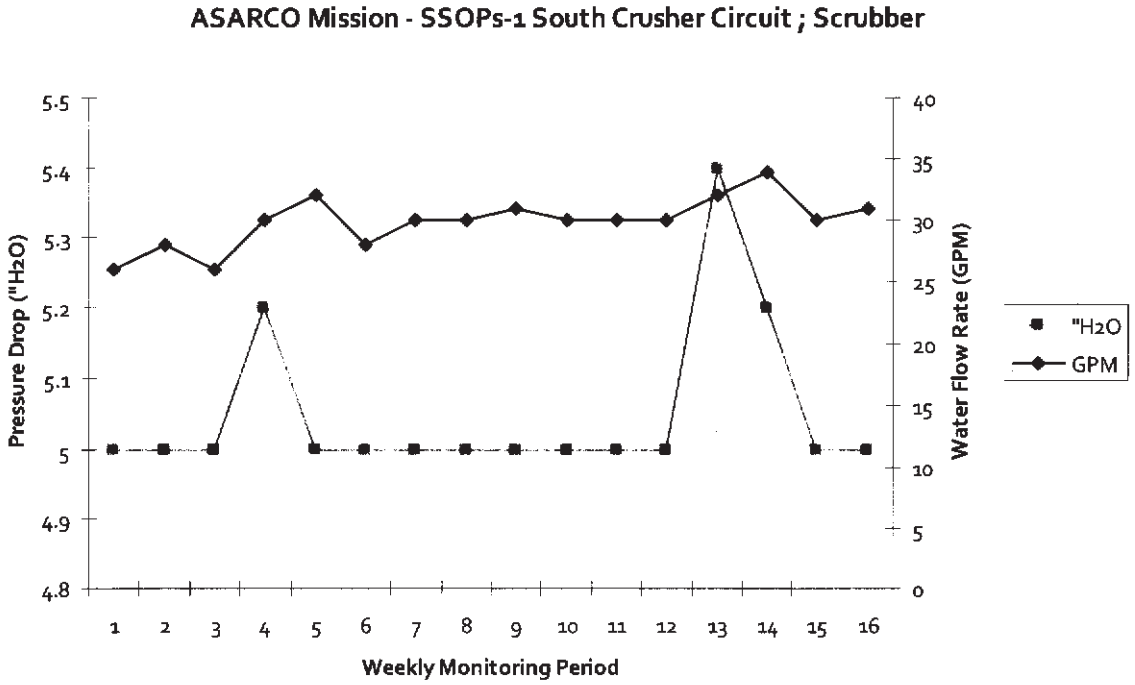
ASARCO currently monitors and records information for pressure drop and water flow for the operational scrubbers on a weekly basis. Incorporating the manufacturers recommended operational set points, and data documented from periodic performance testing, Asarco has developed a relative acceptable operating range for the control device. As there can be inherent differences between each physical scrubber in place and variations in operations, an acceptable operating range has been established for each system. The functional range for these two indicators has been assigned a +/- 30% tolerance from the average obtained during the most recent performance test and recommended manufacturers acceptable operational points

Pressure Drop. An excursion is defined as a pressure drop greater than 7 in. H_2O. Excursions trigger an inspection and corrective action. Readings less than 2 inches H_2O require a system inspection and corrective action, if necessary. Operating level and acceptable ranges are established from stack test and operation data and can be adjusted as new data is developed and periodic testing, where required, is completed.

Scrubber Water Flow. An excursion is defined as a water flow rate outside the operating range of 25 to 90 gallons per minute. Excursions trigger an inspection and corrective action. Operating range established from stack test and operation data.

In June, 1997, a performance test was performed on the scrubber under conditions of maximum achievable feed (crushing) and representative system operating conditions. The estimated emission calculated for this source and used in Asarco's annual emission inventory is from testing on Scrubber #303-21. Asarco does not have current data for this source, and thus will conduct performance testing during the permit term to define the compliance and appropriate operating ranges for the system. Based on the historic weekly monitoring of the pressure drop and water flow, Asarco has correlated compliance with the particulate limit as illustrated below.

Period	Pressure dP (" H_2O)	Water Flow (GPM)	Period	Pressure dP (" H_2O)	Water Flow (GPM)
Week 1	5	26	Week 9	5	31
Week 2	5	28	Week 10	5	30
Week 3	5	26	Week 11	5	30
Week 4	5.2	30	Week 12	5	30
Week 5	5	32	Week 13	5.4	32
Week 6	5	28	Week 14	5.2	34
Week 7	5	30	Week 15	5	30
Week 8	5	30	Week 16	5	31



The recorded data indicated that the wet scrubber(s) can be operated at a wide range of differential pressure and water flow and support emissions below the standard. Table A-1 Parametrics for Monitoring Wet Scrubber Operations, Monitoring Approach for Wet Scrubbers, provides a tabulated and organized approach to the monitoring indicators and tolerances defined for these systems.

ATTACHMENT A
Table A-1 Parametrics for Monitoring Wet Scrubber Operations
Monitoring Approach for Wet Scrubbers

	Indicator No. 1	Indicator No. 2
I. Indicator	Change in pressure drop across Wet Scrubber	Change in water flow rate through the Wet Scrubber
Measurement Approach	Pressure Drop is measured with a pressure gauge of appropriate range across the scrubber system. Pressure drop is measured in inches of water .	Water flow rate is measured by a flow monitor of appropriate range in "gallons per minute".
II. Indicator Range (refer to Table A-1)	An excursion is defined as a daily average differential pressure reading that is greater than ± 30% from the average documented during the most recent performance test. Individual indicator ranges are presented in each CAM submittal.	An excursion is defined as a daily average differential pressure reading that is greater than ± 30% from the average documented during the most recent performance test.
III. Performance Criteria A. Data Representativeness	Pressure taps are located on scrubber to measure the relative change in pressure across the scrubber systems. A magnehelic gauge with a design range with ±1 in. H2O accuracy is required.	A flow meter is installed at the scrubber side of the gate shut-off valve. A needle valve is installed to allow adjustment and alignment set-points for water flow. The flow meter accuracy range of ±5 percent of the design of the required scrubbing water flow rate.
B. Verification of Operation Status	NA	NA
C. QA/QC Practices and Criteria	Pressure gauges are calibrated on an annual basis or in accordance with manufacturer's specifications. Gauge operations are following manufacturer's recommendations.	Water flow meter s are verified accurate on an annual basis in accordance with manufacturer's specs. Maintenance and checks are performed according to manufacturer's recommendations.
D. Monitoring Frequency	Pressure drop is monitored continuously with the fixed gauge system and recorded according to prescribed recordkeeping intervals with a minimum of one recording daily.	Water flow rate is monitored continuously with the fixed gauge system and recorded according to prescribed recordkeeping intervals, with a minimum of one recording daily.
Data Collection Procedures	Daily recordkeeping	Daily recordkeeping
Averaging Period	NONE	NONE

ATTACHMENT A
Table A-2 General Design Parameters for Wet Scrubber Operations
General Wet Scrubber Operating Specifications for
ASARCO Mission Complex

Equipment	General Design Air Flow Rate (ACFM)[1]	General Design Water Flow Rate (GPM)2	General Design Inlet Pressure Drop ("H2O)[3]
Ducon Dynamic Wet Scrubber Type Uw-4; Size 42	5,000	15	-2.0
Ducon Dynamic Wet Scrubber Type Uw-4; Size 66	11,500	24	-4.5
Ducon Dynamic Wet Scrubber Type Uw-4; Size 72	14,500	44	-6.4
Ducon Dynamic Wet Scrubber Type Uw-4; Size 84	18.900	59	-3.5
Ducon Dynamic Wet Scrubber Type Uw-4; Size 96	25,500	77	-3.5
Ducon Dynamic Wet Scrubber Type Uw-4; Size 108	32,000	96	-5.2
American Air Filter RotoClone Type N-4; Size 12	10,650	32	-6.7

General Operating data were developed from the DUCON Company, Inc., "Installation, Operating, and Maintenance Instructions for Dynamic Scrubber Type UW-4, Model III Systems. Specific site elevation, humidity, and fan drive specifications, motor Hp, Brake horsepower (BHp), water quality, scrubber liquid, and exhaust dimensions can alter these base settings and site specific values should be assessed on a case by case basis.

ATTACHMENT A
Table A-3 Parametrics for Monitoring Baghouse Operations
Monitoring Approach for BH Systems

	Indicator No. 1	Indicator No. 2
I. Indicator	Pressure differential across the BH system.	Opacity
Measurement Approach	Pressure differential is measured by a pressure gauge across the body of the BH measured in "H2O.	Opacity is measured in percent Visible emissions
II. Indicator Range	1.5 to 4.5 inches of water for baghouses	Opacity levels are defined as per the unit and permit. Levels are not to be exceeded above established baseline ("0").
III. Performance Criteria A. Data Representativeness	Pressure taps are located at the baghouse/cartridge collector inlet and outlet.	Monitoring location is per Reference Method 9 requirements.
B. Verification of Operation Status	NA	NA
C. QA/QC Practices and Criteria	Magnehelic gauges are replaced on an annual basis to support annual calibration requirements.	Current EPA Reference Method 9 certification.
D. Monitoring Frequency	Pressure differential monitored daily.	Visible emissions surveyed biweekly.
Data Collection Procedures	Operators record pressure differential manually.	Operators record visible emissions results as per RM 22
Averaging Period	NONE	Presence / Absence defines Action and documentation requirements