MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OPERATING PERMIT TECHNICAL REVIEW DOCUMENT

Permitting and Compliance Division
1520 E. Sixth Avenue
P.O. Box 200901
Helena, Montana 59620-0901

Montana Sulphur & Chemical Company
Billings - Lockwood Plant
627 Exxon Road
Billings, MT 59107

The following table summarizes the air quality programs testing, monitoring, and reporting requirements applicable to this facility.

Facility Compliance Requirements	Yes	No	Comments
Source Tests Required	X		Method 6/6C, 9, 7/7E, 11 and 417B
Ambient Monitoring Required		X	
COMS Required		X	
CEMS Required	X		SO_2 Concentration in stack gas, stack gas volumetric flowrate monitor
Schedule of Compliance Required		X	
Annual Compliance Certification and Semiannual Reporting Required	X		
Monthly Reporting Required		X	
Quarterly Reporting Required	X		CEMS, Temperatures, Buoyancy Flux etc.
Applicable Air Quality Programs			
ARM Subchapter 7 Preconstruction Permitting	X		Permit #2611-03
New Source Performance Standards (NSPS)		X	
National Emission Standards for Hazardous Air Pollutants (NESHAPS)		X	Except for 40 CFR 61, Subpart M
Maximum Achievable Control Technology (MACT)		X	
Major New Source Review (NSR)	X		MSCC is defined as a major source but has not yet triggered a PSD/NSR.
Prevention of Significant Deterioration (PSD)	X		
Risk Management Plan Required (RMP)	X		H_2S, CS_2
Acid Rain Title IV		X	
Compliance Assurance Monitoring (CAM)		X	
State Implementation Plan (SIP)	X		Billings SO_2 SIP

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SECTION I. GENERAL INFORMATION

A. Purpose

This document establishes the basis for the decisions made regarding the applicable requirements, monitoring plan, and compliance status of emission units affected by the operating permit proposed for this facility. The document is intended for reference during review of the proposed permit by the Environmental Protection Agency (EPA) and the public. It is also intended to provide background information not included in the operating permit and to document issues that may become important during modifications or renewals of the permit. Conclusions in this document are based on information provided in the original application submitted by Montana Sulphur & Chemical Company (MSCC) on June 12, 1996, an additional submittal on March 3, 1999, an administrative amendment request on May 16, 2002, and a renewal application submitted February 4, 2005.

B. Facility Location and Site Description

The MSCC Lockwood facility is located in Yellowstone County, Montana at 627 Exxon Road. The site is a strip of land located in the SE¼ of Section 24, Township 1 North, Range 26 East; the NE¼ of Section 25, Township 1 North, Range 26 East; and the SW¼ of Section 19, Township 1 North, Range 27 East. MSCC's plant site is approximately three miles northeast of the city of Billings, at the northeastern end of the Burlington Northern Railroad East Billings industrial switchyard. The greater Billings area lies to the west, with less developed area to the north, south, and east, of the plant. The small, unincorporated community of Lockwood is south of the site.

The facility is located in an area characterized by heavy industrial properties. The plant site is long and narrow, extending approximately one mile along the adjacent Montana Rail Link mainline railroad tracks, generally between Exxon Road and N. Johnson Lane. The Exxon oil refinery and the Exxon RCRA land farm are located adjacent to the northwest property boundary and the Yellowstone Energy Limited Partnership (YELP) cogeneration facility is located to the south. Also adjacent to the southeast boundary of the property are a livestock auction yard, trucking terminals, a carbon dioxide plant, pipeline pumping stations, and a large oil-products terminal.

The Yellowstone River is approximately one-half mile from the facility. Interstate 90 is one-quarter mile to the south of the site. The plant site is generally flat and the elevation is 3107 feet above sea level at the main stack location. Hills and bluffs rise from 3,500 to 3,900 feet and flank the valley to the northwest and southeast. The area has been characterized as rural terrain roughness.

The climate of the area is considered semi-arid. Average rainfall is approximately 13 inches per year with the majority of the precipitation occurring in the late spring and early summer months. The annual temperature is 45 degrees Fahrenheit (°F) with maximum temperatures in the summer ranging from 95 to 100 °F and occasionally exceeding 100 °F. Winter temperatures are typical of continental air masses and can be well below zero at winter extremes.

The air quality classification for the area is "Better than National Standards" or "Unclassified/ Attainment" (40 CFR 81.327) for all pollutants near the plant site. There are two small nonattainment areas, for carbon monoxide (CO) and sulfur dioxide (SO_2) within the county. The CO nonattainment area begins in the urban Billings area a few kilometers west of the plant complex. The SO_2 nonattainment area is located around a refinery in Laurel, Montana, approximately 20 miles up-river from the plant site.

C. Facility Background Information

Permit #1157

In November of 1977, the Department of Environmental Quality (Department) issued Permit No. 1157 to MSCC, which authorized the construction of a 100-Meter SRU stack at the facility. At that time neither EPA nor the Department had promulgated rules to define Good Engineering Practice (GEP) Stack Height.

Also in November of 1977, the Department entered into a stipulation with several Billings/Laurel industries, including MSCC. The 1977 stipulation, which was in response to an EPA directive, set out control measures for meeting the national standards for SO_2 in the Billings/Laurel area. Paragraph 16 of the 1977 stipulation stated that the MSCC's Permit NO.1157 had been issued because "the proposed stack height increases constitute good engineering design." Paragraph 17 of the 1977 stipulation required future permits for stack height increases to be subject to GEP review based upon the 1977 CAA amendments "until such time as the Board adopts a stack height increase rule." The Board first adopted stack height rules in 1978.

By 1981, MSCC had still not constructed its proposed SRU stack. On February 23, 1981, the Department informed MSCC that Permit No. 1157 had expired and that a new permit application would be required prior to construction. The expiration of Permit No. 1157 was based upon a rule requiring completion of construction within 2-years from the date of issuance (ARM 16-2.14(1)s1400(7). In June of 1981, MSCC attorneys agreed to apply for a new permit, although they sought to retain GEP status for the 100-Meter stack.

Permit #2611

On November 30, 1990, the first Permit **#2611** was issued to MSCC. The Department revised its stack height rules in 1983 and 1986 to conform to federal rules. In September of 1989, MSCC applied for Permit #2611 to build the SRU stack and to modify the existing sulfur recovery operations, which included the construction of the ammonium thiosulfate (ATS) process. Construction of the ATS project was suspended in October 1992 due to litigation initiated by Exxon. With the conclusion of the litigation, MSCC was supposed to proceed with the construction.

Permit #2611-01

On November 18, 1993, MSCC was issued Permit **#2161-01** to construct and operate the Monaca processing equipment at its sulfur processing plant. The Monaca equipment is designed for the production of supplementary Hydrogen Sulfide (H_2S) for the facility. The Monaca unit is capable of producing about 2 tons per hour of H_2S gas. The gas is then sent to the liquefaction unit. The addition of the Monaca unit did not increase the amount of liquid H_2S produced since it only provides a different mechanism for providing H_2S gas to the liquefaction unit.

Permit #2611-02

On August 15, 1999, MSCC was issued Permit **#2161-02** to allow MSCC to install a 17-million British thermal units per hour (MMBtu/hr) boiler for steam generation and plant heating and to install an additional 35-MMBtu/hr incinerator. The boiler will not debottleneck any process; thus, sulfur production will not increase as a result of the installation of the boiler. The boiler may be vented through the 100-foot (30-Meter Stack), 100-Meter Stack, or its own stack. However, the emissions must be vented to the 100-Meter Stack whenever any fuel (diesel or oils) other than natural gas, or its equivalent in lb/MMBtu of sulfur, is fired in order to preserve the requirements of the Stipulation adopted by the Board of Environmental Review on June 12, 1998 (1998 Stipulation). The incinerator may operate in two different modes. In one mode the incinerator serves as a backup to the current incinerator, while in a second mode the incinerator would serve as a source of sulfur feed to the ATS plant. The air dispersion modeling, performed by MSCC for the Hazardous Air Pollutants (HAPs) emitted from the incinerator, demonstrated compliance with the negligible risk requirement.

In addition, the permitting action allowed MSCC to continue construction of the ATS process equipment and updated the permit with correct rule references and current permit language. Originally, when Permit #2161 was issued for the ATS process emission limits were established for the ATS equipment and a plant-wide emission limit was included in order to avoid Prevention of Significant Deterioration (PSD) review. The project was not completed by November 30, 1996, and according to Permit #2161-01 Section V.H, those portions of the permit pertaining to the ATS process were revoked. Therefore, the emission limits established on a plant-wide basis and for the 100-Meter Stack were also rescinded.

On November 13, 1998, MSCC sent a letter to the Department requesting that equipment related to the construction and operation of the ATS operation be retained in the permit. Also, MSCC provided a new Best Available Control Technology (BACT) review for the ATS equipment and stated that they would be preparing a Permit Application #2161-02 for the incinerator.

Permit #2161-02 re-established emission limits for the 100-Meter Stack and all associated ATS equipment. The SO_2 emission limit for the 100-Meter Stack was based on the average of the previous 2-years of actual emissions from the 100-Meter Stack plus 39 tons minus the SO_2 emissions from the quench water evaporator treating cooling towers emissions (57.52 tons per year (tpy)).

The former SO_2 limit of 3829 tpy previously established in Permit #2611 now became 3817 tpy. The 21 ton per day (tpd) SO_2 limit for the 100-Meter Stack was removed from the permit because it was based on previous modeling for the 100-Meter Stack, which was conducted at a 65-meter stack height. The limit was previously included to protect the National Ambient Air Quality Standards (NAAQS). Since that time, the 1998 Stipulation has incorporated emission limits to protect the NAAQS using a buoyancy flux curve. The limits previously established for the ATS equipment remained the same, with the exception of the plant wide emissions limit. This limit was been omitted because it was no longer necessary with the new limit established for the 100-Meter Stack. The limits imposed for the 100-Meter Stack and associated equipment were less than those required for PSD review.

The facility's allowable emissions for the boiler and incinerator increased by 2.4 tpy of PM_{10}, 9 tpy of CO, 23.7 tpy of NO_X, 0.4 tpy of $SO_{2,}$ 0.9 tpy of volatile organic compound (VOC).

Operating Permit **#OP2611-00** became effective for facility compliance on July 29, 2000.

Permit **#OP2611-01** was an administrative amendment, to changing the responsible official to Larry Zink for the MSCC facility. In addition, the Department updated the general conditions in the permit to more closely reflect current rules and replaced language that "busted" the credible evidence (ARM 17.8, Subchapter 15) rules (namely, by replacing "demonstrate compliance" with "monitor compliance".)

On October 20, 2003, the Department received a request from MSCC for an administrative amendment of Operating Permit #OP2611-01 to update Section V.B.3 of the General Conditions.

The amendment incorporated changes to federal Title V rules 40 CFR 70.6(c)(5)(iii)(B) and 70.6(c)(5)(iii)(C) (to be incorporated into Montana's Title V rules at ARM 17.8.12130 regarding Title V annual compliance certifications. Operating Permit **#OP2611-02** replaced Operating Permit #OP2611-01.

D. Current Permit Action

On February 4, 2005, the Department received a Title V renewal application from MSCC. Operating Permit #**OP2611-03** replaces Operating Permit OP2979-02.

E. Taking and Damaging Analysis

HB 311, the Montana Private Property Assessment Act, requires analysis of every proposed state agency administrative rule, policy, permit condition or permit denial, pertaining to an environmental matter, to determine whether the state action constitutes a taking or damaging of private real property that requires compensation under the Montana or U.S. Constitution. As part of issuing an operating permit, the Department is required to complete a Taking and Damaging Checklist. As required by 2-10-101 through 105, Montana Code Annotated, the Department has conducted a private property taking and damaging assessment and has determined there are no taking or damaging implications. The checklist was completed on March 31, 2005.

F. Compliance Designation

This facility is inspected annually. It was last inspected on August 4, 2004, and found to be in compliance with all applicable requirements at the time.

The Department issued MSCC two Notice of Violation letters (NOVs) in 1997, two NOVs in 1998, and two NOVs in 1999 for eleven violations involving excess opacity emissions, excess main stack emissions and excess flaring emissions. The Department and MSCC have resolved the subsequent NOVs through a Consent Decree, Judgment, and Order adopted by the Court on October 20, 1999. A copy of the Consent Decree Judgment and Order is included in the permit as Appendix G.

SECTION II. SUMMARY OF EMISSION UNITS

A. Facility Process Description

The MSCC Complex serves two primary purposes. First, it acts as an air pollution control device for the Exxon refinery. MSCC receives sulfur-containing fuel gases from Exxon, desulfurizes these gases in its amine unit, and returns low-sulfur fuel gas back to the refinery. This action serves to reduce sulfur oxide emissions that might otherwise be emitted to the atmosphere from the disposal of this material at the oil refinery site. Historically, the plant has also received gas material from two area refiners and sulfur from numerous sources, and it operates its own connections to two nearby refineries by a small gas pipeline system.

The second purpose of the facility is to convert the raw sulfur compounds from fuel gases, acid gases, and other materials to create useful, marketable products. With a variety of processes, MSCC creates a multitude of products including elemental sulfur, hydrogen gas, hydrogen and sodium and carbon sulfides, sodium hydrosulfide (NaSH), dry fertilizers, and in the future may produce ammonium bisulfites and ammonium thiosulfate.

Typical operation of the complex consists of treating gases from the refinery using an amine unit. This unit removes the sulfur compounds in the sour gas stream and returns a cleaned fuel gas stream to the refinery. The recovered sulfur compounds are combined with other sulfur-containing gas streams and then primarily sent to the Claus recovery unit (SRU) and converted to elemental sulfur, which is then routed to sulfur storage, shipping, or further processing. Alternatively, these sulfur-containing gases may be used in producing useful sulfur compounds such as H_2S, sodium sulfides, ATS, and other sulfur-based compounds. Remaining sulfur from these processes is then routed to the SRU feed material or to storage/shipping.

The elemental sulfur produced in the Claus plant may be sold directly or further processed into fertilizer products, animal feed supplements, or industrial sulfur products. Sulfur may be sent to the revised Monaca process to create H_2S or carbon disulfide.

B. Emission Units and Pollution Control Device Identification

EU1 Sulfur Vaporizer Heater and EU2 - Steam Methane Superheater

The Monaca processing equipment is designed for the production of H_2S gas for the facility. The Monaca process has de minimis air emissions. It is designed as a completely enclosed system with the exception of the emissions from two associated heaters, which burn natural gas and/or refinery gas. EU1 Vaporizer Heater is rated at 5.5 MMBtu/hr and it heats raw material sulfur and gases to reaction temperature and also generates steam for the process. EU2 Steam Methane Superheater is rated at 5.0 MMBtu/hr and it pre-heats raw material steam and/or methane for the Monaca process and feeds to the Superheater Unit and directly to the Monaca Reactor equipment. Emissions from the heaters are from the combustion of low-sulfur fuel gas and natural gas; both heaters vent to individual 40-ft stacks.

EU3 100-Meter ATS-SRU Stack (Claus and other units)

The 100-Meter ATS-SRU stack handles emissions from the Claus Sulfur Recovery Plant and the permitted Ammonium Bisulfite/Ammonium Thiosulfate (ABS/ATS) facility, as well as emissions from the Railroad Boiler, the multipurpose boilers H1, H1A, H1-1, H1-2, and the permitted 17-MMBtu/hr boiler. The Claus Sulfur Recovery Process is a combination of equipment including but not limited to the four boilers listed above, five Claus reactor stages including their associated multi-fuel process re-heaters, process gas coolers, barometric seal legs (which connect to run-down pits discussed elsewhere), and tail gas oxidation heater and oxidation reactor equipment with optional waste heat recovery. A redundant tailgas oxidation heater (Redundant Incinerator) and reactor were permitted by Permit #2161-02 to allow more continuous operation of tailgas oxidation for odor control. The original and redundant tail gas oxidizer equipment is designed to operate either catalytically or non-catalytically.

The five Claus reactors are generally configured in a three-stage operation, but may be configured in two-stage operation during reactor maintenance. They are designed to operate as a combined single train or as dual parallel train. By-pass ducting and alternate ducting allow maintenance and operational flexibility over a wide range of operating loads. At reduced loads, the unit has also been configured as a 4-stage Claus plant. Individual reactors and the associated stage equipment may be taken on or off line to allow repairs/maintenance on each stage while operations of the Claus process continue. This is normally accomplished by brief shutdowns to swing blinds on alternate duct routes. Gas is flared during these brief shutdowns. Claus process reheaters are dual fueled, meaning that the re-heat energy is provided by either fuel gas or by process acid gas. Normally these are fired by process gases, which join the main Claus process gases at each stage for further processing. The Claus process is capable of converting H_2S rich gases into elemental sulfur by means of partial oxidation and catalytic oxidation-reduction of SO_2 and H_2S. The process also is capable of converting other sulfur containing materials (e.g. carbonyl sulfide, carbon disulfide, mercaptans, sulfuric acid and others) to elemental sulfur in conjunction with H_2S rich feed gases. It is capable of handling small concentrations of volatile ammonia compounds in the acid gas feed. The Claus process is enclosed and pressurized to minimize fugitive emissions and vents to the 100-Meter Stack. Historically, it has vented to the 30-Meter Stack, along with the above boilers, however, Section 3(A)(2)(d) of the STIP prohibits the Claus Process from venting to the 30-Meter Stack. The Claus process is rated at 282 tons per day of elemental sulfur production.

EU4 30-Meter ATS-SRU Stack (Boilers and Process Units)

The 30-Meter stack (100-foot stack) may receive emissions from the Railroad Boiler, the Process boilers and the 17-MMBtu/hr boiler in accordance Section 3(A)(2)(d) of the STIP. There are limitations found in the permit and STIP regarding what fuels may be fired in some emission units before being released to the 30-Meter Stack.

EU5 Railroad Boiler

The Railroad Boiler's maximum rated design capacity is 18-MMBtu/hr and it was manufactured in 1904. It is primarily fueled with fuel gas or natural gas and operates year round. The boiler also has an oil/liquid fuel firing capability, which is used intermittently and rarely. The liquid firing capability is used primarily to recover heating value from spent lubricants, non-chlorinated solvents, glycols, and alcohols generated incidental to the company's on-site operations. The Railroad Boiler can vent through its own stack (43 feet), the 30-Meter Stack, or the 100-Meter Stack.

EU6 Fuel Gas Boiler H-1 and EU7 Fuel Gas Boiler H1-A

Fuel Gas Boilers H1 and H1-A are multipurpose units that can serve as auxiliary steam generators (variable Btu fuel gas-fired) or as a component in the Claus unit. The boilers were manufactured in 1959 and have Bigelow boiler ratings of 19-MMBtu/hr; this is a minimal design or performance rating not a maximum rated design capacity and may understate the capacity by 15% or more. When configured as part of the Claus unit, the boilers separate stacks are closed and emissions are vented through the 100-Meter Stack. When configured as fuel-fired steam generators, each boiler vents emission through its own 27-foot stack or the 30-Meter Stack. Flue gas emissions from these boilers, when fueled by fuel gas or natural gas may be partially diverted as feed to the Inert Gas Unit. In either "fuel burning" or Claus service, this multipurpose boiler is designed with a burner that allows combustion of gases from hydrogen to LPG and substantial amounts of entrained liquids (e.g., distillates, water) in liquid/gas mixtures.

EU8 Fuel Gas Boiler H1-1 and EU9 Fuel Gas Boiler H1-2

Both boilers serve the same functions as fuel gas boilers H1 and H1-A so their process descriptions will not be repeated. Fuel Gas Boiler H1-1 was manufactured in 1956 and Fuel Gas Boiler H1-2 was manufactured in 1963. Their Bigelow ratings are both 13-MMBtu/hr that may be understated by 15% or more. These boilers may vent to the 100-Meter Stack at any time or, when not in Claus service, may be vented through the 30-Meter Stack, or may vent to its own stack. Fuel Gas Boiler H1-1 has a 38-foot stack and Fuel Gas Boiler H1-2 has a 23-foot stack.

EU10 17-MMBtu/hr Boiler

The 17-MMBtu/hr boiler was constructed by York-Shipley in 1981. The primary purpose of the boiler will be for steam generation and plant heating. It has the capability of firing gas, diesel, used oil, and residual oil and may, in the future, augment or replace the Railroad Boiler. The boiler can vent through its own stack (43 feet) or the 30-Meter Stack when fired on natural gas, or to the 100-Meter-Stack at any time or when fired on fuels other than natural gas.

EU11 Redundant Incinerator and EU11a Existing Incinerator

The Existing incinerator was installed prior to 1968 and was grandfathered from permitting. The only requirements for this incinerator are those imposed by rules (e.g., Opacity).

The redundant incinerator has two modes of operation. In one mode, the incinerator serves as a backup to the current incinerator. It is contemplated that this incinerator will be used primarily when the main incinerator needs to be taken off-line for repairs and the like. There could be brief periods when both incinerators operate at the same time. One example is when one unit is being brought up while the other is being taken off-line for servicing.

The second use of the incinerator would be to serve as one source of sulfur feed to the ATS plant. When in the ATS mode of operation, the equipment can not be considered an "incinerator" because in the ATS mode it acts as feed to the ATS unit, since its primary purpose is no longer the removal, destruction, etc. of the input material. The primary emissions from the ATS plant would be emitted from the 100-Meter Stack.

EU12 80-foot West Flare, EU13 125-foot East Flare (near Monaca Process), and EU14 100-Meter West Flare (located on 100-Meter SRU Stack)

Occasionally during operation, off-specification gases are received from the refineries or upstream units and sent directly to a flare to prevent damage to the operating equipment and hazard to persons. Pressure relieving devices are also connected to the flares. In addition, normal activities incident to the operation and maintenance of the facility direct some routine emissions to the flares, including without limitation purging of vessels and piping incident to plant and transportation equipment testing and maintenance, disposition of excess hydrogen and fuel gas materials, disposition of hydrocarbon rich streams from portions of the NaSH process, startup/shutdown activities involving acid gases, and similar activities. There are three flares at the facility, one 80-foot West Flare, one located on the 100-Meter Main Stack, and the other 125-foot East Flare, located near the Monaca Process area. The flares have as part of their design continuous pilot lights burning natural gas, low-sulfur fuel gas, or LP Gas to assure ignition of any flows to these flares.

EU15 Hydrogen Plant

Hydrogen may be produced in a 3-step process in the existing plant. Steam and preheated natural gas (or other suitable desulfurized lighter hydrocarbons) are sent to a gas fired reformer unit, producing crude hydrogen over a catalyst. CO produced in the reformer unit is converted to carbon dioxide (CO_2) and hydrogen using a shift converter and a fixed catalyst bed. A carbon dioxide removal unit returns a hydrogen gas stream, normally about 99.9% pure. The separated non-hydrogen-rich stream is sent to a burner unit for combustion as fuel. Product hydrogen is available for use on-site (e.g., Monaca Unit) or for sale to others.

EU16 Liquid Hydrogen Sulfide (H_2S) and Compressor Unit

The Liquid H_2S and Compressor Unit processes acid gases (raw H_2S) into a purified stream of H_2S and streams enriched in light gases (e.g. carbon dioxide, methane, ethane, propane, nitrogen) and enriched in 'heavy' vapors (e.g. butanes and heavier, water, carbon disulfide, ammonia), which in turn are processed in the Claus Unit or other processes on site. Feed for this unit is diverted from Claus Feed and may arise, for example, from the Amine Unit or the Monaca Unit. To the extent H_2S is not returned to the Claus Process this unit also serves to reduce overall SO_2 emissions from the facility. The purified H_2S is stored in pressurized storage on site and loaded into pressure vessels for shipment (e.g. railcars, highway trailers, and cylinders). Excess purified H_2S is also processed into elemental sulfur or NaSH and may be used on ATS production by reaction with ABS solutions. During periods of startup, shutdown, malfunctions, etc. emissions from this unit are vented to the flare(s) to the extent they are not accommodated in the Claus process. Production of liquid H_2S is limited to 82 tons per day in Permit #2611-03. Acid gases in the liquid H_2S unit are compressed. Seals on these compressors are purged with fuel gases (e.g. natural gas, methane) to prevent accumulation of H_2S or its escape to atmosphere in large quantities. Purge gas is vented to the flares or to the Claus Tailgas Oxidizer where oxidation to CO_2 and SO_2 occurs. The crankcases of each of these specialized compressors are air-purged to prevent accumulation of gases therein arising from fugitive mechanical seal leakage. The purge air is vented to atmosphere for safety and may contain small quantities of H_2S or VOC's.

EU17 ATS Quench Water Evaporator-Treater-Cooling Towers (2)

The quench water cooling towers are an integral part of the ATS process and are included in Permit #2611-03. However, these towers have not been built as of the date of the issuance of OP2611-03.

EU18 Molten Sulfur Storage

The molten sulfur is stored in enclosed above ground storage tankage with small atmospheric vents. Emissions are considered to be volatile sulfur vapors/gases, resulting from the evaporation and cooling of the elemental liquid sulfur and releases of small amounts of SO_2 and H_2S that may be dissolved in the sulfur in low concentrations. The formation of SO_2 in the air directly surrounding the vent from sulfur vapor is not likely absent combustion.

EU18.a Molten Sulfur Storage in Railcars and Mobile Tanks

Molten sulfur is also stored in rail tank cars and other mobile tanks after loading. Individual tanks hold less than 210,000 pounds of sulfur. The molten sulfur is stored in enclosed above ground storage tankage with a small atmospheric venting. Emissions from the tanks are considered to be volatile sulfur vapors/gases, resultant of the evaporation and cooling of the elemental sulfur and release of small amounts of SO_2 and H_2S that may be dissolved in the sulfur in low concentrations.

EU19 Molten Sulfur Loadout/Unloading

The molten sulfur can be loaded directly into either railcar tanks or over-the-road tanker trucks through a top opening on each tank. Molten sulfur is also unloaded in rail tank cars and other mobile tanks. Individual tanks hold less than 210,000 pounds of sulfur. Steam coils may be used to heat the tanks during unloading. Emissions from the tanks are considered to be volatile sulfur vapors/gases, resultant of the evaporation and cooling or heating of the elemental sulfur and releases of small amounts of SO_2 and H_2S that may be dissolved in the sulfur in low concentrations. The formation of SO_2 in the air directly surrounding the vents from sulfur vapor is not likely absent combustion.

EU20 Molten Sulfur Run-down Pits

As liquid sulfur is recovered in the Claus Process including the boilers in Claus service, it passes through barometric seal legs that serve to keep the pressurized process gases inside the Claus unit. These seal legs discharge the separated molten sulfur into small open run-down pits at the base of the unit en route to underground holding reservoirs also called run-down pits. The run-down pits are small and vent to atmosphere. Emissions from the run-down are considered to be volatile sulfur vapors/gases, resulting from the evaporation and cooling or heating of the elemental sulfur and releases of small amounts of SO_2 and of H_2S that may be dissolved in the sulfur in low concentrations. The fresh sulfur is also partially air-stripped by injection of compressed air in the larger underground reservoirs. The formation of SO_2 in the air directly surrounding the vents from sulfur vapor is not likely absent combustion release.

EU21 Fertilizer Manufacture, Conveying and Loadout

Fertilizer is produced on-site by mixing the sulfur with bentonite clays, and processing the mixture to form fertilizer pellets, pastilles, prills, flakes or slates. The material is sized and may be crushed as part of the process depending on end use. The finished fertilizer product can be loaded into bags of various sizes for sale or storage, or can be directly loaded into an over-the-road truck or railcar for transport. Possible emission sources for the process are the open mixing of the sulfur and clay, the forming machinery, the conveying, recycling and/or crushing of the fertilizer pellets, and the loadout of the fertilizer product. The sulfur and clay are mixed in vessels with partially open tops and/or vents with a possibility of volatile sulfur emissions and minimal clay particulate emissions. The forming machinery and the rooms containing it are positively vented to outdoors. The fertilizer pellet conveyors, treaters and sizing equipment in portions of the process are enclosed or covered and have a continuous layer of inert gas applied to limit dust and minimize the possibility of dust explosions. The inert gas - blanketed equipment is maintained at a slight positive pressure. Product is discharged from blanketed areas through airlock arrangements or by use of product seals. Inert gas lost as fugitive emissions from flanges and connections is replaced continuously as needed. Re-melting in steam heated, open melters recycles unwanted sizes. Particulate emissions (PM_{10}) from the manufacture of pellets are generally limited to the clay-mixing tanks and the transfer points between conveyors, fugitive emissions, and the recycle and loadout transfer points.

EU22 Sulfur Product Manufacture, Conveying and Loadout

The molten sulfur can be processed on-site to produce several varieties of solid sulfur flakes, slates, powders, and granules. After forming, the products may be ground, sized, and/or recycled.

The high purity finished sulfur products can be loaded into bags of various size for sale or storage, or can be directly loaded into over-the road trucks for transport. Possible emission sources for the process are the conveying and loadout of the sulfur products, the discharges of recycle streams to remelt, and fugitive emissions. The sulfur product conveyors, grinders, and sizers in portions of the process are covered and have a continuous layer of inert gas applied to limit dust and minimize the possibility of explosions. A slight positive pressure of inert gas is maintained in the equipment by the inert gas generator equipment. Airlock equipment or product seals are used at discharge points. Inert gas is replaced as needed from the inert gas equipment as it escapes as fugitive emissions. The SO_2 content of the inert gas is considered insignificant. Open melters recycle unwanted sizes. The forming operations and the rooms where these operations occur are positively ventilated to atmosphere. Emissions from the remelt operations and forming operations are expected to be sulfur vapors, as discussed above for handling molten sulfur. SO_2 emissions are expected to be minimal absent combustion. Emissions from the manufacture of the solid sulfur products are generally limited to the transfer points between conveyors, discharge to recycles points, fugitive emissions and the loadout transfer points.

EU23 Various Valves, Pumps and Flanges Leaks

Process equipment used in the production of desulfurized fuel gas; hydrogen, H_2S, sulfur and associated products have numerous valves, pumps, and flanges, all with the potential to release emissions to the atmosphere. Valves include manual and control valves, with packing and numerous pressure safety relief valves. Some pressure relief valves vent to the flare(s) and others vent to the atmosphere. Pumps include liquid and gas pumps and compressors. There are numerous pipes interconnecting the complex equipment in the facility with flanged connections and access to the process vessels, heat exchangers, boilers, and related equipment. Depending on the contents of the piping or vessel the nature of the potential or actual emissions from each of these thousands of points will vary but generally will reflect the contents of the specific system. Thus, fugitive emissions from the fuel system, hydrogen plant, hydrogen permeation equipment etc. may contain methane and hydrogen, along with lesser concentrations of VOC's and H_2S. For example, fugitive emissions from the acid gas handling equipment, NaSH equipment etc. similarly would be expected to contain H_2S and lesser concentrations of VOC's. Fugitive emissions from the Claus process equipment generally would be expected to contain H_2S, SO_2, sulfur vapors, CO, and lesser amounts of carbonyl sulfide and carbon disulfide. Molten sulfur lines, which run throughout much of the facility may release sulfur vapors and small amounts of H_2S and SO_2 associated with the sulfur. Because of the extensive nature of the piping, vessels, and other equipment in the facility as a whole and the fact that no reliable means of quantifying these emissions was identified, the collective emissions are estimated to be significant.

EU24 Boiler Treatment Lagoon with Aeration

The lagoon receives wastewater from the facility, primarily from the operation of the several boilers and steam generating devices on site, but also from the sanitary system pumping (septic tanks) and minor amounts or process waters, which may contain petroleum distillates and/or ammonia in small amounts. These waters contain nutrient matter both from the river water feed and from the boiler treatment chemicals. The waters are subject to alga blooms and other bio-decomposition with a potential to release odors. An aeration system is operated as needed to minimize anaerobic decay processes and the associated potential for odors. Water is lost by evaporation/percolation and after aeration treatment, the water is used for irrigation on the premises.

EU25 Fugitive Emissions - Access Roads

These emissions are a result of vehicle travel on paved and unpaved portions of the facility. MSCC estimates that 65% percent of the access roads are paved and 35% are unpaved.

C. Categorically Insignificant Sources/Activities

MSCC identified several emission units as insignificant in their permit application (June 12, 1996). However, what was identified in the application as insignificant and what the Department has actually identified as insignificant differs as a result of a March 31, 1998, rule change.

Insignificant emission units were previously defined as any activity or emissions unit located within a source that has a potential to emit less than 15 tpy of any pollutant, does not have the potential to emit hazardous air pollutants in any amount, and is not regulated by an applicable requirement. Under the new definition an insignificant emissions source must have the potential to emit of less than 5 tpy of any regulated pollutant, a potential to emit less than 500 lbs. of any HAP, and must be regulated by an applicable requirement other than those generally applicable requirements that apply to all emission units (e.g., opacity, process weight, sulfur in fuel etc.). The insignificant emission units have been identified in Appendix A of the permit.

EU ID	Description
IEU1	Amine Unit
IEU2	NaSH Plant, Atmospheric NaSH Plant Storage, Atmospheric NaSH and Caustic Loading/Unloading
IEU3	Inert Gas Units (2)
IEU4	Hydrogen Permeation Unit
IEU5	Old Hydrogenation Unit
IEU6	Cryogenic Storage
IEU7	Solid Sulfur Storage, Handling and Loadout
IEU8	Scrap Handling and Remelt
IEU9	Emergency/Back-up Generator
IEU10	Auxiliary Diesel Generators
IEU11	Repair and Maintenance Activities
IEU12	Space Heaters < 500 MBtu/hr
IEU13	Welding/Grinding/Cutting Operations
IEU14	Operation, Loading, and Unloading of VOC Storage Tanks
IEU15	Sewer Manholes, Junction Boxes, Sumps and Lifts Associated with Wastewater Treatment
IEU16	Fugitive Emissions: Diesel Fuel & Gasoline Fuel Combustion
IEU17	Feedwater Treatment Unit/Pumphouse

SECTION III. PERMIT CONDITIONS

A. Emission Limits and Standards

There are no emission limits or standards identified in this permit that were not previously applicable to the facility either by rule, permit or by the Board of Environmental Review (Board) Order signed on June 12, 1998. The rule citations for all emission limits are included in the operating permit.

Opacity

This permit contains requirements for MSCC to perform semiannual Method 9 tests for both the 30-Meter and 100-Meter stacks. All major emission units are vented to these stacks as well as individual stacks. For those individual stacks, a Method 9 shall be performed upon request of the Department. The compliance demonstrations for the individual stacks require that all fuel burning units fire either natural or low sulfur refinery fuel gas when venting to individual stacks; thus, opacity limitations should not be violated when emissions units are operating.

For those non-fuel burning process emission units Method 9 tests will be required as requested by the Department. For those emission units that have a remote chance of violating opacity limits have, the permit does not include any testing requirements. Those units include EU16 Liquid Hydrogen Sulfide (H_2S) and Compressor Unit; EU17 ATS Quench Water Evaporator-Treater-Cooling Towers (2); EU18 Molten Sulfur Storage; EU18.a Molten Sulfur Storage in Railcars and Mobile Tanks; EU19 Molten Sulfur Loadout/Unloading; EU20 Molten Sulfur Run-down Pits; EU23 Various Valve, Pump and Flange Leaks, EU24 Boiler Treatment Lagoon with Aeration; EU21 Fertilizer Manufacture, Conveying and Loadout; and EU22 Sulfur Product Manufacture, Conveying and Loadout.

Particulate Matter – Industrial Processes and Fuel Burning Equipment

This permit does not require any specified Method 5 testing because this facility does not have any particulate emission limits established other than those applicable to process weight and fuel burning equipment. Furthermore, the SIP, Board Order signed on January 25, 1978, specifies how process weight is to be interpreted and it is highly unlikely that any process would violate either process weight or the particulate fuel burning limitations when only natural gas or low sulfur refinery fuel gas is burned. Thus, testing will only be required as requested by the Department.

SO_2 Emission Limits

MSCC has established emission limits for the 100-Meter Stack, the 30-Meter Stack, and boiler specific stacks. For cases, where the emission units are vented to the 100-Meter stack, a SO_2 CEMs and annual testing (Method 6/6C) shall be used to demonstrate compliance with the emission limits.

For other fuel burning emissions units, the permit has included emission limits for the 30-Meter stack and a collective emission limit for boilers when exhausting to individual or auxiliary stacks. In this case, the compliance demonstration method requires that MSCC burn only natural gas, or perform Draeger Tube testing (or equivalent as approved by the Department) in coordination with recording the refinery fuel gas consumption to demonstrate compliance with the 12 lb/3hr SO_2 limit. By demonstrating compliance with the 12 lb/3 hr SO_2 limit, MSCC is presumed to be in compliance with the sulfur in fuel limits**.**

As stated above, the compliance demonstrations established by this permit for those sources not venting to the 100-Meter Stack requires that MSCC burn only natural gas, or perform a Draeger Tube testing (or equivalent) in order to assure compliance for those sources that burn refinery fuel gas.

NO_X Emission Limits

The only NO_X limits included in this permit are for the Monaca Heaters and Hydrogen Plant. The potential emissions from these sources are less than the trigger level for testing according to Departmental policy. Therefore, these units will only be tested as deemed necessary by the Department.

B. Monitoring Requirements

ARM 17.8.1212(1) requires that all monitoring and analysis procedures or test methods required under applicable requirements are contained in operating permits. In addition, when the applicable requirement does not require periodic testing or monitoring, periodic monitoring must be prescribed that is sufficient to yield reliable data from the relevant time period that is representative of the source's compliance with the permit.

The requirements for testing, monitoring, recordkeeping, reporting, and compliance certification sufficient to assure compliance do not require the permit to impose the same level of rigor for all emissions units. Furthermore, they do not require extensive testing or monitoring to assure compliance with the applicable requirements for emission units that do not have significant potential to violate emission limitations or other requirements under normal operating conditions. When compliance with the underlying applicable requirement for a insignificant emissions unit is not threatened by lack of regular monitoring and when periodic testing or monitoring is not otherwise required by the applicable requirement, the status quo **(i.e., no monitoring)** will meet the requirements of ARM 17.8.1212(1). Therefore, the permit does not include monitoring for insignificant emission units.

The permit includes periodic monitoring or recordkeeping for each applicable requirement. The information obtained from the monitoring and recordkeeping will be used by the permittee to periodically certify compliance with the emission limits and standards. However, the Department may request additional testing to determine compliance with the emission limits and standards.

C. Test Methods and Procedures

The operating permit may not require testing for all sources if routine monitoring is used to determine compliance, but the Department has the authority to require testing if deemed necessary to determine compliance with an emission limit or standard. In addition, the permittee may elect to voluntarily conduct compliance testing to confirm its compliance status.

D. Recordkeeping Requirements

The permittee is required to keep all records listed in the operating permit as a permanent business record for at least five-years following the date of the generation of the record.

E. Reporting Requirements

Reporting requirements are included in the permit for each emissions unit and Section V of the operating permit "General Conditions" explains the reporting requirements. However, the permittee is required to submit semi-annual and annual monitoring reports to the Department and to annually certify compliance with the applicable requirements contained in the permit. The reports must include a list of all emission limit and monitoring deviations, the reason for any deviation, and the corrective action taken as a result of any deviation.

F. Public Notice

In accordance with ARM 17.8.1232, a public notice was published in the *Billings Gazette* newspaper on or before July 8, 2005. The Department provided a 30-day public comment period on the draft operating permit from July 11, 2005, to August 10, 2005. ARM 17.8.1232 requires the Department to keep a record of both comments and issues raised during the public participation process. The comments and issues received by August 10, 2005, were summarized, along with the Department's responses, in the following table. All comments received during the public comment period were promptly forwarded to MSCC so they had an opportunity to respond to these comments as well.

Summary of Public Comments

Person/Group Commenting	Comment	Department Response
No Comment		

G. Draft Permit Comments

Summary of Permittee Comments

Permit Reference	Permittee Comment	Department Response
No Comment		

Summary of EPA Comments

Permit Reference	EPA Comment	Department Response
No Comment		

SECTION IV. NON-APPLICABLE REQUIREMENTS

Pursuant to ARM 17.8.1221, MSCC requested a permit shield for all non-applicable regulatory requirements and regulatory orders identified in the tables in Section 8 of the permit application. In addition, the MSCC permit application identified a permit shield request for applicable requirements for both the facility and for certain emission units. The Department has determined that the requirements identified in the permit application for the individual emission units are non-applicable. These requirements are contained in the permit in Section IV- Non-applicable Requirements.

The following table outlines those requirements that MSCC had identified as non-applicable in the permit application but will not be included in the operating permit as non-applicable. The table includes both the applicable requirement and reason that the Department did not identify this requirement as non-applicable.

Requirements Not Included in Section IV. Non-applicable Requirements of the Operating Permit

Rule Citation		Reason
State	Federal	
	40 CFR 60, Subparts C- Z; 40 CFR 60, Subparts AA-EE; 40 CFR 60, Subparts GG-HH; 40 CFR 60, Subparts KK-NN; 40 CFR 60, Subparts PP-XX; 40 CFR 60, Subparts AAA-BBB; 40 CFR 60, Subparts DDD-FFF; 40 CFR 60, Subparts GGG-LLL; 40 CFR 60, Subparts NNN-VVV; 40 CFR 61, Subparts B-F; 40 CFR 61, Subparts H- R; 40 CFR 61, Subpart T; 40 CFR 61, Subpart V; 40 CFR 61, Subpart W; 40 CFR 61, Subparts Y, BB, and FF. 40 CFR 63, Subpart F; 40 CFR 63, Subpart G-I; 40 CFR 63, Subpart L; 40 CFR 63, Subpart M; 40 CFR 63, Subpart Q; 40 CFR 63, Subpart T; 40 CFR 63, Subpart W-Y; 40 CFR 63, Subpart CC; 40 CFR 63, Subpart EE; 40 CFR 63, Subpart GG; 40 CFR 63, Subpart II; 40 CFR 63, Subpart JJ;	These requirements are not applicable because the facility is not an affected source under these regulations.
	40 CFR 72 - 78;	The facility is not in this source category.
	40 CFR 82 (Except subparts B&F).	This rule refers to a process, equipment, or activity that is not used at this facility.
ARM 17.8.321 ARM 17.8.323 ARM 17.8.324 (Except ARM 324(1) and ARM 324(3)).		These rules are not applicable because the facility is not listed in the source category cited in the rules.
ARM 17.8.316 ARM 17.8.320 ARM 17.8.330 - 334		These rules are not applicable because the facility does not have the specific emissions unit cited in the rules.

SECTION V. FUTURE PERMIT CONSIDERATIONS

A. MACT Standards

As of the issuance date of draft Operating Permit #OP2611-03, the only MACTs that the Department is aware which MSCC may be subject to is Subpart CC National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries and National Emission Standards for Hazardous Air Pollutants from Subpart DDDDD Industrial/Commercial/Institutional Boilers and Process Heaters. However, Subpart CC is not applicable to MSCC because emission points routed to a fuel gas system as defined in 63.641 of the subpart does not require any testing, monitoring, recordkeeping, or reporting. Subpart DDDDD is not applicable because MSCC is not an affected source for this MACT.

B. NESHAP Standards

As of the issuance date of draft Operating Permit #OP2611-03, the Department is unaware of any future requirement that may be promulgated during the permit term for which this facility must comply.

C. NSPS Standards

As of the issuance date of draft Operating Permit #OP2611-03, the Department is unaware of any future NSPS requirement that may be promulgated that would affect this facility. The only NSPS requirements that the facility may be subject to include 40 CFR 60, Subparts D, Da, Db, and Dc Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, and 40 CFR 60, Subpart J Standards of Performance for Petroleum Refineries. However, these subparts are not applicable to this facility for the following reasons.

40 CFR 60, Subpart J is not applicable because MSCC is not an "affected facility" as defined by this subpart for either fuel gas combustion or the Claus plant. The Claus plant was constructed in approximately 1955, which is before the applicability date for this NSPS. In addition, fuel gas combustion devices are not an "affected facility" under this NSPS because the fuel is not combusted within a "refinery" and it precedes the date of applicability for this NSPS, which is June 11, 1973.

In addition Subpart D, Da, Db, or Dc is not applicable for this facility because none of the boilers located at the facility meet either the size or applicability dates contained in the definition of affected facilities.

D. Risk Management Plant

MSCC stores H_2S and carbon disulfide in greater quantities than the minimum threshold quantity defined by 40 CFR 68.115 or 40 CFR 68.130.

The owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process must comply with these requirements no later than June 21, 1999; 3-years after the date on which a regulated substance is first listed under 68.130; or the date on which a regulated substance is first present in more than a threshold quantity in a process, whichever is later.

MSCC was required to submit a plan to EPA no later than June 21, 1999. On August 24, 1999, the Department confirmed that MSCC had submitted their plan. The plan was mailed on June 21, 1999 and received on June 24, 1999.