

PM₁₀ SIP/Maintenance Plan Evaluation Report:
Kennecott Utah Copper - Power Plant

Salt Lake County Nonattainment Area

Utah Division of Air Quality

Major New Source Review Section

October 1, 2015

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Kennecott Utah Copper – Tailings Facility

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PM₁₀ SIP/MAINTENANCE PLAN EVALUATION REPORT

Kennecott – Tailings Facility

1.0 Introduction

This evaluation report (report) provides Technical Support for Section IX, Part H.1 and Section IX, Part H.2 of the Utah PM₁₀ Maintenance Plan; to address the Salt Lake County PM₁₀ Nonattainment Area. This document specifically serves as an evaluation of Kennecott Utah Copper's Tailings Facility.

Note on document identification: The intention of the Utah Division of Air Quality is to develop a Maintenance Plan to address PM₁₀. As part of this effort, SIP Subsections IX.H.1 Emission Limits and Operating Practices – General Requirements, IX.H.2 Source-Specific Particulate Emission Limitations in Salt Lake and Davis Counties and IX.H.3 Source-Specific Particulate Emission Limitations for Utah County will be repealed and replaced. Subsection IX.H.4 will be repealed and replaced with Interim Emission Limits and Operating Practices. This subsection provides interim limits, consistent with the limits codified in the PM_{2.5} SIP, until future controls have been implemented within timeframes identified in Section IX Part H.2.

These SIP Subsections were adopted by the Air Quality Board on July 6, 2005 and became state law on August 1, 2005. However, this version of the SIP was not adopted by EPA and therefore never became federal law. Thus, this evaluation report also references an earlier SIP version originally dated June 28, 1991. This SIP was adopted by EPA and published in the federal register on July 8, 1994. This earlier SIP version is often referred to as the “original SIP.” In order to distinguish between the various documents in this report, a coding scheme will be used:

- Since Section IX.H of the 2005 State-only SIP will be repealed entirely, there is no need to refer to that document version within this report.
- When referencing the original SIP (the one issued in 1991/1992 and adopted by EPA in 1995), the qualifier ^(OS) will follow any citation from that document.
- When referencing any new SIP condition or requirement, the citation will be left blank.

Therefore, a particular sentence of this document might read as follows:

SIP Subsection IX.H.1.c – Stack Testing supersedes 2.a.A^(OS) from the original SIP.

1.1 Facility Identification

Name: Kennecott Utah Copper – Tailings Facility
Address: 11984 West Highway 202, Magna, Utah, Salt Lake County
Owner/Operator: Kennecott Utah Copper, LLC
UTM coordinates: 4,515 km Northing, 405 km Easting, Zone 12

1.2 Facility Process Summary

Tailings material, from the concentrating and smelting of concentrate, are transported in slurry form to the tailings storage facility located south of Interstate 80 and west of 8000 West in Salt Lake County, Utah.

1.3 Facility Criteria Air Pollutant Emissions Sources

The following is a listing of installations at the Tailings facility:

- Liquid petroleum-fired emergency generator
- Tailings storage facility

This is not meant to be a complete listing of all equipment which may be involved or required during permitting activities at the mine, rather it is a listing of all significant emission units.

1.4 Facility 2011 Baseline Actual Emissions and Current PTE

In 2011, the Tailings facility baseline actual emissions were determined to be the following (in tons per year):

Table 1: Actual Emissions

Pollutant	Actual Emissions (Tons/Year)
PM ₁₀	23.04
SO ₂	0.00
NO _x	0.03

The current PTE values, as established by the most recent AO issued to the source (DAQE-AN10572018-06), are as follows:

Table 2: Current Potential to Emit

Pollutant	Potential to Emit (Tons/Year)
PM ₁₀	36.26
SO ₂	0
NO _x	0.26

2.0 Demonstration of Maintaining Attainment

These values have been used in the modeled attainment demonstration. The 2011 actual emissions were used as baseline for model validation. The Tailings facility emissions were projected for future years using growth factors for the mining industry in Salt Lake County. Those emissions projected with growth are intended to represent future actual emissions for the Tailings facility.

Although a specific application of new RACT is not a requirement of the maintenance plan, the limitations found within this maintenance plan are based on the most recent PM_{2.5} Section of the SIP. This Section of the SIP required the application of RACT above and beyond the existing controls already required of most listed PM₁₀ SIP sources. The conditions, requirements and emission limitations contained within this maintenance plan are based on those in Sections IX.H.11, IX.H.12 and IX.H.13 – which comprise the PM_{2.5} sections of the SIP, and include this additional RACT application. All requirements from the original PM₁₀ SIP that have not been superseded or replaced, and which are still necessary will also be retained. By necessary, meaning: needed in the demonstration of attainment of the 24-hour standard, or in demonstrating that no backsliding in the application of RACT has taken place. This is discussed in greater detail in Item 3 below.

3.0 Comparison of Requirements – Original SIP and New Maintenance Plan

The Tailings facility is a previously listed SIP source. In the original PM₁₀ SIP document for Davis and Salt Lake Counties [IX.H.2 Emission Limitations and Operating Practices (Davis and Salt Lake Counties) – dated 28 June 1991 and Updated 4 November 1992]^(OS), the Tailings facility was listed in Subsection IX.H.2.b.BB.B^(OS). As a listed source there were several requirements and conditions that applied to the facility.

The Tailings facility is not a listed source in the PM_{2.5} Section of the SIP. As was discussed above in Item 2.0, the limits in this maintenance plan are based on the limits in the PM_{2.5} SIP; either in the general requirements of subsection IX.H.11 or the source specific requirements of IX.H.12. Therefore, a comparison between the original SIP requirements, and those found in this new maintenance plan can be found below:

3.1 Original SIP General Requirements

IX.H.2.a General Requirements^(OS)

The original SIP was a divided document, having two separate sets of General Requirements. The requirements found at IX.H.1.a^(OS) applied to the listed sources found in Utah County, while those found at IX.H.2.a^(OS) applied to the listed sources found in Salt Lake and Davis Counties. The Tailings facility is located in Salt Lake County, only the general requirements of IX.H.2.a^(OS) applied. However, except for the additional requirements found under IX.H.2.a.M^(OS) for petroleum refineries and the specific fuel requirements of IX.H.2.a.N^(OS), the two subsections are essentially identical.

2.a.A. Stack Testing^(OS) – this subsection covered the general methods and procedures for conducting stack testing, including the establishment of a pretest protocol, pretest conference, and the use of specific EPA test methods. This subsection has since been updated and superseded by SIP subsection IX.H.1.e which incorporates equivalent language.

2.a.B. Visible Emissions^(OS) – covered the establishment of designated opacity limitations for specified process units and/or process equipment. This subsection has since been superseded by SIP subsection IX.H.1.f which incorporates equivalent language.

2.a.C. Visible Emissions (cont.)^(OS) – covered the procedure by which visible emission observations would be conducted. This subsection has since been superseded by SIP subsection IX.H.1.f which incorporates equivalent language.

2.a.D. Annual Emission Limitations^(OS) – established that annual emissions would be determined on a rolling 12-month basis, and that a new 12 month emission total would be calculated on the first day of each month using the previous 12 months data. This subsection is no longer needed as the annual PM₁₀ standard no longer exists.

2.a.E. Recordkeeping Requirements^(OS) – established that records need to be kept for all periods that the plant is in operation, for a period of at least two years, and provided upon request. This subsection has since been superseded by SIP subsection IX.H.1.c which incorporates equivalent language.

2.a.F. Approval Orders^(OS) – established that this subsection of the SIP superseded any

previously issued AOs. No longer applicable, as this subsection of the SIP will be superseded, and no previously issued AOs are still in existence.

2.a.G. Proper Maintenance^{OS} – established that all facilities need to be adequately and properly maintained. Not needed. This is inherent in the NSR permitting program.

2.a.H. Future Modifications^{OS} – established that future modifications to the approved facilities were also subject to the NSR permitting requirements. Not needed. This is inherent in the NSR permitting program.

2.a.I. Unpaved Operational Areas^{OS} – established rules for treating fugitive dust with water sprays or chemical dust suppression.

2.a.J. Actual Emissions^{OS} – established that the actual emissions included for each listed source in subsection IX.H.2.b would not be used for compliance purposes. This subsection is no longer needed as a listing of individual source actual emissions are no longer included in the requirements of subsection IX.H of the SIP. This requirement is outdated and obsolete.

2.a.K. Test if Directed^{OS} – established a definition of this term. No longer needed as this term is no longer used and the condition itself no longer applies. UDAQ has a minimum test frequency established under R307-165-2. This same rule also allows for (and requires) any additional testing to demonstrate compliance status as deemed necessary by the Director.

2.a.L. Definitions^{OS} – established that the definitions contained in R307 apply to Section IX.H.2. This subsection has since been superseded by SIP subsection IX.H.1.b which incorporates equivalent language.

2.a.M. Petroleum Refineries^{OS} – This is a fairly lengthy subsection pertaining only to the petroleum refineries. This subsection has its own sub-subsections that are either moved or no longer necessary.

2.a.N. Specific Fuel Requirements for Coal and/or Oil^{OS} – established that specific rules for the sulfur content of these fuels also existed and applied. This subsection has since been superseded by the individual source requirements found in IX.H.2 and IX.H.3. This requirement is now, largely irrelevant as few sources have the ability or authority to burn coal, and the rules on the sulfur content of fuel oil have been updated with lower sulfur requirements – specifically the requirements on the sulfur content allowed in diesel fuel found under 40 CFR 80.510(c) for off-highway diesel and 40 CFR 80.520(a) for on-highway diesel. None of the listed sources have the ability to burn any other fuel oils.

3.2 Original SIP Source Specific Requirements

Individual source requirements:

In 1995 KUC received approval through AO DAQE-627-95 to construct the North Tailings Impoundment. Since then KUC has revegetated the existing (South) Tailings Impoundment. The discharge system and Arthur pump station on the South Tailings Impoundment were removed when the impoundment area was revegetated.

2.b.BB.B.1.&2.^{OS} These subsections describe the previous discharge system at the tailings facility. The infrastructure is in place and is the method used to construct the facility. These

subsections are outdated.

2.b.BB.B.3 and 4.^{OS} These subsections describe a dust mitigation measure - redirect deposition to areas susceptible to wind erosion when a wind event is forecasted and also measures for roadways. This mode of operation is inherent to the way the tailings facility is operated with the new discharge system. These subsections are outdated.

2.b.BB.B.5.^{OS} This subsection describes a inspection requirements when a wind event is forecast. This subsection is outdated and will be superseded by requirements in new SIP Subsection IX.H.2. Subsection IX.H.2.h.ii.A.II.

2.b.BB.B.6.^{OS} This subsection describes the requirements to maximize surface wetness. This requirement has fulfilled and is integral to the operation of the tailings facility. This subsection is outdated and will be superseded by requirements in new SIP Subsection IX.H.2.h.ii.A.

2.b.BB.B.7.^{OS} This subsection describes requirements to minimize dust emissions. This requirement has been fulfilled and is an integral to the operation of the tailings facility. This subsection is outdated. See section 5.0 below.

2.b.BB.B.8.^{OS} This subsection describes requirements for dike construction and dust mitigation measures. Tailings are placed strategically to ensure that the seismic and geotechnical requirements are met for the impoundment. This subsection is outdated.

2.b.BB.B.9.^{OS} This subsection describes requirements for dust mitigation near the Arthur pump station. The Arthur pump station is not in operation since the closure of the South Tailings Impoundment. This subsection is outdated.

2.b.BB.B.10&11.^{OS} These subsections describe dust mitigation measures and reporting requirements when a wind event is forecasted. This mode of operation is inherent to the way the tailings facility is operated. These subsection have been replaced by Subsections IX.H.2.h.ii.A.II and III.

2.b.BB.B.12-15.^{OS} These subsections require compliance with the state rules and regulations. This subsection will be superseded by the general requirements in IX.H.1. of the maintenance plan.

4.0 New Maintenance Plan – General Requirements

The general requirements for all listed sources are found in SIP Subsection IX.H.1. These serve as a means of consolidating all commonly used and often repeated requirements into a central location for consistency and ease of reference.

IX.H.1.a. This paragraph states that the terms and conditions of Subsection IX.H.1 apply to all sources subsequently addressed in the following subsections IX.H.2 and IX.H.3. It also clarifies that should any inconsistency exist between the general requirements and the source specific requirements, then the source specific requirements take precedence.

IX.H.1.b States that the definitions found in State Rule 307-101-2, Definitions, apply to SIP Section IX.H. Since this is stated for the Section (IX.H), it applies equally to IX.H.1, IX.H.2 and IX.H.3.

IX.H.1.c This is a recordkeeping provision. Information used to determine compliance shall be recorded for all periods the source is in operation, maintained for a minimum period of five (5) years, and made available to the Director upon request. As the general recordkeeping requirement of Section IX.H, it will often be referred to and/or discussed as part of the compliance demonstration provisions for other general or source specific conditions. This recordkeeping requirement includes records of startup/shutdown implementation procedures, as well as CEMS testing data and stack testing data, as applicable.

IX.H.1.d Statement that emission limitations apply at all times that the source or emitting unit is in operation, unless otherwise specified in the source specific conditions listed in IX.H.2 or IX.H.3.

This is the definitive statement that emission limits apply at all times – including periods of startup or shutdown. It may be that specific sources have separate defined limits that apply during alternate operating periods (such as during startup or shutdown), and these limits will be defined in the source specific conditions of either IX.H.2 or IX.H.3.

Conditions 1.a, 1.b and 1.d are declaratory statements, and have little in the way of compliance provisions. Rather, they define the framework of the other SIP conditions. As condition 1.c is the primary recordkeeping requirement, it shall be further discussed under item 4.2 below.

IX.H.1.e This is the main stack testing condition, and outlines the specific requirements for demonstrating compliance through stack testing. Several subsections detailing Sample Location, Volumetric Flow Rate, Calculation Methodologies and Stack Test Protocols are all included – as well as those which list the specific accepted test methods for each emitted pollutant species (PM₁₀, NO_x, or SO₂). Finally, this subsection also discusses the need to test at an acceptable production rate, and that production is limited to a set ratio of the tested rate.

These stack testing requirements supersede those found in IX.H.1.a.A^(OS) and IX.H.2.a.A^(OS) of the original SIP.

IX.H.1.f This condition covers the use of CEMs and opacity monitoring. While it specifically details the rules governing the use of continuous monitors (both emission monitors and opacity monitors), it also covers visible opacity observations through the use of EPA reference method 9.

These requirements specifically supersede those found in IX.H.1.a.C^(OS) and IX.H.2.a.C^(OS) of the original SIP. The original SIP requirements of IX.H.1.a.B^(OS) and IX.H.2.a.B^(OS), both of which addressed individual equipment opacity, will be superseded as necessary by the particular source specific limitations found in IX.H.2 or IX.H.3.

Both conditions 1.e and 1.f serve as the mechanism through which sources conduct monitoring for the verification of compliance with a particular emission limitation.

4.1 Monitoring, Recordkeeping and Reporting

As stated above, the general requirements IX.H.1.a through IX.H.1.f primarily serve as

declaratory or clarifying conditions, and do not impose compliance provisions themselves. Rather, they outline the scope of the conditions which follow the source specific requirements of IX.H.2 and IX.H.3.

For example, most of the conditions in those subsections include some form of short-term emission limit. This limitation also includes a compliance demonstration methodology – stack test, CEM, visible opacity reading, etc. In order to ensure consistency in compliance demonstrations and avoid unnecessary repetition, all common monitoring language has been consolidated under IX.H.1.e and IX.H.1.f. Similarly, all common recordkeeping and reporting provisions have been consolidated under IX.H.1.c.

4.2 Discussion of Attainment Demonstration

As is discussed above in Items 4.0 and 4.1, these are general conditions and have few if any specific limitations and requirements. Their inclusion here serves three purposes. 1. They act as a framework upon which the other requirements can build. 2. They demonstrate a prevention of backsliding. By establishing the same or functionally equivalent general requirements as were included in the original SIP, this demonstrates both that the original requirements have been considered, and either retained or updated/replaced as required. 3. When a general requirement has been removed, careful consideration was given as to its specific need, and whether its retention would in any way aid in the demonstration of attainment with the 24-hr standard. If no argument can be made in that regard, the requirement was simply removed.

5.0 New Maintenance Plan – Tailings Facility Specific Requirements

The Tailings facility specific conditions in Section IX.H.2.h.ii address the limitations and requirements that apply only to the Tailings facility. The tailings impoundment is subject to the following requirements in addition to the Fugitive Emissions and Fugitive Dust rule UAC R307-1-4.5

IX.H.2.h.ii.A No more than 50 contiguous acres or more than 5% of the total tailings area shall be permitted to have the potential for wind erosion.

- I. Wind erosion potential is the area that is not wet, frozen, vegetated, crusted or treated and has the potential for wind erosion.
- II. KUC shall conduct wind erosion potential grid inspections monthly between February 15 and November 15.
- III. If KUC or the Director of Utah Division of Air Quality (Director) determines that the percentage of wind erosion potential is exceeded, KUC shall meet with the Director, to discuss additional or modified fugitive dust controls/operational practices, and an implementation schedule for such, within five working days following verbal notification by either party.

This subsection requires KUC to prevent fugitive dust by limiting the potential surface area that has the potential for wind erosion. This requirement originated in Condition IX.2.BB.B.6.^{OS}

IX.H.2.h.ii.B This condition required KUC to monitor the weather forecast. This requirement monitors for future wind events so that fugitive dust can be minimized during wind events.

A KUC Weather Forecast includes a review of short range and long range weather forecasts. Using the KUC Tailings Impoundment station along with other monitoring data in the area, a specific forecast is issued for the Tailings site. If the analysis forecasts a high wind event (a wind event is defined as wind gusts exceeding 25 mph for more than one hour), the KUC weather forecasts are sent to the Utah Division of Air Quality for necessary surveillance and coordination.

The tailings specific conditions in IX.H.2.h.ii.A & B are comprehensive of tailings operations, are effective in minimizing emission and are applicable at all times. Dust minimization requirements are applicable regardless of wind forecast and are required at all operational areas of the site. The conditions also require additional notification to UDAQ and coordination prior to a wind event. Several of the original SIP requirements are now inherent to the way the facility is operated and the tailings site is constructed. These conditions are no longer necessary and are now captured in the conditions above, applicable to all tailings operations at all times.

IX.H.2.1.i.E KUC is subject to the most recently federally approved fugitive dust rules. The fugitive dust rules that are in R307-1-4.5, Fugitive Emissions and Fugitive Dust. This rule was approved by EPA in 1994 and is applicable to the KUC Tailings facility under the 1994 PM₁₀ SIP. This rule sets a minimum for controlling fugitive dust at tailing piles and ponds that are located in the nonattainment area along the Wasatch Front. The subsection R307-1.4.5.5, Tailings Piles and Ponds, outlines the minimum requirements that sources are required to follow in minimizing the fugitive dust from their operations. Upon EPA approval of a modified fugitive dust rule, KUC will be subject to the modified rule. The EPA will not approve a rule that allows backsliding.

5.1 Monitoring, Recordkeeping and Reporting

Monitoring, recordkeeping and reporting for the conditions above is addressed through a variety of methods, such as visual inspections, field records and reporting.

5.2 Discussion of Attainment Demonstration

Generally, the calculation methodology for determination of emissions for the Tailings facility is similar to the method used in during the 1991/1992 timeframe of the original SIP.

6.0 Implementation Schedule

The requirements imposed on the tailings are effective immediately. While some provision was made for sources generally to implement the RACT requirements of the PM_{2.5} SIP (and which were included as part of the modeled emission values for each source as discussed in that section above), the tailings did not have any required RACT modifications to undertake. The emission limits listed in IX.H.2.i can be applied immediately. Similarly, the provisions of IX.H.1.a-f (the General Requirements) can also be applied immediately.

8.0 References

- Tailings, PM_{2.5} SIP Major Point Source RACT Documentation
- UDSHW Contract No. 12601, Work Assignment No. 7, Utah PM_{2.5} SIP RACT Support – TechLaw Inc.
- Tailings Approval Order DAQE-AN10572018-06
- Tailings ITA DAQE-IN105720029-14
- Utah Administrative Code R307-1-4.5.

Evaluation Report – Tailings Facility

UTAH PM₁₀ SIP/MAINTENANCE PLAN

Salt Lake County Nonattainment Area

Supporting Information

PM₁₀ SIP/MAINTENANCE PLAN EVALUATION REPORT

Power Plant

1.0 Introduction

This evaluation report (report) provides Technical Support for Section IX, Part H.1 and Section IX, Part H.2 of the Utah PM₁₀ Maintenance Plan; to address the Salt Lake County PM₁₀ Nonattainment Area. This document specifically serves as an evaluation of the Kennecott Utah Copper (KUC) Power Plant located in Salt Lake County.

Note on document identification: The intention of the Utah Division of Air Quality is to develop a Maintenance Plan to address PM₁₀. As part of this effort, SIP Subsections IX.H.1 Emission Limits and Operating Practices – General Requirements, IX.H.2 Source-Specific Particulate Emission Limitations in Salt Lake and Davis Counties and IX.H.3 Source-Specific Particulate Emission Limitations for Utah County will be repealed and replaced. Subsection IX.H.4 will be repealed and replaced with Interim Emission Limits and Operating Practices. This subsection provides interim limits, consistent with the limits codified in the PM_{2.5} SIP, until future controls have been implemented within timeframes identified in Section IX Part H.2.

This evaluation report references the SIP version originally dated June 28, 1991 and made effective by EPA on August 8, 1994. This SIP version is often referred to as the “original SIP.” The Utah County portion of the SIP was further updated on June 5, 2002 and made effective by EPA on January 22, 2003. Additional SIP revisions were adopted by the Air Quality Board on July 6, 2005 and became state law on August 1, 2005. However, this version of the SIP was not adopted by EPA and therefore never became federal law. In order to distinguish between the various documents in this report, the following coding scheme will be used:

- Since Section IX.H of the 2005 State-only SIP will be repealed entirely, there is no need to refer to that document version within this report.
- When referencing the original SIP (the one issued in 1991/1992 and adopted by EPA in 1994), the qualifier ^(OS) will follow any citation from that document.
- When referencing any new SIP condition or requirement, the citation will be left blank.

Therefore, a particular sentence of this document might read as follows:

SIP Subsection IX.H.1.c – Stack Testing supersedes 2.a.A^(OS) from the original SIP.

1.1 Facility Identification

Name: Kennecott Utah Copper Power Plant
Address: 9600 West 2100 South, Magna, Utah, Salt Lake County
Owner/Operator: Kennecott Utah Copper, LLC
UTM coordinates: 4,507,000 m Northing, 405,000 m Easting, Zone 12

1.2 Facility Process Summary

Kennecott Utah Copper operates a Power Plant. The Power Plant is a four-unit, 175-megawatt capacity steam turbine generator facility. The initial plant was constructed in 1943, with the

current output capacity and configuration since 1959. The plant operates on both coal and natural gas. In 2011 KUC received a permit to install a new combined-cycle, natural gas-fired combustion turbine. It will replace three existing coal-fired boilers (identified as Units 1, 2 and 3 boilers). The emissions will be limited through a combination of dry low-NOx combustors, selective catalytic reduction (SCR) and catalytic oxidation (CatOx).

1.3 Facility Criteria Air Pollutant Emissions Sources

The following is a listing of the main emitting units from the KUC Power Plant:

- Power Plant Boiler #1
- Power Plant Boiler #2
- Power Plant Boiler #3
- Power Plant Boiler #4
- Power Plant Turbine (Unit #5)
- Hot Water Boiler
- Cold Solvent Parts Washers
- Wet Cooling Towers
- Natural Gas Generator
- Hydraulic Coal Unloader System with Diesel Engine
- Coal and Ash Handling Equipment
- Diesel Engine

This is not meant to be a complete listing of all equipment which may be involved or required during permitting activities at the power plant, rather it is a listing of all significant emission units or emission unit groups.

1.4 Facility 2011 Baseline Actual Emissions and Current PTE

In 2011, the power plant baseline actual emissions were determined to be the following (in tons per year):

Table 1: Actual Emissions

Pollutant	Actual Emissions (Tons/Year)
PM ₁₀	43.93
SO ₂	1,704.17
NO _x	920.18

The actual emissions are from the 2011 inventory. The current PTE values for the KUC power plant, as established by the most recent AO issued to the source (DAQE-AN105720026-11) are as follows:

Table 2: Current Potential to Emit

Pollutant	Potential to Emit (Tons/Year)
PM ₁₀	256.00
SO ₂	6,522
NO _x	4,160

2.0 Demonstration of Maintaining Attainment

These values have been used in the modeled attainment demonstration. The 2011 actual emissions were used as baseline for model validation. The power plant emissions were projected for future years using growth factors for the manufacturing industry in Salt Lake County. Those emissions projected with growth are intended to represent future actual emissions for the power plant.

Although a specific application of new RACT is not a requirement of the maintenance plan, the limitations found within this maintenance plan are based on the most recent PM_{2.5} Section of the SIP. This Section of the SIP required the application of RACT above and beyond the existing controls already required of most listed PM₁₀ SIP sources – including the KUC Power Plant in specific. The conditions, requirements and emission limitations contained within this maintenance plan are based on those in Sections IX.H.11, IX.H.12 and IX.H.13 – which comprise the PM_{2.5} sections of the SIP, and include this additional RACT application. All requirements from the original PM₁₀ SIP that have not been superseded or replaced, and which are still necessary will also be retained. By necessary, meaning: needed in the demonstration of attainment of the 24-hour standard, or in demonstrating that no backsliding in the application of RACT has taken place. This is discussed in greater detail in Item 3 below.

3.0 Comparison of Requirements – Original SIP and New Maintenance Plan

The Kennecott Power Plant is a previously listed SIP source. In the original PM₁₀ SIP document for Davis and Salt Lake Counties [IX.H.2 Emission Limitations and Operating Practices (Davis and Salt Lake Counties) – dated 28 June 1991 and Updated 4 November 1992]^(OS), the power plant was listed in Subsection IX.H.2.b.Z^(OS) as Kennecott Utah Copper, Utah Power Plant. As a listed source there were several requirements and conditions that applied to the facility.

In addition, the power plant is also a listed source in the PM_{2.5} Section of the SIP (see SIP Section IX.H.12.n.i). As was discussed above in Item 2.0, all limits in this maintenance plan are based on the limits in the PM_{2.5} SIP; either in the general requirements of subsection IX.H.11 or the source specific requirements of IX.H.12.n.i. Therefore, a comparison between the original SIP requirements, and those found in this new maintenance plan can be found below:

3.1 Original SIP General Requirements

IX.H.2.a General Requirements^(OS)

The original SIP was a divided document, having two separate sets of General Requirements. The requirements found at IX.H.1.a^(OS) applied to the listed sources found in Utah County, while those found at IX.H.2.a^(OS) applied to the listed sources found in Salt Lake and Davis Counties. As the then the power plant was located in Salt Lake County, only the general requirements of IX.H.2.a^(OS) applied. However, except for the additional requirements found under IX.H.2.a.M^(OS) for petroleum refineries and the specific fuel requirements of IX.H.2.a.N^(OS), the two subsections are essentially identical.

2.a.A. Stack Testing^(OS) – this subsection covered the general methods and procedures for conducting stack testing, including the establishment of a pretest protocol, pretest conference, and the use of specific EPA test methods. This subsection has since been updated and superseded by SIP subsection IX.H.1.e which incorporates equivalent language.

2.a.B. Visible Emissions^{OS} – covered the establishment of designated opacity limitations for specified process units and/or process equipment. This subsection has since been superseded by SIP subsection IX.H.1.f which incorporates equivalent language.

2.a.C. Visible Emissions (cont.)^{OS} – covered the procedure by which visible emission observations would be conducted. This subsection has since been superseded by SIP subsection IX.H.1.f which incorporates equivalent language.

2.a.D. Annual Emission Limitations^{OS} – established that annual emissions would be determined on a rolling 12-month basis, and that a new 12 month emission total would be calculated on the first day of each month using the previous 12 months data. This subsection is no longer needed as the annual PM₁₀ standard no longer exists.

2.a.E. Recordkeeping Requirements^{OS} – established that records need to be kept for all periods that the plant is in operation, for a period of at least two years, and provided upon request. This subsection has since been superseded by SIP subsection IX.H.1.c which incorporates equivalent language.

2.a.F. Approval Orders^{OS} – established that this subsection of the SIP superseded any previously issued AOs. No longer applicable, as this subsection of the SIP will be superseded, and no previously issued AOs are still in existence.

2.a.G. Proper Maintenance^{OS} – established that all facilities need to be adequately and properly maintained. Not needed. This is inherent in the NSR permitting program.

2.a.H. Future Modifications^{OS} – established that future modifications to the approved facilities were also subject to the NSR permitting requirements. Not needed. This is inherent in the NSR permitting program.

2.a.I. Unpaved Operational Areas^{OS} – established rules for treating fugitive dust with water sprays or chemical dust suppression.

2.a.J. Actual Emissions^{OS} – established that the actual emissions included for each listed source in subsection IX.H.2.b would not be used for compliance purposes. This subsection is no longer needed as a listing of individual source actual emissions are no longer included in the requirements of subsection IX.H of the SIP. This requirement is outdated and obsolete.

2.a.K. Test if Directed^{OS} – established a definition of this term. No longer needed as this term is no longer used and the condition itself no longer applies. UDAQ has a minimum test frequency established under R307-165-2. This same rule also allows for (and requires) any additional testing to demonstrate compliance status as deemed necessary by the Director.

2.a.L. Definitions^{OS} – established that the definitions contained in R307 apply to Section IX.H.2. This subsection has since been superseded by SIP subsection IX.H.1.b which incorporates equivalent language.

2.a.M. Petroleum Refineries^{OS} – This is a fairly lengthy subsection pertaining only to the petroleum refineries. This subsection has its own sub-subsections that are either moved or no longer necessary.

2.a.N. Specific Fuel Requirements for Coal and/or Oil^{OS} – established that specific rules for the sulfur content of these fuels also existed and applied. This subsection has since been superseded by the individual source requirements found in IX.H.2 and IX.H.3 (see specifically the sources Kennecott and BYU). This requirement is now, largely irrelevant as few sources have the ability or authority to burn coal, and the rules on the sulfur content of fuel oil have been updated with lower sulfur requirements – specifically the requirements on the sulfur content allowed in diesel fuel found under 40 CFR 80.510(c) for off-highway diesel and 40 CFR 80.520(a) for on-highway diesel. None of the listed sources have the ability to burn any other fuel oils.

3.2 Original SIP Source Specific Requirements

KUC is in the process of upgrading their power plant with the removal of Units 1, 2 & 3 by January 2018. KUC will also be upgrading Unit 4 with low NO_x burners by January 2018.

Individual source requirements:

2.b.Z.1.^{OS} This subsection was a listing of the equipment at the power plant – this subsection has been superseded and is irrelevant. A simple listing of equipment does not constitute an emission limitation, does not impose any restriction on daily emissions, and rapidly becomes out of date as well as impossible to enforce. The original listing found in this subsection will be replaced and would represent a significant step backwards in emission control.

2.b.Z.2.^{OS} This subsection sets fuel requirements, emission limits and testing frequencies for Units 1-4 during the winter months from November 1 to the last day of February. These requirements are inherent to the ongoing operations at the Utah Power Plant and will be superseded by requirements in IX.H.2.h.i.D.II.

2.b.Z.3.^{OS} This subsection sets fuel requirements and emission limits for the Units 1-4 during the non-winter months from March 1 to October 31. These requirements are inherent to the ongoing operations at the Utah Power Plant and will be superseded by requirements in IX.H.2.h.i.D.III.

2.b.Z.4.^{OS} This subsection sets testing frequencies for the limits set in condition 2.b.Z.3, above. These requirements are inherent to the ongoing operations at the Utah Power Plant and will be superseded by requirements in IX.H.2.h.i.D.IV.

2.b.Z.5.^{OS} This subsection sets opacity limits for Units 1-4. Visible emissions limits are consistent with federal standards and will be superseded by requirements in Section IX.H.1.f.

2.b.Z.6.^{OS} This subsection limits sulfur content in fuel and reporting requirements for Units 1-4. These requirements are inherent to the ongoing operations at the Utah Power Plant and are not needed in the source specific limitations section of the Maintenance Plan.

2.b.Z.7.^{OS} This subsection sets monitoring requirements for fuel consumption in Units 1-4. These requirements are inherent to the ongoing operations at the Utah Power Plant and are not needed.

2.b.Z.8.^{OS} Annual Emissions – established total annual emissions for the entire power plant. Conditions limiting operations of the boilers included in Maintenance Plan Section IX.H.2.h.i.D supersede the outdated annual emissions estimates. Therefore, the annual limits have been eliminated. Salt Lake County has not shown an exceedance in over ten years and the reduction in

allowable emissions will demonstrate a prevention of backsliding.

4.0 New Maintenance Plan – General Requirements

The general requirements for all listed sources are found in Maintenance Plan Subsection IX.H.1. These serve as a means of consolidating all commonly used and often repeated requirements into a central location for consistency and ease of reference.

IX.H.1.a. This paragraph states that the terms and conditions of Subsection IX.H.1 apply to all sources subsequently addressed in the following subsections IX.H.2 and IX.H.3. It also clarifies that should any inconsistency exist between the general requirements and the source specific requirements, then the source specific requirements take precedence.

IX.H.1.b States that the definitions found in State Rule 307-101-2, Definitions, apply to Maintenance Plan Section IX.H. Since this is stated for the Section (IX.H), it applies equally to IX.H.1, IX.H.2 and IX.H.3 and IX.H.4.

IX.H.1.c This is a recordkeeping provision. Information used to determine compliance shall be recorded for all periods the source is in operation, maintained for a minimum period of five (5) years, and made available to the Director upon request. As the general recordkeeping requirement of Section IX.H, it will often be referred to and/or discussed as part of the compliance demonstration provisions for other general or source specific conditions.

IX.H.1.d Statement that emission limitations apply at all times that the source or emitting unit is in operation, unless otherwise specified in the source specific conditions listed in IX.H.2 or IX.H.3.

This is the definitive statement that emission limits apply at all times – including periods of startup or shutdown. It may be that specific sources have separate defined limits that apply during alternate operating periods (such as during startup or shutdown), and these limits will be defined in the source specific conditions of either IX.H.2 or IX.H.3.

Conditions 1.a, 1.b and 1.d are declaratory statements, and have little in the way of compliance provisions. Rather, they define the framework of the other Maintenance Plan conditions. As condition 1.c is the primary recordkeeping requirement, it shall be further discussed under item 4.2 below.

IX.H.1.e This is the main stack testing condition, and outlines the specific requirements for demonstrating compliance through stack testing. Several subsections detailing Sample Location, Volumetric Flow Rate, Calculation Methodologies and Stack Test Protocols are all included – as well as those which list the specific accepted test methods for each emitted pollutant species (PM₁₀, NO_x, or SO₂). Finally, this subsection also discusses the need to test at an acceptable production rate, and that production is limited to a set ratio of the tested rate.

These stack testing requirements supersede those found in IX.H.1.a.A^{OS} and IX.H.2.a.A^{OS} of the original SIP.

IX.H.1.f This condition covers the use of CEMs and opacity monitoring. While it specifically details the rules governing the use of continuous monitors (both emission monitors and opacity monitors), it also covers visible opacity observations through the use of EPA reference method 9.

These requirements specifically supersede those found in IX.H.1.a.C^(OS) and IX.H.2.a.C^(OS) of the original SIP. The original SIP requirements of IX.H.1.a.B^(OS) and IX.H.2.a.B^(OS), both of which addressed individual equipment opacity, will be superseded as necessary by the particular source specific limitations found in IX.H.2 or IX.H.3.

Both conditions 1.e and 1.f serve as the mechanism through which sources conduct monitoring for the verification of compliance with a particular emission limitation.

4.1 Monitoring, Recordkeeping and Reporting

As stated above, the general requirements IX.H.1.a through IX.H.1.f primarily serve as declaratory or clarifying conditions, and do not impose compliance provisions themselves. Rather, they outline the scope of the conditions which follow – the source specific requirements of IX.H.2 and IX.H.3.

For example, most of the conditions in those subsections include some form of short-term emission limit. This limitation also includes a compliance demonstration methodology – stack test, CEM, visible opacity reading, etc. In order to ensure consistency in compliance demonstrations and avoid unnecessary repetition, all common monitoring language has been consolidated under IX.H.1.e and IX.H.1.f. Similarly, all common recordkeeping and reporting provisions have been consolidated under IX.H.1.c.

4.2 Discussion of Attainment Demonstration

As is discussed above in Items 4.0 and 4.1, these are general conditions and have few if any specific limitations and requirements. Their inclusion here serves three purposes. 1. They act as a framework upon which the other requirements can build. 2. They demonstrate a prevention of backsliding. By establishing the same or functionally equivalent general requirements as were included in the original SIP, this demonstrates both that the original requirements have been considered, and either retained or updated/replaced as required. 3. When a general requirement has been removed, careful consideration was given as to its specific need, and whether its retention would in any way aid in the demonstration of attainment with the 24-hr standard. If no argument can be made in that regard, the requirement was simply removed.

5.0 New Maintenance Plan – Power Plant Specific Requirements

IX.H.2.h.i.A Boilers #1, #2, and #3 shall not be operated upon commencing operations of Unit #5 (combined-cycle, natural gas-fired combustion turbine).

This condition requires the shutdown of Units 1, 2 and 3 upon commencing operation of the new Unit 5.

IX.H.2.h.i.B Unit #5 shall not exceed the following emission rates to the atmosphere:

POLLUTANT	lb/hr	ppmdv (15% O2 dry)
I. PM ₁₀ with duct firing: Filterable + condensable	18.8	
II. NO _x :		2.0*

* Under steady state operation.

This condition establishes emission requirements for Unit 5.

The ppmvd for the Unit #5 is 2.0 with a calculated mass emission rate of 15.5 lb/hr. The flow rate is determined by 40 CFR Part 60 Appendix A Method 2 and the concentration is determined by 40 CFR Part 60 Appendix A Method 7e.

IX.H.2.h.i.C This condition sets the stack testing frequency for Unit #5.

IX.H.2.h.i.D This condition sets the requirements for operation of Units 1, 2, 3 and 4 during the period November 1 to the end of February of the next year.

- I. This requires KUC to burn natural gas except during a natural gas curtailment.
- II. This condition sets the PM₁₀ and NO_x limits for Units 1-4 when natural gas is used as a fuel. PM₁₀ limits for Units 1-3 are 0.004 gr/dscf, filterable (2.26 lb/hr) and 0.03 gr/dscf, filterable plus condensable (17.0 lb/hr). PM₁₀ limits for Unit 4 is 0.004 gr/dscf, filterable (4.36 lb/hr) and 0.03 gr/dscf, filterable plus condensable (32.7 lb/hr). The NO_x limits for Units 1-3 are 336 ppm (159 lb/hr) and the limit for Unit 4 is 336 ppm (306 lb/hr). In 2018 the limit for Unit 4 will be 60 ppm (31 lb/hr).
- III. This condition sets the limits for using coal during a natural gas curtailment. PM₁₀ limits for Units 1-3 are 0.029 gr/dscf, filterable (17.3 lb/hr) and 0.29 gr/dscf, filterable plus condensable (382 lb/hr). PM₁₀ limits for Unit 4 is 0.029 gr/dscf, filterable (33.5 lb/hr) and 0.29 gr/dscf, filterable plus condensable (382 lb/hr). The NO_x limits for Units 1-3 are 426.5 ppm (216 lb/hr) and the limit Unit 4 is 384 ppm (377 lb/hr).
- IV. This condition sets the stack testing frequency for Units 1-4 at once per year if they are operated during the time period November 1 to the end of February the following year.

IX.H.2.h.i.E This condition sets the requirements for operation of Units 1, 2, 3 and 4 during the period March 1 thru October 31.

- I. This condition sets the limits for the operation of Units 1, 2, 3 and 4. PM₁₀ limits for all units are 0.029 gr/dscf (filterable). The NO_x limits for Units 1-3 are 426.5 ppm (216 lb/hr) and the limit Unit 4 is 384 ppm (377 lb/hr).

- II. This condition sets the stack testing frequency for Units 1-4 at once per year if they are operated during the time period March 1 to the end of October. The DAQ does not want KUC to operate the boilers just to test them.

IX.H.2.h.i.F This condition sets sulfur limit and the testing requirements for the sulfur content of coal used as a fuel in the boilers.

- A. The sulfur content of any fuel burned shall no exceed 0.66 lb of sulfur per million BTU per test.
 - I. Coal increments will be collected using ASTM 2234, Type I conditions A, B, or C and systematic spacing.
 - II. Percent sulfur content and gross calorific value of the coal on a dry basis will be determined for each gross sample using ASTM D methods 2013, 3177, 3173 and 2015.
 - III. KUC shall measure at least 95% of the required increments in any one month that coal is burned in Units 1, 2, 3 or 4.

5.1 Monitoring, Recordkeeping and Reporting

Monitoring for all three emission points is addressed through stack testing. As appropriate, these monitoring requirements are complemented by the general provisions of IX.H.1.e for stack testing, and 1.c for recordkeeping and reporting.

5.2 Discussion of Attainment Demonstration

Generally, the calculation methodology for determination of emissions from the power plant is identical to the method used in during the 1991/1992 timeframe of the original SIP. However, several key differences exist:

1. Units 1-3 will be shut down upon commencement of operation of Unit 5.
2. Condensable emissions, which were excluded from the original SIP, are included in the new maintenance plan

The original SIP was based on filterable PM₁₀ emissions only. The new maintenance plan includes both filterable and condensable PM₁₀ emissions. The hourly PM₁₀ limit listed in IX.H.2.h.i. includes condensable emissions from Units #4 and #5.

6.0 Implementation Schedule

Unit 5 is scheduled to be operational by January 1, 2018

7.0 References

- Kennecott Power Plant, PM_{2.5} SIP Major Point Source RACT Documentation
- UDSHW Contract No. 12601, Work Assignment No. 7, Utah PM_{2.5} SIP RACT Support – TechLaw Inc.
- Power Plant AO DAQE-AN105720025-11
- Power Plant/ Lab/ Tailings Impoundment Title V 3500346002

Evaluation Report – KUC Power Plant

UTAH PM₁₀/Maintenance Plan

Salt Lake County Nonattainment Area

Supporting Information

PM₁₀ Maintenance Plan EVALUATION REPORT

Bonneville Concentrator

1.0 Introduction

The Bonneville (North) Concentrator has been closed down. It ceased operations in 2003 under AO DAQE-AN0572014-03.

2.0 References

- Bonneville Concentrator AO DAQE-AN0572014-03

Evaluation Report – KUC Bonneville Concentrator

UTAH PM₁₀ SIP

Salt Lake County Nonattainment Area

Supporting Information

PM₁₀ SIP EVALUATION REPORT

Laboratory

1.0 Introduction

The actual emissions from the laboratory are less than one ton per year. This is less than the five tons per year exemption under the rule UAC R307-401-9, Small Source Exemption.