

## MEMORANDUM

TO: FILE - Denison Mines (USA) Corp

THROUGH: Jay Morris, Minor Source Compliance Section Manager

FROM: Debbie Olson

DATE: June 30, 2008; updated July 9, 2008; revised September 11, 2008

SUBJECT: Denison Mines Corp, B, NESHAP, NSPS, San Juan County, #037-0017

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TYPE OF INSPECTION: annual - partial initial - partial inspection (vanadium circuit still under construction)

DATE OF INSPECTION: May 22, 2008; final info. rec. July 2, 2008

MULTIPLE INSPECTION SOURCE: no

FFY QUARTER ASSIGNED: 3rd qtr FFY 2008

SOURCE LOCATION: 6425 South Highway 191, Blanding (6 miles south of Blanding)

SOURCE CONTACTS: Tanner Holliday, Environmental Tech  
Ryan Palmer, Lead Environmental Tech  
Wayne Palmer, Safety Tech  
Charles Orvin, Lab Tech  
Mike Spillman, Safety Coordinator  
David Turk, Radiation Safety Officer, 435-678-2221 x113 (primary contact, but out-of-state for this inspection)

OPERATING STATUS: crushing mill operational up to yellow cake precip (uranium precip to sold form)  
Leach tanks, tailings pile and ponds operating  
Drying and packaging n/o; vanadium equipment area still under construction and/or being overhauled.

PROCESS DESCRIPTION:  
The White Mesa Mill uses conventional milling methods including grinding, two-stage acid leaching, solvent extraction, precipitation and thickening, drying and packaging to process uranium and vanadium ores from mines in southeastern Utah and northern Arizona. The mill has a 2,000-tpd ore capacity. The ore is estimated to contain an

average of 0.2%  $U_3O_8$  (2.6 lbs.  $U_3O_8$ /ton) and after processing yields a yellow cake product containing about 90%  $U_3O_8$ . The yellow cake product is transported to uranium enrichment facilities outside of Utah and converted to  $UF_6$  and used as fuel for nuclear reactors to produce electricity. The vanadium circuit operates intermittently depending on ore content and vanadium prices. The products from this circuit are  $V_2O_5$  black flake vanadium and ammonia metavanadate.

Following grinding and leaching, the sand portion of the ore tailings has been pumped to cell 3, which is in the process of being covered and closed. Cell 2 has already been closed. Uranium is stripped from the leachate by solvent extraction. The slimes portion (aq. acid salts known as raffinate, current pH ~1) of the tailings were recycled or pumped to cell 1, or to cells 2 and 3 for dust control. The tailings cells 1-3 are compacted clay-lined ponds constructed below grade. Cells 4a (constructed) and 4b (under construction) have a synthetic liner and were constructed according to 40 CFR 61 Subpart W. The entire tailings facility has up and down gradient monitoring wells, leak detection systems and a particulate monitoring network regulated by the Nuclear Regulatory Commission (NRC).

Since 1990 when production ceased, the slimes content of cell 1 has been pumped and sprayed over cells 2 and 3. When dry, the salts form a stabilizing crust over the sand tailings. On cells 2 and 3, as evaporation has allowed, a 1-4 foot thick soil cover has been advanced. Since 1993, contaminated materials from dismantled mill sites outside of Utah have been deposited in cells 2 and 3. Cell 2 has recently been closed and is now covered by fill material. Cell 3 has been significantly reduced in size as it is also being covered by fill material. Cell 4a is in the process of being rebuilt in preparation for the mill to resume full capacity operations.

APPLICABLE REGS: AO DAQE-AN0112050008-08, March 28, 2008

SOURCE INSPECTION  
EVALUATION:

1. This AO applies to the following company:

Site Office  
Denison Mines (USA) Corp.  
P.O. Box 809  
Blanding, Utah 84511

Corporate Office Location  
Denison Mines (USA) Corp.  
1050 17<sup>th</sup> Street  
Independence Plaza, Suite 950  
Denver, Colorado 80265

Phone Number (435) 678-2221  
Fax Number (435) 678-2224

(303) 628-7798  
(303) 389-4125

The equipment listed in this AO shall be operated at the following location:  
White Mesa Mill, six miles South of Blanding, Utah on Highway 191

Universal Transverse Mercator (UTM) Coordinate System: UTM Datum  
NAD27

4,155.4 km. Northing, 632.2 km. Easting, Zone 12

**Status:** In compliance - The information above is correct.

2. All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and Title 40 of the Code of Federal Regulations (40 CFR). Unless noted otherwise, references cited in these AO conditions refer to those rules.

**Status:** Compliance determination not required.

3. The limits set forth in this AO shall not be exceeded without prior approval in accordance with R307-401.

**Status:** In compliance - None of the limitations appear to have been exceeded at the time of inspection.

4. Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved in accordance with R307-401.

**Status:** Non-compliance - A baghouse associated with the lab operations was not listed as approved equipment. See condition 8.

Denison received a CA dated July 29, 2008. Part of Denison's response, received as email on September 11, 2008, indicated that calculated emissions from the baghouse are 110 lbs/year. Therefore, no penalty was recommended for this over site, however it was recommended that the baghouse be listed in the permit during the next modification.

5. All records referenced in this AO or in applicable NSPS and NESHAP standards, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or Executive Secretary's representative upon request. Records shall be kept for the following minimum periods:

- A. Emission inventories Five years from the due date of each emission statement or until the next inventory is due, whichever is longer
- B. All other records Two years

**Status:** In compliance - Records kept by the company were made available either during the inspection or afterwards.

6. Denison Mines (USA) Corp. shall operate the White Mesa Mill in accordance with the terms and conditions of this AO, which was written pursuant to Notice of Intent (NOI) submitted to the Division of Air Quality (DAQ) on December 24, 2007 and additional information submitted to the DAQ on January 29, 2008.

**Status:** In compliance - The facility appeared to be properly maintained and operated at the time of this inspection.

7. This AO shall replace the AO (DAQE-AN11205005-06) dated July 20, 2006.

**Status:** In compliance - Only this AO was used in the compliance determination.

8. The approved installations shall consist of the following equipment or equivalent\*:

A. Uranium Drying and Pollution Control (Yellow Cake Circuit)

- 1) One (1) Yellowcake South Dryer YC

Dryer Type: Six hearth rotary Skinner dryer  
Fuel Type: Propane  
Heat Input Capacity:  $3 \times 10^6$  Btu/hr

- 2) Air Pollution Equipment for the South Dryer: One (1) Ducon Dry Cyclone followed by one (1) Ducon Scrubber with cyclonic separator

Wet Scrubber Model: UW4, Size 36, Scrubber w/demister  
Design Flow Rate: 3,800 acfm (150 °F)\*\*\*  
Estimated Emission Rate: 0.02 gr/dscf, PM, 0.016 gr/dscf  
PM<sub>10</sub>\*\*\*

- 3) One (1) Yellowcake North Dryer (older)\*\*

Dryer Make: 6 hearth rotary Skinner dryer  
Fuel Type: Propane  
Heat Input Capacity:  $2.4 \times 10^6$  Btu/hr

- 4) Air Pollution Equipment for the North Dryer  
Dry cyclonic separator followed by One (1) Ducon Venturi Scrubber with Ducon packed demister

Design Flow Rate: 3,160 acfm (140 °F)\*\*\*  
Estimated Emissions Rate: 0.02 gr/dscf PM; 0.016 gr/dscf  
PM<sub>10</sub>\*\*\*

5) Packaging Area

Baghouse

Both dryers (South & North) discharge into a common hopper located in the enclosed packing area. Packing area is under negative pressure and all the generated dust discharges through a baghouse.

Designed Flow Rate: 5,000 acfm (68 °F)\*\*\*

Estimated Emission Rate: <0.01 gr/dscf, PM\*\*\*

B. Vanadium Dryer and Pollution Control

1) One (1) Ammonium Meta-Vanadate (AMV) Dryer and Two (2) Fusion Furnaces \*\*

AMV Dryer:

Fuel Type: Propane

Heat Input Capacity: 7,740,000 Btu/hr

2) Two (2) Fusion Furnaces and casting wheels\*\* venting through AMV Dryer\*\*

Dryer Make: Single burner for each furnace

Fuel Type: Propane

Heat input Capacity: up to  $1.8 \times 10^6$  Btu/hr, each

3) Air Pollution Equipment for AMV Dryer and Fusion Furnaces  
Dry Cyclone followed by the Sly No 6 Ducon Venturi Scrubber<sup>2</sup>:

Scrubber Flow: 7,910 acfm, Temp. 370°F\*\*\*

4) Two (2) Multi Hearth Dryer Pollution Control<sup>1</sup> System

Kice Dry Cyclone followed by Ducon Venturi Wet Scrubber<sup>2</sup>

Scrubber Flow: 27,800 acfm, Temp 440 °F\*\*\*

<sup>1</sup>Also serves as a backup for the two fusion furnaces

<sup>2</sup>Venturi Scrubbers Systems B.3) & B.4) shall connect in parallel to a mist eliminator and fan which discharges to the final stack

5) One (1) Rotary Calciner\*\*

Dryer Make: Bartlett/Snow Rotary Multi Burner

Fuel Type: Propane

Heat input Capacity:  $4 \times 10^6$  Btu/hr

6) Calciner Pollution Control

System: Dry Cyclone followed by Sly #6 Ducon Venturi Scrubber (B.3)

7) One Mist Eliminator

C. Leaching Process Control

Leach Mist Eliminator

D. Boilers

1) One (1) Superior Boiler (Pre NSPS-Manufactured in 1987)

Fuel Type: Propane  
Type of Burner: 60 ppm NO<sub>x</sub>  
Heat Input Capacity: up to 23.5 x 10<sup>6</sup> Btu/hr

2) One (1) Cyclotherm Boiler

Fuel Type: Propane  
Heat Input Capacity: up to 5 x 10<sup>6</sup> Btu/hr

3) One (1) Low NO<sub>x</sub> Superior Boiler Works (new)

Model: X6-5-3000-5150-PF-LPG  
Fuel type: Propane  
Heat Input Capacity: up to 25.2 x 10<sup>6</sup> Btu/hr

E. Baghouses

1) One (1) Grizzly Baghouse

Design Rate: 5,000 acfm\*\*\*  
Grain Loading: 0.02 grain per acf\*\*\*

2) One (1) Yellow Cake Dryer Enclosures and Hoppers Baghouse

Emission Rate: 0.02 gr/dscf PM (0.73 lb/hr)\*\*\*  
0.016 gr/dscf PM<sub>10</sub> (0.58 lb/hr)\*\*\*

3) Dry Soda Ash Silo Bin Baghouse (Fuller Dracco dust collector), and Packing Area Vents Baghouse

4) Cartridge filter baghouse with 24 cartridges (new)

Design rate: 12,500 acfm\*\*\*  
Grain Loading: 0.0014 grain per scf\*\*\*

F. One (1) Leaching and Vanadium Demister Scrubber

Process Rate: 250 tons/year  
Design Rate: 0.07 lb/hr of SO<sub>2</sub>\*\*\*

G. One (1) Fire Pump

Fuel Type: #2 Diesel  
Rated at: up to 365 bhp

H. One (1) Emergency Generator

Fuel Type: #2 Diesel  
Electrical Output: up to 565 kW

\* Equivalency shall be determined by the Executive Secretary.

\*\* This equipment does not have direct emission point; it vents through control equipment.

\*\*\* This information is provided only for the identification of the equipment.

**Status:**

Compliance pending - the heat input capacity and design flow rate of the equipment listed was not verified during this inspection. Much of the equipment is original, and was utilized when the facility was previous operated. The vanadium circuit (8B4-6) was still under "construction"; equipment was being moved and installed (or overhauled) with the intent to operate in 1-2 months. Therefore, the equipment listed under 8B was not observed in any depth. Company contacts were not aware of where the rotary calciner and control equipment (8B5 and 6) were located. The leaching process (8D) with tanks was operating. The rating of the new low NOx Superior (Seminal) boiler (steam capacity 20,700 lb/hr) could not be found on the plate; Mr. Turk indicated after the inspection that the rating was 20,000,000 Btu. The cartridge filter baghouse (8E4) was still under construction. The emergency generator (8H) was in need of new parts to operate. Also on site were lab fume hoods and a baghouse in the lab bucking area that is infrequently used (only when testing samples). It was recommended that Denison submit information to the DAQ requesting the baghouse be added to the AO.

Denison received a CA dated July 29, 2008. Part of Denison's response, received as email on September 11, 2008, indicated that calculated emissions from the baghouse are 110 lbs/year. Therefore, no penalty was recommended for this over site, however it was recommended that the baghouse be listed in the permit during the next modification.

9. Denison Mines (USA) Corp. shall notify the Executive Secretary in writing when the installation of the equipment listed in Condition #8 D.3 and E.4 has been completed and is operational. To insure proper credit when notifying the Executive Secretary, send your correspondence to the Executive Secretary, attn: Compliance Section.

If the installations have not been completed within eighteen months from the date of this AO, the Executive Secretary shall be notified in writing on the status of the construction and/or installation. At that time, the Executive Secretary shall require documentation of the continuous construction and/or installation of the operation and may revoke the AO in accordance with R307-401-18.

**Status:**

Not applicable at this time - the new boiler is still under startup conditions and the cartridge filter will not begin operations until mid-July. The company was reminded of the need for notification after the boiler begins full operations. Steve Landau (Colorado office) has contacted DAQ several

times to ensure the notification (also required by NSPS regulations) is complete.

10. Emissions to the atmosphere at all times from the indicated emission point(s) shall not exceed the following rates and concentrations:

Source: Vanadium Circuit Scrubbers

<u>Pollutant</u>	<u>lb/hr</u>	<u>grains/dscf</u> (68°F, 29.92 in Hg)
PM <sub>10</sub> .....	2.5.....	0.02

Source: Yellow Cake Dryers Scrubbers

<u>Pollutant</u>	<u>lb/hr</u>	<u>grains/dscf</u> (68°F, 29.92 in Hg)
PM <sub>10</sub>	0.4, each	0.003, each

**Status:**

Not applicable at this time for the vanadium circuit scrubbers - the equipment is still being overhauled after being down for 10+ years. Expected startup 1-2 months. The yellow cake dryer scrubbers were tested in 2/08; however the test report has not yet been submitted or reviewed, therefore a compliance determination will not be made at this time. Previous test 6/27/96 (prior to shutdown). Results = North yellowcake scrubber 0.12 lb/hr (based on test results provided after this inspection).

11. Stack testing to show compliance with the emission limitations stated in the above condition shall be performed as specified below:

A.

<u>Emissions Point</u>	<u>Pollutant</u>	<u>Testing Status</u>	<u>Test Frequency</u>
(Vanadium Circuit Scrubber)	PM <sub>10</sub> .....	*	@
(Yellow Cake Dryers)	PM <sub>10</sub> .....	*	@

B. Testing Status

Initial compliance testing is required. The initial test date shall be performed as soon as possible and in no case later than 180 days after the start up of the emission source.

\* The initial testing has already been performed.

@ Test every five years. The Executive Secretary may require testing at any time.

C. Notification

The Executive Secretary shall be notified at least 30 days prior to conducting any required emission testing. A source test protocol



shall be submitted to DAQ when the testing notification is submitted to the Executive Secretary.

The source test protocol shall be approved by the Executive Secretary prior to performing the tests. The source test protocol shall outline the proposed test methodologies, stack to be tested procedures to be used. A pretest conference shall be held, if directed by the Executive Secretary.

D. Sample Location

The emission point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or other methods as approved by the Executive Secretary. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location.

E. Volumetric Flow Rate

40 CFR 60, Appendix A, Method 2 or other testing methods approved by the Executive Secretary.

F. PM<sub>10</sub>

For stacks in which no liquid drops are present, the following methods shall be used: 40 CFR 51, Appendix M, Methods 201, 201a, or other testing methods approved by the Executive Secretary. The back half condensibles shall also be tested using the method specified by the Executive Secretary. All particulate captured shall be considered PM<sub>10</sub>.

For stacks in which liquid drops are present, methods to eliminate the liquid drops should be explored. If no reasonable method to eliminate the drops exists, then the following methods shall be used: 40 CFR 60, Appendix A, Method 5, 5a, 5d, or 5e as appropriate, or other testing methods approved by the Executive Secretary. The back half condensibles shall also be tested using the method specified by the Executive Secretary. The portion of the front half of the catch considered PM<sub>10</sub> shall be based on information in Appendix B of the fifth edition of the EPA document, AP-42, or other data acceptable to the Executive Secretary.

The back half condensibles shall not be used for compliance demonstration but shall be used for inventory purposes.

G. Existing Source Operation

The production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three (3) years.

**Status:** Compliance determination pending review of test report. Mr. Turk stated that the company does quarterly sampling for other NRC requirements. Testing was conducted in 2/08 by Tetco (based on a pretest protocol). Mr. Turk stated that he would contact Tetco to ensure that DAQ receives a copy of the test.

12. Visible emissions from the following emission points shall not exceed the following values:

- A. Ore Loading Ares - 15% opacity
- B. Vanadium Circuit - 15% opacity
- C. All Baghouses - 10% opacity
- D. All diesel engines - 20% opacity
- E. Conveyor drop points - 20% opacity
- F. Propane fired, low NO<sub>x</sub> boiler - 10%
- G. All other points - 20% opacity

Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9.

**Status:** In compliance - no visible or fugitive emissions were observed from the facility that exceeded the above limitations.

13. The following production and/or consumption limits shall not be exceeded:

- A. 720,720 tons of ore processing per rolling 12-month period
- B. Total 2,960,880 gallons of propane per rolling 12-month for the entire source except the Superior Boiler Works below
- C. Total 2,439,249 gallons of propane per rolling 12-month period for Superior Boiler Works model X6-5-3000-5150-PF-LPG

To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Records of consumption/production shall be kept for all periods when the plant is in operation. Ore production shall be determined from plant records. The records of production shall be kept on a daily basis. The source shall maintain separate records of propane consumption for the Superior Boiler Works boiler model number X6-5-3000-5150-PF-LPG. Propane consumption shall be determined from purchase order receipts. Records of purchase orders shall be maintained by the supervisor in a log.

**Status:** In compliance - For June 1, 2007 - May 31, 2008:

- A. 21,567.12 tons
- B. 537,515 gallons for the process and boiler
- C. not fully operational

14. Emergency generators shall be used for electricity producing operation only during the periods when electric power from the public utilities is interrupted, or for regular maintenance of the generators. Records documenting generator usage shall be kept in a log and they shall show the date the generator was used, the duration in hours of the generator usage, and the reason for each generator usage.

**Status:** Non-compliance - records of generator usage were written on the equipment for previous years, however no records were available since the facility has re-opened.

Denison received a CA dated July 29, 2008. In Denison's original response, dated August 11, 2008, they stated that the emergency generator has not operated since 1996. Therefore, no penalty was recommended.

15. Denison Mines (USA) Corp. shall abide by all applicable requirements of R307-205 for Fugitive Emission and Fugitive Dust sources. To be in compliance, the source must operate in accordance with the most current version of R307-205.

**Status:** In compliance - Minimal fugitive dust was observed along the gravel roads, loading areas and surrounding the tailings pile and ponds. The opacity limitation in condition 16 was met.

16. Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity. Visible emissions determinations for traffic sources shall use procedures similar to Method 9. The normal requirement for observations to be made at 15-second intervals over a six-minute period, however, shall not apply. Six points, distributed along the length of the haul road or in the operational area, shall be chosen by the Executive Secretary or the Executive Secretary's representative. An opacity reading shall be made at each point when a vehicle passes the selected points. Opacity readings shall be made  $\frac{1}{2}$  vehicle length or greater behind the vehicle and at approximately  $\frac{1}{2}$  the height of the vehicle or greater. The accumulated six readings shall be averaged for the compliance value.

**Status:** In compliance - Haul trucks were observed dumping ore in the storage pile area; minimal fugitive dust was observed. Mobile equipment use observed also resulted in minimal dust.

17. All unpaved roads and other unpaved operational areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition. The

opacity shall not exceed 20% during all times the areas are in use or unless it is below freezing. If chemical treatment is to be used, the plan must be approved by the Executive Secretary.

**Status:** In compliance - unpaved roads and operational areas are watered as needed to control dust. The water truck operated during this inspection and fugitive dust was maintained < 20% opacity.

18. Any section of paved road under the owner/operator's jurisdiction shall be periodically swept or sprayed clean as dry conditions warrant or as determined necessary by the Executive Secretary. Records of cleaning paved road shall be made available to the Executive Secretary or the Executive Secretary's representative.

All records shall include the following items:

- A. Date
- B. Number of treatments made
- C. Rainfall received, if any, and approximate amount
- D. Time of day treatments were made

**Status:** In compliance - Trucks go through a decontamination unit process and drive over gravel prior to leaving the facility. The company has the ability to clean the paved road to the intersection but it has not been needed. The road was clean at the time of inspection. Even though the requirement above specifies watering records for paved areas, records of watering unpaved roads and operational areas are maintained and included the date, time, number of loads and weather conditions.

19. Unpaved haul/access roads shall have at least one inch of gravel as road-base surface or will be watered and/or chemically treated as needed to meet the 20% opacity requirement.

**Status:** In compliance - the unpaved road had > 1" gravel and was being water during the inspection. No fugitive dust was observed from any of the graveled areas. No chemical treatment is used.

20. The storage piles shall be watered to minimize generation of fugitive dusts as dry conditions warrant or as determined necessary by the Executive Secretary.

**Status:** In compliance - Storage piles are watered as needed; records are included with the unpaved area watering records.

21. Fugitive dust from the disturbed areas shall be controlled through the use of watering as dry conditions warrant or as determined necessary by the Executive Secretary. The speed of compactors shall not exceed three (3)

miles per hours (mph) at any time.

**Status:** In compliance - fugitive dust observed on the facilities grounds was minimal. A water truck operated and records provided after the inspection indicate actions are taken to control fugitive dust. There are no compactors on site.

22. For front-end loading operations and truck dumping operations, the drop distances shall be kept as small as practicable. The speed of the scrapers shall not exceed three (3) mph while loading and twelve (12) mph while dumping. The moisture content of the materials shall be no less than four percent by weight during these operations. The moisture content shall be tested if directed by the Executive Secretary using a test method approved by the Executive Secretary.

**Status:** Non-compliance - several trucks were observed dumping ore along the various storage piles. Minimal dust was created by this activity. Also, a front-end loader was observed dumping this ore on the storage piles. This activity resulted in opacity below the 20% limitation. Dropping distances are minimized and slow. No scraping was observed. However, documented moisture content determined by the on-site lab from samples taken ranged 2.3 - 8.8%. Data was provided after the inspection. Samples are taken from every third truckload (~2400 samples from 7200 truck loads, each ~25 tons). Testing has not been required.

Denison received a CA dated July 29, 2008. In Denison's original response, dated August 11, 2008, they state that it is not a violation when read in the context of the entire AO and within what they believe was the regulatory intent of the specific language used in the condition. However, compliance is determined on the content of the condition, not the intent of the AO. The violation stands.

23. The ore grizzly shall be enclosed on three sides and have wetting agents applied at the apron feeder and the conveyor discharge as needed. Additionally the baghouse dust collection system shall be utilized at the grizzly and apron feeder tunnel.

**Status:** In compliance - the grizzly is under a three-sided enclosure. Emissions appear to vent to a bag house. The grizzly and baghouse were not in operation at time of inspection.

24. The tailings retention areas shall be sprayed with water or a crusting agent when dry conditions exist or as determined necessary by the Executive Secretary.

**Status:** In compliance - water is applied for all areas to control fugitive dust as needed. A crusting agent is not used.

25. The mill area shall be graveled and shall be sprayed with water to minimize fugitive dust as dry conditions warrant or as determined necessary by the Executive Secretary.

**Status:** In compliance - the area is graveled and no dust was observed.

26. The soil and overburden stockpiles shall be sprayed between stockpiling and vegetation periods as required (records of spraying shall be maintained).

**Status:** In compliance - no dust was observed in these areas. Water is applied to all areas to control fugitive dust as needed. Records are included in the main watering records for the unpaved haul roads and operational areas.

27. The owner/operator shall use only propane as a fuel in the two yellow cake dryers, vanadium multi hearth dryer, rotary calciner, AMV dryer, fusion furnaces and boilers. Number 2 or better diesel fuel shall be used in the mobile equipment, emergency generator and fire pump engine.

**Status:** In compliance - only propane and #2 diesel is used in the equipment listed.

28. The sulfur content of any fuel oil or diesel burned shall not exceed:

0.05 percent by weight for diesel fuels consumed in all other equipment

The sulfur content shall be determined by ASTM Method D-4294-89 or approved equivalent. Certification of used oil shall be either by Denison Mines (USA) Corporation's own testing or test reports from the used oil fuel marketer

**Status:** In compliance - the lab technician indicated that the sulfur content was <0.05% by weight. Supplier = Farley's from Cortez, Colorado. Testing has not been required to date. Used oil is not permitted for this source.

29. In addition to the requirements of this AO, the owner/operator shall comply with 40 CFR 61, Subpart W, National Emission Standards for Radon Emissions from Operating Mill Tailings. To be in compliance, this source must operate in accordance with the most current version of 40 CFR 61 applicable to this source.

**Status:** In compliance - Subpart W:  
61.252(b) Standard - no new tailings impoundment has been constructed.

61.253 Determining compliance - Compliance is determined using Method 115. Cells 1 and 4 are used for "liquor" storage; cells 2 and 3 are used for tailings/liquor deposition. Cell 2 = 13.5 pCi/m<sup>2</sup>; cell 3 = 8.9 pCi/m<sup>2</sup> for

calendar year 2007. Therefore, the standard of 20 pCi was met (61.252(a)).

61.254(a) Annual reporting requirements - the results of sampling, calculations, and input parameters used in making the calculation were submitted on March 28, 2008, prior to the due date of March 31st. The report was accepted by DAQ upon review.

61.254(b) - the facility was found in compliance with the requirements for 2007.

61.255 Recordkeeping requirements - records are maintained as required, although they were not requested for review.

30. In addition to the requirements of this AO, all applicable provisions of 40 CFR 60, NSPS Subpart A, 40 CFR 60.1 to 60.18 and Subpart Dc, 40 CFR 60.40c to 60.48c (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) apply to Superior Boiler Works boiler rated at 25.2 million Btu per hour. To be in compliance, this source must operate in accordance with the most current version of 40 CFR 60 applicable to this emission source.

**Status:**

In compliance - Subpart Dc:

60.40c - the boiler is 20,000,000 Btu and operates on propane.

60.48c(a) - requires notification of the date of construction and actual startup. The boiler was not yet under full operation at the time of this inspection.

60.48c(g) requires the company to record and maintain records of the amount of fuel combusted daily. 60.48(c)(g)(2) permits the records to be maintained monthly - the company was maintaining propane usage monthly (gallons).

31. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Executive Secretary which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded.

**Status:**

In compliance - the facility appeared to be properly operated and maintained at the time of this inspection. Maintenance records are kept by

the maintenance department but were not requested for review. All opacity limitations were met. A water truck operated to control fugitive dust.

32. The owner/operator shall comply with R307-150 Series. Inventories, Testing and Monitoring.

**Status:** In compliance - inventories are submitted as required.

33. The owner/operator shall comply with R307-107. General Requirements: Unavoidable Breakdowns.

**Status:** In compliance - no unavoidable breakdowns have occurred during the previous 12-month period in excess of 2 hours. Just prior to the inspection a sulfuric acid leak was found from an elbow connection on a tank in a containment area. The leak was quickly repaired. Notification was not required.

**TITLE V SOURCE:** Not at this time.

**EMISSION CAP AND EVALUATION:** See Condition 10 for the emissions cap.

**EMISSION INVENTORY:** 2005 Emission Inventory, in tpy: CO: 3.69 NOx: 2.17  
PM10: 0.18 SO2: 0.2 VOC: 0.31

**SOURCE INSPECTION  
SUMMARY EVALUATION:**

The facility appeared to be properly operated and maintained at the time of this inspection. All production, consumption and opacity limitations were met. The equipment for the vanadium circuit was still being installed and/or overhauled, and therefore not operating. The crushing mill was operational up to the yellow cake precip (uranium precip to solid form); the leach tanks, tailings pile and ponds were operating. The drying and packaging areas were not operating at the time of inspection. A water truck was operating to control fugitive dust.

The following observations were made during the inspection:

- Condition 4 requires all modifications to the equipment or processes be reviewed and approved. A baghouse associated with the lab operations was not listed as approved equipment - see condition 8 below.
- Condition 8 of the AO lists approved equipment. An unapproved baghouse in the lab bucking area (infrequently used) was observed. It was recommended that Denison Mines submit information to DAQ on the baghouse.
- Condition 10 requires stack testing for the yellow cake dryer scrubbers. A pretest protocol was submitted on 1/22/08 for testing in 2/08.



Denison Mines was informed that the test report needed to be submitted to DAQ. On July 2, 2008, test results for the 6/06 tests were submitted by Tetco. Clarification needs to be made since the test only needs to be conducted every 5 years. Denison is required to test more frequently on NRC rules.

- Condition 14 requires records of emergency generator usage for interrupted power and maintenance reasons. Records of generator usage were written on the equipment for previous years, however no recent records were available.
- Condition 22 requires the moisture content of material to be  $\geq 4\%$  by weight during loading and unloading operations. Documented moisture content determined by the on-site lab from samples taken ranged 2.3 - 8.8%.

Also on site were a landfill and a series of empty 55 gallons drums, some of which were left by the previous landowner.

**Update:**

Denison received a CA dated July 29, 2008. Part of Denison's response, received as email on September 11, 2008, indicated that calculated emissions from the baghouse are 110 lbs/year. Therefore, no penalty was recommended for this over site, however it was recommended that the baghouse be listed in the permit during the next modification.

In Denison's original response, dated August 11, 2008, they stated that the emergency generator has not operated since 1996. Therefore, no penalty was recommended for this violation.

In Denison's original response they state that they were not in violation of condition 22 when read in the context of the entire AO and within what they believe was the regulatory intent of the specific language used in the condition. However, compliance is determined on the content of the condition, not the intent of the AO. The violation stands.

Information on the sulfur content of the diesel burned was provided, and found in compliance.

Recommended penalty: \$869.00, discounted to \$695.20.

**Previous Enforcement Actions:** none last 5 years

**Compliance Assistance:** Reminded source to submit notification of startup for new equipment according to 60.48c (a) and condition 9.

**CURRENT**

**RECOMMENDATIONS:** Source should receive a CA for:

1. installation/operation unapproved baghouse (condition 4 and 8)
2. not maintaining current records of emergency generator usage (condition 14)
3. not maintaining moisture of material during loading/unloading operations at 4% or greater (condition 22)

Denison should be reminded to submit the results for the 2/08 stack test on the yellow cake scrubber (condition 10) and to keep the propane usage for the new boiler separate from other sources (condition 13).

HIGH PRIORITY VIOLATOR: not applicable at this time

RECOMMENDATION FOR  
NEXT INSPECTION:

Bring respirator - it may be needed in certain areas of the facility. Complete initial inspection on Superior boiler and cartridge filter if both are operating.

ATTACHMENTS

VEO, email with production data and water logs, ITM

INSPECTORS SIGNATURE:

*D. Olson*

**STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY** Page 1 of 1  
**DIVISION OF AIR QUALITY**  
**VISIBLE EMISSION OBSERVATION FORM**

Type of Inspection: Initial  Partial Initial ( ) Stack Test ( ) CEM ( ) Annual  Followup ( ) Surveillance ( ) Complaint ( )

Source Name: Denison Mines  
 Street Address: \_\_\_\_\_  
 City/County: Blanding - San Juan  
 Phone: 435-678-2221  
 AIRS ID: \_\_\_\_\_

Observation Date: 5/22/08  
 Start Time: 9:00 Stop Time: \_\_\_\_\_

Facility: process uranium + vanadium ores  
 Equipment: all  
 Control Equipment: \_\_\_\_\_

min	sec				
	0	15	30	45	
1	0	→			
2					
3	↓				
4					
5			↘		
6				0	
7					
8					
9					
10					
11					
12					

Emission Point: \_\_\_\_\_

Height of Discharge Relative in Observer: \_\_\_\_\_

Distance from Observer: \_\_\_\_\_

Condensed Water Vapor Present? Y / N \_\_\_\_\_

Attached  Detached

Length of Condensed Water Vapor Plume: \_\_\_\_\_

Background: \_\_\_\_\_

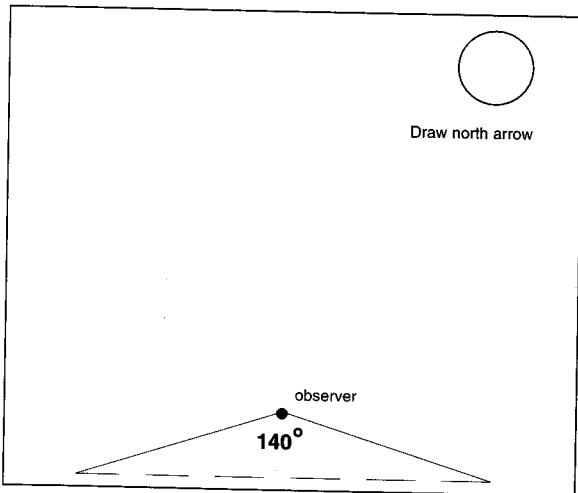
Sky Conditions: Clear  Partly Cloudy  Overcast

Wind Direction: \_\_\_\_\_ Wind Speed: \_\_\_\_\_ mph

Ambient Temp: \_\_\_\_\_ ° F RH: \_\_\_\_\_ %

Average Opacity for Highest Six-Minute Period: 0%

Comments: AO 3/28/08 E-AN011205 0008-08



- 12 A ore loading 15%
- B vanadium circuit 15%
- C all bh 10%
- D diesel engines 20%
- E conveyor drop pts 20%
- F propane fired boilers 10% low 19%
- G all other points 20%

- 11c fugitive dust 20%
- haul road traffic
- mobile equipment

- 17. Unpaved roads or op. areas 20%

Sun ⊕

Wind ►

Emission Point with Plume ○

Observation Point X

Observer's Signature: Debbie Olson

Affiliation: State of Utah, Department of Environmental Quality  
 Division of Air Quality

I Have Received a Copy of These Observations: \_\_\_\_\_

SIGNATURE: Wayne Palmer

Printed Name: Wayne Palmer

Title: Safety Tech

Distribution: white-file; canary-EPA; pink-inspector; gold-owner/operator visible emissions

Crushing <sup>operating</sup> - mill operational up to yellow cake - final precip (uranium precip to solid form) no drying, no packaging

Leach tanks operating tailing piles & ponds operational van. process under const. no dust observed - no visible emissions