



State of Utah
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY

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Reply to: State of Utah
Division of Air Quality
Department of Environmental Quality
Salt Lake City, Utah 84114-4820

DAQE-416-92

April 28, 1992

James R. Van Orman
Director of Environmental Management
Department of the Air Force
Hill A.F.B., Utah 84056-5990

Re: Approval Order for Industrial Wastewater Treatment Plant Sludge Dryers,
Building 577
Davis County CDS A1 NA

Dear Mr. Van Orman:

The above-referenced project has been evaluated and found to be consistent with the requirements of the Utah Air Conservation Rules (UACR) and the Utah Air Conservation Act. A 30-day public comment period was held and all comments received were evaluated. The conditions of this Approval Order (AO) reflect any changes to the proposed conditions which resulted from the evaluation of the comments received. This air quality AO authorizes the project with the following conditions and failure to comply with any of the conditions may constitute a violation of this order:

1. Hill Air Force Base, shall install and operate the Industrial Wastewater Treatment Plant Sludge Dryers in Building 577 according to the information submitted in the Notice of Intent dated September 4, 1991.

A copy of this AO shall be posted on site and shall be available to the employees who operate the air emission producing equipment. All employees who operate the air emission producing equipment shall receive instruction as to their responsibilities in operating the equipment in compliance with all of the relevant conditions.

4.2.4-713

2. The approved installations shall consist of the following equipment:

A. Two JWI Metal Hydroxide Sludge Volume Reducers

Model: J360G
Heat source: Natural gas
Burner rating: 400,000 BTU/hr
Gas consumption: 400 CFH

B. Two JWI single speed wet venturi scrubbers

Scrubber water usage: 3 GPM
Dry gas: 79.93 SCFM
Humidity: 51%
Saturation Temp: 184°F
Discharge Volume: 293 ACFM

3. Emissions to the atmosphere of NO_x from the sludge dryer exhaust stacks shall not exceed the following rates and concentrations:

- A. 200 ppmdv (7% oxygen, dry)
- B. 0.47 lb/hr (per stack)

4. Stack testing to show compliance with the emission limitations in condition #3 shall be performed as specified below:

<u>Emission Point</u>	<u>Pollutant</u>	<u>Testing Status</u>	<u>Retest</u>
Dryer exhaust stacks	NO _x	§	***

Testing Status (To be applied above)

§ The stacks shall be tested for NO_x emissions compliance within 30 days of start-up using a portable testing instrument approved by the Executive Secretary

*** The dryer stacks shall be retested every 30 dryer operating days ± 10 days. The maximum time between tests shall be 35 dryer operating days.

5. Test Procedure

Dryer stack emissions testing shall be performed by the following procedure or an approved equivalent. Equivalency shall be determined by the Executive Secretary and approved prior to tests being conducted.

A. - Sample Port

A sampling port shall be installed in each dryer exhaust stack in accordance with 40 CFR 60, Appendix B, Performance Specification #2 or as approved by the Executive Secretary. The sample ports shall be safely accessible to the tester, operator, or inspector in accordance with OSHA standards.

B. - Operating Rate

The steam production or operating rate during testing shall be performed under three operating rates; 90%, 70% and 50% (all $\pm 10\%$) of the dryers' rated capacities.

C. - Test Instrument

The test procedure shall be conducted using a portable testing instrument approved by the Executive Secretary. The testing instrument shall be calibrated on site with a suitable NBS referenced or traceable calibration gas in accordance with the instruction of the test instrument.

D. - Test Procedure

The test shall be conducted in the following manner:

- (1) The dryers shall be:
 - a) operated at the designated production rate in Condition #5B
 - b) allowed to stabilize for a minimum of 5 minutes.
- (2) The gas sample shall be drawn according to the instructions of the test instrument being used.
- (3) The sample value shall be determined from the test instrument, appropriate calculations made, and the data recorded.

E. - Failed Dryer Status

- (1) If a dryer is unable to attain the emission limitation in Condition #3, at any one of the operating rates specified in condition #5B, the dryer shall be taken out of service until the unit has been repaired or maintenance performed and a successful retest completed.

- (2) Maintenance and repairs of any dryer that fails the periodical test shall be performed within 15 days, or the dryer shall be idled.
 - a) If a dryer that has failed a test is repaired and a successful retest completed according to the limitations of Condition #3 within 15 days, the dryer shall be determined to not have been in violation.
 - b) A dryer that fails the retest after repair shall be idled until further repairs are made and a successful retest completed. If the dryer demand requires the dryer to be operated, it shall be base loaded at the rate that will result in the lowest emissions rate possible until the dryer can be repaired and shown in compliance by the above test.
 - c) Operation of a dryer that has failed the above "retest after repair" may be determined to be a violation of this AO.

F. - Reports

A copy of all test reports containing the test results, any calculations required, and the test instrument calibration data shall be retained by the owner/operator for two years. The reports shall be made available to the Executive Secretary or his agent upon request. An annual summary report of all the test results with a copy of the periodical reports shall be submitted to the Executive Secretary no later than January 31 of each year for the previous calendar year.

6. Visible emissions from any point or fugitive emission source associated with the installation or control facilities in this NOI shall not exceed 10% opacity. Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9.
7. The owner/operator shall use only natural gas as a primary fuel in the two sludge dryers located in Building 577. If any other fuel is to be used, an AO shall be required in accordance with R307-1-3.1, UAC.
8. All records referenced in this AO or in an applicable NSPS or NESHAPS, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or his representative upon request.

Mr. Van Orman
April 28, 1992
Page 5

9. All installations and facilities authorized by this AO shall be adequately and properly maintained. The owner/operator shall comply with R307-1-3.5 and 4.7, UAC. R307-1-3.5, UAC addresses emission inventory reporting requirements. R307-1-4.7, UAC addresses unavoidable breakdown reporting requirements. The owner/operator shall calculate/estimate the excess emissions whenever a breakdown occurs. The sum total of excess emissions shall be reported to the Executive Secretary for each calendar year no later than January 31 of the following year.
10. The Executive Secretary shall be notified in writing upon start-up of the installation, as an initial compliance inspection is required. Eighteen months from the date of this AO the Executive Secretary shall be notified in writing of the status of installation if installation is not completed. At that time the Executive Secretary shall require documentation of the continuous installation of the operation and may revoke the AO in accordance with R307-1-3.1.5, UAC.

Any future modifications to the equipment approved by this order must also be approved in accordance with R307-1-3.1.1, UAC.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including the Utah Air Conservation Rules.

Annual emissions for this source (the wastewater treatment plant sludge dryers in building 577) are currently calculated at the following values:

- A. 1.026 tons/yr for Particulate
- B. 0.453 tons/yr for PM₁₀
- C. 0.002 tons/yr for SO₂
- D. 2.050 tons/yr for NO_x
- E. 1.328 tons/yr for VOC
- F. 0.149 tons/yr for CO

These calculations are for the purposes of determining the applicability of PSD and nonattainment area major source requirements of the UACR.

Sincerely,



F. Burnell Cordner, Executive Secretary
Utah Air Quality Board

FBC:HGN:cl

cc: EPA Region VIII, Mike Owens
Davis County Health Department

4.2.4-717

UTAH DIVISION OF AIR QUALITY
NEW/MODIFIED SOURCE PLAN REVIEW

James R. Van Orman
Director of Environmental Management
Department of the Air Force
Hill A.F.B., Utah 84056-5990

RE: Industrial Wastewater Treatment Plant Sludge
Dryers, Building 577
Davis County CDS A1 NA

ENGINEER: Herman G. Nellestein

DATE: February 12, 1992

NOTICE OF INTENT DATED: September 4, 1991

PLANT CONTACT: Jay Gupta

PHONE NUMBER: (801) 777-6917

PLANT LOCATION: Building 577, Hill Air Force Base, Utah

FEES:

Filing Fee	\$ 1500.00
Review Engineer - XX hours at \$50.00/hour	\$ 0.00
Modeler - 00 hours at \$50.00/hour	\$ 000.00
Computer Usage Fee	\$ 000.00
Notice to Paper	\$ 00.00
Travel - 00 miles at \$0.23/mile	\$ 000.00
Total	\$ 1500.00

APPROVALS:

Engineering Unit Manager

JP 2-12-92

Applicant Contact Made

JP

I. NSPS - NO
TOXICS - NO
NONATT MAJOR - NO

PSD - NO
TITLE V - NO

NESHAPS - NO
TOXIC MAJOR - NO

DESCRIPTION OF PROPOSAL

Hill AFB has submitted a Notice of Intent dated September 4, 1991 to replace two electric batch sludge dryers in Building 577. These dryers were not permitted. The replacement dryers are continuous natural gas fired sludge dryers. The purpose of the sludge dryers is to process the wastewater produced throughout the base, remove the water, and compact the sludge.

Sludge from the Industrial Wastewater Treatment Plant Clarifier is pumped to sludge holding tanks in sludge drying Building 577. Raw sludge is treated with lime and pumped to a filter press for dewatering to 70 percent solids. Dewatered sludge is then fed to a sludge dryer feed hopper via a dump trolley. Sludge is dried to 5 - 10% moisture in two JWI Model J360G continuous moving belt gas fired sludge dryers at a temperature of about 550°F.

Dried granular sludge is emptied into a dumpster via a screw conveyor for disposal. The dried sludge is disposed by an outside vendor at a proper disposal site. Off gas from the dryers is treated in venturi scrubbers before being exhausted to the atmosphere. The scrubbers are 95 - 98% effective in removing emissions. Manufacturers' bulletins on dryers are contained in the NOI.

II. EMISSION SUMMARY

The emissions from this source (sludge dryers) will be as follows:

Total Emissions

Particulate	1.026 ton/yr
PM ₁₀	0.453
SO ₂	0.002
NO _x	2.050
CO	0.149
VOC non meth	1.328
VOC meth	0.001
Metals	0.131

III. BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

HAFB has chosen to use natural gas to supply heat in the dryers. The dryers are to be equipped with high efficiency venturi impactor scrubbers and cyclonic separators. Removal efficiency of 95 - 98% is achieved with 6 - 8 inches water column pressure drop across the scrubber.

Specifications of the scrubbers are as follows:

Dry gas:	79.93 SCFM
Humidity:	51%

Saturation Temp.: 184°F
Discharge Volume: 293 ACFM

Two stacks each eight inches in diameter will exhaust approximately 300 acfm. The point of discharge is approximately 30 feet above grade. There are no sampling points provided. Normally, dryers are operated during the day shift. However, in the event of sludge back-up, they may be operated in other shifts. All emission calculations were based on 24 hour-per-day operations.

No other systems were investigated. The selected system, operating on natural gas and the use of venturi scrubbers is considered BACT by HAFB. The Engineering Section recommends the following limits as BACT:

- A. 10% opacity
- B. NO_x - 200 ppm (7% oxygen dry)

IV. APPLICABILITY OF FEDERAL AND UTAH AIR CONSERVATION RULES (UACR)

This Notice of Intent is for a minor modification of a major source. It is not a new major source or a major modification. The following federal regulations and state rules have been examined to determine their applicability to this Notice of Intent:

1. R-446-1-3.1 - Notice of Intent required for a modified source. This rule applies.
2. R-446-1-3.1.7 (a) - Notice of Intent not required for fuel burning equipment with a rated capacity of less than 5 x 10⁶ BTU per hour using no other fuel than natural gas. This rule does not apply to sludge dryers even if fired by natural gas.
3. R-446-1-3.1.8(A) - Application of best available control technology (BACT) required at all emission points. This rule applies.
4. R-446-1-3.1.8(D) - Enforceable offset of 1.2:1 required for new sources or modifications which would produce an emission increase greater than or equal to 50.00 tons per year of any combination of PM₁₀, SO₂, and NO_x. This is required in Salt Lake, Davis, and Utah Counties and in any area that impacts these three counties as defined in the rule. The effective date is November 15, 1990. This rule will not apply to this NOI.
5. R-446-1-3.1.8(D) - Enforceable offset of 1:1 required for new sources or modifications which would produce an emission increase greater than or equal to 25.00 tons per year of any combination of PM₁₀, SO₂, and NO_x. This is required in Salt Lake, Davis, and Utah Counties and in any area that impacts these three counties as defined in the rule. The effective date is November 15, 1990. This rule will not apply to this NOI.

- 6. R-446-1-3.1.9 - Rules for relocation of temporary sources. This source is a permanent source. Therefore, this rule does not apply.
- 7. R-446-1-3.1.12 - Requirement for installation of low-NO_x burners on all existing sources whenever existing fuel combustion burners are replaced, unless the replacement is not physically practical or cost effective. The effective date is November 15, 1990. This rule applies. However, installation may not be cost effective.
- 8. R-446-1-3.2.1 - Particulate emission limitations for existing sources which are located in a nonattainment area. This rule has been superseded by the PM₁₀ SIP, except for Weber County. The effective date is August 14, 1991. The sources listed in Weber County are as follows:
 - A. Farmers Grain Coop
 - B. Fife Rock Products
 - C. Interpace Corporation
 - D. Parsons Asphalt Plant
 - E. Pillsbury Company
 - F. Teledyne Incinerator
 - G. Gibbons and Reed Asphalt

HAFB is not listed in the SIP. This rule does not apply.

- 9. R-446-1-3.3.2 - Review requirements for new major sources or major modifications which are located in a nonattainment area or which impact a nonattainment area. This Notice of Intent does not represent a new major source or a major modification. Therefore, this rule will not apply.
- 10. R-446-1-3.5 - Emission inventory reporting requirements. This rule requires any source which emits 25 tons or more per year of any pollutant to submit an emission inventory to the Division of Air Quality at least every third year or as determined necessary by the Executive Secretary. This source does not emit 25 tons per year of any pollutant. Therefore, HAFB must comply with this rule.
- 11. R-446-1-3.6.3 - PSD Increment Consumption - This rule lists the allowable PSD increment consumption. Under the PSD rules, the entire state has been triggered for TSP, SO₂, and NO_x. The allowable increments are as follows:

TSP

- A. Class I areas
 - 1) 5 µg/m³ (annual)
 - 2) 10 µg/m³ (24 hour)

B. Class II areas

- 1) 19 $\mu\text{g}/\text{m}^3$ (annual)
- 2) 37 $\mu\text{g}/\text{m}^3$ (24 hour)

SO₂

A. Class I areas

- 1) 2 $\mu\text{g}/\text{m}^3$ (annual)
- 2) 5 $\mu\text{g}/\text{m}^3$ (24 hour)
- 3) 25 $\mu\text{g}/\text{m}^3$ (3 hour)

B. Class II areas

- 1) 20 $\mu\text{g}/\text{m}^3$ (annual)
- 2) 91 $\mu\text{g}/\text{m}^3$ (24 hour)
- 3) 512 $\mu\text{g}/\text{m}^3$ (3 hour)

NO_x

A. Class I areas - 2.5 $\mu\text{g}/\text{m}^3$ (annual)

B. Class II areas - 25 $\mu\text{g}/\text{m}^3$ (annual)

There are also Class III increments, which do not apply in Utah. The above increments apply at all locations, unless the area is already nonattainment. The entire increment may not be available at all locations due to previously permitted sources consuming increment.

12. R-446-1-3.6.5(b) - Prevention of significant deterioration (PSD) review requirements for new major sources or major modifications. This Notice of Intent does not represent a new major source or a major modification under PSD rules. Therefore, this rule does not apply.
13. R-446-1-3.6.6 - Increment violations. This rule requires the UACC to promulgate a plan and implement rules to eliminate any PSD increment violations which occur in the state. No known violations have yet occurred. These sludge dryers will consume no increment. They are existing (they are being replaced) but were never approved.
14. R-446-1-3.8 - Stack height rule. This rule limits the creditable height of stacks to that height determined to be good engineering practice. The formulas used to determine good engineering practice are found in 40 CFR 51.100. A de minimus height of 65 meters (213.2 feet) is allowed. Building 577, Hill AFB, has no stacks which exceed 65 meters in height. It is in compliance with this rule.

15. R-446-1-3.11 - Visibility screening analysis requirements. This rule requires all new major sources or major modifications to undergo a visibility screening analysis to determine visibility impact on any mandatory Class I area. This Notice of Intent does not represent a new major source or a major modification under UACR rules. Therefore, this rule does not apply.
16. R-446-1-4.1.2 - 20% opacity limitation at all emission points unless a more stringent limitation is required by New Source Performance Standards (NSPS) or BACT or National Emission Standards for Hazardous Air Pollutants (NESHAPS). In this case an opacity limitation of 15% is recommended as BACT.
17. R-446-1-4.1.9 - EPA Method 9 to be used for visible emission observations. This rule applies.
18. R-446-1-4.2.1 - Sulfur content limitations in oil and coal used for combustion. This emission point does not use oil or coal for combustion. This rule does not apply.
19. R-446-1-4.6 - Continuous Emission Monitoring Systems Program - Reporting and technical requirements for continuous emission monitoring systems. It covers breakdowns and quarterly reports for continuous monitoring systems. Section 4.6.5 states that this regulation applies to the following:
 - A. Sources required to install CEMS as required by the following documents:
 - 1) NSPS
 - 2) State Implementation Plan
 - 3) Approval Order
 - 4) Consent Decree
 - 5) Administrative Orders and Agreements
 - B. Any source that constructs after the promulgation of this rule two or more emission points, which may interfere with VEO's, shall install an opacity monitor on each stack.
20. R-446-1-4.7 - Unavoidable breakdown reporting requirements. This rule applies. Section 4.7.1 discusses reporting requirements. A breakdown for any period longer than 2 hours must be reported to the Executive Secretary within 3 hours of the beginning of the breakdown, if reasonable, but in no case longer than 18 hours after the beginning of the breakdown. A written report is required within 7 calendar days. The report shall include the estimated quantity of pollutants (total and excess). Section 4.7.2 discusses penalties.
21. R-446-1-4.9 - Review requirements for volatile organic compound (VOC) sources located in a nonattainment area for ozone constructed in 1980 or earlier. This process is not covered in

22. R-446-1-5 - Emergency episode requirements. This rule applies.
23. R-446-1-7 - Air Pollution Episode Plan - This plan provides the basis for taking action to prevent air pollutant concentrations from reaching levels which could endanger the public health, or to abate such concentrations should they occur. All sources in a nonattainment area or impacting a nonattainment area must submit a plan outlining what they will do in an emergency episode. This regulation applies to Salt Lake, Davis, and Utah Counties.
24. New Source Performance Standards (NSPS) - There is no NSPS for this industrial process.
25. National Emission Standards for Hazardous Air Pollutants (NESHAPS) - There is no NESHAPS for this industrial process.
26. National Ambient Air Quality Standards (NAAQS) - This source is located in Davis County, which is a nonattainment area for ozone. The Division of Air Quality guidelines do not call for this source to be modeled for any pollutant. The Division has found through experience that, because of the small quantity of emissions involved and the conservative predictions made by modeling, a source or emission point of this small size is very unlikely to cause a new violation of the NAAQS.
27. 40 CFR 60.14, Definition of Modification - Any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which an NSPS standard applies. The following are not by themselves considered modifications:
- 1) Maintenance, repair, and replacement
 - 2) An increase in production rate of an existing facility, if that increase can be accomplished without a capital expenditure on that facility
 - 3) An increase in the hours of operation
 - 4) Use of an alternative fuel or raw material if, prior to the date any standard under this part becomes applicable to that source type, as provided by 60.1, the existing facility was designed to accommodate that alternative use
 - 5) The addition or use of any system or device whose primary function is the reduction of air pollutants
 - 6) Relocation or change in ownership

Also see Section 1.92, which is the State's definition. It is a

planned increase in emissions.

28. 40 CFR 60.15, Definition of Reconstruction - the replacement of components of an existing facility to such an extent that:
- 1) The fixed capital cost of the new components exceeds 50% of the fixed capital cost that would be required to construct a comparable entirely new facility and
 - 2) It is technologically and economically feasible to meet the applicable standards set forth in this part

This Notice of Intent is not a reconstruction.

29. R-446-1-1.89, Definition of Major Modification - It means any physical change in or change in the method of operation of a major source that would result in a significant net emission increase of any pollutant. A net emissions increase that is significant for VOC shall be considered significant for ozone. A physical change or change in the method of operation shall not include:
- A. Routine maintenance, repair, or replacement
 - B. Use of an alternative fuel or raw material by reason of an order under Section 2a and b of the ESECA of 1974 or by reason of a natural gas curtailment plan pursuant to the Federal Power Act
 - C. Use of an alternative fuel by reason of an order under Section 125 of the CAA
 - D. Use of an alternative fuel at a steam generating unit to the extent that the fuel is generated from municipal solid waste
 - E. Use of an alternative fuel or raw material by a source:
 - 1) which the source was capable of accommodating before January 6, 1975, unless such change would be prohibited under any enforceable permit condition
 - 2) which the source is otherwise approved to use
 - F. An increase in the hours of operation or the production rate unless such change would be prohibited under any enforceable permit condition
 - G. Any change in ownership at a source

This Notice of Intent is not a major modification.

V. RECOMMENDED APPROVAL ORDER CONDITIONS

1. All Air Force Base, shall install and operate the Industrial Wastewater Treatment Plant Sludge Dryers in Building 577 according to the information submitted in the Notice of Intent dated September 4, 1991.

A copy of this Approval Order shall be posted on site and shall be available to the employees who operate the air emission producing equipment. All employees who operate the air emission producing equipment shall receive instruction as to their responsibilities in operating the equipment in compliance with all of the relevant conditions.

2. The approved installations shall consist of the following equipment:

A. Two JWI Metal Hydroxide Sludge Volume Reducers

Model:	J360G
Heat source:	Natural gas
Burner rating:	400,000 BTU
Gas consumption:	400 CFH

B. Two JWI single speed wet venturi scrubbers

Scrubber water usage:	3 GPM
Dry gas:	79.93 SCFM
Humidity:	51%
Saturation Temp:	184°F
Discharge Volume:	293 ACFM

3. Emissions to the atmosphere of NO_x from the sludge dryer exhaust stacks shall not exceed the following rates and concentrations:

A. 200 ppmdv (7% oxygen, dry)

B. 0.47 lb/hr

4. Stack testing to show compliance with the emission limitations of condition #3 shall be performed as specified below:

<u>Emission Point</u>	<u>Pollutant</u>	<u>Testing Status</u>	<u>Retest</u>
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Dryer exhaust stacks	NO _x	§	***
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Testing Status (To be applied above)

§ The stack shall be tested for NO_x emissions compliance within 30 days of start-up using a portable testing instrument approved by the

Executive Secretary

*** The dryer stack shall be retested every 30 dryer operating days \pm 10 days. The maximum time between tests shall be 35 dryer operation days.

5. Test Procedure

Dryer stack emissions testing shall be performed by the following procedure or an approved equivalent. Equivalency shall be determined by the Executive Secretary and approved prior to tests being conducted.

A. - Sample Port

A sampling port shall be installed in each dryer exhaust stack in accordance with 40 CFR 60, Appendix B, Performance Specification #2 or as approved by the Executive Secretary. The sample port shall be safely accessible to the tester, operator or inspector in accordance with OSHA standards.

B. - Operating Rate

The steam production or operating rate during testing shall be performed under three operating rates; 90%, 70% and 50% (all \pm 10%) of the dryer's rated capacity.

C. - Test Instrument

The test procedure shall be conducted using a portable testing instrument approved by the Executive Secretary. The testing instrument shall be calibrated on site with a suitable NBS referenced or traceable calibration gas in accordance with the instruction of the test instrument.

D. - Test Procedure

The test shall be conducted in the following manner:

- (1) The dryer shall be:
 - a) operated at the designated production rate in Condition 5.B
 - b) allowed to stabilize for a minimum of 5 minutes.
- (2) The gas sample shall be drawn according to the instructions of the test instrument being used.
- (3) The sample value shall be determined from the test instrument, appropriate calculations made,

and the data recorded.

E. - Failed Dryer Status

- (1) If the dryer is unable to attain the emission limitation in Condition #3, at any one of the operating rates specified in condition 5B, the dryer shall be taken out of service until the unit has been repaired or maintenance performed and a successful retest completed.
- (2) Maintenance and repairs of any dryer that fails the periodical test shall be performed within 15 days, or the dryer shall be idled.
 - a) If a dryer that has failed a test is repaired and a successful retest completed according to the limitations of Condition #3 within 15 days, the dryer shall be determined to not have been in violation.
 - b) A dryer that fails the retest after repair shall be idled until further repairs are made and a successful retest completed. If the dryer demand requires the dryer to be operated, it shall be base loaded at the rate that will result in the lowest emissions rate possible until the dryer can be repaired and shown in compliance by the above test.
 - c) Operation of a dryer that has failed the above "retest after repair" may be determined to be a violation of this Approval Order.

F. - Reports

A copy of all test reports containing the test results, any calculations required, and the test instrument calibration data shall be retained by the owner/operator for 2 years. The reports shall be made available to the Executive Secretary or his agent upon request. An annual summary report of all the test results with a copy of the periodical reports shall be submitted to the Executive Secretary no later than January 31 of each year for the previous calendar year.

6. Visible emissions from any point or fugitive emission source associated with the installation or control facilities in this NOI shall not exceed 10% opacity. Opacity observations of emissions from stationary sources shall be conducted in

accordance with 40 CFR 60, Appendix A, Method 9.

7. The owner/operator shall use only natural gas as a primary fuel in the two sludge dryers located in Building 577. If any other fuel is to be used, an Approval Order shall be required in accordance with R446-1-3.1, UAC.
8. All records referenced in this Approval Order or in an applicable NSPS or MACTS, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or his representative upon request.
9. All installations and facilities authorized by this Approval Order shall be adequately and properly maintained.
10. The owner/operator shall comply with R446-1-3.5, UAC. Section 3.5 addresses emission inventory reporting requirements.
11. The owner/operator shall comply with R446-1-4.7, UAC. Section 4.7 addresses unavoidable breakdown reporting requirements. The owner/operator shall calculate/estimate the excess emissions whenever a breakdown occurs. The sum total of excess emissions shall be reported to the Executive Secretary for each calendar year no later than January 31 of the following year.
12. The Executive Secretary shall be notified in writing upon start-up of the installation, as an initial compliance inspection is required. Eighteen months from the date of this Approval Order the Executive Secretary shall be notified in writing of the status of installation if installation is not completed. At that time the Executive Secretary shall require documentation of the continuous installation of the operation and may revoke the Approval Order in accordance with R-446-1-3.1.5, UAC.

Any future modifications to the equipment approved by this order must also be approved in accordance with R-446-1-3.1.1, UAC.

This Approval Order in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including the Utah Air Conservation Rules.

Annual emissions for this source (the wastewater treatment plant sludge dryers in building 577) are currently calculated at the following values:

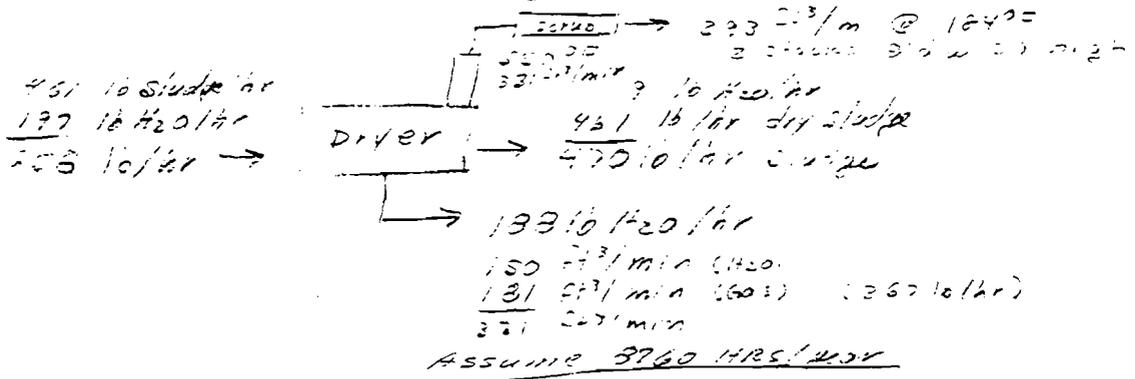
- A. 1.026 tons/yr for Particulate
- B. 0.453 tons/yr for PM₁₀
- C. 0.002 tons/yr for SO₂
- D. 2.050 tons/yr for NO_x

- E. 1.328 tons/yr for VOC
- F. 0.149 tons/yr for CO

These calculations are for the purposes of determining the applicability of PSD and nonattainment area major source requirements of the UACR.

K:\...\DUTCH\WP\HILLS77A.RVW ②

Hill AFB Sludge Dryers



TSP $0.23 \text{ lb/hr} = 2015 \text{ lb/year} = 1.007 \text{ Tons/year}$

metals $0.03 \text{ lb/hr} = 226.8 \text{ lb/year} = 0.131 \text{ Tons/year}$

10C SO₂ ppm = $0.131 \text{ lb/hr} = 1536 \text{ lb/year} = 0.793 \text{ Tons}$

PM₁₀ $0.1 \text{ lb/hr} = 376.0 \text{ lb/hr} = 0.433 \text{ Tons}$

what is in sludge - everything from area

Sludge disposal - contractor disposal -
water - waste water

what kind of metals - cad etc
when installed 1991

Where does it come from - adjacent to combustion treatment

Total emissions

	<u>Inputs</u>	<u>3760 HRS</u>	<u>Total</u>
TSP	2.019 Tons	1.007 Tons	1.026 Tons
PM ₁₀	0.515	0.433	0.753
SO ₂	0.002		0.002
NO ₂	2.050		2.050
CO	0.147		0.147
HCN	0.005	0.793	1.228
H ₂	0.001		
metals		0.131	0.131

Hill AFB Sludge Dryers
 Gas: 400,000 BTU/hr
 740 BTU/ft³

$$\frac{400,000 \text{ BTU}}{740 \text{ BTU/ft}^3} = 540.5 \text{ ft}^3/\text{hr}$$

Assume 24 HR. operation = 8760 HR/yr.

Emissions from Natural Gas from AP 42 Table 1.4.1
 For each dryer:

$$\frac{\text{CO} \ 3.5}{10^6} \times \frac{540.5 \text{ ft}^3}{\text{hr}} \times \frac{8760 \text{ HR}}{\text{yr}} \times \frac{1 \text{ yr}}{365 \text{ days}} = \frac{511363.67}{10^3} \text{ Tons/yr}$$

$$= 0.0093 \text{ TPI}$$

(0.0186 TPI Total)

$$\text{SO}_2 \ \frac{0.6}{10^6} \times 540.5 \times 8760 = 2.9214 \text{ TPI}$$

(0.0022 TPI Total)

$$\text{NO}_2 \ \frac{550}{10^6} \times 540.5 \times 8760 = 1.035 \text{ TPI}$$

(2.05 TPI Total)

$$\text{CO} \ \frac{40}{10^6} \times 540.5 \times 8760 = 0.074 \text{ TPI}$$

(0.149 TPI Total)

$$\text{VOC}_{\text{NM}} \ \frac{1.4}{10^6} \times 540.5 \times 8760 = 0.0026 \text{ TPI}$$

(0.0052 TPI Total)

$$\text{H}_2\text{S}_{\text{M}} \ \frac{2.3}{10^6} \times 540.5 \times 8760 = 0.0011 \text{ TPI}$$

(0.0022 TPI Total)

$$\text{Stack exhaust rate} = 331 \text{ ft}^3/\text{min}$$

$$\text{NO}_x \text{ emissions} = 2.05 \text{ Tons/year} = 0.468 \text{ lb/hr}$$

$$\frac{0.468 \text{ lb}}{\text{hr}} \times \frac{\text{min}}{331 \text{ ft}^3} \times \frac{\text{hr}}{60 \text{ min}} \times \frac{453592}{16} \times \frac{\text{ft}^3}{0.0283 \text{ m}^3} \times \frac{16^6 \text{ mg}}{\text{lb}}$$

$$= 377,697 \text{ } \mu\text{g}/\text{m}^3$$

$$= 201 \text{ ppm}$$



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS OGDEN AIR LOGISTICS CENTER (AFLC)
HILL AIR FORCE BASE, UTAH 84056-5990

4 SEP 1991

RECEIVED
SEP 06 1991
AIR QUALITY

Mr F. Burnell Cordner, Executive Secretary
Department of Environmental Quality
Division of Air Quality
1950 W North Temple
Salt Lake City UT 84114-4820

Re: Notice of Intent to Construct Industrial Wastewater
Treatment Plant Sludge Dryers, Bldg 577

Dear Mr Cordner

Building 577 had two electric batch sludge dryers. These sources
were not permitted. We replaced these electric dryers with
continuous gas fired sludge dryers. Technical information and
emission rates from these dryers is attached.

If this office can provide additional information, please feel
free to contact Jay Gupta at 777-6917.

03 59

Sincerely

James R. VanOrman

JAMES R. VAN ORMAN
Director of Environmental Management

1 Atch
Notice of Intent to Construct

4.2.4-734

NOTICE OF INTENT TO CONSTRUCT

1. PROJECT DESCRIPTION:

Sludge from the Industrial Wastewater Treatment Plant Clarifier is pumped to sludge holding tanks in sludge drying building 577. Raw sludge is treated with lime and pumped to filter press for dewatering to 70 percent solids. Dewatered sludge is then fed to sludge dryers feed hoppers via a dump trolley. Sludge is dried to 5-10 percent moisture in JWI Model J360G continuous moving belt gas fired sludge dryers at a temperature of about 550⁰F. Dried granular sludge is emptied into a dumpster via a screw conveyor for disposal. There are two continuous gas fired sludge dryers. Off gas from the dryers is treated in venturi scrubbers before being exhausted to the atmosphere. Manufacturers' bulletin on dryers is Atch 1. Equipment schematic is Atch 2. Design data and exhaust gas flow rate calculations are as follows:

Data Each Dryer (Two Required):

Working capacity - water removal rate	- 188 Lbs/hr
Heat source	- Gas
Heat rate	- 400,000 BTU/hr
Natural gas heating value	- 1,000 BTU/SCF
Gas consumption	- 400 SCFH
Operating temperature	- 550-600 ⁰ F
Water rate to Venturi Scrubber	- 2-4 GPM
Water pressure	- 40-50 PSIG
Venturi Scrubber pressure drop	- 5-8" W.C.

Exhaust Gas Flow Rate and Moisture Balance:

Water evaporation rate	- 188 Lbs/hr
Moisture content of sludge Filter Press	- 30%
Moisture content of sludge exiting dryer	- 5%
Water in wet sludge entering dryer	- 188 X 1.05 = 197.4 Lbs/hr
Bone dry sludge	- 70/30 X 197.4 = 460.6 Lbs/hr
Wet sludge entering dryer	- 460.6 + 197.4 = 658 Lbs/hr
Water in sludge leaving dryer	- 197.4 - 188 = 9.4 Lbs/hr
Sludge leaving dryer	- 460.6 + 9.4 = 470 Lbs/hr

Gas Volume Leaving Dryer:

P, atmosphere	- 12.42 PSiA
Products of combustion from Natural Gas (15% excess air):	
Standard Volume	- Factor S X MM BTU/hr input X 1/60
Factor S for Natural Gas	- 11,990
Standard volume	- 11,990 X 0.4 X 1/60 = 79.93 SCFM
Temperature correction	- $(460 + 550)/(460 + 60) = 1.942$
Pressure correction	- $1 + (\text{Altitude}/1,000 \times .0375)$ - $1 + (4,500/1,000 \times .0375) =$ 1.169
Actual volume	- 79.93 X 1.942 X 1.169 - 181.4 ACFM @ 550 ⁰ F, 12.42 PSiA
Evaporation	- 188 Lbs/hr - 188 Lbs/hr X Lb Mole/18.02 Lb X 379 SCF/Lb Mole X Hr/60 Min - 65.9 SCFM
Actual Volume	- 65.9 X 1.942 X 1.169 = 149.6 ACFM
Total gas leaving dryer	- 181.4 + 149.6 = 331 ACFM @ 550 ⁰ F, 12.42 PSiA

Gas volume leaving Venturi Scrubber:

Dry Gas	- 79.93 SCFM - 79.93 SCF/Min X Lb Mole/ 379 SCF X 29 Lb/Lb Mole X 60 Min/hr - 366.9 Lb/hr
Inlet gas humidity (H)	- $188/366.9 = 0.51$ Lb Water Vapor/Lb Dry Air
From Pschymetric Chart @ Dry bulb temp	- 550 ⁰ F H = 0.51
Adiabatic Saturation temp (Tsat)	- 184 ⁰ F
Saturated Volume	- 48 cu ft/Lb dry air - 48 X 366.9/60 = 293.5 ACFM

Discharge Volume, each dryer: 293 ACFM @ 184⁰F

2. AIR EMISSIONS:

The plume comprises mostly of water vapor evaporated from wet sludge. Some particulate and hydrocarbon emissions may also be present. Emissions from natural gas combustion are negligible. Base upon vendor testing of the smaller dryer on metal hydroxide sludge, a total particulate discharge of 0.012 pounds per hour was observed.

Assuming carryover to be 1% of bone dry solids,
 particulate in air stream entering venturi - 4.6 Lbs/hr
 Per vendor, venturi impactor scrubber - 95-98%
 efficiency
 Particulate emission rate - $4.6 \times .05 = 0.23$
 Lb/hr
 PM-10 emission rate - 0.1 Lb/hr
 From sludge composition, metals content - 13%
 Metals emission rate - $.23 \times .13 =$
 0.03 Lb/hr

Hydrocarbon emissions: Some hydrocarbon emissions may be present depending on oil and grease content of wet sludge. A preliminary test of stack gas showed hydrocarbon concentration of approximately 500 PPMV.

Exhaust gas from each dryer - $79.93 + 65.9 = 145.83$ SCFM
 Hydrocarbon emission rate - $500/10^6 \times 145.83 = .0729$ SCFM
 Hydrocarbon emissions - $.0729 \times 16/379 \times 60$
 (as methane)
 - 0.18 Lb/hr

These emission rates are estimates only.

3. AIR CLEANING DEVICES:

Particulate emissions will be controlled by venturi impactor scrubber and cyclonic separator. Removal efficiency of 95-98% is achieved with 6-8" W.C. pressure drop across the scrubber.

4. EMISSION POINTS:

Two stacks each 8" diameter will exhaust approximately 300 cubic feet per minute. Point of discharge is approximately 30 feet above grade.

5. SAMPLING POINTS:

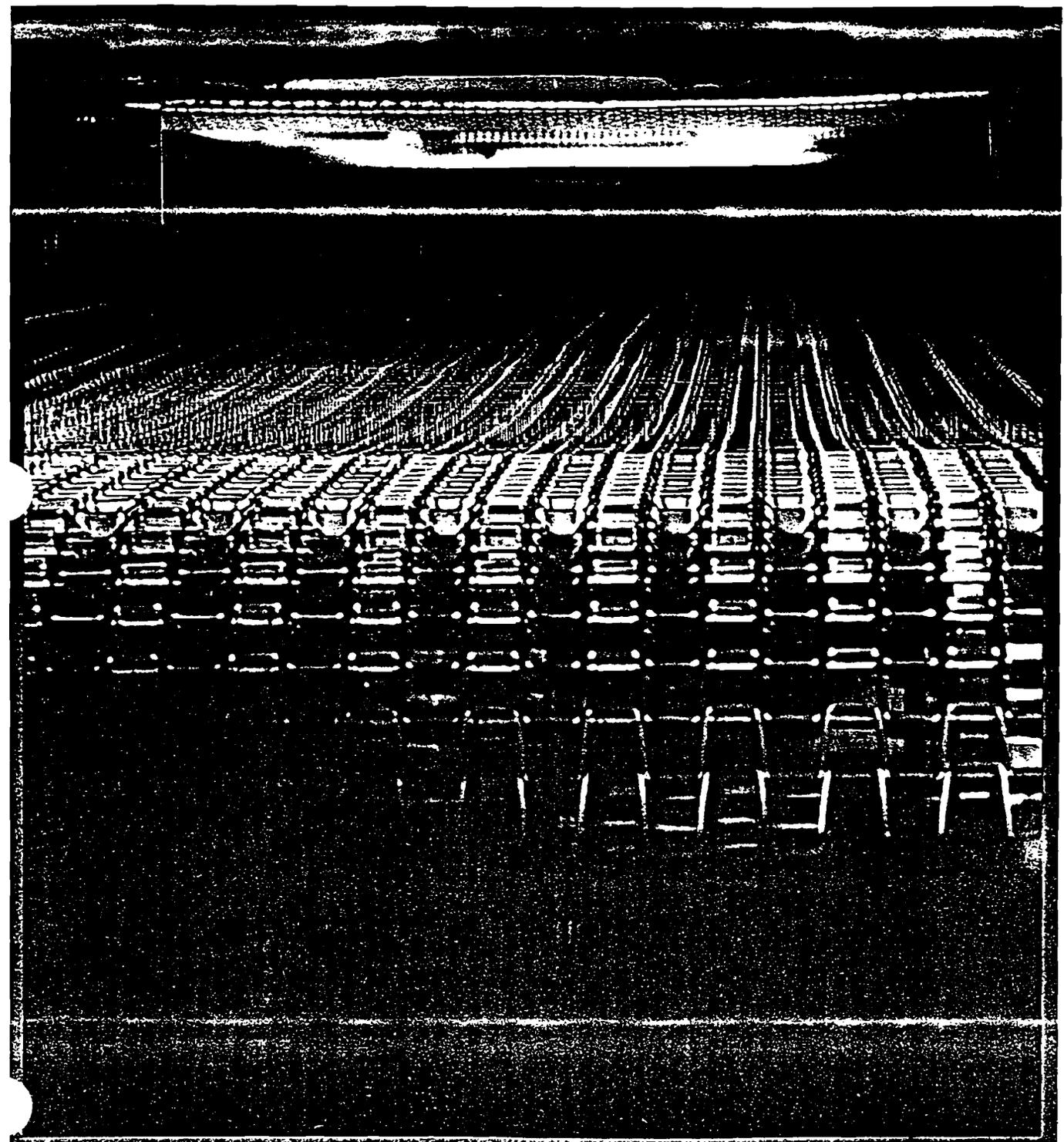
No sampling points are provided.

6. OPERATING SCHEDULE:

Normally, dryers are operated during the day shift. However, in the event of sludge back-up, they may be operated in other shifts.



Metal Hydroxide Sludge Volume Reducers

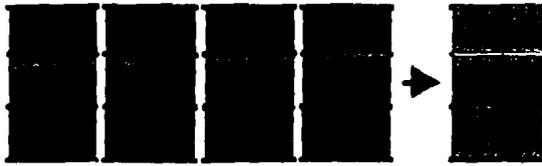


4.2.4-738

ATCH-1

Continuous J-Mates™ ... The Final Step in Metal Hydroxide Sludge Volume Reduction

The J-Mate, by JWI, has been designed to take over where filter presses, vacuum filters and centrifuges leave off. While these mechanical dewatering units can reduce sludge volume by up to 20:1, a substantial amount of water still remains in the material. The J-Mate units use gas or electric infrared heat for rapid, effective water removal which results in reduced sludge volume ... changing the material to a dry, granular form. The result is a further volume reduction of about 4:1. One fourth the waste volume ... one fourth the handling and disposal costs. So effective is the J-Mate, that **6 month paybacks are possible** (depending on local disposal costs).



Features and Benefits:

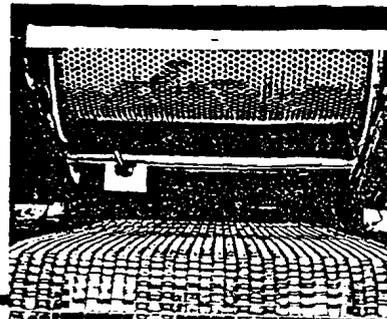
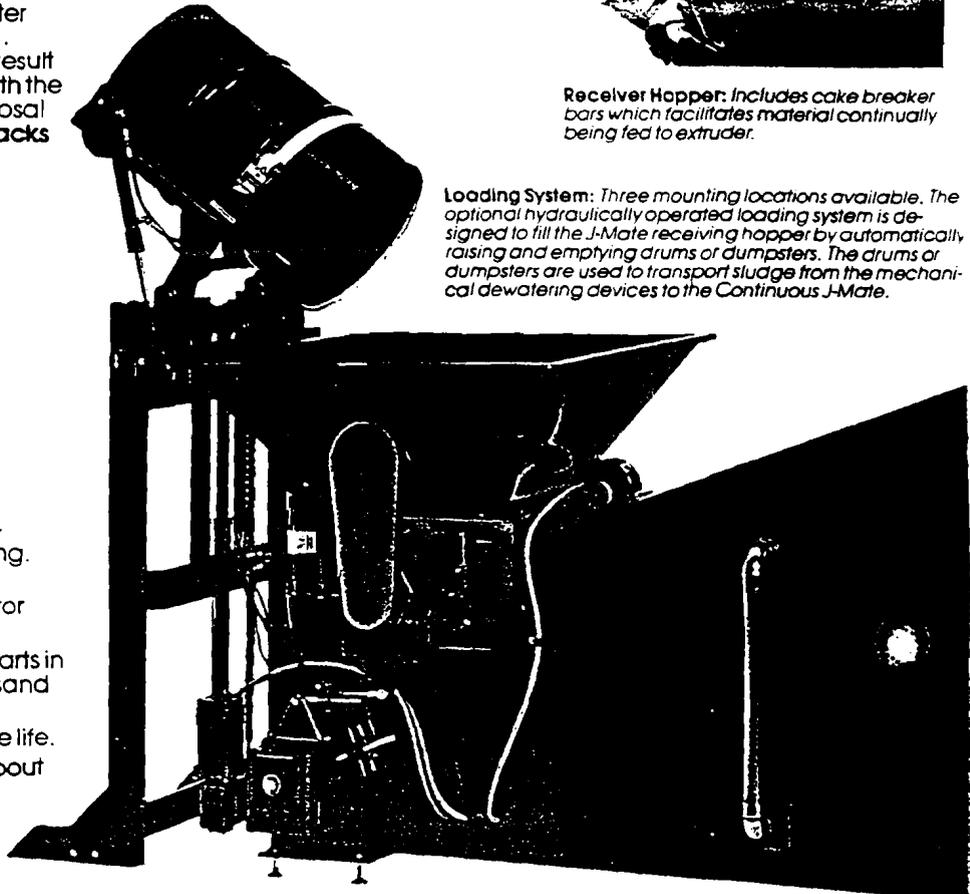
- Payback within 6 months possible.*
- Designed specifically for metal hydroxide sludge.
- Installation flexibility. Simple loading and unloading. No additional labor required.
- Fully automatic processing cycle. Minimal operator attention required.
- Stainless steel construction of all internal wetted parts in processing chamber. All other parts are carbon steel-sand blasted, and polyurethane primed and painted.
- Ruggedly built for continuous use and long service life.
- Sludge volume reduction ranges by a factor of about 2:1 to 5:1
- Highly efficient infrared heaters keep energy cost at a minimum.
- Available in either LP or natural gas. Smaller models available in electric.
- Extruded filter cake for maximum weight and volume reduction with a minimum of BTU's.
- No direct flame torching material.
- No material build up or clogging problems.
- Electronic ignition used ... no pilot light.
- All models include a stainless steel venturi-type wet scrubber to maintain high air quality.

*Actual performance is a function of local energy and disposal costs and initial sludge solids concentration



Receiver Hopper: Includes cake breaker bars which facilitates material continually being fed to extruder.

Loading System: Three mounting locations available. The optional hydraulically operated loading system is designed to fill the J-Mate receiving hopper by automatically raising and emptying drums or dumpsters. The drums or dumpsters are used to transport sludge from the mechanical dewatering devices to the Continuous J-Mate.

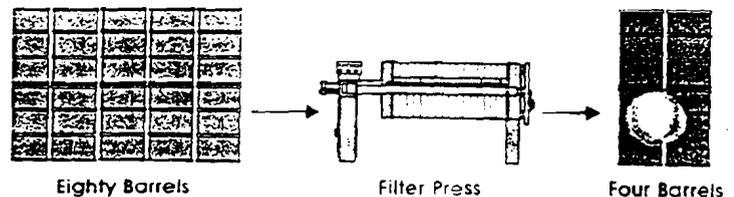


Extruder System: Receives filter cake which has been broken down by the bridge breaker in the receiver hopper. The wiper blades force the sludge through holes in the stainless steel drum. This produces pellet-like particles with maximum surface area for drying. The extruded material falls onto a continuous stainless steel mesh conveyor for passage under a series of highly efficient infrared heat drying elements

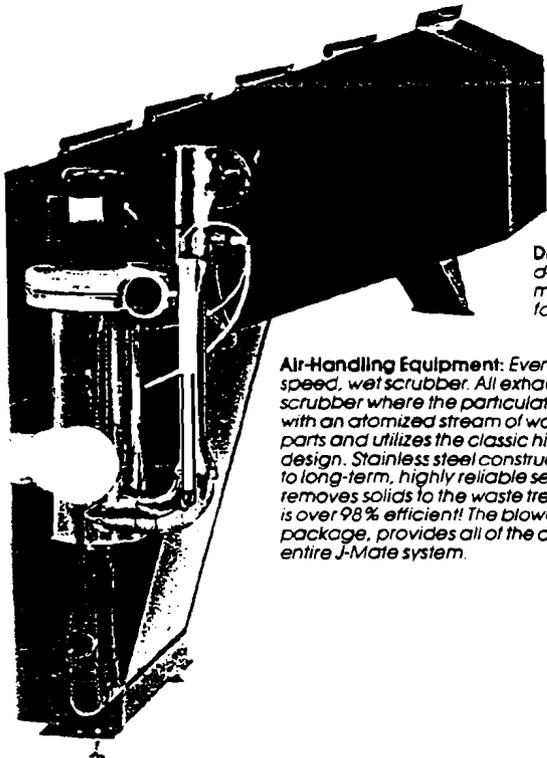
The J-Press[®] / Continuous J-Mate™ Combination

The J-Mate, used in conjunction with JWI's filter press (or other brand of filter presses) provides a capability to reduce a metal hydroxide slurry by a ratio of 80:1. Eighty barrels of slurry, filtered and dewatered in a filter press is reduced to four barrels of filter cake. While this represents a substantial reduction in waste volume, even greater savings can be realized with a J-Mate since 60 to 80% of remaining material is still water. These four barrels of dewatered sludge, when processed through the Continuous J-Mate can be further reduced to only one barrel of granular, moisture free material for handling and disposal. The dumpster receiving the filter cake from the J-Press can also be used to transfer and dump the cake into the J-Mate. If desired, drums can be handled in a similar manner. Thus, no additional labor is needed for waste disposal. Labor may even be reduced due to the smaller volumes of end product.

The JWI Dewatering combination ... an 80:1 reduction in your waste disposal problem.



Heater Options: All energy for drying in the J-Mate comes from infrared heating elements. Heating energy options are natural or LP gas on all models with electric available on Models J-120E, J-180E and J-360E. Ambient air is drawn through the heat chamber by the fan mounted on the outlet of the wet scrubber. The J-Mate heat chamber and scrubber are protected from high temperature levels by an exhaust air temperature monitor. Infrared heat is known to be the most efficient source of heat available for drying applications.

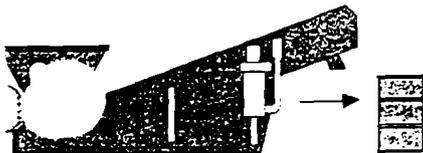


Stainless Steel Construction: All internal parts in drying chamber exposed to wet sludge are stainless steel for corrosion resistance and long service life.

Discharge System: As the material reaches the desired reduction (dryness), the dry, granular material is emptied into a bag, barrel or dumpster for disposal.

Air-Handling Equipment: Every J-Mate unit is supplied with a single speed, wet scrubber. All exhaust air from the J-Mate enters the scrubber where the particulate matter is combined for removal with an atomized stream of water. The scrubber uses no moving parts and utilizes the classic high-energy venturi type scrubber design. Stainless steel construction and simple design contributes to long-term, highly reliable service. A 1-2 GPM blowdown stream removes solids to the waste treatment system. The scrubber is over 98% efficient! The blower, mounted on top of the scrubber package, provides all of the air movement through the entire J-Mate system.

Heavy Duty, Long Life Motor: TEFC Industrial motor provides years of maintenance free operation.

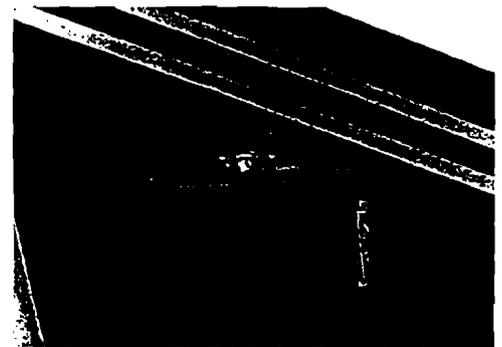


J-Mate

One Barrel

Unit Includes: ■ Hopper ■ Cake Breaker ■ Extruder ■ Drive Gearmotor ■ Wet Scrubber (exhaust ducting not included) ■ Control Panel, Prewired with all Operational Controls ■ Infrared Heat Chamber Mounted on Rugged Frame ■ Dried Sludge Unloading Chute ■ One (1) Copy of an Installation/Operation/Maintenance Manual. ■ Moving Stainless Steel Grating Type Belt

Optional Equipment: ■ Dumpsters ■ Barrel Loader ■ Dumpster Loader ■ One Way Disposable Bags ■ Optional Hydraulic Dumping Mechanism for Dumpster ■ Special Hopper Designs and Sizes ■ Custom Support Structures Available to Elevate Filter Press for Direct Disposal into J-Mate.



Control Console: Provides finger-tip control of all J-Mate functions; including extruder feed rate, drying chamber belt rate, system on-off and main disconnect.

Specifications

	J120G	J120E	J180G	J180E	J360G
Heat Source	Gas	Electric	Gas	Electric	Gas
Working Capacity - Water Removal Rate *	47# H ₂ O/HR	47# H ₂ O/HR	94# H ₂ O/HR	94# H ₂ O/HR	188# H ₂ O/HR
Power Requirements - including Dump Lift** 230V 30 60CY 480V 30 60CY	20A 10A	50A	20A 10A	65A	30A 15A
Electric Heat Kilowatts	-	31.5 KW	-	45 KW	-
Gas Burner Rating	125,000 BTU	-	200,000 BTU	-	350/465,000 BTU
Gas Consumption CFM GPH	100 CFM 14 GPH	-	200 CFM 22 GPH	-	400 CFM 38-5 GPH
Scrubber Water usage	1 GPM	1 GPM	1 GPM	1 GPM	3 GPM
Scrubber Drain	GRAVITY DRAIN				
Length	170"	170"	170"	170"	170"
Width	46"	46"	52"	52"	70"
Height	78"	78"	78"	78"	78"
Weight (Shipping) (Without Lift)	3400 lbs.	3400 lbs.	3600 lbs.	3600 lbs.	4200 lbs.
Std. Hopper Capacity	10.7 cu. ft.	10.7 cu. ft.	13 cu. ft.	13 cu. ft.	20 cu. ft.
Exhaust Air CFM	275	275	275	275	300
Materials of Construction:	304 SS, Carbon Steel, Polyurethane Finish				

*Service to be determined by local electrical code requirements

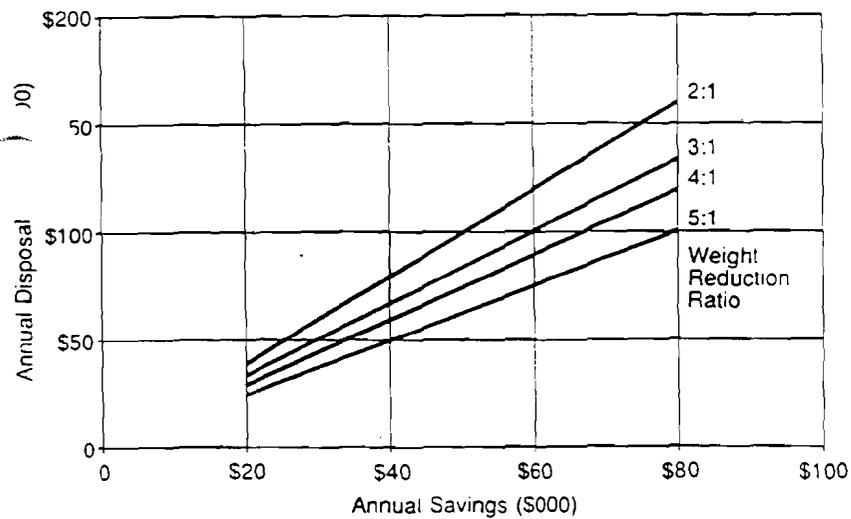
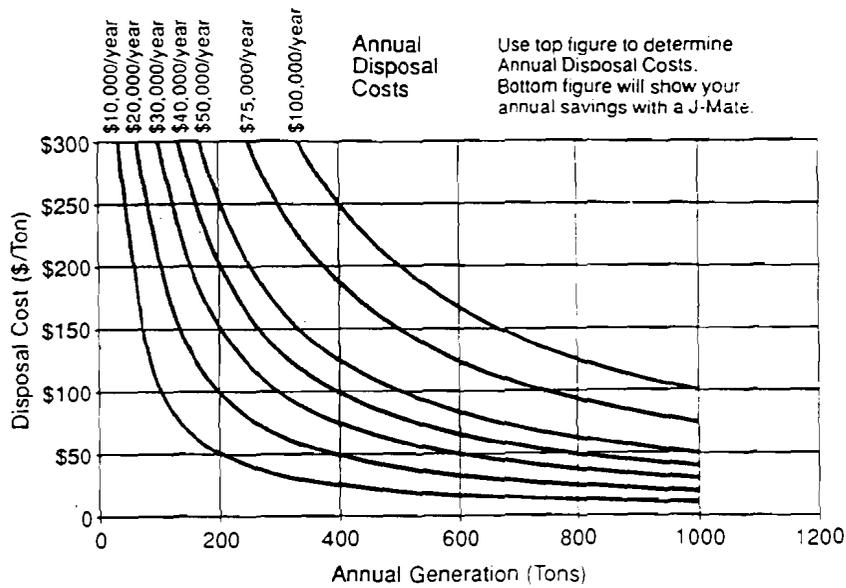
**Based on using 2125 BTU to remove 1 lb. of H₂O. BTU requirement may vary with materials

NOTE: Machine gas components comply with FM and IRI requirements

Specifications subject to change without notice

4.2.4-740

Figure your disposal costs and savings with these charts.

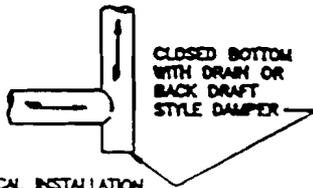


Patents have been applied for and are pending on products described herein

1/2 MIN. SLOPE (1/8" / FT.) AWAY FROM UNIT



HORIZONTAL INSTALLATION



VERTICAL INSTALLATION

CLOSED BOTTOM WITH DRAIN OR BACK DRAFT STYLE DAMPER

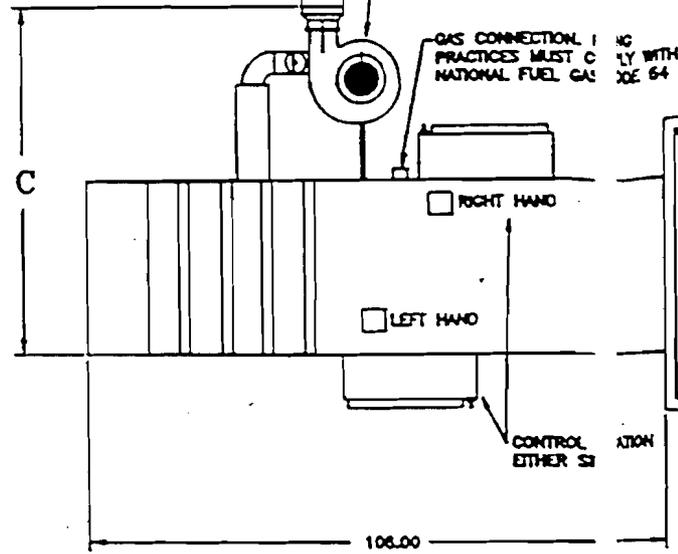
NOTE: DISCHARGE MUST GRAVITY DRAIN. IF GRAVITY DRAIN NOT AVAILABLE A LIFT PUMP WILL BE REQUIRED.

NOTE: SCRUBBER FOR MOD 360 J-MATE IS NOT MOUNTED TO MACHINE.

2" FPT. COUPLING FOR HOOK UP TO CUSTOMERS DRAIN.

6" DIA. EXHAUST WATER SUPPLY TO 40 PSL MIN. 80 PSL MAX. (BY OTHERS)

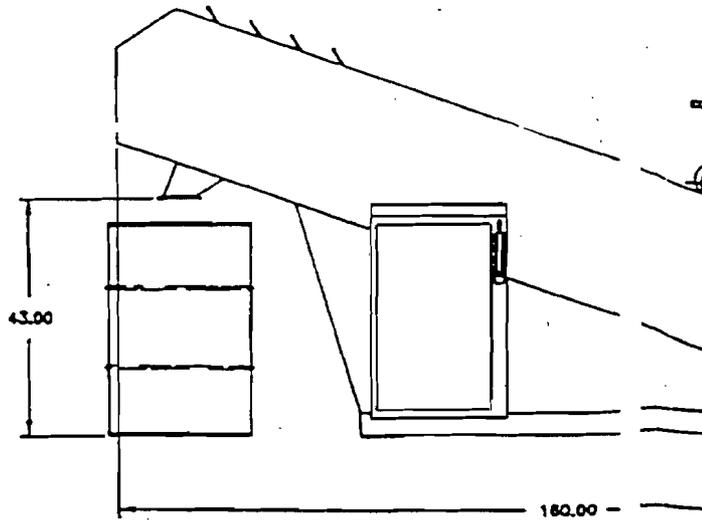
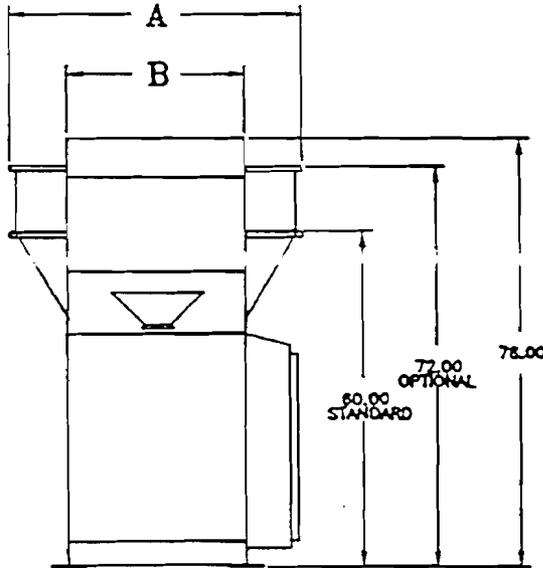
GAS CONNECTION. PRACTICES MUST COMPLY WITH NATIONAL FUEL GAS CODE 64



RECOMMENDED EXHAUST VENT PIPING INSTALLATION

USE 6" DIA. PIPE WITH 100' MAX. RECOMMENDED LENGTH OF RUN, WITH SCRUBBER OPTION ONLY. (PIPE BY OTHERS)

CUSTOMER TO FURNISH ELECTRICAL SERVICE IN ACCORDANCE WITH APPLICABLE LOCAL AND NATIONAL CODES.



MODEL	A	B	C	D	E	F	WORKING CAPACITY FT. ³ /HR	HOPPER VOLUME (CUBIC FEET)	OPTIONAL HOPPER VOLUME	WEIGHT (LBS.)
120	46.00	25.00	41.00	31.00	99.00	30.00	1 - 1.5	10.7	24.7	3000
180	52.00	31.00	47.00	37.00	99.00	36.00	1.5 - 3	13	29	3700
360	52.00	49.00	102.00	55.00	99.00	54.00	3 - 6	17	33	4400

MODELS J-120, J-180, & J-360
ELECTRICAL CONSUMPTION (GAS FIRED)

DRIVE MOTORS	240V. 3PH.	480V. 3PH.
MODEL: 120	20AMPS	10AMPS
MODEL: 180	20AMPS	10AMPS
MODEL: 360	30AMPS	15AMPS

ELECTRIC HEAT MODELS (480V. 3PH.)

MODEL: 120:	50AMPS
MODEL: 180:	65AMPS

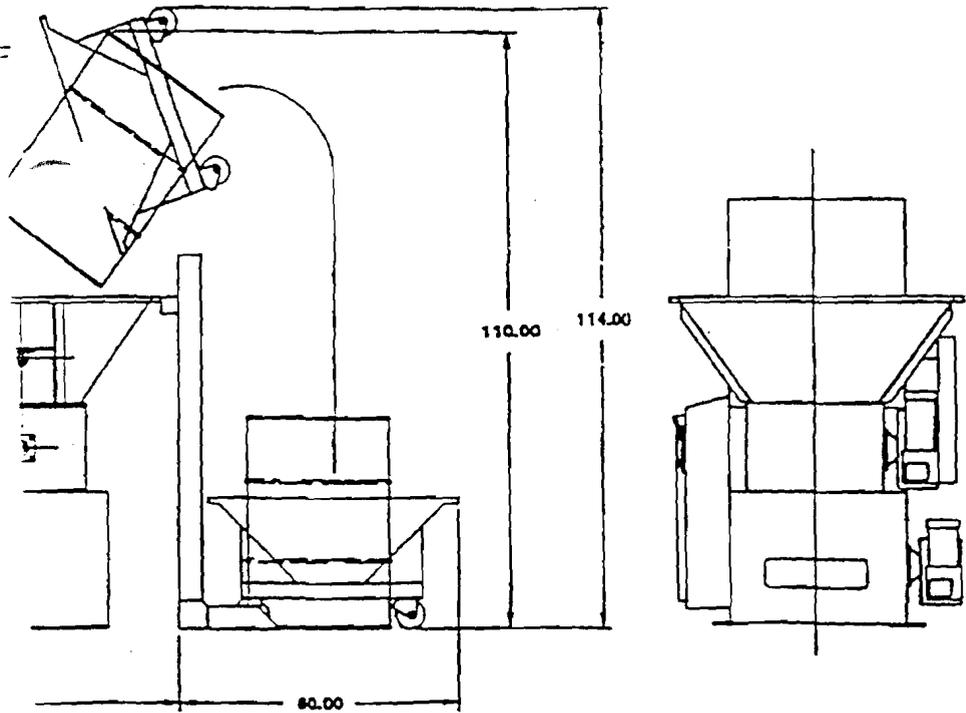
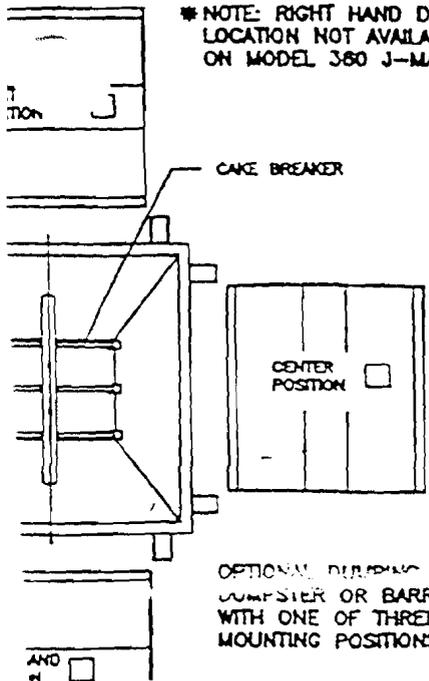
MINIMUM GAS REQUIREMENTS (GAS FIRED ONLY)
NATURAL GAS SUPPLY @ 7"-28" W.C.

MODEL: 120:	125 CFH (125,000 BTU)
MODEL: 180:	200 CFH (200,000 BTU)
MODEL: 360:	400 CFH (400,000 BTU)

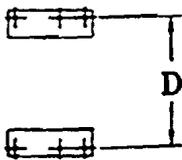
PROPANE GAS SUPPLY:

MODEL: 120:	42 CFH,	1.1 GPH
MODEL: 180:	68 CFH,	1.9 GPH
MODEL: 360:	135 CFH,	3.7 GPH

*NOTE: RIGHT HAND DUMP
 LOCATION NOT AVAILABLE
 ON MODEL 360 J-MATES.



BOLT HOLE LOCATION



REV.	QTY.	DATE	DESCRIPTION	BY
1				
JWI				
CONTINUOUS J-MATE				
G.A.				
MPD	H	REVISED SPECS	2/89	

4.2.4-743