

**The Doe Run Company
Herculaneum Smelter
Herculaneum, Missouri**

**WORK PRACTICE MANUAL
For Control of Lead Emissions**

January 2007

Use and Maintenance of this manual is a requirement of the Missouri Air Conservation Rule 10 CSR 10-6.120 (4), and the 2007 Revision of the State Implementation Plan (SIP) for the Herculaneum Lead Nonattainment Area. This document is intended to fulfill the obligation of 2007 SIP Consent Judgment.

(with the Primary Lead MACT)

Note: Revisions to manual are shown underlined for revision date shown on same page.

WORK PRACTICE MANUAL

Herculaneum Smelter

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**WORK PRACTICE MANUAL
HERCULANEUM SMELTER**

PURPOSE, USE AND CHANGE

1. This manual is written to comply with the Missouri Air Conservation Rule 10 CSR 10-6.120 Section (4).

This manual is also intended to fulfill the obligation under paragraph B.7. of the 2007 SIP Consent Judgment which was entered as an element of the 2007 Revision of the State Implementation Plan (SIP) for the Herculaneum Lead Nonattainment Area.

2. The manual shall be the method of determining compliance with the provisions of Doe Run's obligation under the rule and Consent Judgment. Failure to adhere to the work practices in the manual shall be a violation of the rule or Consent Judgment.
3. Any change to the work practices in the manual requires prior written approval from the MDNR director before any change becomes effective and goes into practice.

ACTION TO PREVENT EXCESS PROCESS EMISSIONS

-Utilizing Emissions Predictor Profile Operating Procedures (OP) and Decision Trees (DT)

Appendix A: Sinter Hood - Decision Tree

Appendix B: Sinter plant - Waste gas Inlet Temperature to # 3 Baghouse

Appendix C: Blast Furnace/# 5 Baghouse - Waste Gas Inlet Temperature to #5 Baghouse

4. Definitions:

Accumulated materials: lead bearing particulate that has the potential to become easily re-entrained.

Hose down: to wet or reduce accumulated materials.

Wetting: sufficient water to be used to insure no visible emission immediately following hose down.

150 Sinter Plant

1. A simplified crushing circuit was installed in 1991 in the sinter plant, resulting in a reduction in the number of physical pieces of equipment, reduced number of transfer points and improved ventilation through more efficient baghouses versus the previous wet scrubbers. The sinter plant crushing circuit is ventilated by the sinter plant "smooth rolls" baghouse.
2. Hose down of areas to be performed when weather conditions permit so as not to create slipping hazards due to ice formation or glazing of surfaces. These conditions can exist when the temperature is less than 39 F or whenever the application of water results in the formation of ice, which could result in injury to personnel.
 - a. The following areas will be hosed down on a per shift basis to wet or reduce accumulated material:

Location	Elevation, ft. (*)
-- sinter machine main floor	55
-- claw breaker floor	40
-- CV-40 floor area	40
-- Live roll floor area	19
-- bottom floor of sinter plant	0

- b. The following areas are scheduled for hose down on a per day basis to wet or reduce accumulated material:

-- wind box floor area	45
-- crusher baghouse floor	40

(*) In a. and b. elevations are Relative to the bottom floor elevation of 0 feet.

3. Sinter production will be limited to no more than 2160 tons per day and 169,190 tons per calendar quarter.
4. Sinter will be wet finished prior to loading to truck or rail for stock.
5. Sinter to stock pile shall be limited to 45000 tons to pile per quarter with a maximum in sinter stock storage pile of 20,000 tons.
6. Building doors to be kept closed during operations:
 - a. By April 7, 2008 Personnel doors (man doors) to the building will be kept closed except when entering and exiting the building by the aid of door weights or similar device to allow for automatic closure
 - b. By April 7, 2007 Large equipment doors will be kept locked and access allowed only by the shift supervisors permission for various pieces of mobile equipment and repair parts to enter and exit the building. Events of door opening and closing will be recorded in departments equipment doors key logbook.

Automatic closure systems may be used in place of the lock and key method. Equipment doors will be kept closed except when entering and exiting the building.

* During periods of heat alerts, it may be necessary to open these doors to prevent heat stress or exhaustion of those employees working inside. A record will be kept of those events as noted in "Record Keeping General" section 2 "Reasons for suspension of work practices".

7. Maintenance of doors and siding - During normal operating conditions all doors will be kept closed and siding/doors will be inspected regularly and repaired promptly. The area's employees will inspect the condition of the doors/siding every two weeks noting both need for repairs and executed repairs using the form found in Appendix G. If holes or openings are found in the doors/siding, request for repairs will be initiated and recorded on the building inspection form on the day of the inspection. Enclosed areas such as the sinter loading area on the northeast corner of the sinter area and cooler baghouse dust handling area will be integrated into the sinter building doors and siding inspection routine. The area supervisor will keep the Appendix G forms. Items for repair will be prioritized such that if a larger type opening such as a 4ft x 4ft size section is found missing, the department will immediately reduce operations up to and including shutting down the buildings processing of material if needed until opening is sealed. Smaller size openings such as a 6 inch type opening that will require bringing in offsite mobile equipment will be scheduled and sealed within 2 weeks.
8. By April 7, 2007 DOE RUN will maintain the hot gas section wheel tunnel of the sinter machine at a design rate of 15,000 cfm. These gases will be vented to the #3 baghouse which shall be designed to meet a total suspended particulate specification of 0.022 grains per dry standard cubic foot. The wheel tunnel ventilation will be continuously operated except when #3 sinter plant baghouse is down or when conducting necessary maintenance, in which instances interlocks will be activated, shutting down the fan.
9. By April 7, 2008 Doe Run will measure the wheel tunnel ventilation in conjunction with the wheel tunnel damper setting and fan amperage and develop a calculation of fan amperage to flow rates. Fan amps will be continuously recorded.
10. **Record keeping for the sinter plant will include:**
 - a. shift hose down to wet or reduce accumulated material of 1) sinter machine floor, 2) claw breaker floor, 3) cv40 floor area, 4) live roll floor area, 5) bottom floor of sinter plant
 - b. Record that water was being added to sinter going to truck or rail at the clamshell area.
 - c. daily sinter trucks to stock.
 - d. daily hose down to wet or reduce accumulated material of 1) wind box floor area, 2) crusher baghouse floor area.

- e. Every two week Building doors and siding inspections with record of requests for maintenance to be performed on findings of holes, openings or improperly working doors, as well as executed repairs, on appendix G form.
- f. Quarterly ventilation reading on Wheel Tunnel ventilation fan.
- g. Once installed, instruments shall continuously record fan amperage of the Wheel tunnel ventilation fan.
- h. Daily MACT differential pressure readings on baghouses.
- i. heat events that require doors to be open.
- j. Record entries of reasons of suspension of any work practices as noted in Record keeping - general section 2.
- k. Continuous recording of #3 baghouse fan amps.
- l. Large equipment doors key log of when doors were opened and closed. *(In the event that doors become automatic, this logbook will no longer be required.)*

152 Blast Furnace

- 1. Blast Furnace charge will be limited to no more than 2160 tons of sinter per day and 169,190 tons per calendar quarter.
- 2. The Dross Plant will be limited to no more than 1260 tons of rough lead produced per day.
- 3. Hose down of areas to be performed when weather conditions permit so as not to create slipping hazards due to ice formation or glazing of surfaces. These conditions can exist when the temperature is less than 39 F or whenever the application of water results in the formation of ice, which could result in injury to personnel.
 - a. The blast furnace feed floor operator will hose down feed floor areas north and south of the charging slots on a per shift basis to wet or reduce accumulated material.
 - b. The floor area in front of the blasting furnaces (blast furnace crane bay) is to be hosed down on a daily basis to wet or reduce accumulated material.
 - c. The area underneath the CV-13 conveyor will be hosed down on a weekly basis to wet or reduce accumulated material.
- 4. At least 3 pots will be used in lead pot rotation during normal furnace operations.
- 5. Building doors to be kept closed during operations:
 - a. By April 7, 2008 Personnel doors (man doors) to the building will be kept closed except when entering and exiting the

building by the aid of door weights or similar device to allow for automatic closure.

- b. By April 7, 2007 Large equipment doors will be kept locked and access allowed only by the shift supervisors permission for various pieces of mobile equipment and repair parts to enter and exit the building. Events of door opening and closing will be recorded by way of departments equipment doors key checkout logbook. Automatic closure systems may be used in place of the lock and key method. Equipment doors will be kept closed except when entering and exiting the building.

* During periods of heat alerts, it may be necessary to open these doors to prevent heat stress or exhaustion of those employees working inside. A record will be kept of those events as noted in "Record Keeping General" section 2 "Reasons for suspension of work practices".

6. Maintenance of doors and siding - During normal operating conditions all doors will be kept closed and siding/doors will be inspected regularly and repaired promptly. The area's employees will inspect the condition of the doors/siding every two weeks. If holes or openings are found in the doors/siding, request for repairs will be initiated and recorded on the building inspection form on the day of the inspection. The area supervisor will keep records of every two week inspections using a form found in appendix G. Items for repair will be prioritized such that if a larger type opening such as a 4ft x 4ft size section is found missing that results in visible building air outflow, the department will immediately reduce operations up to and including shutting down the buildings processing of material if needed until opening is sealed. Smaller size openings such as a 6 inch type opening that will require bringing in offsite mobile equipment will be scheduled and sealed within 2 weeks.
7. By April 7, 2007 furnace void "Blow Hole" Tuyere controls will be operated and maintained. The Automated flow controllers on the tuyers that inject air into the bottom of the furnace will be installed to continuously monitor flow at each tuyere. Tuyere controls will be operated with an interlock system that will automatically reduce the air flow into particular area of the furnace where the computer system detects a "blow hole" effect may be occurring. When the air flow is reduced into the bottom of the furnace, the "Blow Hole" effect on top of the furnace is then reduced to a point where the building ventilation will capture the remaining dust on the furnace feed floor if any residual dust from a hole through the feed shows up on the feed floor within the building. Electrical department will check the system once per quarter and correct programming as problems are found.
8. By April 7, 2007 Doe Run will operate an interlock system that will restrict air feed to the bottom of the furnace when the #5 baghouse fans are not operational such as during an electrical malfunction or mechanical failure. See appendix C.

9. By April 7, 2007 Doe Run will operate an alarm system that will detect when the number 5 baghouse temperature is nearing a point that will cause the baghouse fans to shut down. The alarm will give notice to the blast furnace personnel, by way of an audible alarm and flashing signal, resulting in measures to prevent automatic furnace air reduction and fan shutdown to occur. In the event that fan shutdown will occur, the above item #8 interlock system will take over. See appendix C.
10. By April 7, 2008 Doe Run will continuously record #5 baghouse flow readings on the outlet duct of #5 baghouse *and maintain a ventilation rate of 300,000 actual cubic feet per minute.*
11. By April 7, 2008 Doe Run will Continuously record #6 baghouse amperages *and maintain a ventilation rate of 50,000 actual cubic feet per minute.*
12. By April 7, 2008 Doe Run will Continuously record #7 baghouse amperages. Minimum flowrates to be determined during the building in-flow study.
13. **Record keeping for the blast furnace shall include:**
 - a. Shift items:
 - 1) hose down to wet or reduce accumulated material of 1) feed floor areas north and south of the charging slots, the shift work performed on (eg. Day, evening, night) and shift crew supervisor (eg. John Smith).
 - 2) Pots in rotation
 - b. Daily hose down to wet or reduce accumulated material of the floor area (crane bay) in front of the blasting furnaces (blast furnace crane bay), the shift work performed on (eg. Day, evening, night) and shift crew supervisor (eg. John Smith).
 - c. Weekly hose down to wet or reduce accumulated material of 1) area underneath the CV-13 conveyor the shift work performed on (eg. Day, evening, night) and shift crew supervisor (eg. John Smith).
 - d. Every two weeks building doors and siding inspections with record of requests for maintenance to be performed on findings of holes, openings or improperly working doors, as well as executed repairs, on appendix G form.
 - e. Large Equipment doors key log of when doors were opened and closed. In the event that doors become automatic this logbook will no longer be a requirement.
 - f. Continuous measurement of #5 baghouse flow on the outlet side of the baghouse.
 - g. Continuous measurement of #5 baghouse fan amperages.

- h. Quarterly - Automated "blow holes control" Inspection record by the electrical department showing that the program has been checked and is in proper working order. Any problems found will be corrected at the time of the program inspection and noted with the log of the inspection.
- i. Quarterly - #5 fans down warning due to #5 baghouse temperatures inspection record by the electrical department that the system has been checked and assured to be in proper working order. Any problems found will have corrective measures initiated on the day of the inspection and noted with the log of the inspection. Executed repairs will be recorded in the log with the inspection.
- j. Quarterly - Record by the electrical department that the #5 fans down automated restriction (of air flow to bottom of furnace tuyeres) system has been checked and assured to be in proper working order. Any problems found will be corrected on the day of the inspection and noted with the log of the inspection.
- k. Record entries of reasons of suspension of any work practices as noted in Record keeping - general, section 2.
- l. Continuous recording of #7 building ventilation baghouse fan amperages.
- m. Continuously recording of #6 baghouse fan amperages

155 Strip Mill

- 1. Strip mill floor will be vacuumed or washed at least once a week to wet or reduce accumulated material.
- 2. **Record keeping for the strip mill shall include:**
 - a. For vacuuming of the strip mill floor area the date, the shift work performed on (eg. day, evening, night) and foreman supervising the shift (eg. John Smith).
 - b. Record entries of reasons of suspension of any work practices as noted in Record keeping - general, section 2.

156 Refinery

- 1. Refinery dock floor will be vacuumed at least once a month to reduce accumulated materials.
- 2. Refinery kettle department will hose down the kettle floor at least once a week to wet or reduce accumulated material.
- 3. Refinery will be limited to 888 tons of refined lead produced per day and 50,000 tons per calendar quarter. Limitation may fluctuate as per consent agreement B (6)(c)

4. Hose down will only be performed when weather conditions permit so as not to create slipping hazards due to ice formation or glazing of surfaces. These conditions can exist when the temperature is less than 39 F or whenever the application of water results in the formation of ice, which could result in injury to personnel.
5. Building doors to be kept closed during operations:
 - a. By April 7, 2008 Personnel doors (man doors) to the building will be kept closed except when entering and exiting the building by the aid of door weights or similar device to allow for automatic closure
 - b. By April 7, 2007 Large equipment doors will be kept locked and access allowed only by the shift supervisors permission for various pieces of mobile equipment and repair parts to enter and exit the building. Events of door opening and closing will be recorded by way of departments equipment doors key checkout logbook. Automatic closure systems may be used in place of the lock and key method. Equipment doors will be kept closed except when entering and exiting the building.

** During periods of heat alerts, it may be necessary to open these doors to prevent heat stress or exhaustion of those employees working inside. A record will be kept of those events.*
6. Maintenance of doors and siding - During normal operating conditions all doors will be kept closed and siding/doors will be inspected regularly and repaired promptly. The area's employees will inspect the condition of the doors/siding every two weeks. If holes or openings are found in the doors/siding, request for repairs will be initiated and recorded on the building inspection form on the day of the inspection. The area supervisor will keep records of every two week inspections using a form found in appendix G. Items for repair will be prioritized such that if a larger type opening such as a 4ft x 4ft size section is found missing that results in visible building air outflow, the department will immediately reduce operations up to and including shutting down the buildings processing of material if needed until opening is sealed. Smaller size openings such as a 6 inch type opening that will require bringing in offsite mobile equipment will be scheduled and sealed within 2 weeks.
7. By April 7, 2008 a Kettle heat stack camera will be placed in a location that allows it to survey all Dross Plant and Refinery kettle heat stacks. The camera will be positioned so that emissions can be attributed to specific individual stacks, with minimal light interference. The camera will broadcast in real time to the sinter plant control room, environmental department, blast furnace control room, general foreman's office and the security office so that multiple people can observe for an event. Operators in the sinter plant control room will regularly observe this monitor, and the security office will provide a backup during periods when sinter operators are occupied. In the event that a plume of smoke is noticed from one or more of the kettle heat stacks, the refinery department will be contacted so that they can

immediately shut off the burners to the kettle(s) showing the problem(s) to stop the smoke, have the kettle dipped out to place contents into a previous kettle in the department before the material freezes in the kettle and log that a kettle heat stack event(s) occurred and which kettles were found to be causing the event(s).

8. Kettles and kettle settings will be inspected prior to putting back into operation to assure that any visible lead that was in the kettle setting area has been cleaned out and returned to the process.
9. By April 7, 2008 Doe Run will Continuously record #8 & #9 baghouse amperages (separately). Minimum flowrates to be determined during the building in-flow study.

10. Recording keeping for the Refinery shall include:

- a. Weekly hose down of the kettle floor area the date, the shift work performed on (eg. day, evening, night) and foreman supervising the shift (eg. John Smith).
- b. bi-weekly building doors and siding inspections with record of requests for maintenance to be performed on findings of holes, openings or improperly working doors on appendix G form.
- c. Monthly vacuuming of the refinery lead dock area the date, the shift work performed on (eg. day, evening, night) and foreman supervising the shift (eg. John Smith).
- d. Continuously record #9 & #8 baghouse fan amperages (separately).
- e. Large Equipment doors key log of when doors were opened and closed. In the event that doors become automatic this logbook will no longer be a requirement.
- f. Record entries of reasons of suspension of any work practices as noted in Record keeping - general section 2.
- g. Recording that kettle and kettle settings where inspected prior to replacing kettle and putting back into service.
- h. Events of kettle failures, including discovery and resolution, will be recorded and summarized monthly for the quarterly report.
- i. Record entries of reasons of suspension of any work practices as noted in Record keeping - general section 2, such as any heat events requiring doors to be open.

162 Baghouse

1. Hose down of areas to be performed when weather conditions permit so as not to create slipping hazards due to ice formation or glazing of surfaces. These conditions can exist when the temperature is less than 39 F or whenever the application of water

results in the formation of ice, which could result in injury to personnel.

- a. The ground floor in the # 3 baghouse will be hosed down on a daily basis to wet or reduce accumulated material Monday through Friday.
 - b. The ground floor in the # 5 baghouse will be hosed down on a daily basis to wet or reduce accumulated material Monday through Friday.
2. The #3 and #5 baghouse will use the redler conveyor to move captured dust back to the sinter plant for recycle.
 3. By April 7, 2007 Doe Run will operate water sprays during the movement of dust to railcars to prevent any visual dust from the area during the activity. The operator will increase the amount of water needed at this location in the event that cars begin showing a moisture content less than 8% from the yard departments fume rail car sampling. The purpose for additional water usage at this location is to reduce the need for any additional work of wetting fume by the fume railcar unloading person to maintain the 8% moisture content.
 4. Baghouses will be maintained in accordance with the subpart TTT MACT standards.
 5. **Record keeping:**
 - a. Shift hose down of #3 baghouse floor to wet or reduce material.
 - b. Shift hose down of #5 baghouse floor to wet or reduce material.
 - c. Weekly MACT inspection items
 - d. Monthly MACT inspection items
 - e. Quarterly MACT inspection items
 - f. Record entries of reasons of suspension of any work practices as noted in Record keeping - general section 2.

166 Yard

1. Transportation will wet finished sinter with a fire hose prior to loading sinter to Railcars.
2. Hosedown of plant areas may be suspended during any period when the temperature is less than 39 F, or whenever the application of water results in the formation of ice which could result in injury to plant personnel.
3. Concentrate will be received by truck at the truck unloading station between the hours of 6am and 10pm up to a total of 1,800 tons per day. (See appendix L).

4. A minimum of 11 truck loads of concentrate shall be received directly to railcar on days that concentrate is received. Doe Run shall endeavor to convey concentrate directly to rail cars at all times feasible. The concentrate delivery system may be altered if Doe Run identifies an improved system upon written approval of the Director of the Department of Natural Resources Air Pollution Control Program.

* Note, In the event of broken rails, derailed equipment, or if the unloading conveyor is under repair, direct loading to rail cars will be suspended, and the backup unloading plan (described in appendix M) will be implemented.

5. Concentrate will be received at a daily average moisture content of 6% or greater. The attendant at the unloading station will take a sample from each truck and place in a plastic bag to prevent drying. At the end of the shift the samples will be delivered to the laboratory for moisture analysis. The plant metallurgist will maintain the concentrate file for the daily average moisture contents. If the average daily moisture drops to be below 6%, the plant metallurgist will make the necessary contacts so that daily average moistures will be maintained at 6% or higher.
6. Slag will be hauled by truck to the slag storage pile for approximately 2 weeks per calendar quarter. Truck hauling shall occur during daylight hours. Hauling must be coordinated with Environmental crew to assure that unpaved haul route is covered by water truck at least once every 4 hours during days of hauling and treated with a dust suppressant within 72 hours after hauling period is complete.
7. Concentrate shall be unloaded at the railcar tipper/unloader between the hours of 6 AM and 10 PM.
8. Concentrate loaded to railcars from the ground will be limited to no more than 1187 tons per 6am to 10pm day period.
9. By April 7, 2007, fume shall only be unloaded to stock at the south end stock area between the hours of noon and 6 pm. The unloading of fume to the south end will be limited to 13 cars per quarter. By April 7, 2008, outside fume handling is to be maintained at a daily average moisture content of 8% or higher. Moisture samples will be taken from each car before it is unloaded at the south end stock area. An operator working the area will take the sample, place in a plastic bag and deliver to the lab for moisture analysis. If the moisture level is below 8%, water will be added to bring the moisture up to the 8% level or above. Yard department will notify the baghouse department if the trend for more or less moisture in the fume is needed.
10. Fume unloaded to stock on south end storage will be limited to no more than 1170 tons per calendar quarter.
11. Fume shall only be added into concentrate cars on the south end between the hours of 6am and 10pm. Outside fume handling is to be maintained at a daily average moisture content of 8% or higher. On

days they are working on the fume pile, the operators will visually ensure that moisture levels are such that dusting does not occur. If there is any visual sign of dusting, the operator performing the loading operation will ensure that water is added to the pile before continuing. The portion the pile that is going to be worked with will be sampled daily by the operators performing the loading to assure that moisture levels are being maintained at the 8% or greater level. If the moisture level result falls below the 8% level, water spray will be added to the material with a water hose to bring it back into the 8% or greater moisture level.

12. By April 7, 2008, Doe Run shall limit opening of doors at Rail car tipper/unloader building. Both North and South doors must be closed once a railcar is moved inside the building. Doors will remain closed while the car is tipped and material is conveyed out of the hopper. Doors may be **opened to move out an empty car or to bring a loaded car inside.** Doors will be kept closed when unloader is not in use. Doors may remain open during times equipment that will not fit inside the building is required for maintenance but tipper may not move material during these times..

13. Record keeping for the yard shall include:

1. Record of dates and time periods that trucks hauled slag to slag storage pile.
2. Daily record of railcar loading times:
 - a. Direct loading of concentrate from truck unloading
 - b. Storage loading of concentrate to railcar; dates, times, and tons.
 - c. Time when fume was added to concentrate railcars on south end.
3. Daily record of date and times sinter cars loaded on the south end stock area to rail cars.
4. Daily log record of date and times that rail loads were delivered to unloader and Furnace Trestle.
5. Daily average moisture contents of concentrate loads received.
6. Daily average % moisture, dates, times, and calculated tons of fume transferred on South end stock area from railcar to storage pile and recorded in daily log book.
7. Daily average % moisture in fume pile transferred to railcars at south end stock area.
8. Record of concentrate delivery dates, times and tons received.
9. Record entries of reasons of suspension of any work practices as noted in Record keeping - general section 2.
10. Record of when backup plan is used. Steps taken to correct.

185a Environmental Crew

1. Areas of the plant that are accessible by equipment will be cleaned a minimum of 6 hours per day on a Monday through Friday schedule. One or more of the following pieces of equipment will be used to perform the minimum of 6 hours of cleaning. Wet Sweeper, Water truck, hose washing and/or dry sweeper truck will wet and sweep those areas of plant that are accessible by the equipment. Operators will work off of daily check sheets to assure that all sweeping and watering routes, (see appendices E1, E2 and E3), have adequate coverage. A monthly summary of the daily hours of work performed will be kept by the environmental crew's supervisor. (see appendix E4)

On traffic routes inside the plant, the wet sweeper will be operated unless the temperature falls to below 39 Fahrenheit, When the temperature is below 39 degrees, the traffic routes in the plant will be swept with a high efficiency dry sweeper.

2. Environmental department crew is responsible for hosing down the area between the blast furnace blower room and the trestle on a weekly basis. Record will indicate which shift the work was performed on (eg. Day, evening, night) and the crew Supervisor for that shift. (eg. John Smith).
3. By April 7, 2007 Doe Run will operate a Regenerative air sweeper. Street Sweeping with a Regenerative air sweeper (or sweeper with equivalent or better capture efficiency design) will be performed at a minimum of 6 hours per day Monday through Friday and on any other day that concentrate is scheduled for delivery to the plant. (see routes appendix E3) (see monthly summary of daily sweeper use appendix E4) Sweeper effectiveness will be tracked by a minimum of Quarterly road/street samples designated as 1) Refinery dock road exit, 2) Truck wash exit, 3) Main and Curved Street 4) Station Street. (See Appendix O)
4. Temporary sources of dust on paved surfaces outside the plant due to spillage of materials will be addressed so as to limit the re-entrainment of those materials. Clean up to consist of those materials being loaded into transfer vehicles by either hand shoveling or should the need arise mechanized equipment. Final clean up will incorporate the use of floor sweep compound which will adhere to the smaller particles, making them easier to remove.
5. Chemically stabilize unpaved portion of slag haul route from blast furnace dewatering tanks to paved portion of roadway east of the refinery lead load out dock within 72 hours of completing slag hauling activity. See dotted line on water truck route map. (Appendix E1)
6. Water truck will wet the unpaved slag haul road route from slag dewatering tanks to paved portion of roadway east of the refinery lead load out dock at least once every 4 hours during any day or portion of day that the road is used for hauling slag to storage. (see dotted line on water truck route map (Appendix E1) The water truck will provide a minimum rate of 1000 gallons per day over the defined stretch of road (350 gal per trip). In the event that

rainfall occurs during the slag hauling process, the water truck will not be required to cover the road section. Record will be kept on daily water truck log.

7. Chemically stabilize inactive concentrate storage piles a minimum of once every month to crust surface area of piles and reduce particulate from wind born re-suspension.
8. Chemically stabilize inactive portion of fume storage pile at the yard area where fume is added to concentrate cars a minimum of once every month to crust surface area of pile and minimize particulate from wind born re-suspension. The water truck operator will spray the pile working with a pump and nozzle setup on the water truck. Record will be kept on the water truck operators piles treatment record form and on the monthly summary kept by the environmental crew supervisor (appendix E4)
9. Truck watering and hosedown of plant areas may be suspended during any period when the temperature is less than 39 F, or whenever the application of water results in the formation of ice which could result in injury to plant personnel. Watering and hosedown may be suspended during periods of natural wetting by rainfall.
10. By April 7, 2008 Doe Run will continuously operate a sprinkler system to cover haul routes within the plant. The sprinkler system will be operated when weather conditions permit so as not to create slipping hazards due to ice formation or glazing of surfaces. These conditions can exist when the temperature is less than 39 F or whenever the application of water results in the formation of ice, which could result in injury to personnel. Coverage area map is provided in appendix E-5. Record reasons for any activities not being performed relative to paragraph 2 of "General Record Keeping" section such as short periods of time when water pumps have to be off line for repair and maintenance or conditions exist that cause ice formation which would normally occur at less than 39^o F.
11. By April 7, 2007 Doe Run will maintain a fence to preclude Public access to in plant property. See appendix F fence line map.
12. **Record keeping for the environmental crew shall include:**
 - a. Daily Regenerative air outer roads/streets street sweeper route trip coverage record.
 - b. Daily in plant and slag haul road route water truck use log.
 - c. In plant Envirowhirl sweeper truck log.
 - d. Weekly hosing down the area between the blast furnace blower room and the trestle the shift work performed on (eg. Day, evening, night) and shift crew supervisor (eg. John Smith).
 - e. Daily in plant wet sweeper log.
 - f. Quarterly sampling results of outer roads/streets sampling.
 - g. Monthly record of treating piles on south end stock storage.

- h. Weekly sprinkler inspection record.
- h. Quarterly fence inspection record.
- i. Sweeper effectiveness surveys.
- j. Reasons for any activities not being completed relative to paragraph 2 of General Record keeping.
- k. Monthly sweeper, water truck summary log for Quarterly report.

**185b
Environmental Dept.**

- 1. Monthly reviews for action items/data/recording by departments
- 2. Sample day reviews for monitoring for improvement.
- 3.

Reporting:

- 1. Quarterly S.I.P. Report to MDNR by end of first month following a standard sampling quarter that will include:
 - A. Summary of sample day reviews
 - B. Monthly summary log of sweeper activities
 - C. Quarterly air lead report
 - a. latest laboratory lead audit result
 - b. sample day results for the quarter
 - c. reasons for no sample results
 - D.
- 2. Quarterly meteorological audits to EPA by end of first month following a standard sampling quarter:

**185c
Meteorological Monitoring**

- 1. No later than April 7, 2007 Doe Run will operate all instruments necessary to measure the following parameters in accordance with manufacturer's instructions as well as the latest version, Vol. IV - Meteorological Measurements, Revised EPA/600/R-94/038d (EPA-454/R-99-005, Meteorological Monitoring Guidance for Regulatory Applications, may also be consulted), until EPA has formally redesignated the Herculaneum Lead Nonattainment area as an attainment area for lead:
 - a. At the River meteorological station:
 - i. 10 meter wind speed
 - ii. 10 meter wind direction
 - iii. 10 meter temperature

- iv. 2 meter temperature
 - v. Delta T, 2-10 meters
 - vi. Sigma-theta, 10 meters
 - vii. Barometric pressure (between 1-6 meters)
 - viii. Relative humidity (between 1-6 meters)
 - ix. Incoming solar radiation (between 1-6 meters)
 - x. Net radiation (between 1-6 meters)
 - xi. Precipitation (between 1-6 meters)
- b. At the Broad Street meteorological station:
- i. 2 meter wind speed
 - ii. 2 meter wind direction
 - iii. 2 meter temperature
 - iv. 10 meter wind speed
 - v. 10 meter wind direction
 - vi. 10 meter temperature
 - vii. 40 meter wind speed
 - viii. 40 meter wind direction
 - ix. 40 meter temperature
 - x. Delta T, 2-10 meters
 - xi. Delta T, 10-40 meters and 10 meter sigma theta
 - xii. Delta T, 2-40 meters and 40 meter sigma theta
 - xiii. Barometric pressure (between 1-6 meters)
 - xiv. Relative humidity (between 1-6 meters)
 - xv. Incoming solar radiation (between 1-6 meters)
 - xvi. Net radiation (between 1-6 meters)
 - xvii. Precipitation (between 1-6 meters)
2. By April 7, 2007, Doe Run will submit a protocol applying to all Doe Run meteorological sites (as identified above) to MDNR and EPA. Any issues identified by EPA or MDNR following submission will be addressed by Doe Run. The protocol will address all elements contained in the Doe Run document entitled, "Meteorological QA Project Plan", updated on October 1997, in addition to the following, applicable to each meteorological site and all parameters collected therein:
- a. A quality assurance (QA) and quality control (QC) program in accordance with the manufacturer's instructions, in accordance with the EPA's Quality Assurance Handbook for Air Pollution Measurements, Vol. IV-Meteorological Measurements, Revised EPA/600/R-94/038d.
 - b. The data from the meteorological monitor shall be continuously recorded, reported and processed as fifteen (15) minute and one (1) hour averages.
 - c. Electronic copies of the fifteen (15) minute and one (1) hour averages data for the previous month will be provided to EPA no later than the end of each month.
 - d. Raw electronic data will be permanently archived. Specific sets of raw data will be provided in electronic format to MDNR or EPA within 30 days of receipt of written request.

- e. Install, maintain, and respond to an automated alert system which will issue an alert when any data are not being recorded.
- f. Weekly reviews of the meteorological data shall be conducted by an independent Certified Consulting Meteorologist (CCM) or equally qualified individual to identify any potential biases, errors, or equipment malfunctions. The independent CCM or equally qualified individual shall have the authority to order immediate changes in monitoring equipment or procedures to rectify any identified issues. Weekly findings summaries will be completed and permanently filed. Weekly summaries will be provided to MDNR or EPA on request.
- g. Minimum weekly visual observations of equipment. Conduct visual checks for debris, verify that the wind vane and wind speed propeller are behaving consistently with observed conditions. Maintain a log of checks and findings. See logsheet example in appendix H.
- h. At least once per month, qualified technicians will visit the monitoring site and conduct a visual inspection of all sensors. Real-time observation of the data will be viewed and compared to visual observations of the sensors. The technician will also check for the elements listed in appendix H. Should any problems be found, corrective action will be taken immediately. If data capture falls below 90%, visits will become every two weeks.
- i. Quality assurance audits on all instruments will be conducted once every three months by a qualified technician using calibration devices certified annually to NIST standards.
- j. Audit findings will be reported to Doe Run within a week of the audit.
- k. Doe Run will have a complete unit backup system ready to be installed at all times.
- l. Doe Run will ensure that all sensor and data collection problems are rectified no later than 24 hours following detection. If Doe Run expects a problem will take longer than 24 hours to rectify, Doe Run will communicate this to MDNR and EPA no later than 24 hours following initial detection, and will report the cause for the delay and what they are doing to address the situation, and will institute measures to prevent such a delay in the future.
- m. Quality assurance audits will be sent to EPA when sent to or produced by Doe Run. Data will be provided to MDNR upon request.

1. By April 7, 2007 operate Teom Total Suspended Particulate (TSP) samplers at the Broad Street site and Main Street/City Hall site to continuously monitor Total Suspended Particulate in the air. Samplers will be operated according to manufacturers specifications and audited each quarter with NIST traceable equipment. Samplers will be maintained to achieve 90% data capture.
2. Air samples from the every 6th day EPA sampling schedule at the Broad St. and City Hall monitoring sites will be evaluated to determine the total lead concentration. If either of the samples records a daily average concentration greater than 1.5 micrograms of lead per cubic meter, then the sample(s) with the concentration above 1.5 micrograms, will be evaluated using a receptor modeling technique (e.g. Chemical Mass Balance). In conjunction with this analysis of the lead samples, staff will evaluate the 15-minute average Tapered End Oscillating Microbalance (TEOM) data for each site that exceeds the 1.5 microgram threshold to identify periods of high particulate loading. Also, the 15-minute average meteorological data from the Broad St. meteorological station will be analyzed to determine precipitation events and wind speed/wind direction for all time periods during the day with special attention to period(s) of high particulate loading identified above. Production records for each department and any upset conditions will be tracked to identify sources of lead emissions from the facility. For samples less than 1.5 micrograms daily average lead concentration, staff will conduct the same type of evaluation without the receptor modeling and particulate data review (only meteorological data, production records, and upset conditions). This sampling and analyses are designed to provide a baseline for plant operation for daily concentrations less than 5 micrograms of lead per cubic meter. An example of the full analysis summary is provided in Appendix N.
3. Any air sample at the Broad St. or City Hall monitoring sites with a daily average over 5 micrograms of lead per cubic meter will undergo the full review prescribed above in (2). The results of this review will include an identification of source(s) or source area(s) responsible for the 5 microgram concentration and a record of the root cause analysis conducted for this day. The root cause analysis will address plant operations/upsets and meteorological conditions associated with periods of high particulate loading at the TEOM sampler(s). At a minimum, these analyses will be categorized with respect to department and utilized to identify sources or source areas for which potential contingency measures will be investigated (if necessary) under the 2007 consent agreement.
4. An Environmental Task Management System will be implemented that will include area tasks relating to requirements of the Herculeaneum State Implementation Plan for Lead.
5. **Recordkeeping for the Monitoring for Improvement**
 - a. Sample day chart with Broad Street meteorological data and TSP data for the EPA six day sample schedule of each month. See appendix N Preliminary example of sample day chart.
 - b. Sample day chart with Broad Street meteorological data and TSP data for any sample days with equal to or greater than 5 micrograms of lead per cubic meter of air per day.

- c. Operations report for each EPA six day sample schedule of each month as well as any days with results of equal to or greater than 5 Pb ug/m3/day

Reporting

- a. Quarterly - submit a one to two page summary of sample day reviews by the end of the first month following the end of the quarterly standard monitoring period to MDNR. In the event that a sample falls late in a quarter and CMB analysis results could not be received in time for the quarterly report, the late sample's results will be included in the following quarterly report.

**Construction guidelines
For Capital Construction Projects**

1. Prevention of fugitive dust shall be a consideration in the planning of construction projects.
2. Where feasible old building components will be cleaned by either vacuum or water hose to reduce fugitive emissions prior to removal. Additional power washing may be performed once the component has been removed to an area where electrical shock or shorting of existing equipment can be avoided to assure fugitive emissions do not occur during further handling.
3. Where feasible both the in house water truck and sweeper truck shall be used during construction projects to address dirt stirred up by trucks.
4. Water hoses/water sprays shall be used to address potential dust emissions during excavation should the specific conditions warrant their use.
5. Excavation materials shall be managed to minimize dust blowing (for example, wetting with water hoses, surface treatment with dust binder, establishment of vegetation, trapping).

Record Keeping - General

1. Records will be maintained of regularly scheduled quarterly inspections made by the environmental department of fugitive emissions control equipment such as hoods, air ducts and exhaust fans. See Appendix D for diagrams.
2. For records during periods of suspension of any work practices an entry will be made in the weekly/monthly record after the date that will relate to the following reasons for suspension: "Weather suspension", "Equipment repair/maint", "Operations suspension", "Rain" etc.
 - A. Adverse Weather:

The work practices that use the application of water as described herein may be suspended whenever the application of water results in the formation of ice which could result in injury to plant personnel.

The work practices that refer to closure of doors may be suspended based on heat alerts as issued for the St. Louis area by the National Weather Service or to protect the employees from heat stress and heat exhaustion.
 - B. RAIN:

The work practices that refer to water truck, wet sweeping and hose down in the yard may be suspended when precipitation has resulted in the ground being naturally wetted.
 - C. Equipment Maintenance and Repair:

Sweeping and application of water may also be suspended during those periods necessary to perform maintenance and repairs of equipment essential to the respective activity. Any maintenance and repair work shall be completed as soon as possible, and upon completion, the respective activity shall be immediately resumed in accordance with the stated practice.
 - D. Suspension of Production Operations:

When department is down and material is not being conveyed or processed.
 - E. Suspension of Sweeping:

When snow or ice interfere with operation of sweeper.
3. Records will be maintained of monthly audits conducted by the environmental department with those departments who conduct work practice controls contained in this manual on a daily or more frequent basis. The purpose of the audit is to certify that the requirements of the WPM are being followed.
4. Records of throughputs will be compiled as follows:
 - a. daily records = day shift 5am-5pm report + night shift report 5pm-5am
 - b. 24 hour total = activities occurring from day shift 5am-5pm report + night shift report 5pm-5am

- c. MDNR will be notified In the event that shift work hours change to a different time frame.

SUSPENSION OF WORK PRACTICES

A. Adverse Weather

The work practices that use the application of water as described herein may be suspended whenever the application of water results in the formation of ice which could result in injury to plant personnel.

The work practices that refer to closure of doors may be suspended based on heat alerts as issued for the St. Louis area by the National Weather Service or to protect the employees from heat stress and heat exhaustion.

B. Equipment Maintenance and Repair

Sweeping and application of water may also be suspended during those periods necessary to perform maintenance and repairs of equipment essential to the respective activity. Any maintenance and repair work shall be completed as soon as possible, and upon completion, the respective activity shall be immediately resumed in accordance with the stated practice.

C. Suspension of Production Operations

In the event that department production operations are suspended and shutdown; sweeping and watering applications in the department may be suspended for the duration of the such period until normal operations are resumed.

VENTILATION SURVEY

- A. The plant ventilation systems list in the "D" appendices will be given a volume survey each calendar quarter.
- B. Volumes recorded will be compared with previous quarters to determine need for attention. If the flow rate drops to roughly 75% of what the approximate flow rate is expected to be, the system will be reviewed to see if ventilation ductwork needs cleaning attention or maintenance on items such as fan belts, ductwork, dampers or fan blades need attention.
- C. Ventilation Systems:

Name/Location	Approx. rate, acfm
1. New smooth rolls baghouse	11,000
2. CV-10 Grizzly	9,000
3. CV-10/CV-11/CV-12 vent	8,000
4. CV-13 and CV-14 vent	6,000

5.	Scale belt vent	11,000
6.	Crow's nest vent	14,000
8.	"D" kettle fluxing vent	12,000
9.	Blast fce front end vent	25,000
10.	Wheel Tunnel Vent.	15,000
D.	Systems air flow Diagrams - See Appendix D	