



## DEPARTMENT OF NATURAL RESOURCES

## MISSOURI AIR CONSERVATION COMMISSION

## PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 062011-004      Project Number: 2011-02-043  
Installation Number: 093-0009

Parent Company: The Doe Run Company

Parent Company Address: 1801 Park 270 Drive, St. Louis, MO 63146

Installation Name: Buick Resources Recycling Facility, LLC

Installation Address: 18954 Highway KK, Boss, MO 65440

Location Information: Iron County, S14, T34, R2W

Application for Authority to Construct was made for:

The addition of pollution control equipment to the existing reverberatory furnace and an alternative emergency bypass system. The installation of a new afterburner, baghouse, dry scrubber and dry scrubber baghouse are planned for improved control of the reverberatory furnace process gasses. The new equipment would replace the existing sodium carbonate based sulfur removal process and when operating the bypass from sonic cooler to the existing main baghouse, sulfur control will be by dry addition of soda ash to the reverberatory feed. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

JUN - 8 2011

EFFECTIVE DATE

Handwritten signature of Kya L. Moore in cursive script.

DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Departments' Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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## SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

Buick Resources Recycling Facility, LLC  
Iron County, S14, T34, R2W

### 1. Superseding Condition

The conditions of this permit supersede the following special conditions found in the previously issued construction permit 012005-008A with project number 2007-06-053 issued by the Air Pollution Control Program.

- A. Special Condition number 2 for SO<sub>2</sub> limit of 3,436 tons of sulfur dioxide from the main stack in any rolling 12 month period.
- B. Special Condition number 3 for the CO limit of 13,058 tons of carbon monoxide (CO) from the Main Stack (EP-08) in any rolling 12 month period.
- C. Special Condition number 4 for the PM<sub>10</sub> limit of 9.2 tons of filterable and condensable particulate matter less than 10 micron in diameter (PM<sub>10</sub>) from the main stack ( EP-08) in any rolling 12 month period.
- D. Special Condition number 5 for the lead (Pb) Limit of 5.31 tons of lead from the main stack( EP-08) in any rolling 12 month period

### 2. Emission Limitation

- A. Buick Resources Recycling Facility, LLC shall emit less than 7.0 tons of sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>) in any consecutive 12-month period from the desulfurization scrubber and baghouse (CD-37) which are controlling emissions from the reverberatory furnace.
- B. Buick Resources Recycling Facility, LLC shall emit less than 13.68 tons of condensable and filterable PM<sub>2.5</sub> in any consecutive 12-month period from control listed below the desulfurization scrubber and baghouse (CD-37) which are controlling emissions from the reverberatory furnace.
- C. Buick Resources Recycling Facility, LLC shall keep track of monthly sulfuric acid mist and PM<sub>2.5</sub> emissions and calculate the rolling twelve (12) month emissions at the end of each month to demonstrate compliance with the above limits. Buick Resources Recycling Facility, LLC shall use Attachment A, and Attachment B or equivalent forms approved by the

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

Air Pollution Control Program to keep track of the emissions of sulfuric acid mist and PM<sub>2.5</sub>. All records shall be kept onsite for at least five (5) years.

- D. Buick Resources Recycling Facility, LLC shall emit less than 3118.42 tons of sulfur dioxide (SO<sub>2</sub>) from the Main Stack (EP08) in any rolling twelve (12) month period. Doe Run shall use a Certified Continuous Emissions Monitoring System (CEMS) to comply with the above limit.
  - E. Buick Resources Recycling Facility, LLC shall emit less than 10,862.46 tons of Carbon Monoxide (CO) from the Main Stack (EP08) in any rolling twelve (12) month period. Doe Run shall use a Certified Continuous Emissions Monitoring System (CEMS) to comply with above limit.
  - F. Buick Resources Recycling Facility, LLC shall emit less than 24.2 tons of filterable and condensable particulate matter less than 10 micron in diameter (PM<sub>10</sub>) from the Main Stack (EP08) in any rolling twelve (12) month period.
  - G. Buick Resources Recycling Facility, LLC shall emit less than 4.9 tons of lead (Pb) from the Main Stack (EP08) in any rolling twelve (12) month period.
  - H. Buick Resources Recycling Facility, LLC shall keep track of monthly SO<sub>2</sub>, CO, PM<sub>10</sub> and Pb emissions from the Main Stack (EP08) and calculate the rolling twelve (12) month emissions at the end of each month to demonstrate compliance with the above limits. Buick Resources Recycling Facility, LLC shall use Attachment C, and Attachment D or equivalent forms approved by the Air Pollution Control Program to keep track of the emissions of PM<sub>10</sub>.and Pb. All records shall be kept onsite for at least five (5) years.
3. Performance Testing
- A. Doe Run shall conduct stat tests in order to develop emission factors used to the required record keeping for demonstration of compliance with the emission limitations listed in Special Condition in 2.A., 2.B, 2.F. and 2.G. within 180 days after startup of the desulfurization scrubber. In order to show continued compliance, stack tests shall be conducted once every five years for the main stack (EP08) or desulfurization scrubber (depending on which is applicable) after the issuance of this permit. The applicable test methods and procedures for the permitted pollutants are

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### SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

summarized in 3.B. through 3.I. An alternate method(s) of quantifying the emission rates of pollutants may be used in place of the testing requirement, if requested by Doe Run and approved by the Director. An alternate testing method can also be used if approved by the Compliance Unit of the Air Pollution Control Program.

- B. The test methods and procedures outlined at 40 CFR Part 51, Appendix M, Methods 201, 201A, and 202 shall be adhered to by the applicant in testing for PM<sub>10</sub> and PM<sub>2.5</sub>. Condensable and filterable fractions of PM<sub>10</sub> and PM<sub>2.5</sub> must be tested.
- C. The test methods and procedures outlined at 40 CFR Part 60, Appendix A, Method 12 shall be adhered to by the applicant in testing for lead.
- D. The test methods and procedures outlined at 40 CFR Part 60, Appendix A, Method 8 shall be adhered to by the applicant in testing for Sulfuric Acid Mist.
- E. The test procedures in 3.B. through 3.D. shall have at least 3 test runs and minimum test time of 1-hour.
- F. The desulfurization scrubber will be tested to verify a particulate exit concentration of 0.01 grains per dry standard cubic foot (gr/dscf) and a 95 percent SO<sub>2</sub> reduction in emissions using Method 5 for PM and Method 6 or 6c for SO<sub>2</sub> reduction. An emission factor shall be developed for the scrubber for Sulfuric Acid Mist (H<sub>2</sub>SO<sub>4</sub>) and PM<sub>2.5</sub> per ton of reverberatory feed.
- G. The date on which performance tests are conducted must be pre-arranged with the Air Pollution Control Program a minimum of 30 days prior to the proposed test date so that this Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. A completed Proposed Test Plan form (copy enclosed) may serve the purpose of notification and must be approved by the Air Pollution Control Program prior to conducting the required emission testing.
- H. Two (2) copies of a written report of the performance test results shall be submitted to the Director of the Air Pollution Control Program within 30 days of completion of any required testing and receipt of analysis. The report must include legible copies of the raw data sheets, analytical

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The permittee is authorized to construct and operate subject to the following special conditions:

instrument laboratory data, and complete sample calculations from the required EPA Method for at least one (1) sample run.

- I. If one (1) or more of the above air pollutants for which testing is required by Special Condition 3 is also required to be tested to demonstrate compliance with an applicable rule (such as 40 CFR Part 60 Subpart L, *Standards of Performance for Secondary Lead Smelters*, and 40 CFR Part 63 Subpart X, *National Emission Standard for Hazardous Air Pollutants from the Secondary Lead Smelting, etc.*), then Doe Run may conduct the performance testing according to the time frames indicated by the applicable regulation.
4. Control Device Requirement-Baghouse
    - A. Buick Resources Recycling Facility, LLC shall control emissions from the reverberatory furnace as specified in the permit application, using the following:
      - 1) New baghouse prior to the scrubber (CD-35)
      - 2) Baghouse which is a component of the dry scrubber (CD-37).
    - B. The baghouses shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources' employees may easily observe them.
    - C. Replacement filters for the baghouses shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
    - D. Buick Resources Recycling Facility, LLC shall monitor and record the operating pressure drop across the baghouses at least once every 24 hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
    - E. Buick Resources Recycling Facility, LLC shall maintain an operating and maintenance log for the baghouses which shall include the following:
      - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
      - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

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## SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

### 5. Control Device Requirement-Scrubber

- A. The scrubbing system associated with the desulfurization or the by-pass line with soda ash (sodium carbonate) and lime addition shall be used to control sulfur emissions at all times that the reverberatory furnace is in use.
- B. Doe Run shall monitor and record the operating pressure drop across the scrubber at least once every twenty four (24) hours of operation. The scrubber shall be equipped with a gauge or meter that indicates the pressure drop across the scrubber. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
- C. Doe Run shall maintain an operating and maintenance log for the scrubber which shall include the following:
  - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
  - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
  - 3) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.
- D. The by-pass line is limited to 720 hours of operation per year during reverberatory furnace operation. Tracking of the hours of operation that the by-pass is in operation will be recorded in the blast furnaces shift supervisors' log. The start time will be when the by pass is opened and the stop time will be when it is closed.
- E. Doe Run shall maintain an operating and maintenance log for the by-pass line closing mechanisms and sealing mechanism which shall include the following:
  - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
  - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
  - 3) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.

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The permittee is authorized to construct and operate subject to the following special conditions:

- F. Doe Run shall establish operating parameters during the stack testing required by Special Condition 3. The scrubber shall operate within these parameters at all times. These parameters will include the operating parameters of the afterburner.
  
- 6. This installation shall comply with all applicable emission limits, testing, monitoring, sampling, reporting, and record keeping requirements of 40 CFR Part 63, Subpart X, *National Emission Standards for Hazardous Air Pollutants from Secondary Lead Smelting*.
  
- 7. This installation shall comply with all applicable emission limits, monitoring, testing, reporting, and record keeping requirements of 40 CFR 60, Subpart L, *Standards of Performance for Secondary Lead Smelters*.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2011-02-043  
Installation ID Number: 093-0009  
Permit Number:

Buick Resources Recycling Facility, LLC  
18954 Highway KK  
Boss, MO 65440

Complete: March 15, 2011

Parent Company:  
The Doe Run Company  
1801 Park 270 Drive  
St. Louis, MO 63146

Iron County, S14, T34, R2W

REVIEW SUMMARY

- Buick Resources Recycling Facility, LLC has applied for authority to add pollution control equipment to the existing reverberatory furnace. The additional control equipment includes a new after burner, baghouse and dry scrubber with bag house for control of the reverberatory furnace process gasses. This project also includes a bypass line with dry addition of soda ash to the reverberatory feed for sulfur control.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are Pb Compounds which are decreased.
- 40 CFR 60 Subpart L, "Standards of Performance for Secondary Lead Smelters" applies to the reverberatory furnace.
- 40 CFR Part 63, Subpart X, *National Emission Standards for Hazardous Air Pollutants from Secondary Lead Smelting* of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation.
- An after burner, two baghouses and a dry scrubber are being used to control the SO<sub>2</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub> and Sulfuric Acid Mist (H<sub>2</sub>SO<sub>4</sub>) emissions from the reverberatory furnace in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule Sulfuric Acid Mist, PM<sub>10</sub> and PM<sub>2.5</sub> emission increases were limited to below de minimis levels. All other pollutants are below de minimis levels.
- This installation is located in Iron County, a non attainment area for the 2008 lead (Pb) National Ambient Air Quality Standard.

- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation is classified as item number 19. Secondary metal production plants. The installation's major source level is 100 tons per year and fugitive emissions are counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing are required for the equipment.
- A revised Part 70 Operating Permit application is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

The Doe Run Company operates the Buick Resources Recycling Facility (BRRF) and is a major source with a draft Part 70 operating permit. They are an industry leader in lead recycling. Battery recycling yields a useful byproduct, sodium sulfate, which is used in laundry detergent, paper and glass manufacturing industries. Approximately, seventy five percent or more of the lead recycled at BRRF comes in the form of automotive and industrial batteries.

Batteries arrive at BRRF in Boss, Missouri by truck. They are unloaded and placed into a battery bunker. Approximately one-third of all batteries that are received still have an electrical charge on them, so the batteries are picked up by a loader and placed into a stainless steel shredder.

The whole battery is broken in the shredder, and the battery acid (weak sulfuric acid) is drained and collected into storage tanks. This acid is used later in the process. The shredded batteries are placed in a vibrating feeder that feeds a conveyor belt into the hammer mill. The hammer mill pounds the battery into smaller pieces.

Each lead acid battery contains a set of metal grids, lead posts, plastic components, separators, and a lead sulfate paste. The paste is removed by washing through sets of screens for further processing. After going through the hammer mill, the battery pieces enter into a hydro separator where water separates the heavier elements. All of the lead and metal components sink to the bottom and the floating items are skimmed off and sent to the recycling facilities.

The metallic portions of the batteries including grids, posts, other metallics and constituents are primarily fed to the reverberatory furnace and maybe fed to the blast furnace as well. Lead from the furnaces is mixed with other metals to produce alloys that are cast into products of various weights, shapes and sizes in the refinery.

While the lead components are being processed, the battery paste is de-sulfurized through a chemical reaction with sodium carbonate. The battery paste is transferred to one of the two desulfurization reaction tanks and mixed with sodium carbonate ( $\text{Na}_2\text{CO}_3$ ). The  $\text{Na}_2\text{CO}_3$  reacts with the lead sulfate ( $\text{PbSO}_4$ ) in the battery paste to produce a lead carbonate ( $\text{PbCO}_3$ ) paste and a sodium sulfate ( $\text{Na}_2\text{SO}_4$ ) solution. This process improves the furnace efficiency by reducing the amount of fluxing agents required to reduce lead-sulfur compounds to lead metal. The process also reduces sulfur dioxide ( $\text{SO}_2$ ) furnace emissions. The lead carbonate material is removed by passing the reacted material through a filter press. The remaining sodium sulfate solution is then crystallized to produce a high quality salt that is marketed to the laundry detergent, paper, and glass industries.

The remaining lead carbonate paste is heated at extremely high temperatures in a reverberatory furnace to produce soft antimonial lead bullion and a product called reverberatory slag. The reverberatory slag is fed to the blast furnace to recover the antimonial lead. What remains is a small quantity of secondary blast furnace slag, glassy sand like material that consists of silica, calcium, iron and approximately less than two percent lead. This slag may be treated prior to being transported to the on-site landfill or offsite for disposal.

The following permits have been issued to Doe Run Company-BRRF from the Air Pollution Control Program.

**Table 1: Permits Issued to Doe Run Company-BRRF.**

Permit Number	Description
0179-018	Minor Source Permit
0989-003	Major Source Review
0792-016	Minor Source Permit
0493-006	Minor Source Permit
1093-010	Minor Source Permit
0693-013	Minor Source Permit
1093-003	Minor Source Permit
0989-003	Minor Source Permit
0989-003	Minor Source Permit – amendment increase in lead bullion
1095-009	Minor Source Permit- install pot furnace
	Temporary permit slag treatment process
1296-012	Minor Source Permit - oxide transfer system
0297-015	Minor Source Permit - slag treatment system
0997-006	Minor Source Permit - Metal reclamation sweat furnace
OP	Part 70 Operating Permit
102000-007	Minor Source Permit - Blast furnace production
012005-008	Secondary smelter Major Source Review
092006-007	Multi-Hearth Rotary Furnace
012005-008A	Amendments
012010-006	Boilers

## PROJECT DESCRIPTION

This project considered is a modification to an existing unit at a major source. The reverberatory furnace is the existing unit. The site is changing the way it removes sulfur. If the site elects to revert to the front-end loaded desulfurization they must review the permit issues with the Department before restarting that process. The new sulfur removal process will consist of driving the sulfur from the paste in the reverberatory furnace as  $\text{SO}_2$ . The process is a proven method of operating at other secondary lead production facilities. The sulfur compounds will exit the reverberatory furnace through the existing ductwork and enter into a new afterburner. Excess air will be blown into the after burner to oxidize the sulfur compounds to  $\text{SO}_2$  and the CO will also be oxidized. From the afterburner, the hot gases will enter the existing sonic cooler to reduce the temperature of the gas (air and water sprays will be used to cool the gas). The cooled gas will then go through a new baghouse for particulate control. Finally, the particulate cleaned gas will enter a new dry lime scrubber where the  $\text{SO}_2$  and any  $\text{SO}_3$  will be removed from the gas. The cleaned gas will be then be directed to another baghouse prior to discharging to the main stack. Hydrated lime will be used in the scrubber to absorb the  $\text{SO}_2$ . The scrubber waste is planned to be blended with wet blast furnace slag prior to disposal or to be marketed if a suitable use can be determined. If the blast furnace slag processing system is down, the scrubber waste will be processed in a pugmill at a moisture content of 20 to 25 percent, by weight prior to disposal.

Removal of the front-end loaded desulfurization increases the total amount of sulfur in the reverberatory furnace feed and increases the potential for reduced sulfur compound formation. The afterburner will oxidize any reduced sulfur compounds to  $\text{SO}_2$ . Additionally, CO will also be oxidized to  $\text{CO}_2$ . CO emissions from EP-08 have been under evaluation for some time and this has revealed a new calculation method that will result in an increase in the CO limit. The calculation method will incorporate methods of operation that were not disclosed in previous applications. The Department is currently processing an application to increase the CO limit. The afterburner is designed to operate at approximately 1900 degrees Fahrenheit with a residence time of 1 second. The total destruction efficiency for the CO and reduced sulfur compounds should exceed 99 percent.

A new baghouse will be added because the particulate cleaning must occur prior to the scrubber. The baghouse dust will be transferred by enclosed screw conveyors to recycle the dust back to the reverberatory furnace. The new baghouse will be an approximately 75,000 actual cubic feet per minute pulse jet type baghouse.

A by-pass line acting as an alternative operating scenario will be installed between the sonic cooler and existing main baghouse. The by-pass line will only be used if there is a malfunction of fans or excess baghouse temperature or for maintenance. The facility estimates that the availability of the dry scrubbing system will be in excess of 92 percent of reverberatory furnace operating time. At least once per year the facility will need to sand blast and rebalance the scrubber exhaust fan. Over heating of the baghouse could trigger operation of the by-pass if temperatures greater than 500 degrees Fahrenheit are observed and failure of any major subsystem or key component could cause activation of the by-pass line. No emission standards are relaxed when the bypass is

operated. Adding soda ash to the feed of the reverberatory furnace is a method of controlling sulfur emissions. SO<sub>2</sub> emissions are measured at the main stack (EP-08) by a certified CEMS.

Additional emissions are expected from the ancillary equipment associated with the project. Particulate emissions will be generated from the handling of lime and scrubber waste. Fugitive particulate, lead and HAP compounds will be emitted from the paved haul routes. The emissions from the ancillary equipment and fugitive sources will generate additional emissions.

The project will consist of or impact the following emission points.

**Table 1: Emission Points Impacted by 2011-02-043.**

Emission Point	Description
EP-08	Reverberatory Furnace (existing with new pollution control equipment)
EP-85	Lime Storage (scrubber)
EP-86	Recycle Storage
EP-87	Screw Conveyor (scrubber waste)
EP-88	Lime Storage (Reverb. Furnace Feed) Existing, New Material
EP-89	Paved Haul Routes
EP-19	Blower (pneumatic lime unloading at Acid Neutralization) Existing, New Material
EP-20	Lime Storage Silo (acid Neutralization) Existing, New Material

#### EMISSIONS/CONTROLS EVALUATION

The maximum hourly emissions were calculated from the post modification emission factor and the Maximum Hourly Design Rate (MHDR). A MHDR of 36.3 ton-Feed/hour (reverberatory only) was used which is equivalent to approximately 18 tons refined Pb-produced/hr. The potential annual emissions were calculated from the hourly emissions assuming 8760 operating hours a year. The past actual annual emissions were calculated from the past actual production rate and pre modification factor. The past actual production rate is 95,004 tons Pb produced/year from the reverb furnace and is equivalent to the average annual production rate for the January 2008-December 2009 period. The filterable PM<sub>10</sub> emission factor was estimated from the 8/11/2009 test on the main stack.

The emissions from the new reverberatory furnace baghouse were assumed similar to the existing baghouse. The filterable PM<sub>2.5</sub> emission factor was estimated from the 08/11/2009 PM<sub>10</sub> test on the main stack. A PM<sub>2.5</sub>/PM<sub>10</sub> gravimetric ratio of 0.8 was assumed.

The SO<sub>2</sub> emission factors were developed from the mass balance from the design of the scrubber. The batteries contain 3.2 percent sulfur and 23 percent of the sulfur is acid. Approximately 60 to 70 percent of the sulfur entering the reverberatory furnace will be emitted by the reverberatory furnace. An SO<sub>2</sub> control efficiency of 90 percent was assumed for the dry scrubber. Past actual annual SO<sub>2</sub> emissions were estimated from the 2008/2009 CEMs data.

**Table 2: Emissions Summary (tons per year)**

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2010 EIQ)	Potential Emissions of the Application	Project Emission Increase/Decrease
PM <sub>2.5</sub>	10.0	N/D	20.29	6.10	<10.0
PM <sub>10</sub>	15.0	Major	28.02	7.63	<15.0
SO <sub>x</sub>	40.0	Major	1,786.99	1329.85	-317.58
NO <sub>x</sub>	40.0	Major	53.23	11.79	5.64
VOC	40.0	<100.0 tpy	10.79	N/A	N/A
CO	100.0	Major	19,0006.25	37.05	-2195.54
Pb	0.6	Major	14.81	0.32	-0.41
Hg	0.1	N/D	N/D	0.0031	-0.0039
SAM (Sulfuric Acid Mist)	7.0	N/D	N/D	8.31	<7.0
HAPs	10.0/25.0	Major	4.60	0.47	-0.59

N/A = Not Applicable; N/D = Not Determined

The emissions from the ancillary equipment and fugitive sources handling are from the paved haul road emission factor from AP42, Section 13.2.1(1/11) and lime transfer emission factor from AP42, Table 11.17-4. Product loading Enclosed Tuck.

Emissions from the reverberatory furnace are combined with emissions from the blast furnace prior to EP-08 the main stack. Previous permits did not separate out the emissions from each furnace unit therefore separate limits for each furnace do not exist. The limits for EP-08, the main stack, are combined limits. The combined limits were adjusted based on the increases /decreases associated with the reverberatory modification. therefore the reverberatory modification resulted in both increases and decreases in emissions post the modification.

It was discovered that previous stack testing of PM<sub>10</sub> did not include the condensable portion, only included filterable portion of the PM<sub>10</sub>. Therefore, the method of estimating the PM<sub>10</sub> and PM<sub>2.5</sub> from the stack test would have under estimated the amount of particulate mater. In order to avoid PSD review, only a de minimis increase is allowed. Since the reverberatory is an existing unit, the limit should be the existing actual plus the de minus level. The existing actual is 3.68 tons/year for PM<sub>2.5</sub> from the reverberatory furnace which corresponds to a limit of 13.68 tons/year. With this permit the condensable and filterable portion will be tested and used in recordkeeping to limit emission increase of the modification to less than de minimis levels.

Also, no previous PM<sub>2.5</sub> emissions limit existed for EP-08 the main stack. Therefore, a PM<sub>2.5</sub> emission factor is developed for emissions from the reverberatory furnace. This emission will be measured after the scrubber. This factor will be verified every five years with testing prior to the main stack (EP-08).

## PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions increases of Sulfuric Acid Mist, PM<sub>10</sub> and PM<sub>2.5</sub> were limited to below de minimis levels. All other pollutants are below de minimis levels.

## APPLICABLE REQUIREMENTS

Buick Resources Recycling Facility, LLC shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

### GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110  
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

### SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Standards of Performance for Secondary Lead Smelters*, 40 CFR Part 60, Subpart L
- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Hazardous Air Pollutants from Secondary Lead Smelting*, 40 CFR Part 63, Subpart X
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260

## STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Timothy Paul Hines  
Environmental Engineer

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Date

### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated February 23, 2011, received February 24, 2011, designating The Doe Run Company as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Site Survey, dated 02/28/2011.









Mr. James Lanzafame  
Environmental and Health Manager  
Buick Resources Recycling Facility, LLC  
18954 Highway KK  
Boss, MO 65440

RE: New Source Review Permit - Project Number: 2011-02-043

Dear Mr. Lanzafame:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Timothy Paul Hines, at the Department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale  
New Source Review Unit Chief

KBH:thl

Enclosures

c: Southeast Regional Office  
PAMS File: 2011-02-043

Permit Number: