



STATE OF DELAWARE  
**DEPARTMENT OF NATURAL RESOURCES  
AND ENVIRONMENTAL CONTROL**

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OFFICE OF THE  
SECRETARY

**Secretary's Order No. 2017-A-0003**

**Re: Johnson Controls Battery Group, Inc.'s Applications for Air Quality Permits  
for its Lead Acid Battery Manufacturing Plant at 700 North Broad Street,  
Middletown, New Castle County**

**Date of Issuance: January 23, 2017**

**Effective Date: January 23, 2017**

**Background and Procedural History**

The Secretary of the Department of Natural Resources and Environmental Control ("Department") issues this Order following a November 30, 2016 public hearing on Johnson Controls Battery Group, Inc.'s ("Applicant") July 29, 2016 applications, as revised on September 29, 2016 ("Applications").<sup>1</sup> The Applications seek permits<sup>2</sup> for air emissions from new equipment and modifications to existing equipment as part of Applicant's proposed expansion of its lead acid battery manufacturing facility at 700 North Broad Street, Middletown, New Castle County ("Facility").

Following the public hearing, the Department's presiding hearing officer, Robert P. Haynes, requested assistance from the DAQ, which provided Technical Response Memorandums ("TRMs"), which recommend that the Department issue the permits because the emissions would be within allowed limits and the Applications complied with the Department's Air Quality Regulations. Mr. Haynes prepared the attached

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<sup>1</sup> The Applicant submitted applications seeking a total of 23 permits for new and changed equipment.

<sup>2</sup> Issued under 7 Del. C. 6003(a)(1) and 7 DE Admin. Code 1102.

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Hearing Officer's Report ("Report"), which set forth the complete procedural history, established the record, proposed findings of fact, reasons and conclusions recommending that DAQ prepare and issue the permits. The Report attaches the DAQ TRMs with some draft permits. The Report discussed the public comments, which opposed the Applications based upon its proposed increased air emissions.

### **FINDINGS OF FACT**

The Department finds that the record, as established in the Report, supports DAQ preparing and issuing the permits. The Applications seek major additions and revisions of the Facility's manufacturing equipment as part of the proposed expansion of its lead acid battery manufacturing capacity from its current 4 million battery annual production level to over 8 million batteries. As stated by the Applicant's public hearing presentation, this proposed expansion may result in the Applicant hiring 80 new workers to the Facility's current approximately 180-employee workforce.

The proposed changes affect all of the Facility's manufacturing processes, which include manufacturing lead oxide, making negative and positive plates, and drying and curing the assembled batteries. The Applicant proposed to modify its two existing oxide mills and add four mills. Each mill will have its own pollution control equipment. In addition, the Applicant proposes to transport currently uncontrolled air emissions from the oxide production area to new baghouses and reduce the number of stacks associated with lead oxide production through consolidation. Based upon the Applicant's estimates, the proposed oxide production changes should increase production by 529% and reduce actual air emissions by 57% from current levels.

The Applicant also proposes to add two pasting lines (one positive and one negative) to its existing two pasting lines (one positive and one negative). The pasting lines apply lead oxide as a paste onto the plates used in the batteries. The Applicant proposed to replace the 40-year-old baghouses that now control air emissions from the pasting lines using outdated shaker style technology to control lead and particulate matter emissions. The Applicant proposes to install two modern technology dust collectors, which will use a primary baghouse filtration chamber and a secondary High Efficiency Particulate Air ("HEPA") filtration chamber and achieve 99.98% removal of lead and particulate matter. The proposed pollution control equipment will be located indoors near the pasting lines, as opposed to the current baghouses that are located outside the manufacturing building. The Applicant estimates that the pasting line changes will increase production by 116% and reduce emissions by 50%.

The Applicant also proposes changes to its drying and curing ovens, known as "chemsets." The Applicant currently uses 3 small chemsets (each permitted to produce 44 carts) and 2 large chemsets (each permitted to produce 88 carts). The Applicant proposes to remove the 2 large chemsets and install 8 additional small chemsets for a total of 11 small chemsets. The Applicant estimates that this change will increase production by 124% and reduce emissions by 20%.

The Applicant proposes to install an oxide storage and transfer system to move the lead oxide. This system will have its air emissions ducted to the pasting lines pollution control equipment described above.

The Applicant also proposes to install a Central Vacuum System ("CVS") for the oxide and pasting production areas to perform cleaning functions in these areas to

supplement the other pollution control equipment. The CVS will use a separation cyclone, primary baghouse chamber, and secondary HEPA filtration chamber. The Applicant proposed to locate the CVS and the other pollution control equipment inside of its manufacturing building as opposed to their current location outside of the building and operate the building under negative pressure to reduce air emissions during operations and maintenance.

The Applicant estimates that the above changes will allow production to increase by 124% and air emissions to decrease by 50%. The DAQ review of the Applications determined that the proposed changes would be within allowed limits based on its computer modeling and expert judgment, as described in the DAQ TRMs. Accordingly, the DAQ recommended that the Department issue permits that its experts will prepare.

The permits will include limits that reflect the theoretical operation of the new and modified equipment based upon the regulatory standard that requires the calculation of the equipment's potential to emit ("PTE").<sup>3</sup> The DAQ calculated the proposed PTE of air emissions in tons per year ("TPY") of the pollutants lead, particulate matter ("PM"), nitrogen oxide ("NOx"), carbon monoxide ("CO"), sulfur dioxide ("SO<sub>2</sub>"), and volatile organic compounds ("VOCs") in the below table:

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<sup>3</sup> Department Regulation 1125 defines PTE as "the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is enforceable. Secondary emissions do not count in determining the potential to emit of a stationary source."

pollutant	Current PTE (TPY)	8 Chemsets (TPY)	15 Other Permitted Equipment (TPY)
Lead	1.56	0.04	1.0
PM/PM <sub>10</sub>	15.50	0.83	5.4
NO <sub>x</sub>	9.94	10.99	1.9
CO	8.35	9.23	1.6
VOC	0.55	0.61	0.1
SO <sub>2</sub>	0.06	0.06	0.01

The Applicant stated its intention to remove several pieces of equipment, but it has not submitted applications to remove the equipment. Consequently, the DAQ calculated the PTE as required by State or Federal regulations and without the cancellation of the associated permits for equipment that the Applicant plans to remove but has not submitted applications for their removal.

The DAQ TRMs indicate that stack testing of the installed equipment should reflect much lower emissions than the above PTE limits, which are based on the State and Federal regulations. The efficiency of the baghouses historically shows emissions that are much lower than the PTE levels. The DAQ experts applied recognized computer modeling and determined that, when operated with emissions equal to the PTE, the dispersion of emissions results in downwind concentrations well below threshold levels that are protective of human health and the environment. In addition, DAQ will impose conditions designed to protect the environment and public health. The Applicant in an email provided an explanation for its estimates that actual emissions with the new and modified equipment should be lower than the current equipment's emissions based upon certain operating assumptions and estimated results of the stack testing required of the

installed equipment. The Department finds that the Applications comply with the Department's filing requirements and that the DAQ should prepare and issue the permits.

The above changes will both expand production and improve the air pollution control by replacing older pollution control equipment with modern pollution control baghouses, adding new equipment such as the CVS, and relocating all the air pollution control equipment inside the manufacturing building. The Applicant designed the proposed CVS and other pollution control equipment to produce negative pressure inside the manufacturing building, which should reduce fugitive emissions from within the building.

The Department's permits will include conditions designed to protect the environment and public health. The DAQ determined that proposed levels of emissions would be within the allowable limits set forth in the Department's regulations. The Department finds that the DAQ properly published public notices of the Applications and of the public hearing. The Department also properly held a public hearing to provide the public with an opportunity to comment on the Applications. The public comments questioned the emissions from the proposed expansion, but the public comments did not raise any issue that supports denial of the permits, as noted in the DAQ TRMs.

The public comments from several Middletown residents oppose the Applications because the operation of the equipment may increase air emissions. The Department experts reviewed the Applications and are confident that the proposed new and changed equipment will operate within allowable air emission limits. The DAQ experts agree that the actual emissions will be lower than the calculated theoretical and model tested PTE used for regulatory purposes, but the actual emissions cannot be determined until after the

equipment is installed and tested. Nevertheless, the Department considers that the modern pollution control equipment and improved configuration (inside the building) will result in increased public confidence that the Facility is operating properly at all times.

### **REASONS AND CONCLUSIONS**

In sum, the Applicant supported its Applications to install new equipment and to modify existing equipment, which will allow expansion of the Facility's battery production capacity and will improve the Facility's pollution control equipment. The DAQ permits will require periodic stack testing, monitoring and reporting to ensure that the Facility operates within the prescribed limits. The Applicant's position that actual emissions may decrease may be accurate once Applicant installs and stack tests the equipment. Thus, the subsequent testing and actual operations may confirm the Applicant's estimates of actual future operations decreasing air emission, but that will not change the permits, which are written to regulate air emissions based upon the PTE.

The record supports the above findings and reasons, and the Department's issuance of the permits. Consequently, the Department adopts the following ordering paragraphs:

1. The Department has jurisdiction under its statutory authority to make a determination in this proceeding;
2. The Department provided adequate public notice of the Applications and the public hearing in a manner required by the law and regulations;
3. The Department held a public hearing in a manner required by the law and regulations;
4. The Department considered all timely and relevant public comments in making its determination;

5. The Department shall issue the Applicant the permits, as prepared by the DAQ, which include reasonable conditions designed to protect the environment and public health; and that

6. The Department shall send this Order and/or provide public notice as required by the law, regulations or Department policy and shall publish this Order on its web page.

A handwritten signature in black ink, appearing to read "David S. Small". The signature is fluid and cursive, with a large initial "D" and "S".

David S. Small,  
Secretary

## HEARING OFFICER'S REPORT

TO: The Honorable David S. Small  
Secretary, Department of Natural Resources and Environmental Control

FROM: Robert P. Haynes, Esquire  
Senior Hearing Officer, Office of the Secretary  
Department of Natural Resources and Environmental Control

RE: **Johnson Controls Battery Group, Inc.'s Application for Air Quality Permits for its Lead Acid Battery Manufacturing Plant at 700 North Broad Street, Middletown, New Castle County**

DATE: January 23, 2017

### I. PROCEDURAL HISTORY

This Report makes recommendations to the Secretary of the Department of Natural Resources and Environmental Control ("Department") on Johnson Controls Battery Group, Inc.'s ("Applicant") July 29, 2016 applications, which Applicant updated on September 29, 2016 ("Applications"). The Applicant requested twenty-three permits or permit amendments for the proposed expansion ("Project") of its lead acid battery manufacturing plant at 700 North Broad Street, Middletown, New Castle County ("Facility").

The Department's Division of Air Quality ("DAQ") reviewed the applications and determined that part of the Application was complete for the eight new drying and curing ovens ("chemsets") pursuant to the Department's *Air Quality Regulations 1102, 7 DE Admin. Code 1102*. On August 28, 2016, DAQ had published in *The News Journal* and the *Delaware State News* public notices of the chemset applications.

On September 15, 2016, the DAQ received comments in opposition from Angelo Gallego, Jr. that included a request for a public hearing.

On October 9, 2016, the DAQ had published in *The News Journal* and the *Delaware State News* public notices of the applications for fifteen construction permits, which would add four lead oxide mills, a pellet caster feeder for the lead oxide mills, two pasting lines, lead oxide

storage silos and transport system, would relocate equipment, would consolidate emissions through stacks and would add eleven baghouses as pollution control equipment and a central vacuum system.

The DAQ received comments from Angelo Gallego, Jr. that also requested a public hearing. Pete Sullivan also submitted comments.

On October 30, 2016, the DAQ had published in *The News Journal* and the *Delaware State News* public notices of a November 30, 2016 public hearing at the Appoquinimink High School, 1080 Bunker Hill Road, Middletown.

I presided over the public hearing and the public comment period closed at the conclusion of the hearing. The public hearing record consists of a verbatim transcript and documents introduced as exhibits at the public hearing.

On December 5, 2016, I requested technical assistance from DAQ, which provided me a Technical Response Memorandum (“TRM”) attached hereto that recommends issuance of the permits that DAQ would issue should the Department determine to issue the permits. In addition, on January 12, 2017 I asked that DAQ prepare a summary TRM covering all 23 permits, attached hereto. This TRM recommends issuance of all 23 construction permits to the Facility.

I consider the Record, as established below, complete for a final decision.

## **II. SUMMARY OF THE RECORD**

The record contains the following: 1) the verbatim transcript of the public hearing; 2) the documents marked and introduced at the public hearing as exhibits as identified below; and 3) the documents referenced in this Report, including the attached DAQ TRM.

At the public hearing, DAQ’s representative Angela Marconi, P.E. provided a slide presentation, which summarized the Applications and the Department's review process. Ms.

Marconi provided the documents for the record in order to assist the public. She indicated that when DAQ receives an application they review it to determine if it is complete. The Applicant submitted applications for twenty-three permits to construct either new equipment or make changes to its existing permitted equipment. She indicated that eight applications were for installing new chemsets, and that the DAQ determined that these were complete for public notice, which the DAQ had published and resulted in receipt of one comment that requested a public hearing. The DAQ required more information on the other applications, which the Applicant provided on September 29, 2016. The DAQ determined that the application was complete and published a public notice of them on October 9, 2016, which also resulted DAQ receiving a comment that requested a public hearing.

She described the Facility's permits as a "natural minor" permit, which requires separate permits for each piece of equipment that emits emissions. The equipment must meet federal New Source Performance Standards and comply with the Department's air quality regulations. She described that the Department is required to regulate emissions based upon the equipment's potential to emit ("PTE"). She displayed the DAQ calculations of the Project's PTE of the air pollutants lead, particulate matter ("PM"), nitrogen oxide ("NOx"), carbon monoxide ("CO"), sulfur dioxide ("SO<sub>2</sub>"), and volatile organic compounds ("VOCs") in the following table:

pollutant	Current PTE (TPY)	8 Chemsets (TPY)	Other Equipment (TPY)
Lead	1.56	0.04	1.0
PM/PM <sub>10</sub>	15.50	0.83	5.4
NO <sub>x</sub>	9.94	10.99	1.9
CO	8.35	9.23	1.6
VOC	0.55	0.61	0.1
SO <sub>2</sub>	0.06	0.06	0.01

She indicated that the above PTE were maximum levels and actual emissions will be lower. In addition, the table does not reflect any reduction in emissions from equipment that the Applicant intends to retire from service, such as the two large chemsets. She described that if the Department approves the issuance of the requested permits, then the DAQ would draft permits that will require monitoring and reporting. DAQ will inspect the facility to determine if the operations comply with the permits. She also noted that any permits would also require testing emissions actually emitted through the stacks as opposed to the calculations used to determine PTE for the construction permits.

Kelly Wright, Applicant's Senior Manager of Environmental Relations, spoke and introduced Todd Treybal, the Facility's Manager, Noah Bender, the Engineering Manager, and Bill Shevock, the Shop Chairman. She noted that she and others who work at the Facility live nearby. Her slide presentation included photographs of the Facility, which she said began operations in 1961 and now produces 4 million car batteries. She said the manufacturing process starts with converting lead into lead oxide in the oxide manufacturing process. The lead oxide is made into lead paste, which is applied to lead plates, which are then cured and dried in the chemsets. The plates are then assembled into plastic housings and welded together and tested.

She reviewed slides on the Facility's layout. She described the changes as going from two pasting lines to four, adding three mills using a different type of technology for baking oxide, increasing the chemsets from five to eleven, and adding a new central vacuum system. The changes will allow total production of 8.5 million units, or a 124% increase. She showed photos of the old equipment and new equipment and indicated that two large chemsets would be removed. She described changes in the pasting department, which would replace old shaker type baghouses located outside the manufacturing building with high efficiency CMAXX dust collectors located inside, which will enhance the building's negative pressure. She described the installation of three new ball mills to produce lead oxide and each will have its own baghouse pollution control equipment. She indicated the CVS will be installed inside and will replace the old baghouses located outside the building. She explained that the actual emissions will be lower than the permitted emissions established by the PTE. The two existing oxide mills will be modified and three new mills will expand production to 220 million pounds, or a 529% increase and reduce emissions down to 20 lbs. or a 57% reduction.

She explained the plate curing changes with the chemsets, which she estimated would produce 765 million plates, or a 124% increase and emissions would decrease from 5 lbs. to 4 lbs, or a 20% reduction.

She stated that the expansion of the two pasting lines to four pasting lines will increase production to 765 million lead plates and the emissions will decrease to 1 lb., or a 116 % production increase and a 50% decrease in emissions.

On a total Facility analysis, she said that the battery production will increase by 124% and its emissions are expected to decrease by 50%. She described change that will have lead deliveries now inside the building and that individual emissions stacks will be reduced by consolidation, including transporting air emissions now vented without any control to pollution

control equipment. She also described the Facility's efforts to reduce greenhouse gases and other improvements to reduce energy usage and showed the per battery emission levels decreasing.

Todd Treybal spoke and described the increased employment and the production of automobile batteries and indicated that if anyone had an old battery at their house, it would contain more lead than the Facility will emit from producing 8 million batteries. He encouraged people to delivery their old batteries to the Facility for free recycling of them.

Pete Sullivan spoke first as one of the persons who requested a public hearing and a resident of Middletown. He thanked the DAQ for presenting the chart showing the emissions, which he indicated that he had requested. He also thanked the facility representatives for recycling of automobile batteries. He indicated his concern for more air emissions, particularly lead that impacts the blood and increases the chances of adverse health effects. He said the amount of lead emitted today is already too much. He commented that the Romans produced as much as 80,000 tons a year, and that the Applicant processes more than that amount. He discussed the adverse affects on humans from lead and commented on other possible sources of pollution in Middletown and said it was too much and Middletown did not deserve more pollution.

Angelo Gallego, Jr. spoke next as one of the persons who requested a public hearing. He thanked the Department's hard work on out-of-state sources of air pollution. He indicated that the Facility's proposed expansion will continue to degrade the air quality, and that the American Lung Association rates New Castle County's air quality an "F" for ozone and a "D" for 24 hour particulate pollution. He cited the United States Environmental Protection Agency as finding that New Castle County is a non-attainment area for eight-hour ozone levels from 2012 to 2016.

He went on to describe lead as an extremely potent toxin, as highlighted by the recent lead contamination in drinking water. He mentioned the historic effort to remove lead exposure

in households from lead in paint. He then pointed out that the Applicant wants to emit approximately one third of a ton of lead annually, or 667 pounds. He said that such emission was in excess of the 15 parts per billion standard for drinking water. He wanted to know the air dispersion modeling for the air emissions. He commented on the possible adverse impact from breathing the air with lead in it, or children playing in soil with lead in it. He said that lead does not decay or decompose. He said that there was no safe level of lead in your bloodstream. Any lead he claimed is a biological hazard to you, your children and others because it can cause a host of chronic health issues, including irreversible cognitive deficiencies, peripheral neuropathy, progressive renal dysfunction, seizures and sexual dysfunction. He requested that the Department deny the permit applications, and asked the Department to require air dispersion modeling. He also wanted continuous monitoring of lead emissions. He cited some past air quality violation at the Facility and at a plant in South Carolina.

Mr. Treybal spoke again and indicated that if the Department did not issue the permit then emissions would not go down as proposed. Mr. Sullivan spoke again about how he was confused what was being proposed. Ms. Marconi spoke and explained the differences between the regulated permit employing PTE and the actual emissions that will be less.

I summarize the following documents as exhibits:

- DNREC Ex. 1-Applications dated July 29, 2016, as updated September 29, 2016;
- DNREC Ex. 2-Public notices of the chemset applications;
- DNREC Ex. 3-comment and request for a public hearing on the chemset applications;
- DNREC Ex. 4-Public notices of the other expansion equipment applications;
- DNREC Ex. 5-.comment and request for a public hearing on the other equipment applications;
- DNREC Ex. 6-public notice of the public hearing;
- DNREC Ex. 7-written comments received during the public hearing's comment period;
- DNREC Ex. 8-The DAQ presentation at the public hearing;
- DNREC Ex. 9- the public hearing sign in sheets;
- Applicant Ex. 1-public hearing presentation;
- Gallego Ex. 1-comments
- Gallego Ex. 2-hearing comments;
- Sullivan Ex. 1-comments;

Pitts Ex. 1-email opposing the permits;  
Capelli Ex. 1-email opposing the permits.

The Applicant provided a cover letter that explained its applications and I quote from it as it sets forth some of the complexity in the proposed new and change equipment:

1) Three Sovema System Oxide Ball Mills will enhance the existing lead oxide production processes at the plant. The purpose of lead oxide is for the production of the lead paste that is applied onto the positive and negative lead plates during the pasting process. Ball Mill oxide is produced by melting lead ingots and casting it into lead 'pellets'. The pellets will enter one of the three mill grinders, where they will be pulverized and the oxidation occurs with air, thus forming lead oxide. Each ball mill process is equipped with its own dust collector, comprised of a primary baghouse filtration chamber and a secondary HEPA filtration chamber. Each ball mill dust collector will have its own air stack emission point, to be known as 'S/N 400', 'S/N 401', and 'S/N 402'. The flue gases from the pellet caster, as well as the air cooling systems surrounding the ball mill grinders will be ducted to two dust collectors, each comprised of a primary baghouse filtration chamber and a secondary HEPA filtration chamber. Additionally, existing systems at the plant will also be re-routed from stack emission points, and ducted into these two dust collectors: north and south Barton oxide mill melting pots, lead strip caster, and trim-dry oven. The two dust collectors will share one air stack emission point, to be known as 'S/N 403.'

**The new dust collectors are not only new technology and more efficient than the older model units at the plant, but they will be housed indoors. Additionally, re-routing four existing processes to feed into the new dust collectors means that four existing air emission points can be eliminated**

2) Pasting Lines: The purpose of the pasting lines is to produce the pasted lead plates that will ultimately be assembled into the auto battery housing. The plant currently has two pasting lines (one positive, one negative) in operation. Four shaker-style baghouses supply the air control for these two processes. These older model baghouses will be replaced with two new dust collectors, each comprised of a primary baghouse filtration chamber and a secondary HEPA filtration chamber. In addition, two new pasting lines will be construction, bringing the total to two positive pasting lines, and two negative pasting lines. The two new pasting lines will also be equipped with two new dust collectors, each comprised of a primary baghouse filtration chamber and a secondary HEPA filtration chamber. The two new dust collectors servicing the two negative pasting lines will share one air stack

emission point, to be known as 'S/N 500'. The two new dust collectors servicing the two positive pasting lines will share one air stack emission point, to be known as 'S/N 501'. The oxide transfer system that will be installed (a logistics system of storage and piping, for the purpose of moving the oxide product from the manufacturing and receiving departments to the pasting department) will be ducted into these four dust collectors as well.

**The four new dust collectors are not only new technology and more efficient than the four older model units at the plant, but they will be housed indoors (the existing units sit outdoors).**

**3) Central Vacuum System (CVS):** The CVS is designed to service the oxide and pasting portions of the plant. The purpose is to perform cleaning activities in the process areas. The CVS is comprised of a separation cyclone, primary baghouse chamber, and secondary HEPA filtration chamber. The air stack emission point will be known as 'S/N 800', and will replace two older model baghouses. **The new cyclone dust collector is not only new technology and more efficient than the two older model units at the plant, but it will be housed indoors (the existing units sit outdoors). Additionally, replacing two older model units with one new unit means that one existing air emission point can be eliminated.**

Emphasis in original.

I find that the above Record supports my recommendation that the Department should approve the Applications and direct the DAQ to prepare and issue the permits.

### **III. FINDINGS OF FACT**

I recommend that the Department find that the record, as established above, supports issuing the permits allowing the equipment to be constructed, subject to the reasonable DAQ permit conditions. The Applications seek major additions and revisions of Facility's manufacturing equipment as part of the proposed expansion of its lead acid battery manufacturing capacity from its current 4 million battery annual production level to over 8 million batteries. The Applicant indicates that the proposed expansion may result in hiring 80 new workers to the Facility's current approximately 180-employee workforce.

The proposed changes affect all of the Facility's manufacturing process, which include manufacturing lead oxide, making negative and positive plates, and drying and curing the

assembled batteries. The Applicant proposes to modify its two existing oxide mills and add four mills.<sup>1</sup> Each mill will have its own pollution control equipment. In addition, the Applicant proposes to transport currently uncontrolled air emissions from the oxide production area to new baghouses and reduce the stacks used through consolidation. Based upon the Applicant's estimates, the proposed oxide production changes should increase production by 529% and reduce air emissions by 57%.

The Applicant also proposes to add two pasting lines (one positive and one negative) to its existing two pasting lines (one positive and one negative). The pasting lines apply lead oxide as a paste onto the plates used in the batteries. The Applicant proposed to replace the 40-year-old baghouses that now control air emissions from the pasting lines using outdated shaker style technology to control lead and particulate matter emissions. The Applicant proposes to install two modern technology dust collectors, which will use a primary baghouse filtration chamber and a secondary HEPA filtration chamber and achieve 99.98% removal of lead and particulate matter. The proposed pollution control equipment will be located indoors near the pasting lines, as opposed to the current baghouses that are located outside the manufacturing building. The Applicant estimates that the pasting line changes will increase production by 116% and reduce emissions by 50%.

The Applicant also proposes changes to its drying and curing ovens, known as "chemsets." The Applicant currently uses 3 small chemsets (each permitted to produce 44 carts) and 2 large chemsets (each permitted to produce 88 carts). The Applicant proposes to remove the 2 large chemsets and install 8 additional small chemsets for a total of 11 small chemsets. The Applicant estimates that this change will increase production by 124% and reduce emissions by 20%.

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<sup>1</sup> The record is confusing with references to three new mills, but the DAQ TRM confirms the proposed four mills.

The Applicant proposes to install an oxide storage and transfer system to move the lead oxide. This system will have its air emissions ducted to the pasting lines pollution control equipment described above.

The Applicant also proposes to install a Central Vacuum System ("CVS") for the oxide and pasting production areas to perform cleaning functions in these areas of pollutant that otherwise escape the other pollution control equipment. The CVS will use a separation cyclone, primary baghouse chamber, and secondary HEPA filtration chamber. The Applicant proposed to locate the CVS and the other pollution control equipment inside of its manufacturing building as opposed to its current location outside of the building and operate the building under negative pressure to reduce air emissions during operations and maintenance.

The Applicant estimates that the above changes will allow production to increase by 124% and air emissions to decrease by 50%. The DAQ review of the Applications determined that the proposed changes would be within allowed limits based on State and Federal regulations and expert judgment, as described in the DAQ TRM. Accordingly, the DAQ recommends that the Department issue permits that the experts will prepare.

The DAQ permits will be based upon the theoretical operation of the new and modified equipment based upon the regulatory standard that calculates the equipment's PTE,<sup>2</sup> which reflects the following air emissions tons per year ("TPY") of the pollutants lead, particulate matter ("PM"), nitrogen oxide ("NOx"), carbon monoxide ("CO"), sulfur dioxide ("SO<sub>2</sub>"), and volatile organic compounds ("VOCs"):

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<sup>2</sup> Department Regulation 1125 defines PTE as "the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is enforceable. Secondary emissions do not count in determining the potential to emit of a stationary source."

pollutant	Current PTE (TPY)	8 Chemsets (TPY)	15 Other Permitted Equipment (TPY)
Lead	1.56	0.04	1.0
PM/PM <sub>10</sub>	15.50	0.83	5.4
NO <sub>x</sub>	9.94	10.99	1.9
CO	8.35	9.23	1.6
VOC	0.55	0.61	0.1
SO <sub>2</sub>	0.06	0.06	0.01

The Applicant stated its intention to remove several pieces of equipment, but to date it has not applied to remove the equipment. Consequently, the DAQ calculated the PTE as required by State or Federal regulations and without the cancellation of the associated permits for equipment that the Applicant plans to remove but has not submitted applications for their removal.

The DAQ TRM indicates that stack testing of the installed equipment should reflect much lower emissions than the above PTE, which is based on the requirements of the State and Federal regulations. The efficiency of the baghouses historically shows emissions that are much lower than the PTE levels. The DAQ experts applied recognized computer modeling to evaluate the operations of the proposed equipment's emissions and determined that, when operated with emissions equal to the PTE the dispersion of emissions results in downwind concentrations that are protective of human health and the environment. In addition, DAQ will impose conditions designed to protect the environment and public health. At my request, the Applicant, in a December 1, 2016 email, explained its estimates that actual emissions with the new and modified equipment should be lower than the current equipment's emissions and the DAQ provided a December 2, 2016 email that identified that the estimated emissions were based upon certain assumptions that could not be verified until after the equipment is installed and stack tested. I

find that the Applications comply with the Department's filing requirements and that the DAQ should prepare and issue the permits.

The above changes will both expand production and improve the air pollution control by replacing older pollution control equipment with modern pollution control baghouses, adding new equipment such as the CVS, and relocating all the air pollution control equipment inside the manufacturing building. The Applicant' designed the proposed CVS and other pollution control equipment to produce negative pressure inside the manufacturing building, which should reduce fugitive emissions within the building.

I find that the DAQ properly published public notices of the Applications and of the public hearing. The Department also properly held a public hearing to provide the public with an opportunity to comment on the Applications. The public comments questioned the emissions from the proposed expansion, but the public comments did not raise any issue that supports denial of the permits, as noted in the DAQ TRM.

The public comments from several Middletown residents oppose the Applications because it seeks permits that may increase air emissions. The Department experts reviewed the Applications and are confident that the proposed new and changed equipment will be within allowable limits. The DAQ experts agree that the actual emissions will be lower than the calculated theoretical and model tested PTE used for regulatory purposes, but the Department cannot determine actual emissions until after the equipment is installed and tested, which is why the permits are based on PTE limits.

#### **IV. REASONS AND CONCLUSIONS**

In sum, I conclude that the Applicant supported its Applications to install new equipment and to modify existing equipment, which will allow expansion of the Facility's battery production capacity and will improve the Facility's pollution control equipment. I recommend

that the DAQ be directed to prepare permits and issue permits that will require periodic stack testing, monitoring and reporting to ensure that the Facility operates within the prescribed limits. The Applicant's position that actual emissions may decrease may be accurate once Applicant installs and stack tests the equipment. Thus, the subsequent testing and actual operations may confirm the Applicant's estimates of actual future operations decreasing air emission, but that will not change the permits, which are required to regulate air emissions based upon the PTE.

The record supports the above findings and reasons, and the Department's issuance of the permits. Consequently, I recommend that the Department adopt the following ordering paragraphs:

1. The Department has jurisdiction under its statutory authority to make a determination in this proceeding;
2. The Department provided adequate public notice of the Applications and the public hearing in a manner required by the law and regulations;
3. The Department held a public hearing in a manner required by the law and regulations;
4. The Department considered all timely and relevant public comments in making its determination;
5. The Department shall issue the Applicant the permits, which will include reasonable conditions designed to protect the environment and public health; and that
6. The Department shall send this Order and/or provide public notice as required by the law, regulations or Department policy and shall publish this Order on its web page.



Robert P. Haynes, Esquire  
Senior Hearing Officer

**MEMORANDUM**

TO: Robert P. Haynes, Esq.  
Kara S. Coats, Deputy Secretary

THROUGH: Angela D. Marconi, P.E., BCEE *ADM*

FROM: Chavis J. Bianco *CB*

SUBJECT: **REVISED - Johnson Controls Battery Group, Inc. – Middletown, DE**  
**Permit: APC-2017/0011-CONSTRUCTION through**  
**Permit: APC-2017/0032-CONSTRUCTION and**  
**Permit: APC-2017/0061-CONSTRUCTION**  
**Eight Curing and Drying Ovens & Expansion Project (23 Construction Permits)**

DATE: January 19, 2017

---

Johnson Controls Battery Group, Inc. ("Johnson Controls" or "JCI"), located at 700 North Broad Street, Middletown, Delaware, is a lead acid battery manufacturing facility. The Facility uses various process equipment for the production of its final product (batteries). Examples of processes and operations are: oxide production, paste mixing, pasting lines (paste and grids are combined), casting operations, battery assembly, and cast-on-strap lines. JCI emits lead/lead dust and has various baghouses with bag/HEPA filters which are used to control emissions. Note that the last phase of battery assembly is completed at another location of this company in Middletown, known as Johnson Controls Middletown Distribution Center ("JC-DC"). The JC-DC location currently has an active Registration **APC-2011/0141 (Amendment 2)**.

**CHEMSET APPLICATION (8 Permits)**

JCI requested construction permits for eight (8) new curing and drying ovens (chemsets) on July 29, 2016. These new chemsets will be denoted as chemsets 4a, 5a, 6, 7, 8, 9, 10, and 11. The new chemset units will be permitted by **Permit: APC-2017/0011-CONSTRUCTION through Permit: APC-2017/0018-CONSTRUCTION**.

**EXPANSION PROJECT APPLICATION (15 Permits)**

The Facility revised their permit application on September 29, 2016 and requested an additional 15 construction permits. The Facility plans to enhance the existing lead oxide production process at the plant by installing four Sovema System Oxide Ball Mills. Each ball mill will have its own dust collector, located indoors, and will have its own roof stack. With the addition of the ball mills, the Facility will require a pellet caster which will require a construction permit. The pellet caster will produce lead "pellets" which will be introduced into the ball mills and will convert the lead pellets into lead oxide. Currently the facility produces lead oxide through a Barton System. The flue gases from the pellet caster, as well as the air cooling system surrounding the ball mills grinders will be ducted to two dust collectors located indoors. Each dust collector will be comprised of a primary baghouse filtration chamber and a secondary HEPA filtration chamber. Additionally, existing systems at the plant will also be re-routed from stack emission points, and ducted into these two dust collectors. These existing systems will be the north and south Barton oxide mill melting pots, lead strip caster and trim dry oven. These two dust collectors will share a common roof stack.

With the processing of ball oxide from the Sovema ball mills, the Facility has requested construction permits for nine (9) new silos for lead oxide storage. These new silos will be denoted as transfer storage silos 1 through 6, mixing transfer silo, and start-up transfer silo which will store the ball oxide. The Facility has requested an additional truck storage silo which will store purchased Barton oxide. The existing two Barton oxide silos will be re-routed to a new, more efficient, indoor baghouse.

## **MEMORANDUM**

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Eight Curing and Drying Ovens & Expansion Project (23 Construction Permits)**

January 19, 2017

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In addition to the oxide production described above, the Facility plans to expand the pasting lines. The purpose of the pasting lines is to produce the pasted lead plates that will ultimately be assembled into the automotive battery housing. The plant currently has two pasting lines in operation. These two existing lines will require construction permits in order to be re-routed to new, more efficient, indoor dust collectors. In addition, two new pasting lines will be constructed, bringing the total pasting lines to four, two positive lines and two negative lines. Two existing weight hoppers will be directed to new baghouses. Due to the two new pasting lines, two new surge hoppers and two new screening towers will be required. Emissions from these will be directed to new, more efficient baghouses. The two negative pasting lines will share a common dust collector. Likewise, the two positive pasting lines will share a common dust collector.

The oxide and pasting portions of the proposed plant will be serviced by a central vacuum system which will require a construction permit. The purpose of this unit is to perform cleaning activities in the described process areas. The central vacuum system will be comprised of a separation cyclone, primary baghouse chamber, and a secondary HEPA filtration chamber. This unit will have its own emission point terminated at the roof.

In the attached **Appendix A** located on page 3, there is a list of the Permit numbers for the chemsets and the expansion project described above.

### **RECOMMENDATIONS**

The application for the eight chemset units was advertised Sunday, August 28, 2016. One comment for a public hearing was received. The application for the 15 construction permits for the expansion project was advertised on Sunday, October 9, 2016. One comment for a public hearing was received.

A public hearing was held on November 30, 2016 at Appoquinimink High School which combined the public notice for the eight chemsets and the expansion project at the Facility.

The Division of Air Quality recommends that the application for the 23 construction permits be approved and the permits be issued to the Facility as they are completed.

ADM:CJB

F:\EngAndCompliance\CJB\cjb17002.doc

Attachment: Appendix A – Permit Numbers

pc: Dover File  
Chavis J. Bianco

**MEMORANDUM****Johnson Controls Battery Group, Inc. – Middletown, DE  
Eight Curing and Drying Ovens & Expansion Project (23 Construction Permits)**

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**Appendix A**

<b>Permit Number</b>	<b>Process Description</b>	<b>Stack No.</b>	
<b>APC-2017/0011-C</b>	Chemset 4a	600 & 608	<i>New</i>
<b>APC-2017/0012-C</b>	Chemset 5a	601 & 609	<i>New</i>
<b>APC-2017/0013-C</b>	Chemset 6	602 & 610	<i>New</i>
<b>APC-2017/0014-C</b>	Chemset 7	603 & 611	<i>New</i>
<b>APC-2017/0015-C</b>	Chemset 8	604 & 612	<i>New</i>
<b>APC-2017/0016-C</b>	Chemset 9	605 & 613	<i>New</i>
<b>APC-2017/0017-C</b>	Chemset 10	606 & 614	<i>New</i>
<b>APC-2017/0018-C</b>	Chemset 11	607 & 615	<i>New</i>
<b>APC-2017/0019-C</b>	Sovema Mill #1	400	<i>New</i>
<b>APC-2017/0019-C</b>	Sovema Mill #1 Exhaust	403	<i>New</i>
<b>APC-2017/0020-C</b>	Sovema Mill #2	401	<i>New</i>
<b>APC-2017/0020-C</b>	Sovema Mill #2 Exhaust	403	<i>New</i>
<b>APC-2017/0021-C</b>	Sovema Mill #3	402	<i>New</i>
<b>APC-2017/0021-C</b>	Sovema Mill #3 Exhaust	403	<i>New</i>
<b>APC-2017/0022-C</b>	Sovema Mill #4 + Sovema Mill #4 Exhaust	Future	<i>New</i>
<b>APC-2017/0023-C</b>	Central Vacuum System	800	<i>New</i>
<b>APC-2017/0024-C</b>	Barton S. Melting Pot	403	<i>Existing</i>
<b>APC-2017/0024-C</b>	Barton N. Melting Pot	403	<i>Existing</i>
<b>APC-2017/0025-C</b>	Pellet Caster	403	<i>New</i>
<b>APC-2017/0026-C</b>	Strip Caster	403	<i>Existing</i>
<b>APC-2017/0027-C</b>	Trim Dry	403	<i>Existing</i>
<b>APC-2017/0028-C</b>	Barton Silo #1	501	<i>Existing</i>
<b>APC-2017/0028-C</b>	Barton Silo #2	501	<i>Existing</i>
<b>APC-2017/0028-C</b>	Purchased Barton Oxide	501	<i>New</i>
<b>APC-2017/0029-C</b>	Pasting Line 1	500	<i>New</i>
<b>APC-2017/0029-C</b>	Weight Hopper Transfer 1	500	<i>New</i>
<b>APC-2017/0030-C</b>	Pasting Line 2	500	<i>Existing</i>
<b>APC-2017/0031-C</b>	Pasting Line 3	501	<i>Existing</i>
<b>APC-2017/0032-C</b>	Pasting Line 4	501	<i>New</i>
<b>APC-2017/0032-C</b>	Weigh Hopper Transfer 2	500	<i>New</i>
<b>APC-2017/0061-C</b>	Transfer Storage Silo 1	500	<i>New</i>
<b>APC-2017/0061-C</b>	Transfer Storage Silo 2	500	<i>New</i>
<b>APC-2017/0061-C</b>	Transfer Storage Silo 3	500	<i>New</i>
<b>APC-2017/0061-C</b>	Transfer Storage Silo 4	501	<i>New</i>
<b>APC-2017/0061-C</b>	Transfer Storage Silo 5	501	<i>New</i>
<b>APC-2017/0061-C</b>	Transfer Storage Silo 6	501	<i>New</i>
<b>APC-2017/0061-C</b>	Mixing transfer silo	501	<i>New</i>
<b>APC-2017/0061-C</b>	Start-up transfer silo	501	<i>New</i>



## MEMORANDUM

TO: Angela D. Marconi, P.E., BCEE

FROM: Chavis J. Bianco

**SUBJECT: Johnson Controls Battery Group, Inc. – Middletown, DE**

**Permit: APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #1, Screening Tower #1, Surge Hopper #1*

**Permit: APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #2, Screening Tower #2, Surge Hopper #2*

**Permit: APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #3*

**Permit: APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #4*

**Pasting Lines**

DATE: January xx, 2017

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Johnson Controls Battery Group, Inc. ("Johnson Controls" or "JCI"), located at 700 North Broad Street, Middletown, Delaware, is a lead acid battery manufacturing facility. The Facility uses various process equipment for its final production (batteries). Examples of processes and operations are: oxide production, paste mixing, pasting lines (paste and grids are combined), casting operations, battery assembly, and cast-on-strap lines. JCI emits lead/lead dust and has various baghouses with bag/HEPA filters which are used to control emissions. Note that the last phase of battery assembly is completed at another location of this company in Middletown, known as Johnson Controls Middletown Distribution Center ("JC-DC"). The JC-DC location currently has an active Registration **APC-2011/0141 (Amendment 2)**.

The Facility currently has two pasting lines which utilize the Barton lead oxide produced at the facility. One line produces negative while the other produces positive plates. With the expansion project, two additional pasting lines will be constructed bringing the total pasting lines to a total of four. There will be 2 positive pasting lines which will utilize the new Ball lead oxide produced by the new Sovema Ball Mills (permits to come in the near future, **APC-2017/0019-C** through **0022-C**). Alternatively, two pasting lines will produce negative plates which will utilize the existing Barton lead oxide produced or purchased by the Facility.

The Facility is not a major source for any pollutant because it does not meet any major threshold. The pollutants produced by the four pasting lines are primarily lead emissions. Additionally, each pasting line is equipped with a 1.2 Mmbtu/hr burner which will emit the typical pollutants of natural gas combustion (NO<sub>x</sub>, SO<sub>x</sub>, CO, VOC, and PM). Additionally, the Facility is currently subject to NSPS and MACT standards which are addressed later in more detail.

The Company has not requested confidentiality.

The Company is not located within the Coastal Zone.

The Company is current with their annual fees and has paid appropriate construction application fees.

The property is zone M-1 which allow for light manufacturing and currently the Facility has several natural minor permits open with the State.

### **TECHNICAL INFORMATION**

Currently, the Facility produces and purchases Barton lead oxide to apply on the plates installed into the dry battery cells produced at the Facility. In recent years the battery production industry has shifted lead oxide production and has started using Ball lead oxide which is produced by ball mills. The Facility will

**MEMORANDUM**

Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** Pasting Line #1, Screening Tower #1, Surge Hopper #1

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** Pasting Line #4

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Pasting Lines**

January xx, 2017

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continue to use, produce and purchase Barton lead oxide by use of the existing two Barton Lead Oxide Mills (**Permits: APC-87/0227 (Amendment 1)** and **APC-87/0228 (Amendment 1)** both issued August 12, 2005). The Facility, when required, will purchase Barton lead oxide by truckload and pump this Barton lead oxide into storage silos. The newer technology in the industry is to produce Ball lead oxide. This technology is more efficient in converting lead to lead oxide. With the new expansion, the Facility will be producing Ball lead oxide and Barton lead oxide. It has been expressed by the Facility that the different lead oxides are not stable if mixed due to the chemical and physical properties of the lead oxide's construction. So the different lead oxide products will be purposed differently.

The Facility will be constructing a new pasting line denoted as Pasting Line #1 which will produce positive plates using Ball lead oxide. Pasting Line #2 is an existing line which is currently permitted by **Permit: APC-82/0057-OPERATION (Amendment 4) (NSPS)**, issued April 17, 2007. Pasting #2 will be additionally producing positive plates again utilizing Ball lead oxide. The Facility receives positive plates already stamped and expanded from an outside source. This is not true for the negative plates which will be addressed in more detail for Pasting Line #3 and #4.

Both Pasting Lines #1 and 2 will need new screening towers which are used to help "screen" the Ball lead oxide and remove large clumps of lead oxide which may get stuck along the pasting process. From the screening towers, the Ball lead oxide will be pumped into new surge hoppers which meter the lead oxide into the pasting lines' weigh hopper to introduces the lead oxide into the pasting line at the required speed and amount. The construction of the screening towers and surge hoppers are unique to the Ball lead oxide pasting lines and will be ducted to either Baghouse #1 or #2. Below is a table with the processes going into Baghouse #1 and #2 which are both commonly joined into a single stack, stack #500.

Stack No.	Baghouse No.	Process Description	Emission Standard	Conversions			Lead	
				dscfm	lb/gr	min/hr	lb/hr	tons/yr
<b>500</b>	Baghouse #1	Pasting Line 1	0.000437 gr/dscf	16787	0.000143	60	<b>0.063</b>	<b>0.275</b>
		Surge Hoppers 1&2	0.000437 gr/dscf	2325	0.000143	60	<b>0.009</b>	<b>0.038</b>
	Baghouse #2	Pasting Line 2	0.000437 gr/dscf	17991	0.000143	60	<b>0.067</b>	<b>0.295</b>
		Screening Tower 1&2	0.000437 gr/dscf	2325	0.000143	60	<b>0.009</b>	<b>0.038</b>
<b>Stack #500 Total</b>							<b>0.148</b>	<b>0.647</b>

Construction permits will be provided for the additional two pasting lines denoted as Pasting Line #3 and #4 which will utilize the existing Barton lead oxide. Currently, Pasting Lines #3 has an active **Permit: APC-93/0428- OPERATION (Amendment 5) (NSPS)**, issued April 17, 2007. Both lines #3 and #4 will produce negative plates using Barton lead oxide used in the production of the dry vehicle batteries. The negative plates are produced by the Facilities strip caster. This is an existing piece of equipment which first stamps the grid design and pulls apart, or expands the plate coil. A lube/water mixture is sprayed on this portion of the line. The little pieces that are punched out by the die cutter are known as "trim" which then run through an existing trim-dry oven. Here, the trim-dry oven is used to evaporate the moisture off the trimmed pieces as water and molten lead can cause an explosion. Additionally, the trim-dry oven will evaporate the lubricant which is used in the stamping process of the strip caster. These two pieces of equipment are existing and are going to receive new construction permits to have their emissions ducted to new, more efficient baghouses in the near future.

**MEMORANDUM**

Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** Pasting Line #1, Screening Tower #1, Surge Hopper #1

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** Pasting Line #4

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Pasting Lines**

January xx, 2017

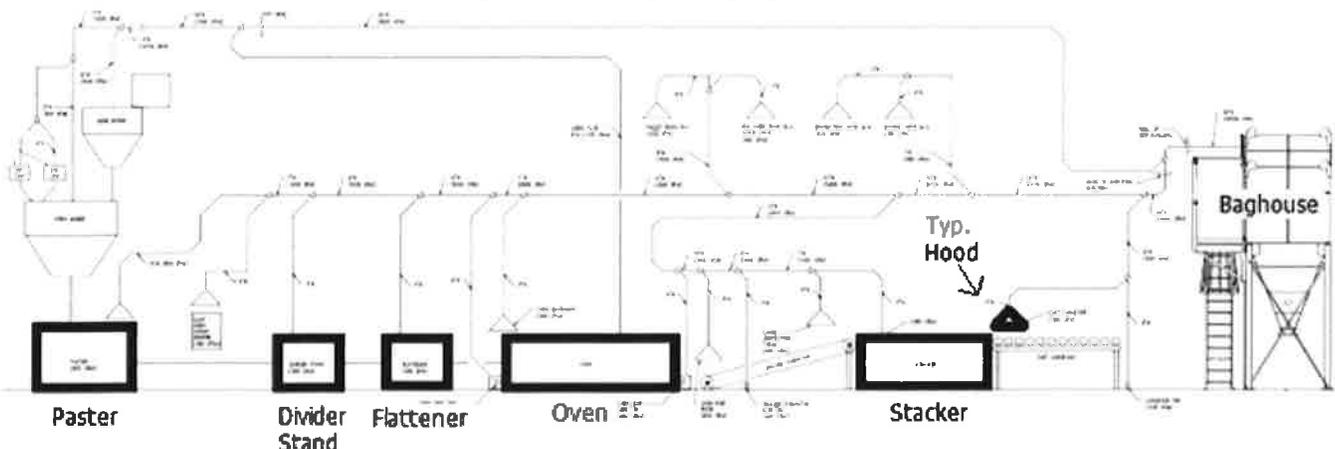
Page 3

Unlike the Ball lead oxide, the use of screening towers and surge hoppers are not needed in Pasting Lines #3 and #4. The Barton lead oxide will be transferred from the possible three storage silos of Barton lead oxide. The three silos are the existing storage silo A and B (**Permit: APC-93/0429-OPERATION (Amendment 1) (NSPS)**, issued February 26, 1997) or a new truck storage silo (construction permit to be issued in near future). These silos all have a combined surge hopper incorporated into them as they provide the Barton lead oxide into the required weigh hopper for the pasting line. Pasting Lines #3 and #4 will be ducted to either Baghouse #3 or #4. Below is a table with the processes going into Baghouse #3 and #4 which are both commonly joined into a single stack, stack #501.

Stack No.	Baghouse No.	Process Description	Emission Standard	Conversions			Lead		
				dscfm	lb/gr	min/hr	lb/hr	tons/yr	
<b>501</b>	Baghouse #3	Pasting Line 3	0.000437 gr/dscf	16787	0.000143	60	<b>0.063</b>	<b>0.275</b>	
		Barton Silo B/Surge Hopper	0.000437 gr/dscf	1163	0.000143	60	<b>0.004</b>	<b>0.019</b>	
		Transfer Storage Silos 1-6	0.000437 gr/dscf	2325	0.000143	60	<b>0.009</b>	<b>0.038</b>	
	Baghouse #4	Pasting Line 4	0.000437 gr/dscf	16787	0.000143	60	<b>0.063</b>	<b>0.275</b>	
		Barton Silo A/Surge Hopper	0.000437 gr/dscf	1163	0.000143	60	<b>0.004</b>	<b>0.019</b>	
		Sovema Startup and Day Bin Mix Silos	0.000437 gr/dscf	2325	0.000143	60	<b>0.009</b>	<b>0.038</b>	
		Purchased Barton Oxide Storage Silo	0.000437 gr/dscf	2325	0.000143	60	<b>0.009</b>	<b>0.038</b>	
	<b>Stack #501 Total</b>							<b>0.161</b>	<b>0.703</b>

The pasting lines will be very similar to the existing two pasting lines in production at the Facility. The process lines will begin by unraveling lead plates which are either purchased or produced via the strip caster, which then has loaded lead oxide applied in the pasting portion of the process seen below. From here the pasted plates go through the divider stand which divides the two-plate wide coil which splits the plates down the middle, essentially creating two continuous strips of plates. From here, the plates proceed to the flattener. When the plates are divided and then cut by the divider stand, they have a curve to them due to being wound into a coil and unraveled. The flattener simply forces them down to be flat. From the flattener, the plates go through a 1.2 Mmbtu/hr oven for a quick drying period, and then finally the plates are cut apart and sent up an incline conveyor to the stacker. This process moves quickly and the application states a total of 766,500,000 positive and negative plates are to be produced in a year. Pasting lines #1 through #4 are typical even though they may use a different lead oxide (Ball or Barton lead oxide). The typical pasting line can be seen below:

**Typical Pasting Line (Typical of 4)**



**MEMORANDUM**

Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** Pasting Line #1, Screening Tower #1, Surge Hopper #1

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** Pasting Line #4

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Pasting Lines**

January xx, 2017

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In summary, during the pasting process, lead oxide paste is applied to the grid panels (or plates) in a pasting machine to fill the spaces of the grid. The major source of lead exposure in the pasting process comes from lead oxide in the paste which can become airborne once it dries. To help collect the airborne lead oxide particulates, each pasting line is equipped with multiple hoods that are strategically placed over areas where lead oxide particles may go airborne. An additional improvement the Facility is taking is the exhaust from the pasting lines will be routed to baghouses located inside the Facility for emission control with HEPA efficiencies.

**EMISSIONS**

A search of the 2016 ACGIH listings resulted in a TLV for lead (CAS [7439-92-1]) of 0.05 mg/m<sup>3</sup>. This value was used in analysis of the TLV/MDC ratio. The TLV for particulate matter was conservatively assumed that all PM was PM<sub>2.5</sub> which has a TLV of 3 mg/m<sup>3</sup>. This value, along with the typical combustion of natural gas emissions were calculated using AP-42 values. The TLV for VOC was conservatively assumed as Benzene and used 1.6 mg/m<sup>3</sup>.

Below are the processes and emissions for Baghouse #1 and #2 which are combined to emit out stack number 500.

	Process	Lead	Product of Combustion (AP-42)				
			PM/PM10	SOx	NOx	CO	VOC
Baghouse #1	Pasting Line #1 (1.2 Mmbtu/hr)	0.063	0.00001	0.0007	0.118	0.099	0.006
	Surge Hoppers 1 & 2	0.009	0	0	0	0	0
Baghouse #2	Pasting Line #2 (1.2 Mmbtu/hr)	0.067	0.00001	0.0007	0.118	0.099	0.006
	Screening Hoppers 1 & 2	0.009	0	0	0	0	0
<b>Stack No. 500 (lb/hr)</b>		<b>0.148</b>	<b>0.00002</b>	<b>0.001</b>	<b>0.235</b>	<b>0.198</b>	<b>0.013</b>

The stack parameters for stack #500 and SCREEN3 modeling results can be seen below in the tables and was taken as per the application for the new processes:

STACK PARAMETERS					Max Conc. (ug/m3) @ 1.0 g/sec	37.53
STACK HEIGHT	45.0	FT	13.716	M		
INSIDE STACK DIA	4.33	FT	1.319784	M		
STACK EXIT VELOCITY	50000	ACFM	23.595	M <sup>3</sup> /S		
STACK EXIT GAS TEMP	95	°F	308.15	°K		
AMBIENT AIR TEMP	68	°F	293.15	°K		

Pollutant	Emission Rate (lb/hr)	Emission Rate (g/sec)	MDC (ug/m3)	Adj. MDC (mg/m3)	TLV (mg/m3)	TLV:MDC Ratio	≥ 100
Lead	0.148	0.019	0.700	0.0005	0.05	102	PASS
PM/PM <sub>10</sub>	0.00002	0.000003	0.00009	0.00000007	3	45315222	PASS
SO <sub>x</sub>	0.0010	0.000126	0.005	0.000003	0.49	148030	PASS
NO <sub>x</sub>	0.235	0.030	1.111	0.0008	0.376	483	PASS
CO	0.198	0.025	0.936	0.0007	28.6	43637	PASS
VOC	0.013	0.002	0.061	0.0000	1.6	37182	PASS

**MEMORANDUM**

Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** Pasting Line #1, Screening Tower #1, Surge Hopper #1

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** Pasting Line #4

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Pasting Lines**

January xx, 2017

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All pollutants pass SCREEN3 modeling at the emission rates written into the Permit under **Condition 2.0** for Stack No. 500. The public health, safety, and welfare are presumed to not be adversely impacted by the new Pasting Lines #1 and #2, Surge hoppers #1 and #2, and Screening hoppers #1 and #2 emissions.

Below are the processes and emissions for Baghouse #3 and #4 which are combined to emit out stack number 501.

	Process	Lead	Product of Combustion (AP-42)				
			PM/PM10	SOx	NOx	CO	VOC
Baghouse #3	Pasting Line #3 (1.2 Mmbtu/hr)	0.063	0.00001	0.0007	0.118	0.099	0.006
	Barton Silo B/Surge Hopper	0.004	0	0	0	0	0
	Transfer Storage Silos 1-6	0.009	0	0	0	0	0
Baghouse #4	Pasting Line #4 (1.2 Mmbtu/hr)	0.063	0.00001	0.0007	0.118	0.099	0.006
	Barton Silo A/Surge Hopper	0.004	0	0	0	0	0
	Sovema Startup and Day Bin Mix Silos	0.009	0	0	0	0	0
	Purchased Barton Oxide Storage Silo	0.009	0	0	0	0	0
<b>Stack No. 501 (lb/hr)</b>		<b>0.161</b>	<b>0.00002</b>	<b>0.001</b>	<b>0.235</b>	<b>0.198</b>	<b>0.013</b>

The stack parameter and SCREEN3 modeling are exactly the same as stack #500 as the height, flow, and exhaust temperature are the same. As such, the maximum concentration and location are the same as previously seen, 37.53 ug/m<sup>3</sup> at 275 meters. Below are the results for stack #501.

Pollutant	Emission Rate (lb/hr)	Emission Rate (g/sec)	MDC (ug/m3)	Adj. MDC (mg/m3)	TLV (mg/m3)	TLV:MDC Ratio	≥ 100
Lead	0.161	0.020	0.759	0.0005	0.05	94	FALSE
PM/PM10	0.00002	0.000003	0.000095	0.0000007	3	45315222	PASS
SOx	0.001	0.00013	0.005	0.0000033	0.49	148030	PASS
NOx	0.235	0.030	1.111	0.0008	0.376	483	PASS
CO	0.198	0.025	0.936	0.0007	28.6	43637	PASS
VOC	0.013	0.002	0.061	0.0000	1.6	37182	PASS

All emissions, except lead, pass the Departments requirement of a TLV/MDC ratio equal to or greater than 100. The TLV/MDC ratio of lead at the emission rate of 0.161 lb/hr is 94. Since this does not meet the requirement, the Facility will be required to extend the stack an additional 3 feet to have a minimum of a 48 feet tall stack. The new parameters were re-entered into SCREEN3 modeling, resulting in the following results:

STACK PARAMETERS						
STACK HEIGHT	48.0	FT	14.6304	M	Max Conc. (ug/m3) @ 1.0 g/sec	35.21
INSIDE STACK DIA	4.32	FT	1.317625	M		
STACK EXIT VELOCITY	50000	ACFM	23.595	M <sup>3</sup> /S	Distance (M)	296
STACK EXIT GAS TEMP	95	°F	308.15	°K		
AMBIENT AIR TEMP	68	°F	293.15	°K		

## MEMORANDUM

Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** Pasting Line #1, Screening Tower #1, Surge Hopper #1

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** Pasting Line #4

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Pollutant	Emission Rate (lb/hr)	Emission Rate (g/sec)	MDC (ug/m3)	Adj. MDC (mg/m3)	TLV (mg/m3)	TLV:MDC Ratio	≥ 100
Lead	0.161	0.020	0.712	0.0005	0.05	100	PASS
PM/PM10	0.00002	0.000003	0.000089	0.00000006	3	48301059	PASS
SOx	0.001	0.00013	0.004	0.0000031	0.49	157783	PASS
NOx	0.235	0.030	1.043	0.0007	0.376	515	PASS
CO	0.198	0.025	0.878	0.0006	28.6	46512	PASS
VOC	0.013	0.002	0.058	0.0000	1.6	39632	PASS

With a 48 foot tall stack, all pollutants pass SCREEN3 modeling at the emission rates written into the Permit under **Condition 2.0** for Stack No. 501. The public health, safety, and welfare are presumed to not be adversely impacted by the new Pasting Lines #3, Barton Silo B, transfer storage silo 1 through 6, Pasting Line #4, Barton Silo A, Sovema Start-up and Day bin mix silos, and purchased Barton oxide storage silo emissions. The Department will require the Facility increase stack number 501 to be 48 feet tall.

### REGULATORY REVIEW

- ✓ 7 DE Admin. Code 1102: Permits
- ✗ 7 DE Admin. Code 1114: Visible Emissions
- ✓ 7 DE Admin. Code 1119: Control of Odorous Air Contaminants
- ✓ 7 DE Admin. Code 1120: New Source Performance Standards
- ✗ 7 DE Admin. Code 1124: Control of Volatile Organic Compound Emissions
- ✗ 7 DE Admin. Code 1125: Requirements for Preconstruction Review
- ✗ 7 DE Admin. Code 1130: Title V State Operating Permit Program
- ✓ 7 DE Admin. Code 1138: Emission Standards for Hazardous Air Pollutants for Source Categories

#### ✓ 7 DE Admin. Code 1102: *Permits:*

The Facility requested permits for two new Pasting Lines #1 and #4. Additionally, the two existing lines, Pasting Lines #2 and #3, will require construction permits as new, more efficient baghouses will be used as control devices to control lead emissions.

- ✓ 7 DE Admin Code 1104, *Particulate Emissions from Fuel Burning Equipment*, is applicable to these emission units. Particulate emissions are limited to  $0.3 \text{ lb}/_{\text{mmBTU}}$  heat input on a maximum two (2) hour average. The Company is in compliance with this regulation because at the maximum firing rate the emission of particulate matter does not exceed  $0.3 \text{ lb}/_{\text{mmBTU}}$ . The following calculation demonstrates particulate matter emissions at the one hour maximum firing rate when fired on natural gas.

$$\text{Maximum natural gas usage} = \frac{1.2 \text{ MMBTU}}{\text{hr}} \times \frac{\text{ft}^3}{1000 \text{ BTU}} = \underline{1,200 \text{ ft}^3}$$

$$\text{Maximum particulate emission} = \frac{\text{hr}}{1.2 \text{ MMBTU}} \times \frac{7.8 \text{ lb}}{\text{hr}} \times \frac{1,200 \text{ ft}^3}{\text{MMBTU}} = \underline{0.0078 \text{ lb}}$$

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Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** Pasting Line #1, Screening Tower #1, Surge Hopper #1

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** Pasting Line #4

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where  $7.8 \text{ lb}/10^6 \text{ ft}^3$  is the particulate matter emission factor for natural gas from AP-42, and  $1,000 \text{ BTU}/\text{ft}^3$  is the maximum heat content of natural gas. Compliance with the emission standard of 7 **DE Admin Code** 1104 can be consistently demonstrated while these emission units are fired on natural gas and shall be demonstrated with record keeping based upon the fuel fired.

- ✓ **7 DE Admin. Code 1105: Particulate Emissions from Industrial Process Operations:**  
Is an applicable regulation, because the Facility is considered an industrial process. Hence, the Facility is subject to the regulation which does not allow emissions in excess of 0.2 grains per standard cubic foot. However, the Facility is also regulated by 7 **DE Admin Code** 1138, Section 11.4.3.2, which is more stringent. This is discussed in more detail below.
- ✓ **7 DE Admin. Code 1108: Sulfur Dioxide Emissions from Fuel Burning Equipment:**  
Is applicable to these permits as the Facility is in New Castle County and uses natural gas which has sulfur. While using natural gas, the sulfur percent by weight will be under 1% by weight. Per an EPA memorandum dated March 24, 2004 which comments on proposed standards of performance for stationary gas turbines (<https://www3.epa.gov/airtoxics/nsps/turbine/oar-2002-0053-0051.pdf>), "Natural gas was defined in the proposed rule as having a sulfur content of 20 grains or less of total sulfur per 100 standard cubic feet, which equates to 0.068 weight percent sulfur, or 680 parts per million by weight (ppmw)". When natural gas is combusted there is no possibility of exceeding the sulfur limit of 1.0 weight percent. This has been incorporated into the Permit under Condition 2.4.
- ✓ **7 DE Admin. Code 1114: Visible Emissions:**  
Is applicable and would require the opacity to not exceed 20% for more than three minutes in any one hour or more than 15 minutes in any 24 hour period. However, the opacity requirement of regulation 7 **DE Admin. Code** 1138, Section 11.0, is more stringent and requires 0% opacity for any source other than a lead reclamation facility. The opacity limit of 0% was incorporated into the permits and can be seen in the below review of 7 **De Admin. Code** 1138.
- ✓ **7 DE Admin. Code 1119: Control of Odorous Air Contaminants:**  
Although the potential for odorous air contaminants is low, Condition 2.3 of the permit includes the odor limits of this regulation. It requires that odors from the pasting lines not be detectable beyond the plant property line in sufficient quantities such as to cause a condition of air pollution.
- ✓ **7 DE Admin. Code 1120: New Source Performance Standards: 14.0 Standards of Performance for Lead -Acid Battery Manufacturing Plants**  
The provisions of Subpart KK - Standards of Performance for Lead–Acid Battery Manufacturing Plants of 40 CFR 60, dated July 1, 1982, are hereby adopted by reference.
- ✓ **40 CFR Part 60, Subpart KK: Standards of Performance for Lead-Acid Battery Manufacturing Plants**  
Is applicable as seen in Section 14.0 of Regulation 1120, Delaware has adopted the provisions of 40 CFR Part 60, Subpart KK. Per the Federal Regulation the Facility meets

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Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #1, Screening Tower #1, Surge Hopper #1*

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #2, Screening Tower #2, Surge Hopper #2*

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #3*

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #4*

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**Pasting Lines**

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the definition of paste mixing facility per §60.371(f). Paste mixing facility means the facility including lead oxide storage, conveying, weighing, metering, and charging operations; paste blending, handling, and cooling operations; and plate pasting, takeoff, cooling, and drying operations. Since the Facility meets the definition per the applicability of §60.370(b)(2), the provisions of the regulation are applicable.

The standard per §60.372(a)(2) of the regulation was incorporated into the Permit which requires no owner or operator subject to the provisions of this subpart shall cause discharge into the atmosphere the emissions from any paste mixing facility gases that contain in excess of 1.00 milligram of lead per dry standard cubic meter of exhaust (0.000437 gr/dscf). This was incorporated into Condition 2.1.1 of these Permits.

Additionally, the standard per §60.372(7) was incorporated into the Permit under Condition 2.2 which requires 0% opacity from an affected Facility.

Since the Facility is subject to the Federal requirements of 40 CFR Part 60, the Permits have been denoted with an "NSPS".

✘ **7 DE Admin Code 1121: *Emission Standards for Hazardous Air Pollutants***

Even though lead is listed as a hazardous substance in Section 112 of the Clean Air Act, this regulation is not applicable to this process as per applicability section 1.0 of the Regulation. The Facility does not emit asbestos, beryllium, mercury, vinyl chloride, or benzene.

✘ **7 DE Admin Code 1125: *Requirements for Preconstruction Review***

Section 2.0 (Emission Offset Provisions) of this standard does not apply because the application does not meet or exceed major source threshold. A Facility is major for VOC and NO<sub>x</sub> at 25 tons per year and CO, SO<sub>2</sub>, PM at 100 tons per year. The Facility is well under these values. Likewise, the Facility would need to be at or over 10 tons per year of lead to be considered a major source. The Facility is not a major for any pollutant. Section 3.0 (Prevention of Significant Deterioration of Air Quality) of this standard does not apply because the application is not a major source for any pollutant as previously stated. Section 4.0 (Minor New Source Review) of this standard does not apply because the application is not a major source for any pollutant as previously stated.

✘ **7 DE Admin. Code 1130: *Title V State Operating Permits Program*:**

Is not applicable because this source is not major for any pollutant. The Facility is under the 100 tons major source threshold of PM and less than 10 tons for a single hazardous substance, lead.

✓ **7 DE Admin. Code 1138, *Section 11.0 Emission Standards for Hazardous Air Pollutants for Area Source Lead Acid Battery Manufacturing Plants*:**

Is applicable and will be discussed with the Federal Regulation P P P P P P from which Delaware Regulation is derived/adopted from. (1138 additionally adopted the requirements of 40 CFR 60, Subpart KK which as talked about in review of **7 DE Admin. Code 1120**)

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Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #1, Screening Tower #1, Surge Hopper #1*

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #2, Screening Tower #2, Surge Hopper #2*

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #3*

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #4*

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- ✓ 40 CFR Part 63, Subpart PPPPPP: *National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources*
  - Is applicable because the Facility operates a lead acid battery manufacturing plant and is an area source of a hazardous air pollutant, lead. The requirements of both 7 **DE Admin. Code** 1138, Section 11.0 and 40 CFR Part 63, Subpart PPPPPP will be discussed concurrently below:
    - 11.3.3 requires the owner or operator of a new affected source that has an initial start-up after July 16, 2007 shall be in compliance with provisions in 7 **DE Admin. Code** 1138, Section 11.0.
    - 11.4.3.6 requires the emissions from any paste mixing facility shall not emit emissions of lead in excess of 1.0 milligrams per dry standard cubic meter of exhaust gas (0.000437 gr/dscf). This was discussed in the applicability with 7 **De Admin. Code** 1120. The lead emission standards have been incorporated into these Permits.
    - 11.4.3.7 requires the opacity to not exceed 0% opacity which was also discussed in the 7 **De Admin. Code** 1120 discussion. The 0% opacity requirement has been incorporated into the Permit.
    - 11.4.5 of the Delaware Regulation is more stringent than the Federal Regulation §60.372(b). The State Regulation requires that the affected source shall implement a written startup, shutdown, and malfunction plan which has been incorporated into these Permits under Condition 3.2.
    - 11.5.1.1 states that the affected sources shall conduct a performance test to demonstrate initial compliance with the emission and opacity limitations. This has been incorporated into these Permits under Condition 4.5.
    - 11.6.3 states, "For any exhaust gas stream controlled by a fabric filter, the owner or operator shall be in compliance with the requirements in 11.6.3.1 through 11.6.3.3 of this regulation. Fabric filters equipped with a high efficiency particulate air (HEPA) filter or other secondary filter are allowed to monitor less frequently, as specified in 11.6.3.4 of this regulation." The Facility is using HEPA filtration on all Baghouses #1, #2, #3, and #4. The requirement of this regulation is incorporated into these Permits under Condition 4.2.
    - 11.6.3.1 states, "The owner or operator shall perform quarterly inspections and maintenance to ensure proper performance of each fabric filter. This quarterly inspection includes inspection for structural and filter integrity. The owner or operator shall record the results of these inspections and any maintenance performed." This condition was incorporated into these Permits under Condition 4.4. The Federal Regulation under §63.11423(b)(2)(i) requires semi-annual inspections of each fabric filter. The Delaware Regulation was used because it is more stringent.

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Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #1, Screening Tower #1, Surge Hopper #1*

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11.8.1 states that the owner or operator shall fulfill all recordkeeping as outlined in 11.8 of the regulation and at a minimum shall maintain the following: inspection records, maintenance records, malfunction records which includes corrective actions, test reports of all performance records, and records of all periods of excess emissions. These are required to be maintained for five (5) years per 11.8.3. The requirements, as described, has been incorporated into Condition 5.3 of these Permits.

11.9 states the requirements for notification and reporting. These conditions have been incorporated into these Permits by Conditions 6.3.1 and 6.3.2 and can be seen below:

- 6.3.1 **Periodic startup, shutdown, and malfunction reports:** If actions taken by an owner or operator during a startup, shutdown, or malfunction of an affected source (including actions taken to correct a malfunction) are consistent with the procedures specified in the source's startup, shutdown, and malfunction plan, the owner or operator shall state such information in a startup, shutdown, and malfunction report. Such a report shall identify any instance where any action taken by an owner or operator during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) is not consistent with the affected source's startup, shutdown, and malfunction plan, but the source does not exceed any applicable emission limitation in the relevant emission standard. Such a report shall also include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. Reports shall only be required if a startup, shutdown, or malfunction occurred during the reporting period. The startup, shutdown, and malfunction report shall consist of a letter, containing the name, title, and signature of the owner or operator or other responsible official who is certifying its accuracy that shall be submitted to the Department **semiannually**. The startup, shutdown, and malfunction report shall be delivered or postmarked **by the 30<sup>th</sup> day following the end of each calendar half**. The excess emissions and continuous startup, shutdown, and malfunction reports required under this paragraph may be submitted simultaneously with the excess emissions and other relevant reports. If startup, shutdown, and malfunction reports are submitted with excess emissions the owner or operator receives approval to reduce the frequency of reporting for the latter under 7 **DE Admin Code** 1138, Section 3.10.5 dated October 1, 2008, the frequency of reporting for the startup, shutdown, and malfunction reports also may be reduced if the Department does not object to the intended change.
- 6.3.2 **Immediate startup, shutdown, and malfunction reports:** Notwithstanding the allowance to reduce the frequency of reporting for periodic startup, shutdown, or malfunction reports under Condition 6.3.1, any time an action taken by an owner or operator during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) is not consistent with the procedures specified in the affected source's startup,

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Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

Permit: **APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** Pasting Line #4

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shutdown, and malfunction plan, and the source exceeds any applicable emission limitation in the relevant emission standard, the owner or operator shall report the actions taken for that event within two working days after commencing actions inconsistent with the plan followed by a letter within seven working days after the end of the event. The immediate report shall consist of a telephone call (or facsimile (FAX) transmission) to the Department **within two working days** after commencing actions inconsistent with the plan, and it shall be followed by a letter, delivered or postmarked **within seven working days** after the end of the event, that contains the name, title, and signature of the owner or operator or other responsible official who is certifying its accuracy, explaining the circumstances of the event, the reasons for not following the startup, shutdown, and malfunction plan, and describing all excess emissions, parameter monitoring exceedances, or both which are believed to have occurred. The owner or operator may make alternative reporting arrangements, in advance, with the Department.

Since the Facility is subject to the Federal requirements of 40 CFR Part 63, the Permits have been denoted with an "MACT".

**COMMENT RECEIVED DURING THE ADVERTISEMENT PERIOD**

<b>Comment Received During the Comment Period ( Oct 9 – Oct 25, 2016)</b>		
<b>Comment Reference</b>	<b>Public Hearing Comment Summary</b>	<b>Responses /Actions Taken by DAQ</b>
Dated: October 19, 2016  Emailed	Tom Godlewski, <i>"Is a pdf available of this permit application? The 1.0 ton per year of lead increase seems to be over the Reg. 1125 significance threshold. I'd be interested to see if a dispersion modeling analysis is included in the application as my home is downwind of this source.</i>	-The application, over 200 pages, was emailed to the respondent.  -The Facility is a natural minor source, hence Regulation 1125 does not apply as it does not meet the requirements.  -All pollutants pass SCREEN3 modeling at the emission rates written into each Permit under <b>Condition 2.0</b> . The public health, safety, and welfare are presumed to not be adversely impacted by the expansion emissions.  *A public hearing was not requested.
Dated: October 25, 2016  Emailed	Pete Sullivan, <i>"Since multiple air permits are being requested on top of existing permits (virtually simultaneously) please put a summary chart that includes not</i>	Mr. Sullivan requested a public hearing. At the public hearing, held on November 30, 2016, the Department provided the existing and requested emissions for the total 23 construction permits requested by JCI.

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Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** Pasting Line #1, Screening Tower #1, Surge Hopper #1

Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

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	<i>only the additional pollutants but also the current pollutants, and the total pollutants (sum of current pollutants and additional pollutants.”</i>	Federal Regulation 40 CFR Part 63, Subpart P P P P P P and State Regulation 7 DE Admin Code 1138, Section 11.0 permit emissions of lead to be within a required limit as defined in each regulation. The Facility will be required to perform state testing to ensure compliance with Federal and State Requirements on lead emissions.
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**RECOMMENDATIONS**

The application for the expansion project was advertised Sunday, October 9, 2016. The expansion project requested a total of 15 construction permits, four of which are for the four pasting lines. One comment for a public hearing was received on October 25, 2016. The comments from that email was addressed in the above table.

A public hearing was held on November 30, 2016 at Appoquinimink High School which combined the public notice for the eight chemsets and the expansion project at the Facility. The other 11 construction permits which comprise the expansion project will be forthcoming when the construction permits and technical memorandums are completed.

The Department will require stack number 501 be 48 feet tall in order to pass SCREEN3 modeling.

The proposed project and attached permits comply with all applicable zoning requirements and federal and state air pollution control laws and regulations. The Division of Air Quality recommends that the attached **Permit: APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** through **Permit: APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** be issued.

ADM:CJB

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pc: Dover File  
Chavis J. Bianco

January xx, 2017

**Permit: APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #1, Screening Tower #1, Surge Hopper #1*

**Permit: APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #2, Screening Tower #2, Surge Hopper #2*

**Permit: APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #3*

**Permit: APC-2017/0032-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #4*

Johnson Controls Battery Group, Inc.  
5757 North Green Bay Avenue, P.O. Box 591  
Milwaukee, Wisconsin 53201

ATTENTION: Todd Treybal  
Plant Manager

Dear Mr. Treybal:

Pursuant to 7 **DE Admin. Code** 1102, Section 2, approval of the Department of Natural Resources and Environmental Control (the Department) is hereby granted for the construction of four (4) pasting lines (*which each contain a mixer hopper, open mixer, paster, divider stand, flattener, oven, incline conveyor, stacker, and a variety of hoods*), Screening Towers #1 and #2, and two Surge Hoppers #1 and #2 all located at the Johnson Controls Battery Group, Inc. on 700 North Broad Street, Middletown, Delaware, in accordance with the application submitted on Form Nos. AQM-1 and AQM-2, AQM-3.1, AQM-4.6, and AQM-5 dated July 29, 2016 signed by Todd Treybal, Plant Manager, and cover letters dated July 29, 2016 signed by Kelly Wright, Senior Manager of Environmental Relations, and a revised application submitted on Form Nos. AQM-1, AQM-2, AQM-3.1, AQM-4.6, and AQM-5 dated September 29, 2016 signed by Todd Treybal, Plant Manager and cover letters dated September 29, 2016 signed by Kelly Wright, Senior Manager of Environmental Relations.

These Permits are issued subject to the following conditions:

**1. General Provisions**

- 1.1 These Permits expires on January 20, 2019. If the equipment covered by these Permit will not be constructed by January 20, 2019, an application for a new construction permit must be submitted by December 6, 2018.
- 1.2 The project shall be constructed in accordance with the application described above. If any changes are necessary, revised plans must be submitted and supplemental approval issued prior to actual construction.

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Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #2, Screening Tower #2, Surge Hopper #2*

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- 1.3 Representatives of the Department may, at any reasonable time, inspect this facility.
- 1.4 These Permits may not be transferred to another location or to another piece of equipment or process.
- 1.5 These Permits may not be transferred to another person, owner, or operator unless the transfer has been approved in advance by the Department. Approval (or disapproval) of the permit transfer will be provided by the Department in writing. A request for a permit transfer shall be received by the Department at least thirty (30) days before the date of the requested permit transfer. This request shall include:
  - 1.5.1 Signed letters from each person stating the permit transfer is agreeable to each person; and
  - 1.5.2 An Applicant Background Information Questionnaire pursuant to 7 Del C, Chapter 79 if the person receiving the permit has not been issued any permits by the Department in the previous five (5) years.
- 1.6 The applicant shall, upon completion of the construction, installation, or alteration, request that the Department grant approval to operate.
  - 1.6.1 A separate application to operate pursuant to 7 **DE Admin. Code** 1102 does not need to be submitted to the Department for the equipment or process covered by these construction permits. Upon a satisfactory demonstration by an on-site inspection that the equipment or process complies with all of the terms and conditions of this permit, the Department shall issue a 7 **DE Admin. Code** 1102 Operating Permit for the equipment or process.
  - 1.6.2 The applicant shall notify the Department sufficiently in advance of the demonstration and shall obtain the Department's prior concurrence of the operating factors, time period, and other pertinent details relating to the demonstration.
  - 1.6.3 The provisions of 7 **DE Admin. Code** 1102 Sections 2.1 and 11.3 shall not apply to the operation of equipment or processes for the purposes of initially demonstrating satisfactory performance to the Department following construction, installation, modification, or alteration of the equipment or processes.
- 1.7 The owner or operator shall not initiate construction, install, or alter any equipment or facility or air contaminant control device which will emit or prevent the emission of an air contaminant prior to submitting an application to the Department pursuant to 7 **DE Admin. Code** 1102, and, when applicable 7 **DE Admin. Code** 1125, and receiving approval of such application from the Department; except as exempted in 7 **DE Admin. Code** 1102 Section 2.2.

Permit: **APC-2017/0029-CONSTRUCTION (NSPS)(MACT)** Pasting Line #1, Screening Tower #1, Surge Hopper #1  
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 Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3  
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**2. Emission Limitations**

2.1 Emissions

2.1.1 Lead Emissions

Lead emissions shall not exceed those specified **Table 1** below: (gr/dscf per 7 DE Admin. Code 1138, Section 11.4.3.2 dated October 1, 2008)

<b>Table 1: Lead Emission Limits</b>		<b>Emission Limits</b>		
Stack No.	Equipment Emitting to Stack	Pound per hour (lb/hr)	Tons per rolling 12-month period	Grains per dry standard cubic foot ( <sup>gr</sup> / <sub>dscf</sub> ) **
500	Pasting Line #1	0.063	0.275	0.000437
500	Pasting Line #2	0.067	0.295	0.000437
501	Pasting Line #3	0.063	0.275	0.000437
501	Pasting Line #4	0.063	0.275	0.000437
500	Surge/Weigh Hoppers #1 and #2	0.009	0.038	0.000437
500	Screening Towers #1 and #2	0.009	0.038	0.000437

Lead emissions from any paste mixing facility shall not exceed 0.000437 grains per dry standard cubic foot. (<sup>gr</sup>/<sub>dscf</sub> per 7 DE Admin. Code 1138, Section 11.4.3.2 dated October 1, 2008)

\*\* Pound per hour emission limit seen in **Table 1** is calculated per 7 DE Admin. Code 1138, Section 11.4.3.2. Calculation can be seen in **Appendix A** of these Permits (Page 13).

2.1.2 Products of Combustion Emissions

Products of combustion emissions shall not exceed those in the **Table 2** seen below:

<b>Table 2: Products of Combustion Emission Limits</b>											
Stack No.	Equipment Emitting to Stack	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		Total Suspended Particulates	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
500	Pasting Line #1 (1.2 Mmbtu/hr)	0.118	0.515	0.099	0.433	0.006	0.028	0.001	0.003	0.00001	0.00004
500	Pasting Line #2 (1.2 Mmbtu/hr)	0.118	0.515	0.099	0.433	0.006	0.028	0.001	0.003	0.00001	0.00004
501	Pasting Line #3 (1.2 Mmbtu/hr)	0.118	0.515	0.099	0.433	0.006	0.028	0.001	0.003	0.00001	0.00004
501	Pasting Line #4 (1.2 Mmbtu/hr)	0.118	0.515	0.099	0.433	0.006	0.028	0.001	0.003	0.00001	0.00004

2.1.2.1 Total suspended particulates emissions shall not exceed 0.3 pound per million BTU heat input, maximum two hour average.

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- 2.2 The emission of visible air contaminants from the equipment covered by these Permits shall not exceed zero (0) percent opacity in accordance with 7 **DE Admin. Code** 1138, Section 11.4.3.7 dated October 1, 2008.
- 2.3 Odors from this source shall not be detectable beyond the plant property line in sufficient quantities such as to cause a condition of air pollution.
- 2.4 No person shall offer for sale, sell, deliver, or purchase any fuel having a sulfur content greater than 1.0% by weight when such fuel is intended for use in any fuel burning equipment in New Castle County. No person shall use any fuel having a sulfur content greater than 1.0% by weight in any fuel burning equipment in New Castle County.

### **3. Operational Limitations**

- 3.1 The owner or operator shall comply with the following operational limits:
  - 3.1.1 The Company shall demonstrate compliance with the emission limitations through the proper use and maintenance of a dust control filter to control total suspended particulate emissions.
  - 3.1.2 Baghouse #1 shall control the emissions from Pasting Line #1 (which comprises a mixer hopper, open mixer, paster, divider stand, flattener, oven, incline conveyor, stacker, and a variety of hoods) and the Surge Hoppers #1 and #2. Baghouse #2 shall control the emissions from Pasting Line #2 (which comprises a mixer hopper, open mixer, paster, divider stand, flattener, oven, incline conveyor, stacker, and a variety of hoods) and Screening Towers #1 and #2. Baghouse #1 and #2 will be combined and shall be exhausted into the atmosphere through stack number 500.  
  
Baghouse #3 shall control the emissions from Pasting Line #3 (which comprises a mixer hopper, open mixer, paster, divider stand, flattener, oven, incline conveyor, stacker, and a variety of hoods), the Barton Silo B, and Transfer Storage Silos 1 through 6. Baghouse #4 shall control the emissions from Pasting Line #4 (which comprises a mixer hopper, open mixer, paster, divider stand, flattener, oven, incline conveyor, stacker, and a variety of hoods), the Barton Silo A, the Sovema Startup and Day Bin Mixing Silo, and the Purchased Barton Oxide Storage Silo. Baghouse #3 and #4 will be combined and shall be exhausted into the atmosphere through stack number 501. (Summarized in **Appendix B** on page 14)
- 3.1.2.1 Pasting Lines #1, #2, #3, and #4 shall not be operated unless the corresponding pollution control devices are working properly. Baghouse #1, #2, #3, and #4 system's differential pressure drop range, when in use, shall be maintained within:  
  
Primary filter pressure drop from 0.25" to 8.0" water gauge.  
  
HEPA filter pressure drop from 0.25" to 3.0" water gauge.

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Proper operation includes adequate air pressure for the pulse jet associated with each baghouse.

- 3.1.3 The removal efficiency of Baghouse #1 and #2 (stack # 500) shall be no less than 99.97%.
  - 3.1.4 The removal efficiency of Baghouse #3 and #4 (stack # 501) shall be no less than 99.97%.
  - 3.1.5 Natural gas shall be the only fuel used in the combustion units of Pasting Lines 1, 2, 3 and 4.
  - 3.1.6 Supersacks and/or drums from the dust collectors are to be disposed of as per the Division of Waste and Hazardous Substances' pre-approved disposal protocol.
- 3.2 The owner or operator shall develop and implement a written startup, shutdown, and malfunction plan (SSMP) that describes, in detail, procedures for operating and maintaining the facility during periods of startup, shutdown, and malfunction and a program of corrective actions for malfunctioning process, control devices, and monitoring equipment used to comply with 7 **DE Admin Code** 1138, Section 11.0. The SSMP shall include the Baghouse Preventative Maintenance and Malfunction Plan (BPMMP). At a minimum, the SSMP shall include the following:
- 3.2.1 Specifications for each baghouse/filter including minimum and maximum pressure drop readings that define a proper operating range (as defined in Condition 3.1.2.1).
  - 3.2.2 Monitoring frequencies for each baghouse/filter in accordance with Condition 4.2.
  - 3.2.3 The operational plan that describes, in detail, a program of corrective actions to be taken when monitoring results are outside proper operating ranges.
  - 3.2.4 The scheduled dates for performing the quarterly inspections on each control device (baghouse/filter). These inspections shall be performed to identify any problems with the structure of the baghouse/filter such as leaks, wear, corrosion, dust accumulation, etc.
  - 3.2.5 A routine maintenance plan developed in accordance with manufacturer's recommendations. If recommendations of the manufacturer cannot be obtained, the Company shall develop a maintenance plan based on industry standards and/or the recommendations of other baghouse maintenance experts.
  - 3.2.6 Troubleshooting procedures.

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3.2.7 Required record keeping.

3.2.8 A schedule for review and update of this plan. Note that subsequent updates must also be submitted to the Department for approval.

The Company is encouraged to combine this plan with the other SSMP plans required under existing permits and submit a combined and updated plan to cover the baghouses and filters associated with all lines/systems.

3.3 At all times, including periods of startup, shutdown, and malfunction, the owner or operator shall, to the extent practicable, maintain and operate the facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating procedures are being used will be based on information available to the Department which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

3.4 All structural and mechanical components of the equipment or process covered by these Permits shall be maintained in proper operating condition.

**4. Testing and Monitoring Requirements**

4.1 The owner or operator shall monitor the implementation of SSMP including the quarterly inspection on each baghouse/filter outlined by Condition 3.2.4.

4.2 The differential pressure across the following units shall be monitored on at least a daily basis:

4.2.1 Baghouse #1 (stack # 500); both primary and HEPA filters.

4.2.2 Baghouse #2 (stack # 500); both primary and HEPA filters.

4.2.3 Baghouse #3 (stack # 501); both primary and HEPA filters.

4.2.4 Baghouse #4 (stack # 501); both primary and HEPA filters.

4.3 Once per month, during operation of the associated equipment and during daylight hours, the Company shall observe each of the following stacks for a period of three (3) minutes to determine compliance with Condition 2.2 of these Permits.

4.3.1 Stack # 500 (Baghouse #1 and #2);

4.3.2 Stack # 501 (Baghouse #3 and #4).

4.4 The owner or operator shall perform quarterly inspections and maintenance to ensure proper performance of each fabric filter. This quarterly inspection includes inspection for structural and filter integrity. The owner or operator shall record the results of these

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inspections and any maintenance performed as outlined in Condition 3.2.4 of these Permits.

- 4.5 The Company shall perform emissions testing to show compliance with the emission limitations found in Condition 2.1.1 of these permits in accordance with the schedule listed below. A pre-approved test method will be determined, prior to any testing, which will determine compliance to the emission limitations. This testing shall be within ninety (90) days after achieving the maximum production rate at which the facility will be operated, but not later than 180 days after initial startup of such facility, the owner or operator shall conduct performance test(s) and furnish the Department with a written report of the results of such performance test(s) in accordance with the following general provisions. The average results shall be used to determine compliance with the limitations found in Condition 2.1.1 of these Permits.

4.5.1 Stack # 500 (Baghouse #1 and #2);

4.5.2 Stack # 501 (Baghouse #3 and #4).

After the initial performance testing per Condition 4.5, at least 50% of the stacks shall be tested during every subsequent six year period, alternating between the stacks such that each stack is tested at least once every 12 years.

- 4.6 The Company shall perform emissions testing to show compliance with the visible emission limitations found in Condition 2.2 of these Permits. This shall be done by enlisting the services of a certified visible emissions evaluator to perform testing in accordance with EPA Reference Method 9 (40 CFR 60, Appendix A). Only one test needs to be performed per stack and shall be comprised of (60) minute observations. This test shall be performed on the same schedule as the lead tests specified in Condition 4.5 of these Permits. Weather permitting, observations shall take place concurrently with one of the test specified in Condition 4.5 of these Permits. If the weather precludes testing concurrently with the lead tests, the visible emissions evaluation shall be rescheduled and performed within 45 days of the associated lead stack test.
- 4.7 The Department reserves the right to require that the owner or operator perform additional emission tests, beyond those herein described, using methods approved in advance by the Department.
- 4.8 For all emission testing required under Conditions 4.5, 4.6, and 4.7 of these Permits, the following procedures shall be implemented.
- 4.8.1 One (1) original and one (1) copy of the test protocol shall be submitted a minimum of sixty (60) days in advance of the tentative test date to the address in Condition 6.3. The tests shall be conducted in accordance with the State of Delaware and Federal requirements.
- 4.8.2 The test protocol shall be approved by the Department prior to initiating any testing. Upon approval of the test protocol, the Company shall schedule the

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compliance demonstration with the Source Testing Engineer. The Department must observe the test for the results to be considered for acceptance.

- 4.8.3 The final results of the testing shall be submitted to the Department within sixty (60) days of the test completion. One (1) original and one (1) copy of the test report shall be submitted to the addresses below:

Original to:

Engineering & Compliance Branch  
Attn: Permitting Engineer  
State Street Commons  
100 W. Water Street, Suite 6A  
Dover, DE 19904

One (1) Copy to:

Engineering & Compliance Branch  
Attn: Source Testing Engineer  
715 Grantham Lane  
New Castle, DE 19720

- 4.8.4 The final report of the results must meet the following requirements to be considered valid:

4.8.4.1 The full report shall include the emissions test report (including raw data from the test) as well as a summary of the results and a statement of compliance or non-compliance with permit conditions;

4.8.4.2 Summary of Results and Statement of Compliance or Non-Compliance  
The owner or operator shall supplement the report from the emissions testing firm with a summary of results that includes the following information:

4.8.4.2.1 A statement that the owner or operator has reviewed the report from the emissions testing firm and agrees with the findings.

4.8.4.2.2 Permit number(s) and condition(s) which are the basis for the compliance evaluation.

4.8.4.2.3 Summary of results with respect to each permit condition.

4.8.4.2.4 Statement of compliance or non-compliance with each permit condition.

- 4.8.5 The results must demonstrate to the Department's satisfaction that the emission unit is operating in compliance with the applicable regulations and conditions of this permit; if the final report of the test results shows non-compliance the owner or operator shall propose corrective action(s). Failure to demonstrate compliance through the test may result in enforcement action.

**5. Record Keeping Requirements**

- 5.1 The owner or operator shall maintain all records necessary for determining compliance with these Permits in a readily accessible location for five (5) years (unless otherwise

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specified) and shall make these records available to the Department upon written or verbal request.

5.2 The following information shall be recorded, initialed and maintained in a log on the frequency specified.

5.2.1 The Company shall record at least one differential pressure reading from each of the following baghouses and filters each day:

5.2.1.1 Baghouse #1, 2, 3, and 4

5.2.1.1.1 Primary Filter

5.2.1.1.2 HEPA Filter

5.2.2 The Company shall maintain records of all routine and non-routine maintenance performed on any of the control devices covered by these Permits.

5.2.3 The Company shall maintain records of all visible emissions observations performed in accordance with Conditions 4.3 and 4.6 of these Permits. These shall include the time, date, and results of the observation. If the equipment did not operate during the period (week or month, as applicable) the observations were to have been performed, this fact shall be so noted.

5.3 Inspection records for the control devices and monitoring equipment to document that the inspection and maintenance required by the SSMP have taken place. The record can take the form of a checklist and should identify the control device and monitoring equipment inspected, the date of inspection, a brief description of the working condition of the control device during the inspection, and any actions taken to correct deficiencies found during the inspection.

5.3.1 Records of the occurrence, duration, and cause (if known) of each malfunction of process, control devices, or monitoring equipment.

5.3.2 Records of any operational failures or outages of any of the control devices covered by these Permits.

5.3.3 Records of actions taken during periods of malfunction when such actions are inconsistent with the startup, shutdown, and malfunction plan.

5.3.4 Other records, which may take the form of checklists, necessary to demonstrate conformance with the provisions of the SSMP.

5.4 The Company shall maintain records of the results of each emissions test required under Conditions 4.5, 4.6, and 4.7 of these Permits for a period of twelve (12) years.

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- 5.5 The Company shall keep vendor documents describing the removal efficiency and maintenance requirements of the dust control filters.

## **6. Reporting Requirements**

- 6.1 Emissions in excess of any permit condition or emissions which create a condition of air pollution shall be reported to the Department immediately upon discovery by calling the Environmental Emergency Notification and Complaint number, (800) 662-8802.

- 6.2 In addition to complying with Condition 6.1 of this permit, any reporting required by 7 DE **Admin. Code** 1203 "Reporting of a Discharge of a Pollutant or an Air Contaminant", and any other reporting requirements mandated by the State of Delaware, the owner or operator shall, for each occurrence of excess emissions, within thirty (30) calendar days of becoming aware of such occurrence, supply the Department in writing with the following information:

6.2.1 The name and location of the facility;

6.2.2 The subject source(s) that caused the excess emissions;

6.2.3 The time and date of the first observation of the excess emissions;

6.2.4 The cause and expected duration of the excess emissions;

6.2.5 For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and

6.2.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

- 6.3 Periodic startup, shutdown, and malfunction reports: In addition to excess emissions reporting requirements outlined by Condition 6.2, the owner or operator shall submit the SSMP reports in accordance with 7 DE **Admin Code** 1138, Section 11.9.2.10 dated October 1, 2008:

6.3.1 Periodic startup, shutdown, and malfunction reports: If actions taken by an owner or operator during a startup, shutdown, or malfunction of an affected source (including actions taken to correct a malfunction) are consistent with the procedures specified in the source's startup, shutdown, and malfunction plan, the owner or operator shall state such information in a startup, shutdown, and malfunction report. Such a report shall identify any instance where any action taken by an owner or operator during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) is not consistent with the affected source's startup, shutdown, and malfunction plan, but the source does not exceed any applicable emission limitation in the relevant emission standard. Such a report shall also include the number, duration, and a brief description for

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each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. Reports shall only be required if a startup, shutdown, or malfunction occurred during the reporting period. The startup, shutdown, and malfunction report shall consist of a letter, containing the name, title, and signature of the owner or operator or other responsible official who is certifying its accuracy that shall be submitted to the Department **semiannually**. The startup, shutdown, and malfunction report shall be delivered or postmarked **by the 30<sup>th</sup> day following the end of each calendar half**. The excess emissions and continuous startup, shutdown, and malfunction reports required under this paragraph may be submitted simultaneously with the excess emissions and other relevant reports. If startup, shutdown, and malfunction reports are submitted with excess emissions the owner or operator receives approval to reduce the frequency of reporting for the latter under 7 **DE Admin Code** 1138, Section 3.10.5 dated October 1, 2008, the frequency of reporting for the startup, shutdown, and malfunction reports also may be reduced if the Department does not object to the intended change.

6.3.2 Immediate startup, shutdown, and malfunction reports: Notwithstanding the allowance to reduce the frequency of reporting for periodic startup, shutdown, or malfunction reports under Condition 6.3.1, any time an action taken by an owner or operator during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) is not consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, and the source exceeds any applicable emission limitation in the relevant emission standard, the owner or operator shall report the actions taken for that event within two working days after commencing actions inconsistent with the plan followed by a letter within seven working days after the end of the event. The immediate report shall consist of a telephone call (or facsimile (FAX) transmission) to the Department **within two working days** after commencing actions inconsistent with the plan, and it shall be followed by a letter, delivered or postmarked **within seven working days** after the end of the event, that contains the name, title, and signature of the owner or operator or other responsible official who is certifying its accuracy, explaining the circumstances of the event, the reasons for not following the startup, shutdown, and malfunction plan, and describing all excess emissions, parameter monitoring exceedances, or both which are believed to have occurred. The owner or operator may make alternative reporting arrangements, in advance, with the Department.

6.4 One original and one copy of all required reports shall be sent to the address below:

Division of Air Quality  
State Street Commons  
100 W. Water Street, Suite 6A  
Dover, DE 19904

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Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** *Pasting Line #3*  
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**7. Administrative Conditions**

- 7.1 These Permits shall be made available on the premises.
- 7.2 Failure to comply with the provisions of these Permits may be grounds for suspension or revocation.

Sincerely,

Angela D. Marconi, P.E., BCEE  
Acting Program Manager  
Engineering & Compliance Branch

ADM:CJB  
F:\EngAndCompliance\CJB\cjb16123.doc

Attachments: **Appendix A:** Calculations of lb/hr emission rates (Page 13)  
**Appendix B:** Baghouse and Process Summary (Page 14)

pc: Dover File  
Chavis J. Bianco

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Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

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**Appendix A**

Information provided in Permit Application dated September 29, 2016.

Stack No.	Baghouse No.	Process Description	Emission Standard	Conversions		Lead			
				dscfm	lb/gr	min/hr	lb/hr	tons/yr	
<b>500</b>	Baghouse #1	Pasting Line 1	0.000437 gr/dscf	16787	0.000143	60	0.063	0.275	
		Surge Hoppers 1&2	0.000437 gr/dscf	2325	0.000143	60	0.009	0.038	
	Baghouse #2	Pasting Line 2	0.000437 gr/dscf	17991	0.000143	60	0.067	0.295	
		Screening Tower 1&2	0.000437 gr/dscf	2325	0.000143	60	0.009	0.038	
					<b>Stack #500 Total</b>			<b>0.148</b>	<b>0.647</b>
<b>501</b>	Baghouse #3	Pasting Line 3	0.000437 gr/dscf	16787	0.000143	60	0.063	0.275	
		Barton Silo B/Surge Hopper	0.000437 gr/dscf	1163	0.000143	60	0.004	0.019	
		Transfer Storage Silos 1-6	0.000437 gr/dscf	2325	0.000143	60	0.009	0.038	
	Baghouse #4	Pasting Line 4	0.000437 gr/dscf	16787	0.000143	60	0.063	0.275	
		Barton Silo A/Surge Hopper	0.000437 gr/dscf	1163	0.000143	60	0.004	0.019	
		Sovema Startup and Day Bin Mix Silos	0.000437 gr/dscf	2325	0.000143	60	0.009	0.038	
				<b>Stack #501 Total</b>			<b>0.161</b>	<b>0.703</b>	

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Permit: **APC-2017/0030-CONSTRUCTION (NSPS)(MACT)** Pasting Line #2, Screening Tower #2, Surge Hopper #2

Permit: **APC-2017/0031-CONSTRUCTION (NSPS)(MACT)** Pasting Line #3

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**Appendix B**

Information provided in Permit Application dated September 29, 2016

	Process	Lead	Product of Combustion (AP-42)				
			PM/PM10	SOx	NOx	CO	VOC
Baghouse #1	Pasting Line #1 (1.2 Mmbtu/hr)	0.063	0.00001	0.0007	0.118	0.099	0.006
	Surge Hoppers 1 & 2	0.009	0	0	0	0	0
Baghouse #2	Pasting Line #2 (1.2 Mmbtu/hr)	0.067	0.00001	0.0007	0.118	0.099	0.006
	Screening Hoppers 1 & 2	0.009	0	0	0	0	0
<b>Stack No. 500 (lb/hr)</b>		<b>0.148</b>	<b>0.00002</b>	<b>0.001</b>	<b>0.235</b>	<b>0.198</b>	<b>0.013</b>

	Process	Lead	Product of Combustion (AP-42)				
			PM/PM10	SOx	NOx	CO	VOC
Baghouse #3	Pasting Line #3 (1.2 Mmbtu/hr)	0.063	0.00001	0.0007	0.118	0.099	0.006
	Barton Silo B/Surge Hopper	0.004	0	0	0	0	0
	Transfer Storage Silos 1-6	0.009	0	0	0	0	0
Baghouse #4	Pasting Line #4 (1.2 Mmbtu/hr)	0.063	0.00001	0.0007	0.118	0.099	0.006
	Barton Silo A/Surge Hopper	0.004	0	0	0	0	0
	Sovema Startup and Day Bin Mix Silos	0.009	0	0	0	0	0
	Purchased Barton Oxide Storage Silo	0.009	0	0	0	0	0
<b>Stack No. 501 (lb/hr)</b>		<b>0.161</b>	<b>0.00002</b>	<b>0.001</b>	<b>0.235</b>	<b>0.198</b>	<b>0.013</b>

**MEMORANDUM**

TO: Angela D. Marconi, P.E., BCEE

FROM: Chavis J. Bianco

**SUBJECT: Johnson Controls Battery Group, Inc. – Middletown, DE**

**Permit: APC-2017/0011-CONSTRUCTION (NSPS)(MACT) (Chemset 4a) Stacks 600 & 608**

**Permit: APC-2017/0012-CONSTRUCTION (NSPS)(MACT) (Chemset 5a) Stacks 601 & 609**

**Permit: APC-2017/0013-CONSTRUCTION (NSPS)(MACT) (Chemset 6) Stacks 602 & 610**

**Permit: APC-2017/0014-CONSTRUCTION (NSPS)(MACT) (Chemset 7) Stacks 603 & 611**

**Permit: APC-2017/0015-CONSTRUCTION (NSPS)(MACT) (Chemset 8) Stacks 604 & 612**

**Permit: APC-2017/0016-CONSTRUCTION (NSPS)(MACT) (Chemset 9) Stacks 605 & 613**

**Permit: APC-2017/0017-CONSTRUCTION (NSPS)(MACT) (Chemset 10) Stacks 606 & 614**

**Permit: APC-2017/0018-CONSTRUCTION (NSPS)(MACT) (Chemset 11) Stacks 607 & 615**

DATE: Month xx, 2017

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Johnson Controls Battery Group, Inc. ("Johnson Controls" or "JCI"), located at 700 North Broad Street, Middletown, Delaware, is a lead acid battery manufacturing facility. The Facility uses various process equipment for its final production (batteries). Examples of processes and operations are: oxide production, paste mixing, pasting lines (paste and grids are combined), casting operations, battery assembly, and cast-on-strap lines. JCI emits lead/lead dust and has various baghouses with bag/HEPA filters which are used to control emissions. Note that the last phase of battery assembly is completed at another location of this company in Middletown, known as Johnson Controls Middletown Distribution Center ("JC-DC"). The JC-DC location currently has an active Registration **APC-2011/0141 (Amendment 2)**.

JCI requested construction permits for eight (8) new curing and drying ovens (chemsets) on July 29, 2016. These new chemsets will be denoted as chemsets 4a, 5a, 6, 7, 8, 9, 10, and 11.

JCI currently has five (5) chemset ovens denoted as chemset 1, 2, 3, 4, 5. All five chemsets are on a single permit with five (5) permit numbers dated April 12, 2007. Below is a table with the current operation permit numbers and the associated chemsets:

<b>Existing Permit #</b>	<b>Chemset Designation #</b>	<b>Permitted maximum # of carts</b>
<b><u>APC-2007/0034-OPERATION (NSPS)</u></b>	Chemset Unit 1	44
<b><u>APC-2007/0035-OPERATION (NSPS)</u></b>	Chemset Unit 2	44
<b><u>APC-2007/0036-OPERATION (NSPS)</u></b>	Chemset Unit 3	44
<b><u>APC-89/0031-OPERATION (Amendment 3)(NSPS)</u></b>	Chemset Unit 4	88
<b><u>APC-2007/0037-OPERATION (NSPS)</u></b>	Chemset Unit 5	88

The Company has not requested confidentiality.

The Company is not located within the Coastal Zone.

The Company is current with their annual fees and has paid appropriate construction application fees.

The property is zone M-1 which allow for light manufacturing and currently the Facility has several natural minor permits open with the State.

**MEMORANDUM**

**Permit: APC-2017/0011-CONSTRUCTION (NSPS)(MACT)** (*Chemset 4A*) Stacks 600 & 608  
**Permit: APC-2017/0012-CONSTRUCTION (NSPS)(MACT)** (*Chemset 5A*) Stacks 601 & 609  
**Permit: APC-2017/0013-CONSTRUCTION (NSPS)(MACT)** (*Chemset 6*) Stacks 602 & 610  
**Permit: APC-2017/0014-CONSTRUCTION (NSPS)(MACT)** (*Chemset 7*) Stacks 603 & 611  
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**Permit: APC-2017/0016-CONSTRUCTION (NSPS)(MACT)** (*Chemset 9*) Stacks 605 & 613  
**Permit: APC-2017/0017-CONSTRUCTION (NSPS)(MACT)** (*Chemset 10*) Stacks 606 & 614  
**Permit: APC-2017/0018-CONSTRUCTION (NSPS)(MACT)** (*Chemset 11*) Stacks 607 & 615

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Eight Curing and Drying Ovens**

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The sizes of the chemset ovens are measured by the number of carts of plates it can contain during operation. Existing chemset units 1, 2 and 3 each have a capacity of 44 carts. The eight new chemsets will be identical to these three units and have had an operation limitation of 44 carts allowed in each oven. The number of plates in the oven will correspond to the concentration of the lead emissions from the stack. The chemset units are applicable to 40 CFR 60, subpart KK which has a standard of lead of 0.000437 <sup>gr</sup>/<sub>dscf</sub>.

Lead emissions for the existing three (3) small chemsets is 0.0132 <sup>lb</sup>/<sub>hr</sub> and the two (2) larger chemsets is 0.0113 <sup>lb</sup>/<sub>hr</sub>. In the application, the facility requested lead emissions of 0.0113 <sup>lb</sup>/<sub>hr</sub> for the eight (8) new chemsets. In reality, emissions are significantly lower than this, however, this extremely conservative estimate results in total emissions from the eight new chemsets of 0.0495 ton per year of lead. Actual emissions based on past stack tests of existing chemsets are expected to be much less. The existing and new chemsets do not have any control devices associated with either the chamber exhaust or burner exhausts.

Fuel burning emissions from the new chemsets are based on AP-42 factors for natural gas used by the 3.2 <sup>mmBTU</sup>/<sub>hr</sub> burners. Even though the heaters by themselves are exempt from requiring a permit as they are natural gas and <10 <sup>mmBTU</sup>/<sub>hr</sub>, the chemsets are applicable to a standard. The Department permits a process; as such the burner's emissions must be included in the permits. Below, is a table with the applicable emission factors and the conversion to the pound per hour using the 3.2 <sup>mmBTU</sup>/<sub>hr</sub> burners:

Heater: 3,200,000 BTU/hr

<b>Combustion of Natural Gas Emissions</b>					
	<b>AP-42 Table 1.4-1 &amp; 1.4-2</b>			<b>Converting to lb/hr</b>	
Table 1.4-1	NO <sub>x</sub>	100	<i>lb/10<sup>6</sup> scf</i>	0.31	<i>lb/hr</i>
	CO	84	<i>lb/10<sup>6</sup> scf</i>	0.26	<i>lb/hr</i>
Table 1.4-2	SO <sub>2</sub>	0.6	<i>lb/10<sup>6</sup> scf</i>	0.002	<i>lb/hr</i>
	PM	7.6	<i>lb/10<sup>6</sup> scf</i>	0.02	<i>lb/hr</i>
	VOC	5.5	<i>lb/10<sup>6</sup> scf</i>	0.02	<i>lb/hr</i>

**SCREEN3 RESULTS**

SCREEN3 modeling was performed on the chamber exhaust which will only emit lead and separately on the 3.2 <sup>mmBTU</sup>/<sub>hr</sub> burners which will emit the typical emission from combustion of natural gas. The emission rates as written into the permits were used in determination of the maximum concentration downwind. First, the emissions of the chamber exhaust was input into SCREEN3 modeling at the air flow rate as seen in the permit application of 10,400 CFM.

**MEMORANDUM**

Permit: APC-2017/0011-CONSTRUCTION (NSPS)(MACT) (Chemset 4A) Stacks 600 & 608  
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 Permit: APC-2017/0018-CONSTRUCTION (NSPS)(MACT) (Chemset 11) Stacks 607 & 615

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Eight Curing and Drying Ovens**

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Pollutant	Emission Rate (lb/hr)	Emission Rate (g/sec)	MDC (ug/m3)	Adj. MDC (mg/m3)	TLV (mg/m3)	TLV:MDC Ratio	≥ 100
Lead	0.0113	0.00142	0.265	0.0002	0.05	270	PASS

DAQ reviewed the existing chemsets' stack tests, which showed that they had achieved around 2,500 CFM. To ensure at this point these units still pass, SCREEN3 was run using 2,500 CFM and the TLV/MDC ratio still passes at 160. As such, DAQ determined it not beneficial to input a limit into the permit ensuring a minimum of 5,000 CFM as the Facility has no real way of ensure compliance other than at the time of stack testing, which the permit will requires. Compliance with the emission rate will not depend on the air flow rate at the time of sampling.

DAQ considers it unusual that the location of the maximum concentration at the maximum 10,400 CFM was 205 meters, however at the minimum 5,000 CFM it increased to 221 meters. Likewise, at the 2,500 CFM the maximum concentration was located at 208 meters. DAQ normally sees that the higher the plume goes, the farther the concentration should be away from the stack. The reason for this discrepancy has to do with the buoyancy flux and momentum flux. The higher the temperature the lower the momentum flux would be and the higher the buoyancy flux would be; until the temperature is high enough that the model assumes that the plume rise is buoyancy dominant. Plume rise changes significantly depending on what force is dominant. Hence, the shape of the trajectory will depend on which forces dominate the plume.

The chemsets chamber exhaust passes SCREEN3 modeling at the lead emission rate written into the Permit under **Condition 2.0**, which means that the public health, safety, and welfare are presumed to not be adversely impacted by the eight, new curing and drying ovens chamber exhausts.

The SCREEN3 dispersion modeling for the 3.2 <sup>mm</sup>BTU/hr natural gas fired burners can be seen below at the emission rates calculated using AP-42 emission factors which was discussed previously:

STACK PARAMETERS			
STACK HEIGHT	25.0	FT	7.62 M
INSIDE STACK DIA	0.75	FT	0.2286 M
STACK EXIT VELOCITY	1200	ACFM	0.56628 M <sup>3</sup> /S
STACK EXIT GAS TEMP	300	°F	422.04 °K
AMBIENT AIR TEMP	68	°F	293.15 °K

<b>Max Conc.</b> <b>(ug/m3) @ 1.0</b> <b>g/sec</b>	<b>341.4</b>
<b>Distance (M)</b>	<b>159</b>

**MEMORANDUM**

Permit: **APC-2017/0011-CONSTRUCTION (NSPS)(MACT)** (*Chemset 4A*) Stacks 600 & 608

Permit: **APC-2017/0012-CONSTRUCTION (NSPS)(MACT)** (*Chemset 5A*) Stacks 601 & 609

Permit: **APC-2017/0013-CONSTRUCTION (NSPS)(MACT)** (*Chemset 6*) Stacks 602 & 610

Permit: **APC-2017/0014-CONSTRUCTION (NSPS)(MACT)** (*Chemset 7*) Stacks 603 & 611

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Permit: **APC-2017/0017-CONSTRUCTION (NSPS)(MACT)** (*Chemset 10*) Stacks 606 & 614

Permit: **APC-2017/0018-CONSTRUCTION (NSPS)(MACT)** (*Chemset 11*) Stacks 607 & 615

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Eight Curing and Drying Ovens**

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- ✓ **7 DE Admin Code 1104, *Particulate Emissions from Fuel Burning Equipment***, is applicable to these emission units. Particulate emissions are limited to 0.3 lb/mmbTU heat input on a maximum two (2) hour average. The Company is in compliance with this regulation because at the maximum firing rate the emission of particulate matter does not exceed 0.3 lb/mmbTU. The following calculation demonstrates particulate matter emissions at the one hour maximum firing rate when fired on natural gas.

$$\text{Maximum natural gas usage} = \frac{3.2 \text{ MMBTU}}{\text{hr}} \times \frac{\text{ft}^3}{1000 \text{ BTU}} = \underline{3,200 \text{ ft}^3}$$

$$\text{Maximum particulate emission} = \frac{\text{hr}}{3.2 \text{ MMBTU}} \times \frac{7.8 \text{ lb}}{10^6 \text{ ft}^3} \times \frac{3,200 \text{ ft}^3}{\text{MMBTU}} = \underline{0.0078 \text{ lb}}$$

where 7.8 lb/10<sup>6</sup> ft<sup>3</sup> is the particulate matter emission factor for natural gas from AP-42, and 1,000 BTU/ft<sup>3</sup> is the maximum heat content of natural gas. Compliance with the emission standard of **7 DE Admin Code 1104** can be consistently demonstrated while these emission units are fired on natural gas and shall be demonstrated with record keeping based upon the fuel fired.

- ✓ **7 DE Admin. Code 1108: *Sulfur Dioxide Emissions from Fuel Burning Equipment***:  
Is applicable to these permits as the Facility is in New Castle County and uses natural gas which has sulfur. While using natural gas, the sulfur percent by weight will be under 1% by weight. Per an EPA memorandum dated March 24, 2004 which comments on proposed standards of performance for stationary gas turbines (<https://www3.epa.gov/airtoxics/nsps/turbine/oar-2002-0053-0051.pdf>), "Natural gas was defined in the proposed rule as having a sulfur content of 20 grains or less of total sulfur per 100 standard cubic feet, which equates to 0.068 weight percent sulfur, or 680 parts per million by weight (ppmw)". When natural gas is combusted there is no possibility of exceeding the sulfur limit of 1.0 weight percent.

- X ✓ **7 DE Admin. Code 1114: *Visible Emissions***:

*Chamber Exhaust*

Is applicable and would require the opacity to not exceed 20% for more than three minutes in any one hour or more than 15 minutes in any 24 hour period. However, the opacity requirement of regulation **7 DE Admin. Code 1138**, Section 11.0, is more stringent and requires 0% opacity for any source other than a lead reclamation facility. The opacity limit of 0% was incorporated for the chamber exhaust into the permit and can be seen in the below review of **7 De Admin. Code 1138**.

*Burner Exhaust*

The burner exhaust will be required to not exceed the 20% for more than 3-minute standard of **7 DE Admin. Code 1114** and has been incorporated into the permits.

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**Eight Curing and Drying Ovens**

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under these values. Likewise, the Facility would need to be at or over 10 tons per year of lead to be considered a major source. The Facility is not a major for any pollutant. Section 3.0 (Prevention of Significant Deterioration of Air Quality) of this standard does not apply because the application is not a major source for any pollutant as previously stated. Section 4.0 (Minor New Source Review) of this standard does not apply because the application is not a major source for any pollutant as previously stated.

X 7 **DE Admin. Code 1130: Title V State Operating Permits Program:**

Is not applicable because this source is not major for any pollutant.

✓ 7 **DE Admin. Code 1138, Section 11.0 Emission Standards for Hazardous Air Pollutants for Area Source Lead Acid Battery Manufacturing Plants:**

Is applicable and will be discussed with the Federal Regulation PPPPPP for which Delaware Regulation is derived/adopted from. (1138 additionally adopted the requirements of 40 CFR 60, Subpart KK which as talked about in review of 7 **DE Admin. Code 1120**)

✓ 40 CFR Part 63, Subpart PPPPPP: *National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources*

- Is applicable because the Facility operates a lead acid battery manufacturing plant and is an area source of a hazardous air pollutant, lead. The requirements of both 7 **DE Admin. Code 1138**, Section 11.0 and 40 CFR Part 63, Subpart PPPPPP will be discussed concurrently below:

11.3.3 requires the owner or operator of a new affected source that has an initial start-up after July 16, 2007 shall be in compliance with provisions in 7 **DE Admin. Code 1138**, Section 11.0.

11.4.3.3 requires the emissions from any paste mixing facility shall not emit emissions of lead in excess of 1.0 milligrams per dry standard cubic meter of exhaust gas (0.000437 gr/dscf). This was discussed in the applicability with 7 **De Admin. Code 1120**. The lead emission standards have been incorporated into the Permit.

11.4.3.7 requires the opacity to not exceed 0% opacity which was also discussed in the 7 **De Admin. Code 1120** discussion. The 0% opacity requirement has been incorporated into the Permit.

11.4.5 of the Delaware Regulation is more stringent than the Federal Regulation §60.372(b). The State Regulation requires that the affected source shall implement a written startup, shutdown, and malfunction plan which has been incorporated into the permit under Condition 3.2. It is noted that the chemsets have no control devices.

## **MEMORANDUM**

Permit: **APC-2017/0011-CONSTRUCTION (NSPS)(MACT)** (*Chemset 4A*) Stacks 600 & 608

Permit: **APC-2017/0012-CONSTRUCTION (NSPS)(MACT)** (*Chemset 5A*) Stacks 601 & 609

Permit: **APC-2017/0013-CONSTRUCTION (NSPS)(MACT)** (*Chemset 6*) Stacks 602 & 610

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Permit: **APC-2017/0018-CONSTRUCTION (NSPS)(MACT)** (*Chemset 11*) Stacks 607 & 615

**Johnson Controls Battery Group, Inc. – Middletown, DE**

**Eight Curing and Drying Ovens**

Month xx, 2017

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## **RECOMMENDATIONS**

The application for the eight chemset units was advertised Sunday, August 28, 2016. One comment for a public hearing was received on September 15, 2016. The comments from that letter were addressed in the above table.

A public hearing was held on November 30, 2016 at Appoquinimink High School which combined the public notice for the eight chemsets and the expansion project at the Facility. The other 15 construction permits which comprise the expansion project will be forthcoming when the construction permits and technical memorandums are completed.

The proposed project and attached permit comply with all applicable zoning requirements and federal and state air pollution control laws and regulations. The Division of Air Quality recommends that the attached **Permit: APC-2017/0011-CONSTRUCTION (NSPS)(MACT)** through **Permit: APC-2017/0018-CONSTRUCTION (NSPS)(MACT)** be issued.

ADM:CJB

F:\EngAndCompliance\CJB\cjb16104.doc

pc:     Dover File  
       Chavis J. Bianco

Month xx, 2017

**Permit: APC-2017/0011-CONSTRUCTION (NSPS)(MACT) (Chemset 4a)**  
**Permit: APC-2017/0012-CONSTRUCTION (NSPS)(MACT) (Chemset 5a)**  
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**Permit: APC-2017/0017-CONSTRUCTION (NSPS)(MACT) (Chemset 10)**  
**Permit: APC-2017/0018-CONSTRUCTION (NSPS)(MACT) (Chemset 11)**

Johnson Controls Battery Group, Inc.  
5757 North Green Bay Avenue, P.O. Box 591  
Milwaukee, Wisconsin 53201

ATTENTION: Todd Treybal  
Plant Manager

Dear Mr. Treybal:

Pursuant to 7 DE Admin. Code 1102, Section 2, approval of the Department of Natural Resources and Environmental Control (the Department) is hereby granted for the construction of eight drying and curing ovens denoted as "Chemsets" with associated 3.2 mmBTU/hr natural gas fired burners, located at the Johnson Controls Battery Group, Inc. on 700 N. Broad Street in Middletown, Delaware, in accordance with the application submitted on Form Nos. AQM-1 and AQM-2, AQM-3.1, AQM-4.6, and AQM-5 dated July 29, 2016 signed by Todd Treybal, Plant Manager, and cover letters dated July 29, 2016 signed by Kelly Wright, Senior Manager of Environmental Relations, additional emissions calculation submitted on August 24, 2016, additional weight information on carts loaded into the chemsets on August 26, 2016 emailed by Kelly Wright, and chemsets flow rates received on September 14, 2016 emailed by Kelly Wright.

This permit is issued subject to the following conditions:

**1. General Provisions**

- 1.1 This permit expires on MONTH xx, 2018. If the equipment covered by this permit will not be constructed by MONTH xx, 2018 a request to extend this construction permit must be submitted by MONTH xx, 2018.
- 1.2 The project shall be constructed in accordance with the application described above. If any changes are necessary, revised plans must be submitted and supplemental approval issued prior to actual construction.
- 1.3 Representatives of the Department may, at any reasonable time, inspect this facility.

Permit: **APC-2017/0011-CONSTRUCTION (NSPS)(MACT)** (*Chemset 4a*) Stacks 600 & 608  
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**Johnson Controls Battery Group, Inc. – Middletown, DE  
 Eight Curing and Drying Ovens**

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**2. Emission Limitations**

2.1 Air contaminant emission levels shall not exceed those specified in 7 DE Admin. Code 1100 and the following:

2.1.1 Lead Emissions

Lead emissions shall not exceed those specified in Table 1 below: (gr/dscf per 7 DE Admin. Code 1138, Section 11.4.3.2 dated October 1, 2008)

**Table 1: Lead Emission Limits**

Emission Limits				
Stack No.	Equipment Emitting to Stack	Pound per hour (lb/hr)	Tons per rolling 12-month period	Grains per dry standard cubic foot (gr/dscf)
600	Chemset #4a – Chamber Exhaust	0.0113	0.0495	0.000437
601	Chemset #5a – Chamber Exhaust	0.0113	0.0495	0.000437
602	Chemset #6 – Chamber Exhaust	0.0113	0.0495	0.000437
603	Chemset #7 – Chamber Exhaust	0.0113	0.0495	0.000437
604	Chemset #8 – Chamber Exhaust	0.0113	0.0495	0.000437
605	Chemset #9 – Chamber Exhaust	0.0113	0.0495	0.000437
606	Chemset #10 – Chamber Exhaust	0.0113	0.0495	0.000437
607	Chemset #11 – Chamber Exhaust	0.0113	0.0495	0.000437

2.1.2 Products of Combustion Emissions

Products of combustion emissions shall not exceed those in the following table:

**Table 2: Products of Combustion Emission Limits**

Stack No.	Equipment Emitting to Stack	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		Total Suspended Particulates	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
608	Chemset #4a – Burner Exhaust	0.314	1.374	0.264	1.154	0.017	0.076	0.002	0.008	0.024	0.104
609	Chemset #5a – Burner Exhaust	0.314	1.374	0.264	1.154	0.017	0.076	0.002	0.008	0.024	0.104
610	Chemset #6 – Burner Exhaust	0.314	1.374	0.264	1.154	0.017	0.076	0.002	0.008	0.024	0.104
611	Chemset #7 – Burner Exhaust	0.314	1.374	0.264	1.154	0.017	0.076	0.002	0.008	0.024	0.104
612	Chemset #8 – Burner Exhaust	0.314	1.374	0.264	1.154	0.017	0.076	0.002	0.008	0.024	0.104
613	Chemset #9 – Burner Exhaust	0.314	1.374	0.264	1.154	0.017	0.076	0.002	0.008	0.024	0.104
614	Chemset #10 – Burner Exhaust	0.314	1.374	0.264	1.154	0.017	0.076	0.002	0.008	0.024	0.104
615	Chemset #11 – Burner Exhaust	0.314	1.374	0.264	1.154	0.017	0.076	0.002	0.008	0.024	0.104

2.1.3 Total suspended particulates emissions shall not exceed 0.3 pound per million BTU heat input, maximum two hour average.

Permit: **APC-2017/0011-CONSTRUCTION (NSPS)(MACT)** (*Chemset 4a*) Stacks 600 & 608  
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Permit: **APC-2017/0015-CONSTRUCTION (NSPS)(MACT)** (*Chemset 8*) Stacks 604 & 612  
Permit: **APC-2017/0016-CONSTRUCTION (NSPS)(MACT)** (*Chemset 9*) Stacks 605 & 613  
Permit: **APC-2017/0017-CONSTRUCTION (NSPS)(MACT)** (*Chemset 10*) Stacks 606 & 614  
Permit: **APC-2017/0018-CONSTRUCTION (NSPS)(MACT)** (*Chemset 11*) Stacks 607 & 615

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may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

- 3.3 All structural and mechanical components of the equipment or process covered by this Permit shall be maintained in proper operating condition. Proper operation of the chemsets shall be considered a necessary part of operation of each unit.

**4. Testing and Monitoring Requirements**

- 4.1 Within ninety (90) days after achieving the maximum production rate at which the facility will be operated, but not later than 180 days after initial startup of such facility, the owner or operator shall conduct performance test(s) and furnish the Department with a written report of the results of such performance test(s) in accordance with Conditions 4.1.2 through 4.1.6. The average results shall be used to determine compliance with the limitations found in Condition 2.1.1 of this permit. The following units shall be tested, additionally the frequency after the initial stack test can be seen below in Condition 4.1.1:

- 4.1.1 Chamber exhaust (stack numbers 600, 601, 602, 603, 604, 605, 606, and 607);

After the initial performance testing per Condition 4.1, at least 50% of the stacks shall be tested during every subsequent six year period, alternating between the stacks such that each stack is tested at least once every 12 years. [Reference 7 DE Admin. Code 1138 Section 11.5.2.2 dated 08/11/2007]

- 4.1.2 One (1) original and one (1) copy of the test protocol shall be submitted a minimum of forty-five (45) days in advance of the tentative test date to the address in Condition 6.3. The tests shall be conducted in accordance with the State of Delaware and Federal requirements.

- 4.1.3 The test protocol shall be approved by the Department prior to initiating any testing. Upon approval of the test protocol, the Company shall schedule the compliance demonstration with the Source Testing Engineer. The Department must observe the test for the results to be considered for acceptance.

- 4.1.4 The final results of the testing shall be submitted to the Department within sixty (60) days of the test completion. One (1) original and one (1) copy of the test report shall be submitted to the addresses below:

Original to:  
Engineering & Compliance Branch  
Attn: Permitting Engineer  
State Street Commons  
100 W. Water Street, Suite 6A  
Dover, DE 19904

One (1) Copy to:  
Engineering & Compliance Branch  
Attn: Source Testing Engineer  
715 Grantham Lane  
New Castle, DE 19720

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**Permit: APC-2017/0012-CONSTRUCTION (NSPS)(MACT)** (*Chemset 5a*) Stacks 601 & 609  
**Permit: APC-2017/0013-CONSTRUCTION (NSPS)(MACT)** (*Chemset 6*) Stacks 602 & 610  
**Permit: APC-2017/0014-CONSTRUCTION (NSPS)(MACT)** (*Chemset 7*) Stacks 603 & 611  
**Permit: APC-2017/0015-CONSTRUCTION (NSPS)(MACT)** (*Chemset 8*) Stacks 604 & 612  
**Permit: APC-2017/0016-CONSTRUCTION (NSPS)(MACT)** (*Chemset 9*) Stacks 605 & 613  
**Permit: APC-2017/0017-CONSTRUCTION (NSPS)(MACT)** (*Chemset 10*) Stacks 606 & 614  
**Permit: APC-2017/0018-CONSTRUCTION (NSPS)(MACT)** (*Chemset 11*) Stacks 607 & 615

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- 4.3 The Department reserves the right to require that the owner or operator perform additional emission tests, beyond those herein described, using methods approved in advance by the Department.
- 4.4 Once per month, during operation of the associated equipment and during daylight hours, the Company shall observe each stack associated with this permit for a period of three (3) minutes to determine compliance with Condition 2.2 and 2.3 of these permits. The detection of the presence or absence of visible emissions shall be in accordance with the procedures of EPA Reference Method 22 (40 CFR 60, Appendix A) paragraphs 4 and 5. This procedure does not require that the opacity of the emissions be determined. Since this procedure requires only the determination of whether a visible emission occurs and does not require the determination of opacity levels, observer certification according to the procedures of EPA Reference Method 9 (40 CFR 60, Appendix A) is not required. However, it is necessary that the observer is educated on the general procedures for determining the presence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects on visibility of emissions caused by background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor).
- 4.4.1 If visible emissions are observed from any of the chemset chamber exhaust stacks (stacks 600, 601, 602, 603, 604, 605, 606, and 607), the operation shall be immediately discontinued and the emissions incident shall be reported in accordance with Condition 6 of these permits. The operation may be resumed once the cause of the visible emissions has been found and corrected and with Department approval.
- 4.4.2 If visible emissions are observed from any of the natural gas heater exhausts stacks (stacks 608, 609, 610, 611, 612, 613, 614, and 615), the owner or operator shall stop operation and ensure the burners are operating per manufacturer specifications. This shall be logged per Condition 5.2.5. After corrective action has been performed, visible observation shall again be taken while in operation. If visible emissions are still observed, the chemset shall not be used until an observation in accordance with EPA Reference Method 9 (40 CFR 60, Appendix A) can be performed to ensure compliance with Condition 2.3. The chemset unit shall not be operated, other than for visible observation testing, until compliance with Condition 2.3 of this Permit is achieved.

## **5. Record Keeping Requirements**

- 5.1 The owner or operator shall maintain all records necessary for determining compliance with this permit in a readily accessible location for five (5) years and shall make these records available to the Department upon written or verbal request.

**Permit: APC-2017/0011-CONSTRUCTION (NSPS)(MACT)** (*Chemset 4a*) Stacks 600 & 608  
**Permit: APC-2017/0012-CONSTRUCTION (NSPS)(MACT)** (*Chemset 5a*) Stacks 601 & 609  
**Permit: APC-2017/0013-CONSTRUCTION (NSPS)(MACT)** (*Chemset 6*) Stacks 602 & 610  
**Permit: APC-2017/0014-CONSTRUCTION (NSPS)(MACT)** (*Chemset 7*) Stacks 603 & 611  
**Permit: APC-2017/0015-CONSTRUCTION (NSPS)(MACT)** (*Chemset 8*) Stacks 604 & 612  
**Permit: APC-2017/0016-CONSTRUCTION (NSPS)(MACT)** (*Chemset 9*) Stacks 605 & 613  
**Permit: APC-2017/0017-CONSTRUCTION (NSPS)(MACT)** (*Chemset 10*) Stacks 606 & 614  
**Permit: APC-2017/0018-CONSTRUCTION (NSPS)(MACT)** (*Chemset 11*) Stacks 607 & 615

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6.2.5 For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and

6.2.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

6.3 One original and one copy of all required reports shall be sent to the address below:

Division of Air Quality  
State Street Commons  
100 W. Water Street, Suite 6A  
Dover, DE 19904

## **7. Administrative Conditions**

7.1 These permits shall be made available on the premises.

7.2 Failure to comply with the provisions of these permits may be grounds for suspension or revocation.

Sincerely,

Angela D. Marconi, P.E., BCEE  
Acting Program Manager  
Engineering & Compliance Branch

ADM:CJB  
F:\EngAndCompliance\CJB\cjb16103.doc

pc: Dover File  
Chavis J. Bianco