AIR QUALITY CONSTRUCTION PERMIT APPLICATION

TOYOTA BATTERY MANUFACTURING NORTH CAROLINA
GREENSBORO, NORTH CAROLINA

TOYOTA

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1. INTRODUCTION

1.1 Executive Summary

Toyota Battery Manufacturing North Carolina (Toyota) proposes to expand a newly permitted battery manufacturing facility at 7039 State Rd 1006, Julian, North Carolina in Randolph County. This new site is located in the Greensboro-Randolph Megasite. This permit application addresses emissions associated with battery cell manufacturing, as well as miscellaneous support activities.

Toyota recently permitted the first phase of the project by permitting four hybrid electric vehicle (HEV) battery production lines. The air permit (Permit No. 10735R00) for the first phase was issued on May 6, 2022. In this application, Toyota is proposing seven (7) battery electric vehicle (BEV) battery production lines. This new facility will include technologies for producing battery cells that will be utilized in Toyota vehicles, some of which include:

- Anode/Cathode Mixing
- Assembly/ Winding
- Electrolyte and NMP additions
- Inspection
- NMP Solvent Recovery

The facility is currently a small source under Title V regulations. Toyota is proposing to increase VOC emissions significantly in this application due to the proposed BEV lines such that potential VOC emissions will increase above 100 tpy, the threshold for becoming a Title V major source. Therefore, the facility is submitting this application as a construction permit to become a Title V source in accordance with Title 15A of North Carolina Administrative Code (15A NCAC) Chapters 2Q .0304 and 2Q .0305. Toyota will submit an application within twelve months of operating as a Title V source, as the second permitting step to issue the initial Title V operating permit.

The permit application fee ($3,090) as required under 2Q .0304(k) and 2Q .0305(a)(1)(A) will be paid using DEQ's e-Payment option. All information required to issue a construction and operating permit for the proposed modification is contained in this permit application. Toyota requests that the NCDEQ review this application and issue a construction and operating permit as soon as possible.

Per 15A NCAC 2Q .0305(a)(1), the required number of copies (3) have been included as required by Rule 2Q .0305(b) and the copies have been signed as required by Rule 2Q .0304(j). Furthermore, as required by 2Q .0304(b)(1) and 2Q .0305(a)(1)(B), a zoning consistency determination has been submitted as part of this application.

1.2 Application Contents

Three copies of this air permit application are enclosed. This application contains the following information:

- Section 2 provides a project description and discusses air emissions,
- Section 3 discusses regulatory applicability,
- Section 4 provides general facility permit application forms,
- Section 5 provides source specific permit application forms for the BEV lines,
- Section 6 provides source specific permit application forms for the Generator,
- Appendix A contains facility-wide emission summaries,

- Appendix B presents a copy of the local zoning consistency determination,
- Appendix C contains process flow diagrams, and
- Appendix D contains EPA background documentation.

2. BACKGROUND AND PROCESS DESCRIPTION

2.1 Background

Toyota is submitting this application to expand an automotive battery manufacturing facility in Greensboro, North Carolina. The facility is currently permitted for the following manufacturing operations in Permit No. 10735R00:

- HEV Manufacturing Lines 1 through 4 consisting of electrode mixing, slitting, assembly, QA/QC evaluation, sealing, stacking, and top plate assembly, with numerous bagfilters controlling PM emissions and scrubbers controlling VOC emissions.
- Cleaning Activities
- Generator (2000 kW)
- Insignificant/Exempt activities, including: cooling towers, several storage tanks, two diesel emergency generators, a diesel fire pump, QC evaluation rooms, QC washing, and table top fume hood.

The plant's processes are discussed in detail in Section 2.2. Facility-wide potential emission estimates associated with the facility's operations and the proposed BEV manufacturing lines are included in Appendix A.

A detailed description of the production process and associated emissions sources are provided in the following subsections. NCDEQ's source-specific application forms for the BEV lines are included in Section 6 of this application.

2.2 Process Description

2.2.1 Process Summary

The facility initially permitted four (4) HEV battery manufacturing lines (Lines 1-4). In this application, Toyota is proposing to add seven (7) BEV manufacturing lines (Lines 5-11). The BEV lines are very similar to HEV lines and will be comprised of the same manufacturing steps as the HEV lines. The BEV products have smaller cells but are built in larger packs; therefore, the emissions per line are greater for each BEV line than each HEV line.

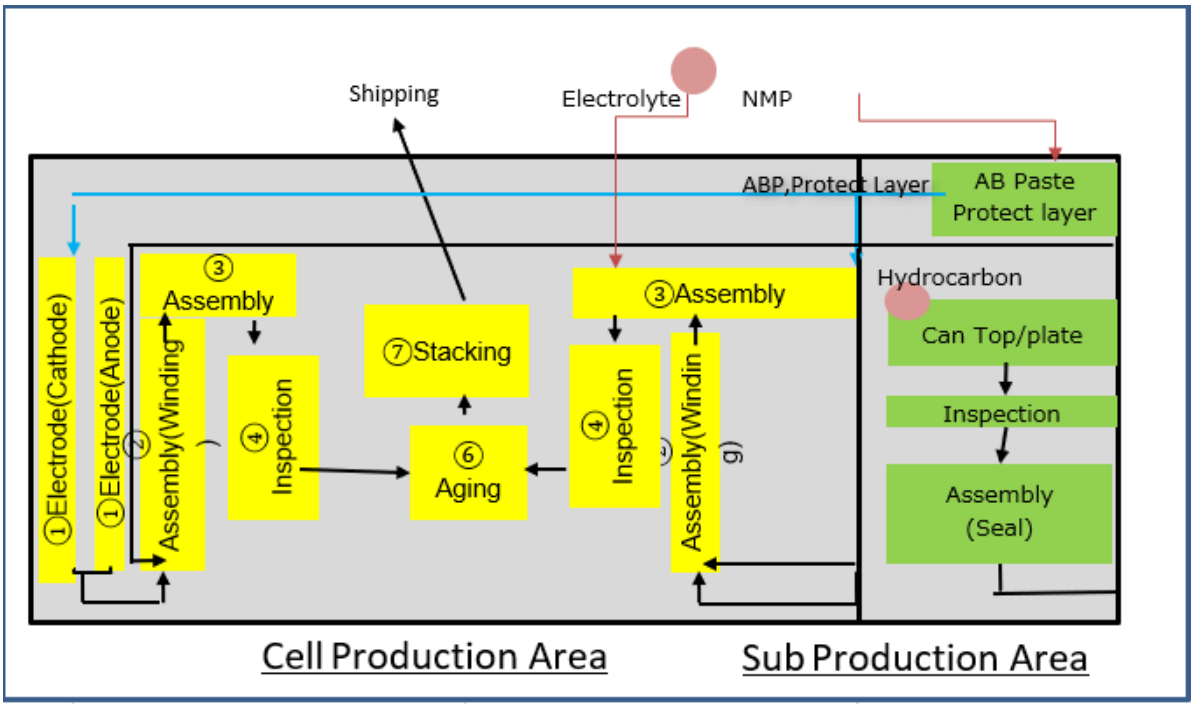
The facility will mix electrode paste using cathode activation and anode activation products, conductive materials, binders and other powder products which are mixed into a slurry. The cathode production process utilizes n-methyl pyrrolidone (NMP) (CAS No. 872-50-4) as the solvent for cathode production and deionized water is utilized as the solvent for anode production. NMP will be recovered through a VOC scrubber (absorber) system, where one scrubber is utilized per HEV manufacturing line and one per BEV manufacturing line. The coating and drying process includes applying slurry onto aluminum (cathode) and/or copper foil (anode).

Each HEV and BEV line will be comprised of the following processes:

- Cathode & Anode Mixing, Press & Slit – Dry dust collectors will be utilized throughout these steps to control dust from mixing processes
- Assembly Process: Winding – Dry dust collectors will be utilized throughout these steps to control dust from winding machines in Assembly Process

- Assembly Process: Sealing – Wet dust collectors will be utilized throughout this step to control dust from seal-weld machines in Assembly Process
- NMP Collector: Cathode Coating/Dry – NMP scrubbers (one per HEV line and one per BEV line) will be utilized to remove NMP from coating exhaust gas (VOC less than 10 ppm)
- Oil Mist Collector – Oil mist collector will be utilized to remove oil from production room (Can/Plate areas). Note this operation only applies to the HEV lines.

Winding is the process of rolling up a total of four sheets of battery material: a positive electrode, a negative electrode, and two separators in sheet form. The winding press is a process of pressurizing and deforming the wound element from a cylindrical to flat shape. The buffer is a place to store the wound elements. The terminal bending process bends the two terminals for connection to the wound element. The can laser sealing is a process of inserting the wound element in a can. Inspection occurs to inspect the laser welds for leaks (using helium). Cell stacking occurs to place workpieces on pallets and then the pieces are heated (electrical) and dried. The electrolyte injection occurs where the electrolyte is poured into the can (this is under vacuum to make it easier to add liquid). The cap laser sealing process occurs to check for leaks using helium, placing a cap on the spout, and laser sealing.



During the initial permitting of the HEV lines, Toyota presented information to support that the bagfilters and NMP scrubbers utilized on the lines are inherent controls. DAQ agreed with this determination and as such Toyota is including this review again in this application as the bagfilters and NMP scrubbers utilized on the BEV lines are also considered inherent controls.

Per EPA letter dated November 27, 1995 (Appendix D) it was determined that equipment in the semiconductor industry is process equipment and not control equipment if the following three questions are addressed:

1) *Is the primary purpose of the equipment to control air pollution?*
2) *Where the equipment is recovering product, how do the cost saving from the product recover compare to the cost of the equipment?*
3) *Would the equipment be installed if no air quality regulations are in place*?

The bagfilters and NMP scrubbers are integral to the process and do not act as add-on control devices in this industry. The bagfilters are not needed to meet any particulate standards. They are installed to keep all dust and any contaminates away from the manufacturing/assembly areas as these areas must be kept to clean room standards. If not for the need to operate at clean room standards, the bag filters would not be installed for these operations.

The NMP that is collected in the scrubbers will be collected and recycled for reuse in the process. NMP is very expensive and thus for economic reasons, the NMP is collected and recycled for reuse. As such, the scrubbers are integral and inherent to the process to keep the operating costs down (i.e., the cost of NMP) and to allow reuse of the NMP.

2.2.2 Miscellaneous Operations

To support the BEV line expansion, Toyota is requesting to add the same supporting operations for the BEV lines that were required for the HEV lines. Thus, Toyota is permitting the following additional emergency combustion sources:

- One diesel fired 2000 kW emergency generator for HVAC backup (Tier 2). Displacement 18.5 L
- One diesel fired 50 kW emergency generator (Tier 3) for emergency ventilation (Tier 1),
- One 1250 kW diesel fired emergency generator (Tier 3), and
- One 147 hp diesel fire pump (Tier 3).

2.2.3 Exempt Activities

Toyota is proposing the following insignificant activities which are exempt from permitting under 15A NCAC 02Q .0102:

- Four NMP Supply Tanks (6,604 gallons each)
- Four NMP Recovery Tanks (5,283 gallons each)
- Two Sub NMP Recovery Tanks (793 gallons each)
- One Electrolyte Receiving Tank
- One Electrolyte Supply Tank
- Two Chemical Wastewater Collection Tanks
- Two Cooling Towers
- Generators (50 kW and 1250 kW) - as listed in 2.2.2 above
- Fire pump (147.7 hp) - as listed in 2.2.2 above

As stated above, these activities are in addition to the activities permitted during the HEV lines application.

[Note: For the two electrolyte tanks and the wastewater collection tanks listed above, it was determined that the electrolyte solution was not a VOC as defined by the air quality regulations and water is not a VOC. As such, no calculations are included in this application.]

3. REGULATORY APPLICABILITY ANALYSIS

3.1 Title V Applicability

40 CFR Part 70 establishes the federal Title V operating permit program. North Carolina has incorporated the provisions of this federal program in its Title V operating permit program under 15A NCAC 2Q .0500. The major source thresholds with respect to the North Carolina Title V operating permit program regulations are 10 tons per year of a single HAP, 25 tpy of any combination of HAP, 100 tpy of certain other regulated pollutants, and 100,000 tpy for CO_2e.

The facility is currently a small source because potential uncontrolled emissions for PM_{10}, NOx, SO_2, VOC, and CO are below the applicable thresholds of 100 tpy, each. In this application, Toyota is requesting to become a Title V source since actual VOC emissions will increase above 100 tpy.

The facility is currently a minor source of HAPs because potential uncontrolled HAP emissions are less than 10/25 tpy. The modification proposed in this application will not affect HAP emissions and thus the facility will remain a minor source of HAP emissions.

3.2 PSD Applicability

North Carolina has implemented the federal PSD requirements of 40 CFR 51.166 under North Carolina Regulation 15A NCAC 2D .0530. Under the PSD regulations, a major stationary source for PSD is defined as any source in one of the 28 named source categories with the potential to emit 100 tpy or more of any regulated pollutant, or any source not in one of the 28 named source categories with the potential to emit 250 tpy or more of any regulated. The facility does not qualify for classification in one of the 28 listed source categories; therefore, the facility's major source threshold for PSD is 250 tpy.

As shown in Appendix A, emissions of PSD-regulated compounds are below PSD major source thresholds. The highest emitting pollutant's (VOC) PTE calculations were estimated based on worst-case scrubber outlet concentrations and operation at 8,760 hours per year. Therefore, the facility is not a major stationary source in regards to PSD regulations.

3.3 NESHAP Applicability

Potential emissions of HAPs are not greater than the major source thresholds of 10/25 tpy for HAPs. Therefore, Toyota is an area source of HAPs.

3.3.1 Stationary Reciprocating Internal Combustion Engines MACT [40 CFR 63 Subpart ZZZZ]

40 CFR 63 Subpart ZZZZ *National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines,* establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. Per §63.6590(a)(2)(iii) a stationary RICE that is located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12,

2006. Therefore, all the diesel-fired emergency generators and fire pump are subject to this regulation.

In accordance with §63.6590(c)(1) a new or reconstructed emergency generator located at an area source of HAP emissions must meet the requirements of Subpart IIII for compression ignition engines. No further requirements of Subpart ZZZZ apply. The requirements to comply with NSPS IIII are discussed in the NSPS section below.

There are no other NESHAP regulations that are applicable for the processes associated with the battery cell manufacturing at this facility.

3.3.2 NESHAP for Area Source Paints and Allied Products Manufacturing [40 CFR 63 Subpart CCCCCCC]

Subpart CCCCCCC (7C) applies to a facility that performs paints and allied products manufacturing that is an area source of hazardous air pollutant (HAP) emissions and processes, uses, or generates materials containing HAP, as defined in §63.11607.

Per a previous Applicability Determination by EPA (Appendix D) lithium battery manufacturing is subject to Subpart 7C.

The operation is considered a new source and thus must be in compliance at startup.

Per the ADI the affected sources in the manufacturing operations include weighing, blending, mixing, grinding, tinting, dilution or other formulation. Thus, for this facility the covered sources are from mixing to cutting. Assembly is not considered an affected source.

Per 63.11601 (a): The affected sources must comply with the following at all times:

(1) operate a capture system that minimizes fugitive particulate emissions during the addition of dry pigments and solids that contain compounds of cadmium, chromium, lead, or nickel to a process vessel or to the grinding and milling process.

(2) You must capture particulate emissions and route them to a particulate control device during the addition of dry pigments and solids that contain compounds of cadmium, chromium, lead, or nickel to a process vessel. This requirement does not apply to pigments and other solids that are in paste, slurry, or liquid form.

(3) You must:

(i) Capture particulate emissions and route them to a particulate control device during the addition of dry pigments and solids that contain compounds of cadmium, chromium, lead, or nickel to the grinding and milling process; or

(ii) Add pigments and other solids that contain compounds of cadmium, chromium, lead, or nickel to the grinding and milling process only in paste, slurry, or liquid form.

(4) You must:

(i) Capture particulate emissions and route them to a particulate control device during the grinding and milling of materials containing compounds of cadmium, chromium, lead, or nickel; or

(ii) Fully enclose the grinding and milling equipment during the grinding and milling of materials containing compounds of cadmium, chromium, lead, or nickel; or

(iii) Ensure that the pigments and solids are in the solution during the grinding and milling of materials containing compounds of cadmium, chromium, lead, or nickel.

(5) The visible emissions from the particulate control device exhaust must not exceed 10-percent opacity for particulate control devices that vent to the atmosphere. This requirement does not apply to particulate control devices that do not vent to the atmosphere.

The facility is not subject to §63.11601(b) since the facility does not utilize methylene chloride or benzene.

Performance Testing

Per §63.11602(a)(1) facilities must perform the following initial compliance as follows:

(1) Initial particulate control device inspections and tests. You must conduct an initial inspection of each particulate control device according to the requirements in paragraphs (a)(1)(i) through (iii) of this section and perform a visible emissions test according to the requirements of paragraph (a)(1)(iv) of this section. You must record the results of each inspection and test according to paragraph (b) of this section and perform corrective action where necessary. You must conduct each inspection no later than 180 days after your applicable compliance date for each control device which has been operated within 60 days following the compliance date. For a control device which has not been installed or operated within 60 days following the compliance date, you must conduct an initial inspection prior to startup of the control device.

(i) For each wet particulate control system, you must verify the presence of water flow to the control equipment. You must also visually inspect the system ductwork and control equipment for leaks and inspect the interior of the control equipment (if applicable) for structural integrity and the condition of the control system.

(ii) For each dry particulate control system, you must visually inspect the system ductwork and dry particulate control unit for leaks. You must also inspect the inside of each dry particulate control unit for structural integrity and condition.

(iii) An initial inspection of the internal components of a wet or dry particulate control system is not required if there is a record that an inspection meeting the requirements of this subsection has been performed within the past 12 months and any maintenance actions have been resolved.

(iv) For each particulate control device, you must conduct a visible emission test consisting of three 1-minute test runs using Method 203C (40 CFR part 51, appendix M).

The visible emission test runs must be performed during the addition of dry pigments and solids containing compounds of cadmium, chromium, lead, or nickel to a process vessel or to the grinding and milling equipment. If the average test results of the visible emissions test runs indicate an opacity greater than the applicable limitation in §63.11601(a), you must take corrective action and retest within 15 days.

Per 63.11602(a)(2) facilities must perform the following ongoing compliance as follows:

(2) Ongoing particulate control device inspections and tests. Following the initial inspections, you must perform periodic inspections of each PM control device according to the requirements in paragraphs (a)(2)(i) or (ii) of this section. You must record the results of each inspection according to paragraph (b) of this section and perform corrective action where necessary. You must also conduct tests according to the requirements in paragraph (a)(2)(iii) of this section and record the results according to paragraph (b) of this section.

(i) You must inspect and maintain each wet particulate control system according to the requirements in paragraphs (a)(2)(i)(A) through (C) of this section.

(A) You must conduct a daily inspection to verify the presence of water flow to the wet particulate control system.

(B) You must conduct weekly visual inspections of any flexible ductwork for leaks.

(C) You must conduct inspections of the rigid, stationary ductwork for leaks, and the interior of the wet control system (if applicable) to determine the structural integrity and condition of the control equipment every 12 months.

(ii) You must inspect and maintain each dry particulate control unit according to the requirements in paragraphs (a)(2)(ii)(A) and (B) of this section.

(A) You must conduct weekly visual inspections of any flexible ductwork for leaks.

(B) You must conduct inspections of the rigid, stationary ductwork for leaks, and the interior of the dry particulate control unit for structural integrity and to determine the condition of the fabric filter (if applicable) every 12 months.

(iii) For each particulate control device, you must conduct a 5-minute visual determination of emissions from the particulate control device every 3 months using Method 22 (40 CFR part 60, appendix A-7). The visible emission test must be performed during the addition of dry pigments and solids containing compounds of cadmium, chromium, lead, or nickel to a process vessel or to the grinding and milling equipment. If visible emissions are observed for two minutes of the required 5-minute observation period, you must conduct a Method 203C (40 CFR part 51, appendix M) test within 15 days of the time when visible emissions were observed. The Method 203C test will consist of three 1-minute test runs and must be performed during the addition of dry pigments and solids containing compounds of cadmium, chromium, lead, or nickel HAP to a process vessel or to the grinding and milling equipment. If the Method 203C test runs indicates an opacity greater than the limitation in §63.11601(a)(5), you must comply with the requirements in paragraphs (a)(2)(iii)(A) through (C) of this section.

(A) You must take corrective action and retest using Method 203C within 15 days. The Method 203C test will consist of three 1-minute test runs and must be performed during the addition of dry pigments and solids containing compounds of cadmium, chromium, lead, or nickel to a process vessel or to the grinding and milling equipment. You must continue to take corrective action and retest each 15 days until a Method 203C test indicates an opacity equal to or less than the limitation in §63.11601(a)(5).

(B) You must prepare a deviation report in accordance with §63.11603(b)(3) for each instance in which the Method 203C opacity results were greater than the limitation in §63.11601(a)(5).

(C) You must resume the visible determinations of emissions from the particulate control device in accordance with paragraph (a)(2)(iii) of this section 3 months after the previous visible determination.

Per §63.11602(b), you must record the information specified in paragraphs (b)(1) through (6) of this section for each inspection and testing activity.

(1) The date, place, and time;
(2) Person conducting the activity;
(3) Technique or method used;
(4) Operating conditions during the activity;
(5) Results; and
(6) Description of correction actions taken.

Notifications, Reporting and Recordkeeping

Initial Notification

This construction application acts as the initial notification.

Notification of Compliance Status

If you own or operate a new affected source, you must submit a Notification of Compliance Status within 180 days after initial start-up, This Notification of Compliance Status must include the following:

(i) Your company's name and address;

(ii) A statement by a responsible official with that official's name, title, phone number, e-mail address and signature, certifying the truth, accuracy, and completeness of the notification, a description of the method of compliance (i.e., compliance with management practices, installation of a wet or dry scrubber) and a statement of whether the source has complied with all the relevant standards and other requirements of this subpart.

Annual Compliance Certification Report

An annual compliance certification report is required if there is a deviation from the requirements of Subpart 7C. The report must include items in §63.11603(b)(1) – (b)(3).

Records

The following record should be kept for five years after the date of each recorded action.

(1) You must keep a copy of each notification and all documentation supporting any Notification of Applicability and Notification of Compliance Status that you submitted.

(2) You must keep a copy of each Annual Compliance Certification Report

(3) You must keep records of all inspections and tests.

(4) Your records must be in a form suitable and readily available for expeditious review

(5) You must keep each record onsite for at least 2 years after the date of each recorded action. You may keep the records offsite for the remaining 3 years.

3.4 NSPS Applicability

3.4.1 Standards of Performance for Stationary Compression Ignition Internal Combustion Engines NSPS [40 CFR 60 Subpart IIII]

To support the BEV lines expansion, Toyota is requesting to add the same supporting operations for the BEV lines that were required for the HEV lines. Thus, Toyota is permitting the following additional emergency combustion sources:

- One diesel fired 2000 kW emergency generator for HVAC backup (Tier 2). Displacement 18.5 L
- One diesel fired 50 kW emergency generator (Tier 3) for emergency ventilation (Tier 1),
- One 1250 kW diesel fired emergency generator (Tier 3), and
- One 147 hp diesel fire pump (Tier 3).

They are all subject to the NSPS Subpart IIII per:

§60.4200(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or
(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006

Generators

Per 60.4205(b) - Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder must comply with the emission standards for new non-road CI engines in §60.4202.

Per 60.4202(a)(2), for engines with a rated power greater than or equal to 37 KW (50 HP), the Tier 2 or Tier 3 emission standards for new nonroad CI engines for the same rated power as described in 40 CFR part 1039, appendix I, for all pollutants and the smoke standards as specified in 40 CFR 1039.105 beginning in model year 2007.

For emergency engines the Tier II requirements are:

- 6.4 g/kW-hr for NOx + NMHC
- 3.5 g/kW-hr for CO
- 0.2 g/kW-hr for PM

For emergency engines the Tier III requirements are:

- 4.0 g/kW-hr for NOx + NMHC
- 3.5 g/kW-hr for CO
- 0.2 g/kW-hr for PM

Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder must use ultra-low sulfur (15 ppm) diesel fuel (40 CFR 80.510(b) compliant).

Per §60.4211(a) operator must operate and maintain engine according to manufacture specification.

Per §60.4211(c) operator must purchase a certified engine.

§60.4211(f)
In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described below:

- 60.4211(f)(1) There is no time limit on the use of emergency stationary ICE in emergency situations.
- 60.4211(f)(2) You may operate your emergency stationary ICE for any combination of the purposes below for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (f)(3) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).
    - (i) Emergency stationary ICE may be operated for maintenance checks and readiness testing.
    - (ii) Emergency stationary ICE may be operated for emergency demand response
    - (iii) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.
- 60.4211(f)(3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for

maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section.

In summary, the generators will be used for emergency use only.

Fire Pump

Per §60.4205(c), fire pumps must meet requirements in Table 4. For units between 100 ≤ HP and <175 HP must meet the following emission limits apply for the fire pump engine:

- NMHC+NO_X = 4.0 g/kW-hr
- PM = 0.30 g/kW-hr

The unit must use diesel fuel that meets the requirements of 40 CFR 1090.305 for nonroad diesel fuel – maximum sulfur content of 15 ppm.

Per §60.4211(a) operator must operate and maintain engine according to manufacture specification.

Per §60.4211(c) operator must purchase a certified engine.

Per §60.4214(b) If the emergency engine does not meet the standards applicable to non-emergency engines, keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. Record the time of operation of the engine and the reason the engine was in operation during that time.

Per §60.4211(f) Any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (3) of this section, is prohibited.

- There is no time limit on the use of emergency stationary ICE in emergency situations.
- Operate your emergency stationary ICE for maintenance and readiness testing for up to 100 hours per year.

3.4.2 Non-Applicable NSPS

The basis for non-applicability of a potential NSPS is provided below.

Subpart Kb: Subpart Kb applies to volatile organic liquid storage vessels with a volume greater than 75 m^3 (19,813 gallons) storing VOCs with a vapor pressure less than or equal to 15.0 kPa (2.18 psia). In addition, tanks with capacities of greater than 151 m^3 (39,890 gallons), containing VOCs with a vapor pressure less than 3.5 kPa (0.5 psia) are exempt from this NSPS. This project will add NMP storage tanks which have vapor pressures below the applicability cutoff per AP-42 Table 7.1-2, and are therefore exempt from this regulation.

3.5 North Carolina Regulations

The applicability of key North Carolina State Implementation Plan (SIP) regulations is discussed below.

3.5.1 Particulates from Miscellaneous Industrial Processes (15A NCAC 2D .0515)

This regulation applies to the bagfilters controlling dust on each BEV manufacturing line.

As required by 15A NCAC 2D .0515 "Particulates from Miscellaneous Industrial Processes," particulate matter emissions from the emission sources shall not exceed allowable emission rates. The allowable emission rates are, as defined in 15A NCAC 2D .0515, a function of the process weight rate and shall be determined by the following equation(s), where P is the process throughput rate in tons per hour (tons/hr) and E is the allowable emission rate in pounds per hour (lbs/hr).

$E = 4.10 * (P)^{0.67}$ for P <= 30 tons/hr, or

$E = 55 * (P)^{0.11} - 40$ for P >30 tons/hr

Bagfilters have been added for "clean room" purposes. The battery manufacturing process will comply with this standard with baghouses.

3.5.2 Control of Visible Emissions (15A NCAC 2D .0521)

Visible emissions from the bagfilters on BEV Lines 1 through 7 manufactured after July 1, 1971, shall not be more than 20 percent opacity when averaged over a six-minute period, except that six-minute periods averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. However, sources which must comply with 15A NCAC 2D .0524 "New Source Performance Standards" or .1110 "National Emission Standards for Hazardous Air Pollutants" must comply with applicable visible emissions requirements contained therein.

3.5.3 Sulfur Dioxide Emissions from Combustion Sources (15A NCAC 2D .0516)

As required by 15A NCAC 2D .0516 "Sulfur Dioxide Emissions from Combustion Sources," sulfur dioxide emissions from the combustion sources shall not exceed 2.3 pounds per million Btu heat input. There are no fossil fuel combustion sources being permitted in this application, with the exception of the emergency generators, which will easily comply with this standard.

3.5.4 Excess Emissions Reporting and Malfunctions (15A NCAC 2D .0535)

As required by 15A NCAC 2D .0535, if a source of excess emissions lasts for more than four hours and results from a malfunction, a breakdown of process or control equipment or any other abnormal conditions, the facility shall:

a. Notify the Director or his designee of any such occurrence by 9:00 a.m. Eastern time of the Division's next business day of becoming aware of the occurrence and describe:
   i. the name and location of the facility,
   ii. the nature and cause of the malfunction or breakdown,
   iii. the time when the malfunction or breakdown is first observed,
   iv. the expected duration, and
   v. an estimated rate of emissions.

b. Notify the Director or his designee immediately when the corrective measures have been accomplished.

3.5.5 Control and Prohibition of Odorous Emissions (15A NCAC 2D .1806)

The facility shall not operate without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

3.5.6 Toxic Air Pollutant Procedures (15A NCAC 2Q .0700)

Under the NC air toxics program regulations, facility-wide modeling and permitting is required if total facility-wide emissions of regulated air toxics emitted from non-exempt, new or modified emission units exceed the toxics de minimis emissions rates (a.k.a., "TPERS") established under the 15A NCAC 2Q .0700 regulations.

The facility emits manganese and nickel from the cathode production areas. Facility wide emissions are below the TPER limits and thus no modeling is required as part of this application. TAPs emitted from the emergency generators are exempt from toxics permitting since they are subject to NESHAP Subpart ZZZZ.

4. NCDEQ GENERAL FACILITY APPLICATION FORMS

This section contains DEQ permit application forms for the general facility.

FACILITY FORMS

- Form A – Facility (General Information)
- Form A2 – Emission Source Listing
- Form A3 – 112(r) Applicability Information
- Form D1 – Facility-wide Emissions Summary
- Form D4 – Exempt and Insignificant Activities Summary
- Form D5 – P.E. Seal Form

FORM A

GENERAL FACILITY INFORMATION

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **A**

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

- [x] Local Zoning Consistency Determination (new or modification only)
- [x] Responsible Official/Authorized Contact Signature
- [x] Appropriate Number of Copies of Application
- [x] P.E. Seal (if required)

Application Fee (please check one option below)

- [ ] Not Required
- [x] ePayment
- [ ] Check Enclosed

GENERAL INFORMATION

Legal Corporate/Owner Name:

Site Name: Toyota Battery Manufacturing, Inc. dba Toyota Battery Manufacturing North Carolina

Site Address (911 Address) Line 1: 7039 State Rd 1006

Site Address Line 2:

City: Julian — State: North Carolina

Zip Code: 27283 — County: Randolph

CONTACT INFORMATION

Responsible Official/Authorized Contact:

Name/Title: April Mason / General Manager, Plant Services

Mailing Address Line 1: 151 Engineering Way

Mailing Address Line 2:

City: Georgetown State: KY Zip Code: 25033

Primary Phone No.: 502-867-2299 Fax No.:

Secondary Phone No.:

Email Address: april.mason@toyota.com

Invoice Contact:

Name/Title: Rebecca Bright / Manager-Environmental Planning

Mailing Address Line 1: 151 Engineering Way

Mailing Address Line 2:

City: Georgetown State: KY Zip Code: 25033

Primary Phone No.: 859-473-3631 Fax No.:

Secondary Phone No.:

Email Address: rebecca.bright@toyota.com

Facility/Inspection Contact:

Name/Title: Rebecca Bright / Manager-Environmental Planning

Mailing Address Line 1: 151 Engineering Way

Mailing Address Line 2:

City: 151 Engineering Way State: KY Zip Code: 25033

Primary Phone No.: 859-473-3631 Fax No.:

Secondary Phone No.:

Email Address: rebecca.bright@toyota.com

Permit/Technical Contact:

Name/Title: Rebecca Bright / Manager-Environmental Planning

Mailing Address Line 1: 151 Engineering Way

Mailing Address Line 2:

City: Georgetown State: KY Zip Code: 25033

Primary Phone No.: 859-473-3631 Fax No.:

Secondary Phone No.:

Email Address: rebecca.bright@toyota.com

APPLICATION IS BEING MADE FOR

- [ ] New Non-permitted Facility/Greenfield
- [x] Modification of Facility (permitted)
- [ ] Renewal Title V
- [ ] Renewal Non-Title V
- [ ] Name Change
- [ ] Ownership Change
- [ ] Administrative Amendment
- [ ] Renewal with Modification

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

- [ ] General
- [x] Small
- [ ] Prohibitory Small
- [ ] Synthetic Minor
- [ ] Title V

FACILITY (Plant Site) INFORMATION

Describe nature of (plant site) operation(s):

Electric vehicle battery manufacturing

Facility ID No. N/A

Primary SIC/NAICS Code: 3692 / 335912

Current/Previous Air Permit No. 10735R00 Expiration Date: March 31, 2030

Facility Coordinates: Latitude: Longitude:

Does this application contain confidential data? [ ] YES [x] NO

If yes, please contact the DAQ Regional Office prior to submitting this application. (See Instructions)

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: Aimee Benoist

Firm Name: Trinity Consultants

Mailing Address Line 1: One Copley Parkway

Mailing Address Line 2: Suite 205

City: Morrisville State: North Carolina Zip Code: 27560 County: Wake

Phone No.: 919-462-9693 Fax No.:

Email Address: abenoist@trinityconsultants.com

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): April Mason

Title: General Manager, Plant Services

X Signature(Blue Ink): April Mason

Date: 7-20-22

Attach Additional Sheets As Necessary

FORM A (continued, page 2 of 2)
GENERAL FACILITY INFORMATION

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **A**

SECTION AA1 - APPLICATION FOR NON-TITLE V PERMIT RENEWAL

N/A (Company Name) hereby formally requests renewal of Air Permit No. _____

There have been no modifications to the originally permitted facility or the operations therein that would require an air permit since the last permit was issued.

Is your facility subject to 40 CFR Part 68 "Prevnetion of Accidental Releases" - Section 112(r) of the Clean Air Act? ☐ YES ☐ NO

If yes, have you already submitted a Risk Manage Plan (RMP) to EPA? ☐ YES ☐ NO Date Submitted: _____

Did you attach a current emissions inventory? ☐ YES ☐ NO

If no, did you submit the inventory via AERO or by mail? ☐ Via AERO ☐ Mailed Date Mailed: _____

SECTION AA2- APPLICATION FOR TITLE V PERMIT RENEWAL

In accordance with the provisions of Title 15A 2Q .0513, the responsible official of N/A (Company Name)

hereby formally requests renewal of Air Permit No. _____ (Air Permit No.) and further certifies that:

(1) The current air quality permit identifies and describes all emissions units at the above subject facility, except where such units are exempted under the North Carolina Title V regulations at 15A NCAC 2Q .0500;

(2) The current air quality permit cits all applicable requirements and provides the method or methods for determing compliance with the applicable requirements;

(3) The facility is currently in compliance, and shall continue to comply, with all applicable requiremetns. (Note: As provided under 15A NCAC 2Q .0512 compliance with the conditions of the permit shall be deemed compliance with the applicable requirements specifically identified in the permit);

(4) For applicable requirements that become effective during the term of the renewed permit that the facility shall comply on a timely basis;

(5) The facility shall fulfill applicable enhanced monitoring requirements and submit a compliance certification as required by 40 CFR Part 64.

The responsible official (signature on page 1) certifies under the penalty of law that all information and statements provided above, based on information and belief formed after reasonable inquiry, are true, accurate, and complete.

SECTION AA3- APPLICATION FOR NAME CHANGE

New Facility Name: N/A

Former Facility Name: _____

An official facility name change is requested as described above for the air permit mentioned on page 1 of this form. Complete the other sections if there have been modifications to the originally premitted facility that would requie an air quality permit since the last permit was issued and if ther has been an ownership change associated with this name change.

SECTION AA4- APPLICATION FOR AN OWNERSHIP CHANGE

By this application we hereby request transfer of Air Quality Permit No. N/A from the former owner to the new owner as described below.

The transfer of permit responsibility, coverage and liability shall be effective _____ (immediately or insert date.) The legal ownership of the facility described on page 1 of this form has been or will be transferred on _____ (date). There have been no modifications to the originally permitted facility that would require an air quality permit since the last permit was issued.

Signature of New (Buyer) Responsible Official/Authorized Contact (as typed on page 1):

X Signature (Blue Ink): _____

Date:

New Facility Name:

Former Facility Name:

Signature of Former (Seller) Responsible Official/Authorized Contact:

Name (typed or print):

Title:

X Signature (Blue Ink): _____

Date:

Former Legal Corporate/Owner Name:

In lieu of the seller's signature on this form, a letter may be submitted with the seller's signature indicating the ownership change

SECTION AA5- APPLICATION FOR ADMINISTRATIVE AMENDMENT

Describe the requested administrative amendment here (attach additional documents as necessary):

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **A2**

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted			
EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
ES-CCD5	Cathode: Coating and Drying Line 5 (BEV) with inherent web scrubber (CD-S05)	NA	NA
ES-CCD6	Cathode: Coating and Drying Line 5 (BEV) with inherent web scrubber (CD-S06)	NA	NA
ES-CCD7	Cathode: Coating and Drying Line 5 (BEV) with inherent web scrubber (CD-S07)	NA	NA
ES-CCD8	Cathode: Coating and Drying Line 5 (BEV) with inherent web scrubber (CD-S08)	NA	NA
ES-CCD9	Cathode: Coating and Drying Line 5 (BEV) with inherent web scrubber (CD-S09)	NA	NA
ES-CCD10	Cathode: Coating and Drying Line 5 (BEV) with inherent web scrubber (CD-S10)	NA	NA
ES-CCD11	Cathode: Coating and Drying Line 5 (BEV) with inherent web scrubber (CD-S11)	NA	NA
ES-CPM5-11	Cathode: Paste Mixing BEV Lines 5-11 with inherent particulate filters DC-803-01 DC-804-01 DC-805-01 DC-806-01 DC-807-01 DC-808-01 DC-809-01	NA	NA
ES-CPH5-11	Cathode: Powder Handling BEV Lines 5-11 with inherent particulate filters DC-803-02 DC-804-02 DC-805-02 DC-806-02 DC-807-02 DC-808-02 DC-809-02	NA	NA
ES-CPS5-11	Cathode: Press BEV Lines 5-11 with inherent particulate filters DC-803-03 DC-804-03 DC-805-03 DC-806-03 DC-807-03 DC-808-03 DC-809-03	NA	NA
ES-APM5-11	Anode: Mixing BEV Lines 5-11 with inherent particulate filters DC-803-04 DC-804-04 DC-805-04 DC-806-04 DC-807-04 DC-808-04 DC-809-04	NA	NA
ES-APH5-11	Anode: Powder Handling BEV Lines 5-11 with inherent particulate filters DC-803-05 DC-804-05 DC-805-05 DC-806-05 DC-807-05 DC-808-05 DC-809-05	NA	NA

ES-APP5-11	Anode: Press BEV Lines 5-11 with inherent particulate filters DC-803-06 DC-804-06 DC-805-06 DC-806-06 DC-807-06 DC-808-06 DC-809-06	NA	NA
ES-AC5-11	Anode: tab-cut BEV Lines 5-11 with inherent particulate filters DC-803-07 DC-804-07 DC-805-07 DC-806-07 DC-807-07 DC-808-07 DC-809-07	NA	NA
ES-WIN810	Winding BEV Lines 5-11 with inherent particulate filters DC-803-08 DC-804-08 DC-805-08 DC-806-08 DC-807-08 DC-808-08 DC-809-08	NA	NA
ES-CPS5-11	Cathode: Press BEV Lines 5-11 with inherent wet dust collectors WDC-803-01 WDC-804-01 WDC-805-01 WDC-806-01 WDC-807-01 WDC-808-01 WDC-809-01	NA	NA
ES-ACW5-11	Anode: Tab-cut BEV Lines 5-11 with inherent wet dust collectors WDC-803-02 WDC-804-02 WDC-805-02 WDC-806-02 WDC-807-02 WDC-808-02 WDC-809-02	NA	NA
ES-TCA5-11	TopCap Assembly BEV Lines 5-11 with inherent wet dust collectors WDC-803-03 WDC-804-03 WDC-805-03 WDC-806-03 WDC-807-03 WDC-808-03 WDC-809-03	NA	NA
ES-AF5-11	Assembly Front BEV Lines 5-11 with inherent wet dust collectors WDC-803-04 WDC-804-04 WDC-805-04 WDC-806-04 WDC-807-04 WDC-808-04 WDC-809-04	NA	NA
ES-MOD5-11	Module BEV Lines 5-11 with inherent wet dust collectors WDC-803-05 WDC-804-05 WDC-805-05 WDC-806-05 WDC-807-05 WDC-808-05 WDC-809-05	NA	NA
ES-GEN2000b	2000 kW Generator	NA	NA

Existing Permitted Equipment To Be **MODIFIED** By This Application			

Equipment To Be **DELETED** By This Application			

112(r) APPLICABILITY INFORMATION

A 3

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? ☐ Yes ☑ No

If No, please specify in detail how your facility avoided applicability: The facility does not store any 112(r) chemicals

If your facility is Subject to 112(r), please complete the following:

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?

☐ Yes ☐ No Specify required RMP submittal date: _____ If submitted, RMP submittal date: _____

B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?

☐ Yes ☐ No If yes, please specify: _____

C. List the processes subject to 112(r) at your facility:

PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	MAXIMUM INTENDED INVENTORY (LBS)

Attach Additional Sheets As Necessary

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **D1**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
AIR POLLUTANT EMITTED	tons/yr	tons/yr	tons/yr
PARTICULATE MATTER (PM)			86.80
PARTICULATE MATTER < 10 MICRONS (PM_{10})			86.62
PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)			86.62
SULFUR DIOXIDE (SO_2)			0.10
NITROGEN OXIDES (NOx)			23.79
CARBON MONOXIDE (CO)			12.93
VOLATILE ORGANIC COMPOUNDS (VOC)			245.28
LEAD			1.01E-06
GREENHOUSE GASES (GHG) (SHORT TONS)			
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

		EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	tons/yr	tons/yr	tons/yr
Cobalt				1.83E-03
Mangenese				1.83E-03
Nickel				2.12E-03
Methanol				4.20E-01
all others are combustion HAPs				

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

					Modeling Required ?	
TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Yes	No
Manganese	MNC		0.0100			No
Nickel	NIC		0.0116			No

COMMENTS:

Attach Additional Sheets As Necessary

FORM D4

EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

ACTIVITIES EXEMPTED PER 2Q .0102 OR INSIGNIFICANT ACTIVITIES PER 2Q .0503 FOR TITLE V SOURCES

DESCRIPTION OF EMISSION SOURCE	SIZE OR PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICANT ACTIVITY
1. Cooling Towers		15A NCAC 02Q.0102 (h)(5)
2. Four NMP Supply Tanks, Four NMP Recovery Tanks, Two Sub NMP Tanks		15A NCAC 02Q.0102 (g)(4) and (h)(5)
3. Generators - 50 kW and 1250 kW		15A NCAC 02Q.0102 (h)(5)
4. Fire Pump - 147.7 HP		15A NCAC 02Q.0102 (h)(5)
5. Two Chemical Wastewater Collection Tanks, One Electrolyte Receiving Tank, One Electrolyte Supply Tank		15A NCAC 02Q.0102(g)(4) and (g)(14)A
NOTE: These insignificant sources are in addition to the list that was permitted as part of the HEV line application		
7.		
8.		
9.		
10.		

Attach Additional Sheets As Necessary

FORM D5

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **D5**

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A **SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B and B1 through B9) -** SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE CALCULATIONS.

B **SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY) -** PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT ANY REQUIRED INFORMATION TO DOCUMENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE EMISSION RATES CALCULATED IN ITEM "A" ABOVE, DATES OF MANUFACTURE, CONTROL EQUIPMENT, ETC. TO SUPPORT THESE CALCULATIONS.

C **CONTROL DEVICE ANALYSIS (FORM C and C1 through C9) -** PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.

D **PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)** - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.

E **PROFESSIONAL ENGINEERING SEAL -** PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, Aimee Andrews *attest that this application for* Toyota Battery Manufacturing North Carolina, Inc. *has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.*

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME:	Aimee Andrews
DATE:	
COMPANY:	Trinity Consultants of NC, PC
ADDRESS:	One Copley Parkway, Suite 205, Morrisville, NC 27560
TELEPHONE:	(919) 462-9693
SIGNATURE:	
PAGES CERTIFIED:	All

(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)

PLACE NORTH CAROLINA SEAL HERE

Attach Additional Sheets As Necessary

5. NCDEQ SOURCE SPECIFIC APPLICATION FORMS-LINES

This section contains DEQ source-specific permit application forms for the proposed operations.

- Form B – Specific Emissions Source Information (BEV Lines 1 through 7)
- Form B9 – Emission Source-Other (BEV Lines 1 through 7)
- Form C1 – Control Device (Bagfilters)
- Form C6 – Control Device (NMP Scrubbers)

NOTE: The facility is still being designed. As such the control device data is still being developed and Toyota will provide at a later date.

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: BEV Lines 5 through 11	EMISSION SOURCE ID NO: See Form A2
	CONTROL DEVICE ID NO(S): See list of bagfilters
OPERATING SCENARIO _____ OF _____	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
See flow diagram in application

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form B7)
- ☐ Incineration (Form B8)
- ☑ Other (Form B9)

START CONSTRUCTION DATE: **2022** DATE MANUFACTURED:

MANUFACTURER / MODEL NO.: EXPECTED OP. SCHEDULE: _____ HR/DAY _____ DAY/WK _____ WK/YR

IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):_____ ☑ NESHAP (SUBPARTS?):_____ **Subpart 7C**

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%** MAR-MAY **25%** JUN-AUG **25%** SEP-NOV **25%**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)							**54.2**
PARTICULATE MATTER<10 MICRONS (PM_{10})							**54.2**
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							**54.2**
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							**228.34**
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
Cobalt								**1.34E-03**
Manganese								**1.34E-03**
Nickel								**1.63E-03**
Methanol								**4.23E-01**

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr
Manganese				**0.0073**	
Nickel				**0.0089**	

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: **BEV Lines 5 through 11**

EMISSION SOURCE ID NO: **See Form A2**

CONTROL DEVICE ID NO(S): **See Form A2**

OPERATING SCENARIO: _____ OF _____

EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

See flow diagram in application

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)
See Supplemental information in Appendix A			

MAXIMUM DESIGN (BATCHES / HOUR):

REQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):

FUEL USED: TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):

MAX. CAPACITY HOURLY FUEL USE: REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C1**

CONTROL DEVICE ID NO: **SEE Form A2**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2**
EMISSION POINT (STACK) ID NO(S):	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
_____ OF _____	P.E. SEAL REQUIRED (PER 2q .0112)? ☐ YES ☐ NO

DESCRIBE CONTROL SYSTEM: **Toyota intends to monitor water circulation rate and exhaust air temperature according to manufacturer specifications once equipment has been sourced. Information will be provided as available.**

See Supplemental C-1 List.

POLLUTANTS COLLECTED:	**PM**			
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	**99** %	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	**12.38**			

PRESSURE DROP (IN H_20): MIN:	MAX:	GAUGE? ☐ YES ☐ NO	
BULK PARTICLE DENSITY (LB/FT^3):		INLET TEMPERATURE (^{o}F): MIN	MAX
POLLUTANT LOADING RATE: ☐ LB/HR ☐ GR/FT^3		OUTLET TEMPERATURE (^{o}F) MIN	MAX
INLET AIR FLOW RATE (ACFM):		FILTER OPERATING TEMP (^{o}F):	
NO. OF COMPARTMENTS:	NO. OF BAGS PER COMPARTMENT:	LENGTH OF BAG (IN.):	
NO. OF CARTRIDGES:	FILTER SURFACE AREA PER CARTRIDGE (FT^2):	DIAMETER OF BAG (IN.):	
TOTAL FILTER SURFACE AREA (FT^2):	AIR TO CLOTH RATIO:		
DRAFT TYPE: ☐ INDUCED/NEGATIVE ☐ FORCED/POSITIVE		FILTER MATERIAL: ☐ WOVEN ☐ FELTED	

DESCRIBE CLEANING PROCEDURES:

☐ AIR PULSE ☐ SONIC
☐ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE
☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE
☐ OTHER:

DESCRIBE INCOMING AIR STREAM:

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1		
1-10		
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

Attach Additional Sheets As Necessary

Form C-1 Supplement Data

Emission Source ID	Line	Number of Filters	Emission Source Description	Control Device ID	Filter Area (ft^2)	Flow/filter (scfm)	Pressure Drop (in H2O)	Cleaning Method
ES-CPM12	HEV Lines 1and 2	2	Cathode: Paste Mixing (Lines 1 and 2)	DC-801-01a and b	TBD	2,740	TBD	TBD
ES-CPS12	HEV Lines 1and 2	2	Cathode: Press-Slitting (Lines 1 and 2)	DC-801-02a and b	TBD	1,130	TBD	TBD
ES-APM12	HEV Lines 1and 2	2	Anode: Paste Mixing (Lines 1 and 2)	DC-801-03a and b	TBD	2,110	TBD	TBD
ES-APS12	HEV Lines 1and 2	2	Anode: Press-Slitting (Lines 1 and 2)	DC-801-04a and b	TBD	1,130	TBD	TBD
ES-AS-WD12	HEV Lines 1and 2	2	Assembly: Winding & Disassemble (Lines 1 and 2)	DC-801-05a and b	TBD	2,100	TBD	TBD
ES-AS-W12	HEV Lines 1and 2	2	Assembly: QC Washing (Lines 1 and 2)	DC-801-06a and b	TBD	170	TBD	TBD
ES-CPM34	HEV Lines 3 and 4	2	Cathode: Paste Mixing (Lines 3 and 4)	DC-801-07a and b	TBD	2,740	TBD	TBD
ES-CPS34	HEV Lines 3 and 4	2	Cathode: Press-Slitting (Lines 3 and 4)	DC-801-08a and b	TBD	1,130	TBD	TBD
ES-APM34	HEV Lines 3 and 4	2	Anode: Paste Mixing (Lines 3 and 4)	DC-801-09a and b	TBD	2,110	TBD	TBD
ES-APS34	HEV Lines 3 and 4	2	Anode: Press-Slitting (Lines 3 and 4)	DC-801-10a and b	TBD	1,130	TBD	TBD
ES-AS-WD34	HEV Lines 3 and 4	2	Assembly: Winding & Disassemble (Lines 3 and 4)	DC-801-11a and b	TBD	2,100	TBD	TBD
ES-AS-W34	HEV Lines 3 and 4	2	Assembly: QC Washing (Lines 3 and 4)	DC-801-12a and b	TBD	170	TBD	TBD
ES-PA-RA	HEV Lines 1-4	1	AB PASTE AREA: PASTE RM A1&A2	DC-801-13	TBD	850	TBD	TBD
ES-PA-RB	HEV Lines 1-4	1	AB PASTE AREA: PASTE RM B1&B2	DC-801-14	TBD	890	TBD	TBD
ES-PA-RC	HEV Lines 1-4	1	AB PASTE AREA: PASTE RM C1&C2	DC-801-15	TBD	890	TBD	TBD
ES-PA-PH1	HEV Lines 1-4	1	AB PASTE AREA: POWDER HANDLING 1	DC-801-16	TBD	3,040	TBD	TBD
ES-PA-PH2	HEV Lines 1-4	1	AB PASTE AREA: POWDER HANDLING 2	DC-801-17	TBD	1,490	TBD	TBD
ES-TPAA DC	HEV Lines 1-4	2	TOP PLATE ASSEMBLY AREA: DUST COLLECTOR	DC-801-18 a and b	TBD	170	TBD	TBD
ES-QC-FH1	HEV Lines 1-4	1	QC EVALUATION RM: TABLE TOP FUME HOOD (C8H8)	DC-801-19	TBD	1,130	TBD	TBD
ES-QC-FH2	HEV Lines 1-4	1	QC EVALUATION RM: TABLE TOP FUME HOOD (C8H8)	DC-801-20	TBD	2,260	TBD	TBD
ES-QC-FH3	HEV Lines 1-4	1	QC EVALUATION RM: TABLE TOP FUME HOOD (C8H8)	DC-801-21	TBD	3,390	TBD	TBD
ES-QC-LST	HEV Lines 1-4	1	QC EVALUATION RM: LIQUID CHEMICAL STORAGE TANK	DC-801-22	TBD	410	TBD	TBD
ES-QC-BD1	HEV Lines 1-4	1	QC EVALUATION RM: BATTERY DISMANTLING BOOTHS 1 (Co,Ni,Mn)	DC-801-23	TBD	8,140	TBD	TBD
ES-QC-BD2	HEV Lines 1-4	1	QC EVALUATION RM: BATTERY DISMANTLING BOOTHS 1 (Co,Ni,Mn)	DC-801-24	TBD	8,140	TBD	TBD
ES-QC-BD3	HEV Lines 1-4	1	QC EVALUATION RM: BATTERY DISMANTLING BOOTHS 1 (Co,Ni,Mn)	DC-801-25	TBD	8,140	TBD	TBD
ES-AS-CLS12	HEV Lines 1 and 2	2	ASSEMBLY: CAN LASER SEALING (LINE 1 and 2)	WDC-801-01a and b	TBD	400	TBD	TBD
ES-AS-CJ12	HEV Lines 1 and 2	2	ASSEMBLY: CURRENT COLLECTOR JUNCTION (LINE 1 and 2)	WDC-801-02a and b	TBD	360	TBD	TBD
ES-AS-HS12	HEV Lines 1 and 2	2	ASSEMBLY: HELIUM SEALING (LINE 1 and 2)	WDC-801-03a and b	TBD	200	TBD	TBD
ES-ST-BBW12-1	HEV Lines 1 and 2	2	STACKING: BUS BAR WELDING (LINE 1 and 2)	WDC-801-04a and b	TBD	210	TBD	TBD
ES-ST-BBW12-2	HEV Lines 1 and 2	2	STACKING: BUS BAR WELDING (LINE 1 and 2)	WDC-801-05a and b	TBD	360	TBD	TBD
ES-AS-CLS34	HEV Lines 3 and 4	2	ASSEMBLY: CAN LASER SEALING (LINE 3 and 4)	WDC-801-06a and b	TBD	400	TBD	TBD
ES-AS-CJ34	HEV Lines 3 and 4	2	ASSEMBLY: CURRENT COLLECTOR JUNCTION (LINE 3 and 4)	WDC-801-07a and b	TBD	360	TBD	TBD
ES-AS-HS34	HEV Lines 3 and 4	2	ASSEMBLY: HELIUM SEALING (LINE 3 and 4)	WDC-801-08a and b	TBD	200	TBD	TBD
ES-ST-BBW34-1	HEV Lines 3 and 4	2	STACKING: BUS BAR WELDING (LINE 3 and 4)	WDC-801-09a and b	TBD	210	TBD	TBD
ES-ST-BBW34-2	HEV Lines 3 and 4	2	STACKING: BUS BAR WELDING (LINE 3 and 4)	WDC-801-10a and b	TBD	360	TBD	TBD
ES-TPAA WS	HEV Lines 1-4	2	TOP PLATE ASSEMBLY AREA: Wet Scrubber	WDC-801-11a and b	TBD	610	TBD	TBD
ES-CPM5-11	BEV Lines 5-11	7	Cathode: Mixing	DC-803-01 DC-804-01 DC-805-01 DC-806-01 DC-807-01 DC-808-01 DC-809-01	TBD	706	TBD	TBD

Emission Source ID	Line	Number of Filters	Emission Source Description	Control Device ID	Filter Area (ft^2)	Flow/filter (scfm)	Pressure Drop (in H2O)	Cleaning Method
ES-CPH5-11	BEV Lines 5-11	7	Cathode: Powder Handling	DC-803-02 DC-804-02 DC-805-02 DC-806-02 DC-807-02 DC-808-02 DC-809-02	TBD	2,649	TBD	TBD
ES-CPS5-11	BEV Lines 5-11	7	Cathode: Press	DC-803-03 DC-804-03 DC-805-03 DC-806-03 DC-807-03 DC-808-03 DC-809-03	TBD	1,121	TBD	TBD
ES-APM5-11	BEV Lines 5-11	7	Anode: Mixing	DC-803-04 DC-804-04 DC-805-04 DC-806-04 DC-807-04 DC-808-04 DC-809-04	TBD	706	TBD	TBD
ES-APH5-11	BEV Lines 5-11	7	Anode: Powder Handling	DC-803-05 DC-804-05 DC-805-05 DC-806-05 DC-807-05 DC-808-05 DC-809-05	TBD	1,413	TBD	TBD
ES-APP5-11	BEV Lines 5-11	7	Anode: Press	DC-803-06 DC-804-06 DC-805-06 DC-806-06 DC-807-06 DC-808-06 DC-809-06	TBD	971	TBD	TBD
ES-AC5-11	BEV Lines 5-11	7	Anode: tab-cut	DC-803-07 DC-804-07 DC-805-07 DC-806-07 DC-807-07 DC-808-07 DC-809-07	TBD	1,266	TBD	TBD
ES-WIN810	BEV Lines 5-11	7	Winding	DC-803-08 DC-804-08 DC-805-08 DC-806-08 DC-807-08 DC-808-08 DC-809-08	TBD	2,260	TBD	TBD
ES-CPS5-11	BEV Lines 5-11	7	Cathode: Press	WDC-803-01 WDC-804-01 WDC-805-01 WDC-806-01 WDC-807-01 WDC-808-01 WDC-809-01	TBD	4,545	TBD	TBD

Emission Source ID	Line	Number of Filters	Emission Source Description	Control Device ID	Filter Area (ft^2)	Flow/filter (scfm)	Pressure Drop (in H2O)	Cleaning Method
ES-ACW5-11	BEV Lines 5-11	7	Anode: Tab-cut	WDC-803-02 WDC-804-02 WDC-805-02 WDC-806-02 WDC-807-02 WDC-808-02 WDC-809-02	TBD	3,067	TBD	TBD
ES-TCA5-11	BEV Lines 5-11	7	TopCap Assembly	WDC-803-03 WDC-804-03 WDC-805-03 WDC-806-03 WDC-807-03 WDC-808-03 WDC-809-03	TBD	374	TBD	TBD
ES-AF5-11	BEV Lines 5-11	7	Assembly Front	WDC-803-04 WDC-804-04 WDC-805-04 WDC-806-04 WDC-807-04 WDC-808-04 WDC-809-04	TBD	849	TBD	TBD
ES-MOD5-11	BEV Lines 5-11	7	Module	WDC-803-05 WDC-804-05 WDC-805-05 WDC-806-05 WDC-807-05 WDC-808-05 WDC-809-05	TBD	706	TBD	TBD

FORM C6

CONTROL DEVICE (GASEOUS ABSORBER)

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **C6**

AS REQUIRED BY 15A NCAC 2Q .0112, THIS FORM MUST BE SEALED BY A PROFESSIONAL ENGINEER (P.E.) LICENSED IN NORTH CAROLINA.

CONTROL DEVICE ID NO: **CD-S05 - S011**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2**
EMISSION POINT ID NO(S):	POSITION IN SERIES OF CONTROLS: NO. ____1__ OF ___1___ UNITS
OPERATING SCENARIO:	
_____ OF __ _____	

DESCRIBE CONTROL SYSTEM:

Control device installed on NMP solvent recovery

Toyota intends to monitor water circulation rate and exhaust air temperature according to manufacturer specifications once equipment has been sourced. Information will be provided as available.

POLLUTANT(S) COLLECTED:	**VOC**			
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	**53.04**			

PRESSURE DROP (IN. H_20): **TBD** _____ MIN _____ MAX	
INLET TEMPERATURE (^oF): _____ MIN _____ MAX	OUTLET TEMPERATURE (^oF): _____ MIN _____ MAX
INLET AIR FLOW RATE (ACFM): **TBD**	GAS VELOCITY (FT/SEC):
TOTAL GAS PRESSURE (PSIG):	GAS DEW POINT (^oF):

TYPE OF SYSTEM:

PACKED COLUMN	TYPE OF PACKING:	COLUMN LENGTH (FT):	COLUMN DIAMETER (FT):
PLATE COLUMN	PLATE SPACING (INCHES):	COLUMN LENGTH (FT):	COLUMN DIAMETER (FT):

ADDITIVE LIQUID SCRUBBING MEDIUM:	PERCENT RECIRCULATED:	
MINIMUM LIQUID INJECTION RATE (GAL/MIN):	MAKE UP RATE (GAL/MIN):	FOR ADDITIVE (GAL/MIN):
pH RANGE:	METHOD pH MONITORING:	

DESCRIBE MAINTENANCE PROCEDURES:

DESCRIBE ANY FIRE DETECTION DEVICES AND ANY MEANS OF FIRE SUPPRESSION:

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:

ATTACH A DIAGRAM OF THE RELATIONSHIP OF CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

Attach Additional Sheets As Necessary

6. NCDEQ SOURCE SPECIFIC APPLICATION FORMS-GENERATOR

This section contains DEQ source-specific permit application forms for the proposed operations.

- Form B – Specific Emissions Source Information (2000 kW generator)
- Form B2 – Emission Source- Engines (2000 kW generator)

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: 2000 kW generators	EMISSION SOURCE ID NO: ES-GEN2000b
	CONTROL DEVICE ID NO(S): NA
OPERATING SCENARIO _____ OF _____	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2000 kW disel generator

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1) ☐ Woodworking (Form B4) ☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2) ☐ Coating/finishing/printing (Form B5) ☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3) ☐ Storage silos/bins (Form B6) ☑ Other (Form B9)

START CONSTRUCTION DATE: **2022**	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: _____ HR/DAY _____ DAY/WK _____ WK/YR

IS THIS SOURCE SUBJECT TO? ☑ NSPS (SUBPARTS?):___IIII_____ ☑ NESHAP (SUBPARTS?):_____ **Subpart 4Z**

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB MAR-MAY JUN-AUG SEP-NOV

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)							**0.230**
PARTICULATE MATTER<10 MICRONS (PM_{10})							**0.230**
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							**0.230**
SULFUR DIOXIDE (SO2)							**0.009**
NITROGEN OXIDES (NOx)							**7.366**
CARBON MONOXIDE (CO)							**4.028**
VOLATILE ORGANIC COMPOUNDS (VOC)							**0.41**
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: 2000 KW generator

EMISSION SOURCE ID NO: ES-GEN2000b

CONTROL DEVICE ID NO(S): NA

OPERATING SCENARIO: _____ OF _____

EMISSION POINT (STACK) ID NO(S): NA

ENGINE SERVICE (CHECK ALL THAT APPLY) ☑ EMERGENCY ☐ PEAK SHAVER ☐ SPACE HEAT ☐ OTHER (DESCRIBE): _____ ☐ ELECTRICAL GENERATION

GENERATOR OUTPUT (KW): 2090

ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): 500

ENGINE OUTPUT (HP): 2826

TYPE ICE: ☐ GASOLINE ENGINE ☐ DIESEL ENGINE UP TO 600 HP ☑ DIESEL ENGINE GREATER THAN 600 HP ☐ DUAL FUEL ENGINE ☐ OTHER (DESCRIBE): _____ (complete below)

ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN

EMISSION REDUCTION MODIFICATIONS ☐ INJECTION TIMING RETARD ☐ PREIGNITION CHAMBER COMBUSTION ☐ OTHER _____

OR ☐ STATIONARY GAS TURBINE (complete below)

FUEL: ☐ NATURAL GAS ☐ OIL ☐ OTHER (DESCRIBE):_____

CYCLE: ☐ COGENERATION ☐ SIMPLE ☐ REGENERATIVE ☐ COMBINED

CONTROLS: ☐ WATER-STEAM INJECTION ☐ UNCONTROLLED ☐ LEAN-PREMIX ☐ OTHER (SPECIFY):_____

☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

ENGINE TYPE: ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE ☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____

CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____ ☐ NONSELECTIVE CATALYTIC REDUCTION ☐ SELECTIVE CATALYTIC REDUCTION ☐ CLEAN BURN AND PRECOMBUSTION CHAMBER ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Diesel	MMBtu		39.56

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Diesel			0.0015

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT	0.0141	0.0077	0.0004	0.0004	0.0008	
UNIT	bkW-hr	bkW-hr	bkW-hr	bkW-hr	bkW-hr	

DESCRIBE METHODS TO MINIMIZE VISIBLE EMISSIONS DURING IDLING, OR LOW LOAD OPERATIONS:

COMMENTS:

Attach Additional Sheets As Necessary

APPENDIX A. EMISSION CALCULATIONS

EMISSION CALCULATIONS **Toyota Battery Manufacturing North Carolina**
Facility Wide Potential Emissions **Greensboro, NC**

Source Name	Pollutant	HAP/TAP	Potential Emissions (lbs/yr)	Potential Emissions (tons/yr)
HEV Lines 1 through 4 includes: Electrode Mixing, Electrolyte Filling, Can/Plate Assembly, Press	PM		63,049	31.5
	PM-10		63,049	31.5
	PM-2.5		63,049	31.5
	VOCs		22,111	11.1
	Methanol	HAP	1.93	9.65E-04
	Copper		5475	2.74E+00
	Cobalt	HAP	0.980	4.90E-04
	Manganese	HAP/TAP	0.980	4.90E-04
	Nickel	HAP/TAP	0.980	4.90E-04
	Total HAP		4.87	0.002
BEV Lines 5 through 11 includes: Electrode Mixing, Electrolyte Filling, Press Assembly	PM		108,454	54.2
	PM-10		108,454	54.2
	PM-2.5		108,454	54.2
	VOCs		456,674	228.3
	Methanol	HAP	838.2	4.19E-01
	Copper		1215122	6.08E+02
	Cobalt	HAP	2.68	1.34E-03
	Manganese	HAP/TAP	2.68	1.34E-03
	Nickel	HAP/TAP	3.26	1.63E-03
	Total HAP		846.79	0.423
Cleaning Activities	VOCs		8.62E+03	4.311
NMP Storage Tanks	VOCs		1.13E+01	0.006
Cooling Towers	PM		6.00E+02	0.300
	PM-10		2.40E+02	0.120
	PM-2.5		2.40E+02	0.120
2000 kW Generators (2)	PM		9.21E+02	4.60E-01
	PM-10		9.21E+02	4.60E-01
	PM-2.5		9.21E+02	4.60E-01
	NOx		2.95E+04	1.47E+01
	VOCs		1.65E+03	8.25E-01
	CO		1.61E+04	8.06E+00
	SO_2		3.43E+01	1.71E-02
	Acetaldehyde	HAP/TAP	3.49E-03	1.74E-06
	Acrolein	HAP/TAP	1.09E-03	5.46E-07
	Arsenic	HAP/TAP	5.54E-04	2.77E-07
	Benzene	HAP/TAP	1.07E-01	5.37E-05
	Benzo(a)pyrene	HAP/TAP	3.56E-05	1.78E-08
	Beryllium	HAP/TAP	4.15E-04	2.08E-07
	Cadmium	HAP/TAP	4.15E-04	2.08E-07
	Chromium	HAP/TAP	4.15E-04	2.08E-07
	Formaldehyde	HAP/TAP	1.09E-02	5.46E-06
	Lead	HAP	1.25E-03	6.23E-07
	Manganese	HAP/TAP	8.31E-04	4.15E-07
	Mercury	HAP/TAP	4.15E-04	2.08E-07
	Napthalene	HAP	1.80E-02	9.00E-06
	Nickel	HAP	4.15E-04	2.08E-07
	Total PAH (POM)	HAP	2.94E-02	1.47E-05
	Selenium	HAP	2.08E-03	1.04E-06
	Toluene	HAP/TAP	3.89E-02	1.95E-05
	Xylene	HAP/TAP	2.67E-02	1.34E-05

Source Name	Pollutant	HAP/TAP	Potential Emissions (lbs/yr)	Potential Emissions (tons/yr)
1250 kW Generators (2)	PM		5.51E+02	2.75E-01
	PM-10		5.51E+02	2.75E-01
	PM-2.5		5.51E+02	2.75E-01
	SO_2		2.05E+01	1.03E-02
	NOx		1.76E+04	8.81E+00
	VOCs		9.95E+02	4.98E-01
	CO		9.64E+03	4.82E+00
	Acetaldehyde	HAP/TAP	2.09E-03	1.04E-06
	Acrolein	HAP/TAP	6.53E-04	3.26E-07
	Arsenic	HAP/TAP	3.31E-04	1.66E-07
	Benzene	HAP/TAP	6.43E-02	3.21E-05
	Benzo(a)pyrene	HAP/TAP	2.13E-05	1.06E-08
	Beryllium	HAP/TAP	2.48E-04	1.24E-07
	Cadmium	HAP/TAP	2.48E-04	1.24E-07
	Chromium	HAP/TAP	2.48E-04	1.24E-07
	Formaldehyde	HAP/TAP	6.53E-03	3.27E-06
	Lead	HAP	7.45E-04	3.73E-07
	Manganese	HAP/TAP	4.97E-04	2.48E-07
	Mercury	HAP/TAP	2.48E-04	1.24E-07
	Napthalene	HAP	1.08E-02	5.38E-06
	Nickel	HAP	2.48E-04	1.24E-07
	Total PAH (POM)	HAP	1.76E-02	8.78E-06
	Selenium	HAP	1.24E-03	6.21E-07
	Toluene	HAP/TAP	2.33E-02	1.16E-05
	Xylene	HAP/TAP	1.60E-02	7.99E-06
50 kW Generators (2)	PM		2.86E+01	1.43E-02
	PM-10		2.86E+01	1.43E-02
	PM-2.5		2.86E+01	1.43E-02
	NOx		4.87E+02	2.43E-01
	VOCs		4.87E+02	2.43E-01
	CO		1.12E+02	5.62E-02
	SO_2		1.37E+02	6.87E-02
	Acetaldehyde	HAP/TAP	4.62E-01	2.31E-04
	Acrolein	HAP/TAP	5.58E-02	2.79E-05
	Arsenic	HAP/TAP	1.69E-05	8.44E-09
	Benzene	HAP/TAP	5.62E-01	2.81E-04
	Benzo(a)pyrene	HAP/TAP	1.13E-04	5.67E-08
	Beryllium	HAP/TAP	1.27E-05	6.33E-09
	Cadmium	HAP/TAP	1.27E-05	6.33E-09
	Chromium	HAP/TAP	1.27E-05	6.33E-09
	Formaldehyde	HAP/TAP	7.11E-01	3.56E-04
	Lead	HAP	3.80E-05	1.90E-08
	Manganese	HAP/TAP	2.53E-05	1.27E-08
	Mercury	HAP/TAP	1.27E-05	6.33E-09
	Napthalene	HAP	5.11E-02	2.56E-05
	Nickel	HAP	1.27E-05	6.33E-09
	Total PAH (POM)	HAP	1.01E-01	5.06E-05
	Selenium	HAP	6.33E-05	3.16E-08
	Toluene	HAP/TAP	2.47E-01	1.23E-04
	Xylene	HAP/TAP	1.72E-01	8.59E-05

Source Name	Pollutant	HAP/TAP	Potential Emissions (lbs/yr)	Potential Emissions (tons/yr)
Total	PM		1.74E+05	86.80
	PM-10		1.73E+05	86.62
	PM-2.5		1.73E+05	86.62
	SO_2		1.92E+02	0.10
	NOx		4.76E+04	23.79
	VOCs		4.91E+05	245.28
	CO		2.59E+04	12.93
	Acetaldehyde	HAP/TAP	4.68E-01	2.34E-04
	Acrolein	HAP/TAP	5.75E-02	2.88E-05
	Arsenic	HAP/TAP	9.02E-04	4.51E-07
	Benzene	HAP/TAP	7.34E-01	3.67E-04
	Benzo(a)pyrene	HAP/TAP	1.70E-04	8.51E-08
	Beryllium	HAP/TAP	6.76E-04	3.38E-07
	Cadmium	HAP/TAP	6.76E-04	3.38E-07
	Chromium	HAP/TAP	6.76E-04	3.38E-07
	Cobalt	HAP	3.66E+00	1.83E-03
	Copper		1.22E+06	6.10E+02
	Formaldehyde	HAP/TAP	7.29E-01	3.64E-04
	Lead	HAP	2.03E-03	1.01E-06
	Manganese	HAP/TAP	3.66E+00	1.83E-03
	Mercury	HAP/TAP	6.76E-04	3.38E-07
	Methanol	HAP	8.40E+02	4.20E-01
	Napthalene	HAP	7.99E-02	3.99E-05
	Nickel	HAP	4.24E+00	2.12E-03
	Total PAH (POM)	HAP	1.48E-01	7.41E-05
	Selenium	HAP	3.38E-03	1.69E-06
	Toluene	HAP/TAP	3.09E-01	1.54E-04
	Xylene	HAP/TAP	2.15E-01	1.07E-04
	Total HAP		8.54E+02	4.27E-01

EMISSION CALCULATIONS **Toyota Battery Manufacturing North Carolina**
BEV Project Potential Emissions **Greensboro, NC**

Source Name	Pollutant	HAP/TAP	Potential Emissions (lbs/yr)	Potential Emissions (tons/yr)
BEV Lines 5 through 11	PM		108,454	54.2
includes:	PM-10		108,454	54.2
Electrode	PM-2.5		108,454	54.2
Electrolyte Filling	VOCs		456,674	228.3
	Methanol	HAP	838.2	4.19E-01
	Copper		1215122	6.08E+02
	Cobalt	HAP	2.682	1.34E-03
	Manganese	HAP/TAP	2.682	1.34E-03
	Nickel	HAP/TAP	3.262	1.63E-03
	Total HAP		846.79	0.423
Cleaning Activities	VOCs		5.49E+03	2.743
NMP Storage Tanks	VOCs		1.13E+01	0.006
Cooling Towers	PM		3.00E+02	0.150
	PM-10		1.20E+02	0.060
	PM-2.5		1.20E+02	0.060
2000 kW Generators	PM		9.21E+02	2.30E-01
	PM-10		9.21E+02	2.30E-01
	PM-2.5		9.21E+02	2.30E-01
	NOx		2.95E+04	7.37E+00
	VOCs		1.65E+03	4.12E-01
	CO		1.61E+04	4.03E+00
	SO_2		3.43E+01	8.57E-03
	Acetaldehyde	HAP/TAP	3.49E-03	8.72E-07
	Acrolein	HAP/TAP	1.09E-03	2.73E-07
	Arsenic	HAP/TAP	5.54E-04	1.38E-07
	Benzene	HAP/TAP	1.07E-01	2.69E-05
	Benzo(a)pyrene	HAP/TAP	3.56E-05	8.90E-09
	Beryllium	HAP/TAP	4.15E-04	1.04E-07
	Cadmium	HAP/TAP	4.15E-04	1.04E-07
	Chromium	HAP/TAP	4.15E-04	1.04E-07
	Formaldehyde	HAP/TAP	1.09E-02	2.73E-06
	Lead	HAP	1.25E-03	3.12E-07
	Manganese	HAP/TAP	8.31E-04	2.08E-07
	Mercury	HAP/TAP	4.15E-04	1.04E-07
	Napthalene	HAP	1.80E-02	4.50E-06
	Nickel	HAP	4.15E-04	1.04E-07
	Total PAH (POM)	HAP	2.94E-02	7.34E-06
	Selenium	HAP	2.08E-03	5.19E-07
	Toluene	HAP/TAP	3.89E-02	9.73E-06
	Xylene	HAP/TAP	2.67E-02	6.68E-06

Source Name	Pollutant	HAP/TAP	Potential Emissions (lbs/yr)	Potential Emissions (tons/yr)
1250 kW Generators	PM		5.51E+02	1.38E-01
	PM-10		5.51E+02	1.38E-01
	PM-2.5		5.51E+02	1.38E-01
	SO_2		2.05E+01	5.13E-03
	NOx		1.76E+04	4.41E+00
	VOCs		9.95E+02	2.49E-01
	CO		9.64E+03	2.41E+00
	Acetaldehyde	HAP/TAP	2.09E-03	5.22E-07
	Acrolein	HAP/TAP	6.53E-04	1.63E-07
	Arsenic	HAP/TAP	3.31E-04	8.28E-08
	Benzene	HAP/TAP	6.43E-02	1.61E-05
	Benzo(a)pyrene	HAP/TAP	2.13E-05	5.32E-09
	Beryllium	HAP/TAP	2.48E-04	6.21E-08
	Cadmium	HAP/TAP	2.48E-04	6.21E-08
	Chromium	HAP/TAP	2.48E-04	6.21E-08
	Formaldehyde	HAP/TAP	6.53E-03	1.63E-06
	Lead	HAP	7.45E-04	1.86E-07
	Manganese	HAP/TAP	4.97E-04	1.24E-07
	Mercury	HAP/TAP	2.48E-04	6.21E-08
	Napthalene	HAP	1.08E-02	2.69E-06
	Nickel	HAP	2.48E-04	6.21E-08
	Total PAH (POM)	HAP	1.76E-02	4.39E-06
	Selenium	HAP	1.24E-03	3.11E-07
	Toluene	HAP/TAP	2.33E-02	5.82E-06
	Xylene	HAP/TAP	1.60E-02	4.00E-06
50 kW Generators	PM		2.86E+01	7.16E-03
	PM-10		2.86E+01	7.16E-03
	PM-2.5		2.86E+01	7.16E-03
	NOx		4.87E+02	1.22E-01
	VOCs		4.87E+02	1.22E-01
	CO		1.12E+02	2.81E-02
	SO_2		1.37E+02	3.44E-02
	Acetaldehyde	HAP/TAP	4.62E-01	1.16E-04
	Acrolein	HAP/TAP	5.58E-02	1.39E-05
	Arsenic	HAP/TAP	1.69E-05	4.22E-09
	Benzene	HAP/TAP	5.62E-01	1.41E-04
	Benzo(a)pyrene	HAP/TAP	1.13E-04	2.83E-08
	Beryllium	HAP/TAP	1.27E-05	3.16E-09
	Cadmium	HAP/TAP	1.27E-05	3.16E-09
	Chromium	HAP/TAP	1.27E-05	3.16E-09
	Formaldehyde	HAP/TAP	7.11E-01	1.78E-04
	Lead	HAP	3.80E-05	9.49E-09
	Manganese	HAP/TAP	2.53E-05	6.33E-09
	Mercury	HAP/TAP	1.27E-05	3.16E-09
	Napthalene	HAP	5.11E-02	1.28E-05
	Nickel	HAP	1.27E-05	3.16E-09
	Total PAH (POM)	HAP	1.01E-01	2.53E-05
	Selenium	HAP	6.33E-05	1.58E-08
	Toluene	HAP/TAP	2.47E-01	6.16E-05
	Xylene	HAP/TAP	1.72E-01	4.30E-05

Source Name	Pollutant	HAP/TAP	Potential Emissions (lbs/yr)	Potential Emissions (tons/yr)
Total	PM		1.10E+05	54.75
	PM-10		1.10E+05	54.66
	PM-2.5		1.10E+05	54.66
	SO_2		1.92E+02	0.05
	NOx		4.76E+04	11.89
	VOCs		4.65E+05	231.87
	CO		2.59E+04	6.47
	Acetaldehyde	HAP/TAP	4.68E-01	1.17E-04
	Acrolein	HAP/TAP	5.75E-02	1.44E-05
	Arsenic	HAP/TAP	9.02E-04	2.25E-07
	Benzene	HAP/TAP	7.34E-01	1.84E-04
	Benzo(a)pyrene	HAP/TAP	1.70E-04	4.26E-08
	Beryllium	HAP/TAP	6.76E-04	1.69E-07
	Cadmium	HAP/TAP	6.76E-04	1.69E-07
	Chromium	HAP/TAP	6.76E-04	1.69E-07
	Cobalt	HAP	2.68E+00	1.34E-03
	Copper		1.22E+06	6.08E+02
	Formaldehyde	HAP/TAP	7.29E-01	1.82E-04
	Lead	HAP	2.03E-03	5.07E-07
	Manganese	HAP/TAP	2.68E+00	1.34E-03
	Mercury	HAP/TAP	6.76E-04	1.69E-07
	Methanol	HAP	8.38E+02	4.19E-01
	Napthalene	HAP	7.99E-02	2.00E-05
	Nickel	HAP	3.26E+00	1.63E-03
	Total PAH (POM)	HAP	1.48E-01	3.70E-05
	Selenium	HAP	3.38E-03	8.46E-07
	Toluene	HAP/TAP	3.09E-01	7.72E-05
	Xylene	HAP/TAP	2.15E-01	5.36E-05
	Total HAP		8.50E+02	4.24E-01

Pollutant	Facilitywide Emissions (lb/day)	TPER (lb/day)	Above (Y/N)
Manganese	0.0100	0.63	NO
Nickel	0.0116	0.13	NO

EMISSION CALCULATIONS — **Toyota Battery Manufacturing North Carolina**

Sourc Electrode Manufacturing Metals Emissions — **Greensboro, NC**

										CONTROLLED							
Emissions Unit	**Emission Source ID**	**Number of Filters**	**Control Device Description**	**Control Device ID**	**Exhaust Flow (ft^3/min)**	**Nickel Emission Factor (gr/ft^3)**	**Cobalt Emission Factor (gr/ft^3)**	**Manganese Emission Factor (gr/ft^3)**	**Copper Emission Factor (gr/ft^3)**	**Nickel Emissions (lb/hr)**	**Cobalt Emissions (lb/hr)**	**Manganese Emissions (lb/hr)**	**Copper Emission (lb/hr)**	**Nickel Emissions (tpy)**	**Cobalt Emissions (tpy)**	**Manganese Emissions (tpy)**	**Copper Emissions (tpy)**
ES-CPM12	HEV Lines 1 and 2	2	Cathode: Paste Mixing (Lines 1 and 2)	DC-801-01	2,740	4.59E-07	4.59E-07	4.59E-07		2.16E-05	2.16E-05	2.16E-05	0.00E+00	9.44E-05	9.44E-05	9.44E-05	0.00E+00
ES-CPS12	HEV Lines 1 and 2	2	Cathode: Press-Slitting (Lines 1 and 2)	DC-801-02	1,130	4.59E-07	4.59E-07	4.59E-07	5.00E-03	8.89E-06	8.89E-06	8.89E-06	9.69E-02	3.89E-05	3.89E-05	3.89E-05	4.24E-01
ES-APM12	HEV Lines 1 and 2	2	Anode: Paste Mixing (Lines 1 and 2)	DC-801-03	2,110	4.59E-07	4.59E-07	4.59E-07		1.66E-05	1.66E-05	1.66E-05	0.00E+00	7.27E-05	7.27E-05	7.27E-05	0.00E+00
ES-APS12	HEV Lines 1 and 2	2	Anode: Press-Slitting (Lines 1 and 2)	DC-801-04	1,130	4.59E-07	4.59E-07	4.59E-07	5.00E-03	8.89E-06	8.89E-06	8.89E-06	9.69E-02	3.89E-05	3.89E-05	3.89E-05	4.24E-01
ES-AS-WD12	HEV Lines 1 and 2	2	Assembly: Winding & Disassemble (Lines 1 and 2)	DC-801-05	2,100	2.63E-07			3.30E-03	0.00E+00	0.00E+00	0.00E+00	1.19E-01	0.00E+00	0.00E+00	0.00E+00	5.20E-01
ES-CPM34	HEV Lines 3 and 4	2	Cathode: Paste Mixing (Lines 3 and 4)	DC-801-07	2,740	4.59E-07	4.59E-07	4.59E-07		2.16E-05	2.16E-05	2.16E-05	0.00E+00	9.44E-05	9.44E-05	9.44E-05	0.00E+00
ES-CPS34	HEV Lines 3 and 4	2	Cathode: Press-Slitting (Lines 3 and 4)	DC-801-08	1,130	4.59E-07	4.59E-07	4.59E-07	5.00E-03	8.89E-06	8.89E-06	8.89E-06	9.69E-02	3.89E-05	3.89E-05	3.89E-05	4.24E-01
ES-APM34	HEV Lines 3 and 4	2	Anode: Paste Mixing (Lines 3 and 4)	DC-801-09	2,110	4.59E-07	4.59E-07	4.59E-07		1.66E-05	1.66E-05	1.66E-05	0.00E+00	7.27E-05	7.27E-05	7.27E-05	0.00E+00
ES-APS34	HEV Lines 3 and 4	2	Anode: Press-Slitting (Lines 3 and 4)	DC-801-10	1,130	4.59E-07	4.59E-07	4.59E-07	5.00E-03	8.89E-06	8.89E-06	8.89E-06	9.69E-02	3.89E-05	3.89E-05	3.89E-05	4.24E-01
ES-AS-WD34	HEV Lines 3 and 4	2	Assembly: Winding & Disassemble (Lines 3 and 4)	DC-801-11	2,100	2.63E-07			3.30E-03	0.00E+00	0.00E+00	0.00E+00	1.19E-01	0.00E+00	0.00E+00	0.00E+00	5.20E-01
TOTAL HEV Lines										**1.12E-04**	**1.12E-04**	**1.12E-04**	**6.25E-01**	**4.90E-04**	**4.90E-04**	**4.90E-04**	**2.74E+00**

Notes:

1. Assumed exit grain loading of 0.01 gr/scf for particulate emissions.
2. For mixing emission factor (1.53E-7 gr/ft^3) for Nickel, Cobalt and Manganese from the Ohio LG Permit applciation 4-1-2020 and applied a safety factor of 3.
3. For Slitting assumption of 50% PM emissions are copper dust from Ohio LG Permit application 4-1-2020. Emission factor (1.53E-7 gr/ft3) for Nickel, Cobalt and Manganese from Ohio LG Permit applciation 4-1-2020 and applied a safety factor of 3.
4. For Assembly assumption is emission factor (8.7E-8 gr/ft^3) Nickel from Ohio LG Permit applciation 4-1-2020 and 33% of PM emissions are copper dust from Ohio LG Permit applciation 4-1-2020 .

Emissions (lb/hr) = Flow (scfm) * EF gr/ft^3 * 1 lb/7000 gr * 60 min/hr * Number of baghouses

										CONTROLLED							
Emissions Unit	**Emission Source ID**	**Number of Filters**	**Control Device Description**	**Control Device ID**	**Exhaust Flow (ft^3/min)**	**Nickel Emission Factor (gr/ft^3)**	**Cobalt Emission Factor (gr/ft^3)**	**Manganese Emission Factor (gr/ft^3)**	**Copper Emission Factor (gr/ft^3)**	**Nickel Emissions (lb/hr)**	**Cobalt Emissions (lb/hr)**	**Manganese Emissions (lb/hr)**	**Copper Emission (lb/hr)**	**Nickel Emissions (tpy)**	**Cobalt Emissions (tpy)**	**Manganese Emissions (tpy)**	**Copper Emissions (tpy)**
ES-CPM5-11	BEV Lines 5-11	7	Cathode: Mixing	DC-803-01 DC-804-01 DC-805-01 DC-806-01 DC-807-01 DC-808-01 DC-809-01	706	4.59E-07	4.59E-07	4.59E-07		1.95E-05	1.95E-05	1.95E-05	0.00E+00	8.52E-05	8.52E-05	8.52E-05	0.00E+00
ES-CPS5-11	BEV Lines 5-11	7	Cathode: Press	DC-803-03 DC-804-03 DC-805-03 DC-806-03 DC-807-03 DC-808-03 DC-809-03	1,121	4.59E-07	4.59E-07	4.59E-07	5.00E-03	3.09E-05	3.09E-05	3.09E-05	3.36E-01	1.35E-04	1.35E-04	1.35E-04	1.47E+00
ES-APM5-11	BEV Lines 5-11	7	Anode: Mixing	DC-803-04 DC-804-04 DC-805-04 DC-806-04 DC-807-04 DC-808-04 DC-809-04	706	4.59E-07	4.59E-07	4.59E-07		1.95E-05	1.95E-05	1.95E-05	0.00E+00	8.52E-05	8.52E-05	8.52E-05	0.00E+00
ES-APP5-11	BEV Lines 5-11	7	Anode: Press	DC-803-06 DC-804-06 DC-805-06 DC-806-06 DC-807-06 DC-808-06 DC-809-06	971	4.59E-07	4.59E-07	4.59E-07	5.00E-03	2.67E-05	2.67E-05	2.67E-05	2.91E-01	1.17E-04	1.17E-04	1.17E-04	1.28E+00
ES-WIN810	BEV Lines 5-11	7	Winding	DC-803-08 DC-804-08 DC-805-08 DC-806-08 DC-807-08 DC-808-08 DC-809-08	2,260	2.63E-07			3.30E-03	3.57E-05	0.00E+00	0.00E+00	4.48E-01	1.56E-04	0.00E+00	0.00E+00	1.96E+00

										CONTROLLED							
Emissions Unit	**Emission Source ID**	**Number of Filters**	**Control Device Description**	**Control Device ID**	**Exhaust Flow (ft^3/min)**	**Nickel Emission Factor (gr/ft^3)**	**Cobalt Emission Factor (gr/ft^3)**	**Manganese Emission Factor (gr/ft^3)**	**Copper Emission Factor (gr/ft^3)**	**Nickel Emissions (lb/hr)**	**Cobalt Emissions (lb/hr)**	**Manganese Emissions (lb/hr)**	**Copper Emission (lb/hr)**	**Nickel Emissions (tpy)**	**Cobalt Emissions (tpy)**	**Manganese Emissions (tpy)**	**Copper Emissions (tpy)**
ES-CPS5-11	BEV Lines 5-11	7	Cathode: Press	WDC-803-01 WDC-804-01 WDC-805-01 WDC-806-01 WDC-807-01 WDC-808-01 WDC-809-01	4,545	4.59E-07	4.59E-07	4.59E-07	0.00E+00	1.25E-04	1.25E-04	1.25E-04	0.00E+00	5.48E-04	5.48E-04	5.48E-04	0.00E+00
ES-ACW5-11	BEV Lines 5-11	7	Anode: Tab-cut	WDC-803-02 WDC-804-02 WDC-805-02 WDC-806-02 WDC-807-02 WDC-808-02 WDC-809-02	3,067	4.59E-07	4.59E-07	4.59E-07	5.00E-01	8.45E-05	8.45E-05	8.45E-05	9.20E+01	3.70E-04	3.70E-04	3.70E-04	4.03E+02
ES-TCA5-11	BEV Lines 5-11	7	TopCap Assembly	WDC-803-03 WDC-804-03 WDC-805-03 WDC-806-03 WDC-807-03 WDC-808-03 WDC-809-03	374	2.63E-07			6.60E-01	5.92E-06	0.00E+00	0.00E+00	1.48E+01	2.59E-05	0.00E+00	0.00E+00	6.49E+01
ES-AF5-11	BEV Lines 5-11	7	Assembly Front	WDC-803-04 WDC-804-04 WDC-805-04 WDC-806-04 WDC-807-04 WDC-808-04 WDC-809-04	849	2.63E-07			3.30E-01	1.34E-05	0.00E+00	0.00E+00	1.68E+01	5.88E-05	0.00E+00	0.00E+00	7.37E+01
ES-MOD5-11	BEV Lines 5-11	7	Module	WDC-803-05 WDC-804-05 WDC-805-05 WDC-806-05 WDC-807-05 WDC-808-05 WDC-809-05	706	2.63E-07			3.30E-01	1.12E-05	0.00E+00	0.00E+00	1.40E+01	4.89E-05	0.00E+00	0.00E+00	6.13E+01
TOTAL BEV Lines										**3.72E-04**	**3.06E-04**	**3.06E-04**	**1.39E+02**	**1.63E-03**	**1.34E-03**	**1.34E-03**	**6.08E+02**
TOTAL HEV + BEV Lines										**4.84E-04**	**4.18E-04**	**4.18E-04**	**1.39E+02**	**2.12E-03**	**1.83E-03**	**1.83E-03**	**6.10E+02**

Notes:

1. For mixing emission factor (1.53E-7 gr/ft^3) for Nickel, Cobalt and Manganese from the Ohio LG Permit application 4-1-2020 and applied a safety factor of 3.
2. For Slitting assumption of 50% PM emissions are copper dust from Ohio LG Permit application 4-1-2020. Emission factor (1.53E-7 gr/ft3) for Nickel, Cobalt and Manganese from Ohio LG Permit application 4-1-2020 and applied a safety factor of 3.
3. For Assembly assumption is emission factor (8.7E-8 gr/ft^3) Nickel from Ohio LG Permit applciation 4-1-2020 and 33% of PM emissions are copper dust from Ohio LG Permit application 4-1-2020 .

Emissions (lb/hr) = Flow (scfm) * EF gr/ft^3 * 1 lb/7000 gr * 60 min/hr * Number of baghouses

EMISSION CALCULATIONS
Sourc Electrode Manufacturing PM Emissions

Toyota Battery Manufacturing North Carolina
Greensboro, NC

Basis:

Assumed Grain Loading = 0.01 gr/ft^3 Conservative assumption based on engineering estimate for exit grain loading for fabric filter
Assumed Control Efficiency = 99% Conservative assumption

Emissions:

									Uncontrolled Potential						Controlled Potential					
								Emission Limit	PM		PM_{10}		$PM_{2.5}$		PM		PM_{10}		$PM_{2.5}$	
Emission Source ID	Line	Number of Filters	Emission Source Description	Control Device ID	Hours of Operation	Filter Area	Flow/filter	Process Weight Rate	per 2D .0515 E (lb/hr) = 4.10 $p^{0.67}$	Emissions		Emissions		Emissions		Emissions		Emissions		Emissions	
					(hrs)	(ft^2)	(scfm)	(tons/hr)	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
ES-CPM12	HEV Lines 1and 2	2	Cathode: Paste Mixing (Lines 1 an	DC-801-01a and b	8,760	TBD	2,740	0.227	1.52	46.97	205.73	46.97	205.73	46.97	205.73	0.47	2.06	0.47	2.06	0.47	2.06
ES-CPS12	HEV Lines 1and 2	2	Cathode: Press-Slitting (Lines 1 an	DC-801-02a and b	8,760	TBD	1,130	0.423	2.30	19.37	84.85	19.37	84.85	19.37	84.85	0.19	0.85	0.19	0.85	0.19	0.85
ES-APM12	HEV Lines 1and 2	2	Anode: Paste Mixing (Lines 1 and 2)	DC-801-03a and b	8,760	TBD	2,110	0.619	2.97	36.17	158.43	36.17	158.43	36.17	158.43	0.36	1.58	0.36	1.58	0.36	1.58
ES-APS12	HEV Lines 1and 2	2	Anode: Press-Slitting (Lines 1 and 2)	DC-801-04a and b	8,760	TBD	1,130	0.805	3.55	19.37	84.85	19.37	84.85	19.37	84.85	0.19	0.85	0.19	0.85	0.19	0.85
ES-AS-WD12	HEV Lines 1and 2	2	Assembly: Winding & Disassemble (Lines 1 and 2)	DC-801-05a and b	8,760	TBD	2,100	1.164	4.54	36.00	157.68	36.00	157.68	36.00	157.68	0.36	1.58	0.36	1.58	0.36	1.58
ES-AS-W12	HEV Lines 1and 2	2	Assembly: QC Washing (Lines 1 and 2)	DC-801-06a and b	8,760	TBD	170	NA	NA	2.91	12.76	2.91	12.76	2.91	12.76	0.03	0.13	0.03	0.13	0.03	0.13
ES-CPM34	HEV Lines 3 and 4	2	Cathode: Paste Mixing (Lines 3 an	DC-801-07a and b	8,760	TBD	2,740	0.227	1.52	46.97	205.73	46.97	205.73	46.97	205.73	0.47	2.06	0.47	2.06	0.47	2.06
ES-CPS34	HEV Lines 3 and 4	2	Cathode: Press-Slitting (Lines 3 an	DC-801-08a and b	8,760	TBD	1,130	0.423	2.30	19.37	84.85	19.37	84.85	19.37	84.85	0.19	0.85	0.19	0.85	0.19	0.85
ES-APM34	HEV Lines 3 and 4	2	Anode: Paste Mixing (Lines 3 and 4)	DC-801-09a and b	8,760	TBD	2,110	0.619	2.97	36.17	158.43	36.17	158.43	36.17	158.43	0.36	1.58	0.36	1.58	0.36	1.58
ES-APS34	HEV Lines 3 and 4	2	Anode: Press-Slitting (Lines 3 and 4)	DC-801-10a and b	8,760	TBD	1,130	0.805	3.55	19.37	84.85	19.37	84.85	19.37	84.85	0.19	0.85	0.19	0.85	0.19	0.85
ES-AS-WD34	HEV Lines 3 and 4	2	Assembly: Winding & Disassemble (Lines 3 and 4)	DC-801-11a and b	8,760	TBD	2,100	1.164	4.54	36.00	157.68	36.00	157.68	36.00	157.68	0.36	1.58	0.36	1.58	0.36	1.58
ES-AS-W34	HEV Lines 3 and 4	2	Assembly: QC Washing (Lines 3 and 4)	DC-801-12a and b	8,760	TBD	170	NA	NA	2.91	12.76	2.91	12.76	2.91	12.76	0.03	0.13	0.03	0.13	0.03	0.13
ES-PA-RA	HEV Lines 1-4	1	AB PASTE AREA: PASTE RM A1&A2	DC-801-13	8,760	TBD	850	0.000	0.00	7.29	31.91	7.29	31.91	7.29	31.91	0.07	0.32	0.07	0.32	0.07	0.32
ES-PA-RB	HEV Lines 1-4	1	AB PASTE AREA: PASTE RM B1&B2	DC-801-14	8,760	TBD	890			7.63	33.41	7.63	33.41	7.63	33.41	0.08	0.33	0.08	0.33	0.08	0.33
ES-PA-RC	HEV Lines 1-4	1	AB PASTE AREA: PASTE RM C1&C2	DC-801-15	8,760	TBD	890			7.63	33.41	7.63	33.41	7.63	33.41	0.08	0.33	0.08	0.33	0.08	0.33
ES-PA-PH1	HEV Lines 1-4	1	AB PASTE AREA: POWDER HANDLING 1	DC-801-16	8,760	TBD	3,040			26.06	114.13	26.06	114.13	26.06	114.13	0.26	1.14	0.26	1.14	0.26	1.14
ES-PA-PH2	HEV Lines 1-4	1	AB PASTE AREA: POWDER HANDLING 2	DC-801-17	8,760	TBD	1,490			12.77	55.94	12.77	55.94	12.77	55.94	0.13	0.56	0.13	0.56	0.13	0.56
ES-TPAA DC	HEV Lines 1-4	2	TOP PLATE ASSEMBLY AREA: DUST COLLECTOR	DC-801-18 a and b	8,760	TBD	170	2.399	7.37	2.91	12.76	2.91	12.76	2.91	12.76	0.03	0.13	0.03	0.13	0.03	0.13
ES-QC-FH1	HEV Lines 1-4	1	QC EVALUATION RM: TABLE TOP FUME HOOD (C8H8)	DC-801-19	8,760	TBD	1,130	N/A	N/A	9.69	42.42	9.69	42.42	9.69	42.42	0.10	0.42	0.10	0.42	0.10	0.42
ES-QC-FH2	HEV Lines 1-4	1	QC EVALUATION RM: TABLE TOP FUME HOOD (C8H8)	DC-801-20	8,760	TBD	2,260	N/A	N/A	19.37	84.85	19.37	84.85	19.37	84.85	0.19	0.85	0.19	0.85	0.19	0.85
ES-QC-FH3	HEV Lines 1-4	1	QC EVALUATION RM: TABLE TOP FUME HOOD (C8H8)	DC-801-21	8,760	TBD	3,390	N/A	N/A	29.06	127.27	29.06	127.27	29.06	127.27	0.29	1.27	0.29	1.27	0.29	1.27
ES-QC-LST	HEV Lines 1-4	1	QC EVALUATION RM: LIQUID CHEMICAL STORAGE TANK	DC-801-22	8,760	TBD	410	N/A	N/A	3.51	15.39	3.51	15.39	3.51	15.39	0.04	0.15	0.04	0.15	0.04	0.15
ES-QC-BD1	HEV Lines 1-4	1	QC EVALUATION RM: BATTERY DISMANTLING BOOTHS 1 (Co,Ni,Mn)	DC-801-23	8,760	TBD	8,140	N/A	N/A	69.77	305.60	69.77	305.60	69.77	305.60	0.70	3.06	0.70	3.06	0.70	3.06
ES-QC-BD2	HEV Lines 1-4	1	QC EVALUATION RM: BATTERY DISMANTLING BOOTHS 1 (Co,Ni,Mn)	DC-801-24	8,760	TBD	8,140	N/A	N/A	69.77	305.60	69.77	305.60	69.77	305.60	0.70	3.06	0.70	3.06	0.70	3.06
ES-QC-BD3	HEV Lines 1-4	1	QC EVALUATION RM: BATTERY DISMANTLING BOOTHS 1 (Co,Ni,Mn)	DC-801-25	8,760	TBD	8,140	N/A	N/A	69.77	305.60	69.77	305.60	69.77	305.60	0.70	3.06	0.70	3.06	0.70	3.06
ES-AS-CLS12	HEV Lines 1 and 2	2	ASSEMBLY: CAN LASER SEALING (LINE 1 and 2)	WDC-801-01a and b	8,760	TBD	400	1.776	6.02	6.86	30.03	6.86	30.03	6.86	30.03	0.07	0.30	0.07	0.30	0.07	0.30
ES-AS-CJ12	HEV Lines 1 and 2	2	ASSEMBLY: CURRENT COLLECTOR JUNCTION (LINE 1 and 2)	WDC-801-02a and b	8,760	TBD	360	2.388	7.35	6.17	27.03	6.17	27.03	6.17	27.03	0.06	0.27	0.06	0.27	0.06	0.27
ES-AS-HS12	HEV Lines 1 and 2	2	ASSEMBLY: HELIUM SEALING (LINE 1 and 2)	WDC-801-03a and b	8,760	TBD	200	3	8.56	3.43	15.02	3.43	15.02	3.43	15.02	0.03	0.15	0.03	0.15	0.03	0.15
ES-ST-BBW12-1	HEV Lines 1 and 2	2	STACKING: BUS BAR WELDING (LINE 1 and 2)	WDC-801-04a and b	8,760	TBD	210	4.3174	10.92	3.60	15.77	3.60	15.77	3.60	15.77	0.04	0.16	0.04	0.16	0.04	0.16
ES-ST-BBW12-2	HEV Lines 1 and 2	2	STACKING: BUS BAR WELDING (LINE 1 and 2)	WDC-801-05a and b	8,760	TBD	360	5.6348	13.06	6.17	27.03	6.17	27.03	6.17	27.03	0.06	0.27	0.06	0.27	0.06	0.27
ES-AS-CLS34	HEV Lines 3 and 4	2	ASSEMBLY: CAN LASER SEALING (LINE 3 and 4)	WDC-801-06a and b	8,760	TBD	400	1.776	6.02	6.86	30.03	6.86	30.03	6.86	30.03	0.07	0.30	0.07	0.30	0.07	0.30
ES-AS-CJ34	HEV Lines 3 and 4	2	ASSEMBLY: CURRENT COLLECTOR JUNCTION (LINE 3 and 4)	WDC-801-07a and b	8,760	TBD	360	2.388	7.35	6.17	27.03	6.17	27.03	6.17	27.03	0.06	0.27	0.06	0.27	0.06	0.27
ES-AS-HS34	HEV Lines 3 and 4	2	ASSEMBLY: HELIUM SEALING (LINE 3 and 4)	WDC-801-08a and b	8,760	TBD	200	3	8.56	3.43	15.02	3.43	15.02	3.43	15.02	0.03	0.15	0.03	0.15	0.03	0.15
ES-ST-BBW34-1	HEV Lines 3 and 4	2	STACKING: BUS BAR WELDING (LINE 3 and 4)	WDC-801-09a and b	8,760	TBD	210	4.3174	10.92	3.60	15.77	3.60	15.77	3.60	15.77	0.04	0.16	0.04	0.16	0.04	0.16
ES-ST-BBW34-2	HEV Lines 3 and 4	2	STACKING: BUS BAR WELDING (LINE 3 and 4)	WDC-801-10a and b	8,760	TBD	360	5.6348	13.06	6.17	27.03	6.17	27.03	6.17	27.03	0.06	0.27	0.06	0.27	0.06	0.27
ES-TPAA WS	HEV Lines 1-4	2	TOP PLATE ASSEMBLY AREA: Wet Scrubber	WDC-801-11a and b	8,760	TBD	610	2.94	8.44	10.46	45.80	10.46	45.80	10.46	45.80	0.10	0.46	0.10	0.46	0.10	0.46
TOTAL HEV Lines										**719.74**	**3152.47**	**719.74**	**3152.47**	**719.74**	**3152.47**	**7.20**	**31.52**	**7.20**	**31.52**	**7.20**	**31.52**

Emission Source ID	Line	Number of Filters	Emission Source Description	Control Device ID	Hours of Operation	Filter Area	Flow/filter	Process Weight Rate	Emission Limit per 2D .0515 E (lb/hr) = 4.10 $p^{0.67}$	Uncontrolled Potential						Controlled Potential					
										PM Emissions		PM_{10} Emissions		$PM_{2.5}$ Emissions		PM Emissions		PM_{10} Emissions		$PM_{2.5}$ Emissions	
					(hrs)	(ft^2)	(scfm)	(tons/hr)	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
ES-CPM5-11	BEV Lines 5-11	7	Cathode: Mixing	DC-803-01 DC-804-01 DC-805-01 DC-806-01 DC-807-01 DC-808-01 DC-809-01	8,760	TBD	706	5.61	13.02	42.38	185.61	42.38	185.61	42.38	185.61	0.42	1.86	0.42	1.86	0.42	1.86
ES-CPH5-11	BEV Lines 5-11	7	Cathode: Powder Handling	DC-803-02 DC-804-02 DC-805-02 DC-806-02 DC-807-02 DC-808-02 DC-809-02	8,760	TBD	2,649	4.15	10.63	158.92	696.05	158.92	696.05	158.92	696.05	1.59	6.96	1.59	6.96	1.59	6.96
ES-CPS5-11	BEV Lines 5-11	7	Cathode: Press	DC-803-03 DC-804-03 DC-805-03 DC-806-03 DC-807-03 DC-808-03 DC-809-03	8,760	TBD	1,121	5.91	13.48	67.27	294.66	67.27	294.66	67.27	294.66	0.67	2.95	0.67	2.95	0.67	2.95
ES-APM5-11	BEV Lines 5-11	7	Anode: Mixing	DC-803-04 DC-804-04 DC-805-04 DC-806-04 DC-807-04 DC-808-04 DC-809-04	8,760	TBD	706	4.26	10.83	42.38	185.61	42.38	185.61	42.38	185.61	0.42	1.86	0.42	1.86	0.42	1.86
ES-APH5-11	BEV Lines 5-11	7	Anode: Powder Handling	DC-803-05 DC-804-05 DC-805-05 DC-806-05 DC-807-05 DC-808-05 DC-809-05	8,760	TBD	1,413	2.64	7.86	84.76	371.23	84.76	371.23	84.76	371.23	0.85	3.71	0.85	3.71	0.85	3.71
ES-APP5-11	BEV Lines 5-11	7	Anode: Press	DC-803-06 DC-804-06 DC-805-06 DC-806-06 DC-807-06 DC-808-06 DC-809-06	8,760	TBD	971	4.05	10.47	58.27	255.22	58.27	255.22	58.27	255.22	0.58	2.55	0.58	2.55	0.58	2.55
ES-AC5-11	BEV Lines 5-11	7	Anode: tab-cut	DC-803-07 DC-804-07 DC-805-07 DC-806-07 DC-807-07 DC-808-07 DC-809-07	8,760	TBD	1,266	9.96	19.12	75.96	332.71	75.96	332.71	75.96	332.71	0.76	3.33	0.76	3.33	0.76	3.33
ES-WIN810	BEV Lines 5-11	7	Winding	DC-803-08 DC-804-08 DC-805-08 DC-806-08 DC-807-08 DC-808-08 DC-809-08	8,760	TBD	2,260	10.42	19.71	135.61	593.97	135.61	593.97	135.61	593.97	1.36	5.94	1.36	5.94	1.36	5.94
ES-CPS5-11	BEV Lines 5-11	7	Cathode: Press	WDC-803-01 WDC-804-01 WDC-805-01 WDC-806-01 WDC-807-01 WDC-808-01 WDC-809-01	8,760	TBD	4,545	5.91	13.48	272.70	1194.43	272.70	1194.43	272.70	1194.43	2.73	11.94	2.73	11.94	2.73	11.94
ES-ACW5-11	BEV Lines 5-11	7	Anode: Tab-cut	WDC-803-02 WDC-804-02 WDC-805-02 WDC-806-02 WDC-807-02 WDC-808-02 WDC-809-02	8,760	TBD	3,067	9.96	19.12	184.02	806.03	184.02	806.03	184.02	806.03	1.84	8.06	1.84	8.06	1.84	8.06
ES-TCA5-11	BEV Lines 5-11	7	TopCap Assembly	WDC-803-03 WDC-804-03 WDC-805-03 WDC-806-03 WDC-807-03 WDC-808-03 WDC-809-03	8,760	TBD	374	0.42	2.28	22.46	98.38	22.46	98.38	22.46	98.38	0.22	0.98	0.22	0.98	0.22	0.98

Emission Source ID	Line	Number of Filters	Emission Source Description	Control Device ID	Hours of Operation	Filter Area	Flow/filter	Process Weight Rate	Emission Limit per 2D .0515 E (lb/hr) = 4.10 $p^{0.67}$	Uncontrolled Potential						Controlled Potential					
										PM Emissions		PM_{10} Emissions		$PM_{2.5}$ Emissions		PM Emissions		PM_{10} Emissions		$PM_{2.5}$ Emissions	
					(hrs)	(ft^2)	(scfm)	(tons/hr)	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
ES-AF5-11	BEV Lines 5-11	7	Assembly Front	WDC-803-04 WDC-804-04 WDC-805-04 WDC-806-04 WDC-807-04 WDC-808-04 WDC-809-04	8,760	TBD	849	10.83	20.23	50.96	223.20	50.96	223.20	50.96	223.20	0.51	2.23	0.51	2.23	0.51	2.23
ES-MOD5-11	BEV Lines 5-11	7	Module	WDC-803-05 WDC-804-05 WDC-805-05 WDC-806-05 WDC-807-05 WDC-808-05 WDC-809-05	8,760	TBD	706	11.36	20.88	42.38	185.61	42.38	185.61	42.38	185.61	0.42	1.86	0.42	1.86	0.42	1.86
TOTAL BEV Lines										1238.06	5422.71	1238.06	5422.71	1238.06	5422.71	12.38	54.23	12.38	54.23	12.38	54.23
TOTAL HEV & BEV Lines										1957.81	8575.19	1957.81	8575.19	1957.81	8575.19	19.58	85.75	19.58	85.75	19.58	85.75

Example Calculations:

Emissions (lb/hr) = Flow (scfm) * 0.01 gr/ft^3 * 1 lb/7000 gr * 60 min/hr

Emissions (tpy) = Emissions (lb/hr) * 8,760 hr/yr * 1 ton / 2,000 lb

Emission Source	Emission Source ID	Control Device ID	Exhaust Flow (scfm)	VOC Conc (ppm)	VOC (lb/hr)	VOC (tpy)
Electrode Mixing - HEV Line 1	ES-CCD1	CD-S01	2,520	10	0.389	1.703
Electrode Mixing - HEV Line 2	ES-CCD2	CD-S02	2,520	10	0.389	1.703
Electrode Mixing - HEV Line 3	ES-CCD3	CD-S03	2,520	10	0.389	1.703
Electrode Mixing - HEV Line 4	ES-CCD4	CD-S04	2,520	10	0.389	1.703
					Total HEV	**6.81**
Electrode Mixing - BEV Line 5	ES-CCD5	CD-S05	47,674	10	7.36	32.22
Electrode Mixing - BEV Line 6	ES-CCD6	CD-S06	47,674	10	7.36	32.22
Electrode Mixing - BEV Line 7	ES-CCD7	CD-S07	47,674	10	7.36	32.22
Electrode Mixing - BEV Line 8	ES-CCD8	CD-S08	47,674	10	7.36	32.22
Electrode Mixing - BEV Line 9	ES-CCD9	CD-S09	47,674	10	7.36	32.22
Electrode Mixing - BEV Line 10	ES-CCD10	CD-S10	47,674	10	7.36	32.22
Electrode Mixing - BEV Line 11	ES-CCD11	CD-S11	47,674	10	7.36	32.22
					Total BEV	**225.52**
					Facility Total	**232.33**

Sample Equations:

VOC Emissions (lb/hr) = Flow (cf/min) * 60 min/hr * MW_{NMP} (lb/lbmol) * Concentration (ppm)/10^6 / (385.5 scf/lbmol)

VOC Emissions (tpy) = VOC Emissions (lb/hr) * (8760 hrs/yr) / (2000 lb/ton)

Pastes/Powders

Properties of Paste D-KP4	Methanol		5% HAP	0.30%	by weight in AB paste formulation		
Paste Usage for HEV Lines	12,863	pounds/yr		HEV Line	12,863	lb/yr	AB paste
Methanol Emissions =	1.93	lb/yr			38.59	lb/yr	D-KP4 ingredient
	0.001	tpy					
Paste Usage for BEV Lines	5,587,748	pounds/yr		0.30%	by weight in AB paste formulation		
Methanol Emissions =	838	lb/yr		BEV Line	5,587,748	lb/yr	AB paste
	0.42	tpy			16,763	lb/yr	D-KP4 ingredient

All other powders in paste ingredients do not contain regulated pollutants

EMISSION CALCULATIONS **Toyota Battery Manufacturing North Carolina**
Source: HEV & BEV Lines - Electrolyte Filling **Greensboro, NC**

Emissions Unit	Electrolyte Usage (Liters/year)	Electrolyte Usage (gals/yr)	Electrolyte Usage (tons/year)	VOC content	VOC emission loss[1.]	VOC (lb/hr)	VOC (ton/yr)
Electrolyte Filling associated with HEV1-4	2,441,850	645,139	3,314	85%	1%	0.13	0.56
Electrolyte Filling associated with BEV5-11	12,257,955	3,238,561	16,638	85%	1%	0.64	2.82

Notes:

1. Assume 1% of electrolyte injection is evaporated

Cleaning Solution used in the Can/Plate area for the HEV lines. Operation is equipped with an oil mist collector, mainly for odor.

Hydrocarbon	Production Area	Maximum Usage (liters/yr)	Maximum Usage (gal/yr)	VOC Emission Loss	Density (lb/gal)	Potential VOC Emissions (lb/year)	Potential VOC Emissions per HEV Line (tons/year)	Potential VOC Emissions for 4 HEV Lines (tons/year)
Mineral Oil	Can/Plate Assembly	918	242.5	100%	7.59	1840.7	0.92	3.681

No additional usage for BEV lines.

EMISSION CALCULATIONS **Toyota Battery Manufacturing North Carolina**

Source: Cleaning Activities ES-Cleaning **Greensboro, NC**

Cleaner	Cleaning Area	Maximum Usage (kg/yr/line)	Maximum Usage (lb/yr/line)	VOC Emission Loss	Potential VOC Emissions for all lines (lb/year)	Potential VOC Emissions for all lines with 30% (lb/year)	Potential VOC Emissions for all lines (tons/year)
Ethanol	Per Line Usage	273.5	603.0	100%	6632.5	8622.3	4.31

Emission Calculations — **Toyota Battery Manufacturing North Carolina**

Source: **2000 kW Generators (2)** **ES-2000 and ES-2000b** **Greensboro, NC**

Engine Power for HEV Lines from Vendor	2090	bkW=
Enging Power for BEV Lines	2090	bkW=
Total Engine Power	4180.0	bkW=
Horsepower =	5651.5	hp
Average Brake Specific Fuel Consumption:	7000.0	Btu/hp-hr
Generator (Fuel Input):	39.56	MMBtu/hr
Potential Hours of Operation	500	hours/yr

Emissions = Throughput * Emission Factor

For both generators

Pollutant	Uncontrolled Emission Factor for Diesel (g/bkW-hr)	Ref	Emissions, lb/hr	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
PM	0.20	5	1.84	921	0.4604
PM-10	0.20	5	1.84	921	0.4604
PM-2.5	0.20	5	1.84	921	0.4604
NOx	6.40	5,7	58.93	29,463	14.7313
VOCs	0.36	5,6	3.30	1,650	0.8250
CO	3.50	5	32.22	16,112	8.0562

Pollutant	Uncontrolled Emission Factor for Diesel (lb/hp-hr)	Ref	Emissions, lb/hr	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
SO_2	1.21E-05	1	0.07	34.29	0.0171

Diesel fuel sulfur content (%) = 0.0015

For both generators

Pollutant	Uncontrolled Emission Factor for Diesel (lb/MMBtu)-Fuel Input	Ref	Emissions from Diesel, lb/hr	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
Acetaldehyde	1.76E-07	2	6.98E-06	3.49E-03	1.74E-06
Acrolein	5.52E-08	2	2.18E-06	1.09E-03	5.46E-07
Arsenic	2.80E-08	3	1.11E-06	5.54E-04	2.77E-07
Benzene	5.43E-06	2	2.15E-04	1.07E-01	5.37E-05
Benzo(a)pyrene	1.80E-09	2	7.12E-08	3.56E-05	1.78E-08
Beryllium	2.10E-08	3	8.31E-07	4.15E-04	2.08E-07
Cadmium	2.10E-08	3	8.31E-07	4.15E-04	2.08E-07
Chromium	2.10E-08	3	8.31E-07	4.15E-04	2.08E-07
Formaldehyde	5.52E-07	2	2.18E-05	1.09E-02	5.46E-06
Lead	6.30E-08	3	2.49E-06	1.25E-03	6.23E-07
Manganese	4.20E-08	3	1.66E-06	8.31E-04	4.15E-07
Mercury	2.10E-08	3	8.31E-07	4.15E-04	2.08E-07
Napthalene	9.10E-07	2	3.60E-05	1.80E-02	9.00E-06
Nickel	2.10E-08	3	8.31E-07	4.15E-04	2.08E-07
Total PAH (POM)	1.48E-06	2	5.87E-05	2.94E-02	1.47E-05
Selenium	1.05E-07	3	4.15E-06	2.08E-03	1.04E-06
Toluene	1.97E-06	2	7.78E-05	3.89E-02	1.95E-05
Xylene	1.35E-06	2	5.34E-05	2.67E-02	1.34E-05

Notes: *Assumes 7,000 Btu/HP-hr conversion factor from AP-42 Table 3.3-1

1- AP-42 Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Chapter 3.4, 10/96, Table 3.4-1

2- NC DAQ Large Diesel ICE Spreadsheet (based on AP-42 Chapter 3.4, Tables 3.4-3 and 3.4-4)

3- NC DAQ Large Diesel ICE Spreadsheet (based on AP-42 Chapter 1.3, Fuel Oil Combustion revised 5/10)

5- Tier II NSPS limits

6- NMHC is generally 5.6% of the NMHC+NOx factor based on the EPA certification level steady-state discrete modal test results for caterpillar Tier II engines.

7- Assumed to be the whole NMHC+NOx limit for worst case emissions

For both generators

GHG Pollutant	Uncontrolled Emission Factor for Diesel (No. 2 Fuel Oil) (kg/MMBtu)	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
CO_2	7.40E+01	4	6.45E+03	3.23E+06	1612.62
Methane	3.00E-03	4	2.62E-01	1.31E+02	0.07
N_2O	6.00E-04	4	5.23E-02	2.62E+01	0.01
CO_2e			6.47E+03	3.24E+06	1618.15

4- GHG factors from Tables C-1 through C-2 of EPA's GHG Reporting Rule.

CO_2e = CO_2 Emissions + CH_4 Emissions * GWP of CH_4 + N_2O Emissions * GWP of N_2O

GWP for CH_4	25	(Table A-1 of 40 CFR Part 98)
GWP for N_2O	298	(Table A-1 of 40 CFR Part 98)

EMISSION CALCULATIONS **Toyota Battery Manufacturing North Carolina**
Source: HEV & BEV Lines - Storage Tanks **Greensboro, NC**

Tank ID	Source Description	Length (ft)	Diameter (ft)	Volume (gal)	Turnover	Gal/year	Material	Total VOC Emissions (lbs/yr)	Total VOC Emissions (tons/yr)
HEV Lines									
IES-1 & IES-2	NMP Supply Tanks (2)	15	8	5,264	100	526,400	N-Methylpyrrolidone (NMP)	2.61	1.31E-03
IES-3 & IES-4	NMP Recovery Tanks (2)	10	7	2,591	100	259,100	N-Methylpyrrolidone (NMP)	1.27	6.37E-04
BEV Lines									
IES-23 thru IES-26	NMP Supply Tanks (4)	14.3	9.2	6,604	151.3	925,659	N-Methylpyrrolidone (NMP)	3.72	1.86E-03
IES-27 thru IES-30	NMP Recovery Tanks (4)	15	8	5,283	252.5	1,234,212	N-Methylpyrrolidone (NMP)	3.74	1.87E-03
Total (tons/yr)								**1.13E+01**	**5.67E-03**

Notes:
Properties of NMP:
Molecular weight 99.13
Vapor Pressure 0.006613 psia
Tank emissions calculated using Trinity Tanks Tool.
The site also has several smaller sub NMP recovery tanks (793 gallons each). Emissions from these small day tanks are included in the tank emissions above.

Total Emissions	
0.068	lb/hr, TSP Emission Rate from Cooling Tower
0.027	lb/hr, PM10 Emission Rate from Cooling Tower
0.300	tpy, TSP (PM)
0.120	tpy, PM_{10}

Cooling Tower

Cooling Tower Type: Induced Draft

PM Emissions from AP-42 cooling water factors[1]:

To determine the PM emissions in the cooling tower, the PM emissions were calculated based on the water flow rate.

HVAC

Water Flow Rate	1,470	gpm / cell	
	5	total cells for HEV line	
	5	total cells for BEV lines	
	14,700	gpm	total for HEV and BEV lines
	14,700	gpm (Circulation Rate)	
	0.001%	Drift Loss	
	0.15	gpm	(Drift Loss * Max Circulation Rate)
	8,760	Hours of Operation	
	8.34	lb/gal, Density of Water	
	800	ppm, Measured Dissolved Solids Content in Water[3]	

The following is a sample calculation for TSP.

$$TSP\left(\frac{lb}{hr}\right) = 0.15\frac{gal}{\min} * 60\frac{\min}{hr} * 8.34\frac{lb}{gal} * \frac{11500\,lb\ PM}{10^6\ lb\ water} = 0.01\frac{lb}{hr}$$

0.059	lb/hr, TSP Emission Rate from Cooling Tower	
0.024	lb/hr, PM10 Emission Rate from Cooling Tower[2]	
0.258	tpy, TSP (PM)	
0.103	tpy, PM_{10}	for 5 cells

[1] AP-42; Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Section 13.4, 1/95 for PM.

[2] Reisman, Joel and Frisbie, Gordan. "Calculating Realistic PM10 emissions from Cooling Towers." (Abstract No. 216) Only 40% of dissolved solids coalesce to PM-10.

[3] Per AP-42, if TDS data for the cooling tower are not available arithmetic average PM-10 factor given in Table 13.4-1 can be used. Table 13.4-1 presents the arithmetic average PM-10 factor calculated from the test data in References 2, 4, 8, and 11 - 14. Note that this average corresponds to an effective cooling tower recirculating water TDS content of approximately 11,500 ppm for induced draft towers

Compressor

Water Flow Rate	600	gpm / cell	
	2	total cells for HEV lines	
	2	total cells for BEV lines	
	2,400	gpm	total for 2 cells
	2,400	gpm (Circulation Rate)	
	0.001%	Drift Loss	
	0.02	gpm	(Drift Loss * Max Circulation Rate)
	8,760	Hours of Operation	
	8.34	lb/gal, Density of Water	
	800	ppm, Measured Dissolved Solids Content in Water[3]	

The following is a sample calculation for TSP.

$$TSP\left(\frac{lb}{hr}\right) = 0.15\frac{gal}{\min} * 60\frac{\min}{hr} * 8.34\frac{lb}{gal} * \frac{11500\,lb\ PM}{10^6\ lb\ water} = 0.01\frac{lb}{hr}$$

0.010	lb/hr, TSP Emission Rate from Cooling Tower	
0.004	lb/hr, PM10 Emission Rate from Cooling Tower[2]	
0.042	tpy, TSP (PM)	
0.017	tpy, PM_{10}	for 2 cells

[1] AP-42; Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Section 13.4, 1/95 for PM.

[2] Reisman, Joel and Frisbie, Gordan. "Calculating Realistic PM10 emissions from Cooling Towers." (Abstract No. 216) Only 40% of dissolved solids coalesce to PM-10.

[3] Per AP-42, if TDS data for the cooling tower are not available arithmetic average PM-10 factor given in Table 13.4-1 can be used. Table 13.4-1 presents the arithmetic average PM-10 factor calculated from the test data in References 2, 4, 8, and 11 - 14. Note that this average corresponds to an effective cooling tower recirculating water TDS content of approximately 11,500 ppm for induced draft towers

Emission Calculations — **Toyota Battery Manufacturing North Carolina**
Source: **1250 kW Generators (2)** — **Greensboro, NC**

Engine Power from Vendor for HEV lines	1250	bkW
Engine Power for BEV lines	1250	bkW
Total Engine power	2500	bkW=
Horsepower =	3380	hp=
Average Brake Specific Fuel Consumption:	7000	Btu/hp-hr
Generator (Fuel Input):	23.66	MMBtu/hr
Potential Hours of Operation	500	hours/yr

Emissions = Throughput * Emission Factor

For both generators

Pollutant	Uncontrolled Emission Factor for Diesel (g/kW-hr)	Ref	Emissions, lb/hr	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
PM	2.00E-01	5	1.10	551	0.2753
PM-10	2.00E-01	5	1.10	551	0.2753
PM-2.5	2.00E-01	5	1.10	551	0.2753
NOx	6.40	5,7	35.24	17,621	8.8106
VOCs	0.36	5,6	1.99	995	0.4977
CO	3.50E+00	5	19.27	9,637	4.8183

Pollutant	Uncontrolled Emission Factor for Diesel (lb/hp-hr)	Ref	Emissions, lb/hr	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
SO_2	1.21E-05	1	0.04	20.51	0.0103

Diesel fuel sulfur content (%) = 0.0015

For both generators

Pollutant	Uncontrolled Emission Factor for Diesel (lb/MMBtu)-Fuel Input	Ref	Emissions from Diesel, lb/hr	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
Acetaldehyde	1.76E-07	2	4.17E-06	2.09E-03	1.04E-06
Acrolein	5.52E-08	2	1.31E-06	6.53E-04	3.26E-07
Arsenic	2.80E-08	3	6.62E-07	3.31E-04	1.66E-07
Benzene	5.43E-06	2	1.29E-04	6.43E-02	3.21E-05
Benzo(a)pyrene	1.80E-09	2	4.26E-08	2.13E-05	1.06E-08
Beryllium	2.10E-08	3	4.97E-07	2.48E-04	1.24E-07
Cadmium	2.10E-08	3	4.97E-07	2.48E-04	1.24E-07
Chromium	2.10E-08	3	4.97E-07	2.48E-04	1.24E-07
Formaldehyde	5.52E-07	2	1.31E-05	6.53E-03	3.27E-06
Lead	6.30E-08	3	1.49E-06	7.45E-04	3.73E-07
Manganese	4.20E-08	3	9.94E-07	4.97E-04	2.48E-07
Mercury	2.10E-08	3	4.97E-07	2.48E-04	1.24E-07
Napthalene	9.10E-07	2	2.15E-05	1.08E-02	5.38E-06
Nickel	2.10E-08	3	4.97E-07	2.48E-04	1.24E-07
Total PAH (POM)	1.48E-06	2	3.51E-05	1.76E-02	8.78E-06
Selenium	1.05E-07	3	2.48E-06	1.24E-03	6.21E-07
Toluene	1.97E-06	2	4.65E-05	2.33E-02	1.16E-05
Xylene	1.35E-06	2	3.20E-05	1.60E-02	7.99E-06

Notes: *Assumes 7,000 Btu/HP-hr conversion factor from AP-42 Table 3.3-1

1- AP-42 Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Chapter 3.4, 10/96, Table 3.4-1

2- NC DAQ Large Diesel ICE Spreadsheet (based on AP-42 Chapter 3.4, Tables 3.4-3 and 3.4-4)

3- NC DAQ Large Diesel ICE Spreadsheet (based on AP-42 Chapter 1.3, Fuel Oil Combustion revised 5/10)

5- NSPS limits for Tier 2 engines, NOx + HC factor used for both NOx and VOC

6- NMHC is generally 5.6% of the NMHC+NOx factor based on the EPA certification level steady-state discrete modal test results for caterpillar Tier II engines.

7- Assumed to be the whole NMHC+NOx limit for worst case emissions

For both generators

GHG Pollutant	Uncontrolled Emission Factor for Diesel (No. 2 Fuel Oil) (kg/MMBtu)	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
CO_2	7.40E+01	4	3.86E+03	1.93E+06	964.48
Methane	3.00E-03	4	1.56E-01	7.82E+01	0.04
N_2O	6.00E-04	4	3.13E-02	1.56E+01	0.01
CO_2e			3.87E+03	1.94E+06	967.79

4- GHG factors from Tables C-1 through C-2 of EPA's GHG Reporting Rule.

CO_2e = CO_2 Emissions + CH_4 Emissions * GWP of CH_4 + N_2O Emissions * GWP of N_2O

GWP for CH_4	25	(Table A-1 of 40 CFR Part 98)
GWP for N_2O	298	(Table A-1 of 40 CFR Part 98)

Emission Calculations — **Toyota Battery Manufacturing North Carolina**
Source: **50 kW Generators (2)** — **Greensboro, NC**

Engine Power from Vendor for HEV lines	50.0			
Engine Power for BEV lines	50.0			
Engine Power from Vendor	100.0	kW=		
Horsepower =	134.1	hp		
Fuel Input from Vendor for 2 generators	32.6	L/hr =	8.61	gallon/hr
Heating Value of Diesel	140,000	Btu/gallon		
Fuel Input rate =	1.2	MMBtu/hr		
Potential Hours of Operation	500.0	hours/yr		

Emissions = Throughput * Emission Factor

For both generators

Pollutant	Uncontrolled Emission Factor for Diesel (g/kW-hr)	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
PM	2.60E-01	5	0.06	29	0.0143
PM-10	2.60E-01	5	0.06	29	0.0143
PM-2.5	2.60E-01	5	0.06	29	0.0143
NOx	4.42	5	0.97	487	0.2434
VOCs	4.42	5	0.97	487	0.2434
CO	1.02	5	0.22	112	0.0562

For both generators

Pollutant	Uncontrolled Emission Factor for Diesel (lb/hp-hr) - Power Output	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
SO_2	2.05E-03	1	0.27	137	0.0687

For both generators

Pollutant	Uncontrolled Emission Factor for Diesel (lb/MMBtu)- Fuel Input	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
Acetaldehyde	7.67E-04	2	9.25E-04	4.62E-01	2.31E-04
Acrolein	9.25E-05	2	1.12E-04	5.58E-02	2.79E-05
Arsenic	2.80E-08	3	3.38E-08	1.69E-05	8.44E-09
Benzene	9.33E-04	2	1.12E-03	5.62E-01	2.81E-04
Benzo(a)pyrene	1.88E-07	2	2.27E-07	1.13E-04	5.67E-08
Beryllium	2.10E-08	3	2.53E-08	1.27E-05	6.33E-09
Cadmium	2.10E-08	3	2.53E-08	1.27E-05	6.33E-09
Chromium	2.10E-08	3	2.53E-08	1.27E-05	6.33E-09
Formaldehyde	1.18E-03	2	1.42E-03	7.11E-01	3.56E-04
Lead	6.30E-08	3	7.60E-08	3.80E-05	1.90E-08
Manganese	4.20E-08	3	5.06E-08	2.53E-05	1.27E-08
Mercury	2.10E-08	3	2.53E-08	1.27E-05	6.33E-09
Napthalene	8.48E-05	2	1.02E-04	5.11E-02	2.56E-05
Nickel	2.10E-08	3	2.53E-08	1.27E-05	6.33E-09
Total PAH (POM)	1.68E-04	2	2.03E-04	1.01E-01	5.06E-05
Selenium	1.05E-07	3	1.27E-07	6.33E-05	3.16E-08
Toluene	4.09E-04	2	4.93E-04	2.47E-01	1.23E-04
Xylene	2.85E-04	2	3.44E-04	1.72E-01	8.59E-05

Notes: *Assumes 7,000 Btu/HP-hr conversion factor from AP-42 Table 3.3-1
1- AP-42 Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Chapter 3.3, 10/96, Table 3.3-1
2- AP-42 Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Chapter 3.3, 10/96, Table 3.3-2
3- AP-42 Chapter 1.3, Fuel Oil Combustion revised 5/10
5-vendor data. NOx + HC factor used for both NOx and VOC

For both generators

GHG Pollutant	Uncontrolled Emission Factor for Diesel (No. 2 Fuel Oil) (kg/MMBtu)	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
CO_2	7.40E+01	4	4.04E+01	2.02E+04	10.11
Methane	3.00E-03	4	1.64E-03	8.20E-01	0.00
N_2O	6.00E-04	4	3.28E-04	1.64E-01	0.00
CO_2e			4.06E+01	2.03E+04	10.15

4- GHG factors from Tables C-1 through C-2 of EPA's GHG Reporting Rule.
CO_2e = CO_2 Emissions + CH_4 Emissions * GWP of CH_4 + N_2O Emissions * GWP of N_2O

GWP for CH_4	25	(Table A-1 of 40 CFR Part 98)
GWP for N_2O	298	(Table A-1 of 40 CFR Part 98)

Emission Calculations **Toyota Battery Manufacturing North Carolina**
Source: **147 hP Fire Pumps (2)** **Greensboro, NC**

Total Engine Power from Vendor	219.8	bkW=	1 kW= 1.34 hp
Horsepower for HEV line Pump	147.4		
Horsepower for BEV line Pump	147.4		
Total Horsepower =	294.8	hp	
Fuel Input	2.064	MMBtu/hr	
Heating Value of Diesel	140,000	Btu/gallon	
Potential Hours of Operation	500.0	hours/yr	

Emissions = Throughput * Emission Factor

For both Fire Pumps

Pollutant	Uncontrolled Emission Factor for Diesel (lb/hp-hr) - Power Output	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
PM	2.20E-03	1	0.65	324	0.1621
PM-10	2.20E-03	1	0.65	324	0.1621
PM-2.5	2.20E-03	1	0.65	324	0.1621
SO_2	2.05E-03	1	0.60	302	0.1511
NOx	0.031	1	9.14	4,569	2.2847
VOCs	2.47E-03	1	0.73	364	0.1820
CO	6.68E-03	1	1.97	985	0.4923

For both Fire Pumps

Pollutant	Uncontrolled Emission Factor for Diesel (lb/MMBtu)- Fuel Input	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
Acetaldehyde	7.67E-04	2	1.58E-03	7.91E-01	3.96E-04
Acrolein	9.25E-05	2	1.91E-04	9.54E-02	4.77E-05
Arsenic	2.80E-08	3	5.78E-08	2.89E-05	1.44E-08
Benzene	9.33E-04	2	1.93E-03	9.63E-01	4.81E-04
Benzo(a)pyrene	1.88E-07	2	3.88E-07	1.94E-04	9.70E-08
Beryllium	2.10E-08	3	4.33E-08	2.17E-05	1.08E-08
Cadmium	2.10E-08	3	4.33E-08	2.17E-05	1.08E-08
Chromium	2.10E-08	3	4.33E-08	2.17E-05	1.08E-08
Formaldehyde	1.18E-03	2	2.44E-03	1.22E+00	6.09E-04
Lead	6.30E-08	3	1.30E-07	6.50E-05	3.25E-08
Manganese	4.20E-08	3	8.67E-08	4.33E-05	2.17E-08
Mercury	2.10E-08	3	4.33E-08	2.17E-05	1.08E-08
Napthalene	8.48E-05	2	1.75E-04	8.75E-02	4.37E-05
Nickel	2.10E-08	3	4.33E-08	2.17E-05	1.08E-08
Total PAH (POM)	1.68E-04	2	3.47E-04	1.73E-01	8.67E-05
Selenium	1.05E-07	3	2.17E-07	1.08E-04	5.42E-08
Toluene	4.09E-04	2	8.44E-04	4.22E-01	2.11E-04
Xylene	2.85E-04	2	5.88E-04	2.94E-01	1.47E-04

Notes: *Assumes 7,000 Btu/HP-hr conversion factor from AP-42 Table 3.3-1
1- AP-42 Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Chapter 3.3, 10/96, Table 3.3-1
2- AP-42 Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Chapter 3.3, 10/96, Table 3.3-2
3- AP-42 Chapter 1.3, Fuel Oil Combustion revised 5/10

For both Fire Pumps

GHG Pollutant	Uncontrolled Emission Factor for Diesel (No. 2 Fuel Oil) (kg/MMBtu)	Ref	Emissions from Diesel (lb/hr)	Emissions from Diesel (lb/yr)	Emissions from Diesel (TPY)
CO_2	7.40E+01	4	6.92E+01	3.46E+04	17.31
Methane	3.00E-03	4	2.81E-03	1.40E+00	0.00
N_2O	6.00E-04	4	5.62E-04	2.81E-01	0.00
CO_2e			6.95E+01	3.47E+04	17.37

4- GHG factors from Tables C-1 through C-2 of EPA's GHG Reporting Rule.
CO_2e = CO_2 Emissions + CH_4 Emissions * GWP of CH_4 + N_2O Emissions * GWP of N_2O

GWP for CH_4	25	(Table A-1 of 40 CFR Part 98)
GWP for N_2O	298	(Table A-1 of 40 CFR Part 98)

APPENDIX B. ZONING CONSISTENCY DETERMINATION

Trinity Consultants
1 Copley Pkwy, Ste 205, Morrisville, NC 27560 / P 919.462.9693 / F 919.578.3690 / **trinityconsultants.com**

sent via email : jay.dale@randolphcountync.gov and eric.martin@randolphcountync.gov

July 20, 2022

Jay Dale, Director
Attn: Planning and Development
Central Permitting Building
204 E Academy Street
Asheboro, NC 27203

RE: Air Permit Application Zoning Consistency Determination Request
Toyota Battery Manufacturing, Inc. dba Toyota Battery Manufacturing North Carolina – Julian, NC

Dear Mr. Dale,

On behalf of Toyota Battery Manufacturing, Inc. dba Toyota Battery Manufacturing North Carolina (Toyota) I am writing to inform you that Toyota is submitting a permit application to expand to the battery manufacturing facility near 7039-7025 State Rd 1006 (Randolph County Megasite). The initial permit was obtained in May 2022. The expansion to the facility will mean that the facility will be a Title V source. I hereby certify that to the best of my knowledge, Randolph County zoning is the only local government having jurisdiction over any part of the land on which the facility and its appurtenances are located.

In accordance with § 143-215.108(f) of the North Carolina General Statutes, we hereby request that you issue a determination as to whether your municipality has in effect a zoning or subdivision ordinance that is applicable to the facility. Additionally, please issue a determination as to whether the proposed use would be consistent with applicable zoning or subdivision ordinances. For your convenience, I have included a form with which you may remit your determination and a copy of the draft air permit application. As a means of demonstrating proof of transmittal, please sign, title, stamp, and date the enclosed form mail (or email) to both the facility mailing address, myself and the checked air quality office at your earliest convenience.

Thank you for your assistance in this important matter. Should you have any questions please contact Rebecca Bright at (859)-743-3631 or me at Trinity Consultants at (919) 215-7713.

Sincerely,

Dana W. Norvell, P.E.

Dana Norvell
Managing Consultant

Attachments

Zoning Consistency Determination

Facility Name	Toyota Battery Manufacturing, Inc. dba Toyota Battery Manufacturing North Carolina
Facility Street Address	near 7039-7025 State Rd 1006 (Randolph County Megasite)
Facility City	Julian, NC
Description of Process	Car Battery Manufacturing Plant
SIC/NAICS Code	3692/335912
Facility Contact	Rebecca Bright
Phone Number	859-473-3631
Mailing Address	151 Engineering Way
Mailing City, State Zip	Georgetown, KY

Based on the information given above:

☐ I have received a copy of the air permit application (draft or final) AND...

☐ There are no applicable zoning ordinances for this facility at this time

☑ The proposed operation IS consistent with applicable zoning ordinances

☐ The proposed operation IS NOT consistent with applicable zoning ordinances
(please include a copy of the rules in the package sent to the air quality office)

☐ The determination is pending further information and can not be made at this time

☐ Other:

Agency	Randolph County Planning & Zoning
Name of Designated Official	Jay Dale
Title of Designated Official	Planning Director
Signature	Jay Dale
Date	7-21-22

Please forward to the facility mailing address listed above and the air quality office at the appropriate address as checked on the back of this form.

All PSD and Title V Applications

☐ Attn: Major Source Review Branch Supervisor
DAQ – Permitting Section
1641 Mail Service Center
Raleigh, NC 27699-1641

Local Programs

☐ Attn: David Brigman
Western NC Regional Air Quality Agency
49 Mount Carmel Road
Asheville, NC 28806
(828) 250-6777

☐ Attn: Leslie Rhodes
Mecklenburg County Air Quality
700 N. Tryon Street, Suite 205
Charlotte, NC 28202-2236
(704) 336-5430

☐ Attn: William Minor Barnette
Forsyth County Office of Environmental Assistance and Protection
201 N. Chestnut Street
Winston-Salem, NC 27101-4120
(336) 703-2440

Division of Air Quality Regional Offices

☐ Attn: Brendan Davey
Asheville Regional Office
2090 U.S. Highway 70
Swannanoa, NC 28778
(828) 296-4500

☐ Attn: Heather Carter
Fayetteville Regional Office
225 Green Street, Suite 714
Fayetteville, NC 28301
(910) 433-3300

☐ Attn: Bruce Ingle
Mooresville Regional Office
610 East Center Avenue, Suite 301
Mooresville, NC 28115
(704) 663-1699

☐ Attn: Taylor Hartsfiels
Raleigh Regional Office
1628 Mail Service Center
Raleigh, NC 27699-1628
(919) 791-4200

☐ Attn: Betty Huddleson
Washington Regional Office
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481

☐ Attn: Brad Newland
Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 796-7215

☑ Attn: T. Ray Stewart
Winston-Salem Regional Office
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
(336) 776-9800

APPENDIX C. PROCESS FLOW DIAGRAMS

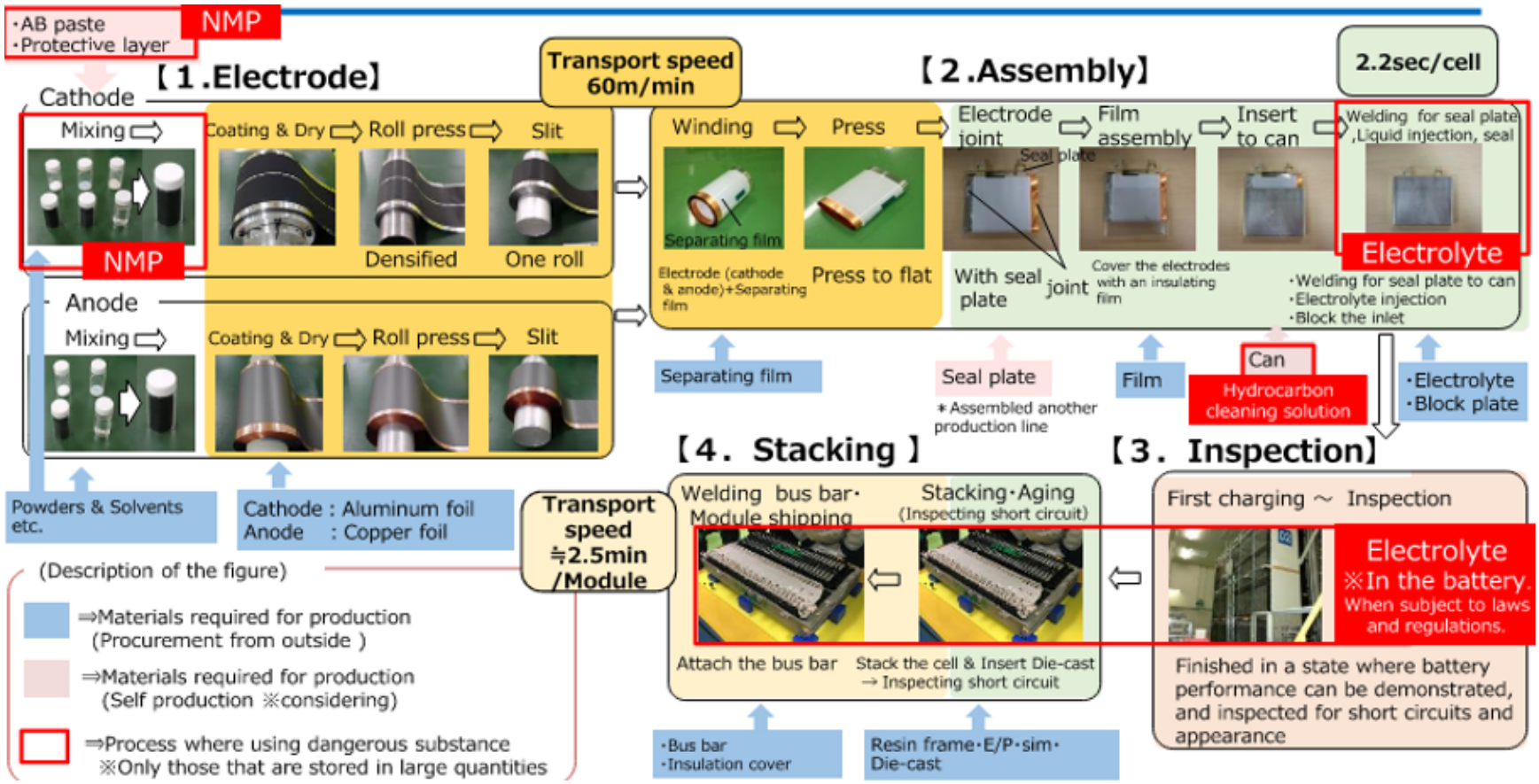


Figure 1. Process Flow Diagram

APPENDIX D. EPA BACKGROUND DOCUMENTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

04/08/2020

ELECTRONIC MAIL
DELIVERY RECEIPT REQUESTED

Joel T. Bowers
Barnes & Thornburg LLP
Joel.Bowers@btlaw.com

RE: Request for Applicability to National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Source, 40 C.F.R. Part 63, Subpart VVVVVV
LG Chem Michigan, Holland, Michigan

Dear Mr. Bowers:

The U.S. Environmental Protection Agency has received and reviewed your May 7, 2019, letter on behalf of LG Chem Michigan (LGCMI), whose lithium ion battery manufacturing facility is located in Holland, Michigan (the Holland facility). In your letter, you request an applicability determination with regards to the National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources, codified at 40 C.F.R. part 63 subpart VVVVVV (the subpart 6V regulations). Subsequent to receipt of your letter, EPA requested additional information via email. This information was provided to EPA on July 10, 2019, October 2, 2019, and February 11, 2020. For the reasons discussed below, we have concluded that LGCMI's cathode mixing line is subject to the National Emission Standards for Hazardous Air Pollutants for Manufacture of Paint and Allied Products, codified at 40 C.F.R. Part 63, Subpart CCCCCCC (Subpart 7C regulations).[1]

Regulatory Background

The subpart CCCCCCC regulations standards apply to owners and operators of a facility that: 1) performs paints and allied products manufacturing, 2) is an area source of hazardous air pollutant (HAP) emissions, and 3) processes, uses, or generates materials containing HAP, as defined in 40 C.F.R. § 63.11607. 40 C.F.R. § 63.11599(a).

[1] In the process of determining whether LGCMI's cathode mixing line is subject to the Subpart 6V regulations, as requested in your letter, EPA concluded that an analysis under Subpart 7C was more appropriate. Furthermore, facilities that are subject to Subpart 7C are not subject to Subpart 6V under 40 C.F.R. §63.11494(c)(1).

Under 40 C.F.R. § 63.11607, "paints and allied products manufacturing" is defined as:

> the production of paints and allied products, the intended use of which is to leave a dried film of solid material on a substrate. Typically, the manufacturing processes that produce these materials are described by Standard Industry Classification (SIC) codes 285 or 289 and North American Industry Classification System (NAICS) codes 3255 and 3259 and are produced by physical means, such as blending and mixing, as opposed to chemical synthesis means, such as reactions and distillation.

Under 40 C.F.R. § 63.11607, Paints and allied products is defined as materials such as paints, inks, adhesives, stains, varnishes, shellacs, putties, sealers, caulks, and other coatings from raw materials that are intended to be applied to a substrate and consists of a mixture of resins, pigments, solvents, and/or other additives.

Under 40 C.F.R. § 63.2, "area source" means any stationary source of hazardous air pollutants that is not a major source, as defined in 40 C.F.R. § 63.2.

Under 40 C.F.R. § 63.2, "hazardous air pollutant" means any air pollutant listed in or pursuant to section 112(b) of the Clean Air Act.

Under 40 C.F.R. § 63.11607, a "material containing HAP" means:

> a material containing benzene, methylene chloride, or compounds of cadmium, chromium, lead, and/or nickel, in amounts greater than or equal to 0.1 percent by weight for carcinogens, as defined by the Occupational Safety and Health Administration at 29 CFR 1910.1200(d)(4), or 1.0 percent by weight for non-carcinogens, as shown in formulation data provided by the manufacturer or supplier, such as the Material Safety Data Sheet for the material. Benzene and methylene chloride are volatile HAP. Compounds of cadmium, chromium, lead and/or nickel are metal HAP.

Under 40 C.F.R. § 63.11599(b) an affected source consists of all paints and allied products manufacturing processes that process, use, or generate materials containing HAP at the facility. Furthermore:

> (1) An affected source is existing if you commenced construction or reconstruction before June 1, 2009.
> (2) An affected source is new if you commenced construction or reconstruction of the affected source on or after June 1, 2009.
> (3) A facility becomes an affected source when you commence processing, using, or generating materials containing HAP, as defined in §63.11607.

Under 40 C.F.R. § 63.11607, "paints and allied products manufacturing process" means:

> all the equipment which collectively function to produce a paint or allied product. A process may consist of one or more unit operations. For the purposes of this subpart, the manufacturing process includes any, all, or a combination of, weighing, blending, is an mixing, grinding, tinting, dilution or other formulation. Cleaning operations, material

storage and transfer, and piping are considered part of the manufacturing process. This definition does not cover activities by end users of paints or allied products to ready those materials for application. Quality assurance and quality control laboratories are not considered part of a paints and allied products manufacturing process. Research and development facilities, as defined in section 112(c)(7) of the CAA are not considered part of a paints and allied products manufacturing process.

Factual Background

In your letter, you state that, at the Holland facility, LGMI produces a variety of lithium ion batteries to meet the demands of the electric car industry. You further note that the Holland facility was commissioned in 2013, and received a State permit to install on October 28, 2013.

In describing the cathode manufacturing process at the Holland facility, you state that the cathode mixing line produces a cathode slurry by using a liquid solvent to dissolve/melt a solid polymer binder and adding a solid cathode powder material. The solid cathode material is made up of mixed metal oxides (nickel or manganese). After mixing, the cathode slurry is applied to foil substrates and then passed through a drying tunnel. The cathode slurry is used to coat the cathode used in a battery cell. The cathode material includes manganese and nickel compounds.

According to safety data sheet LGMI provided, by email on February 11, 2020, the solid cathode powder material contains about 23 percent by weight of nickel according to the formulation data provided by the manufacturer or supplier.[2]

Analysis

After reviewing the information provided to EPA and the applicable regulatory authority, we have concluded that the LGCMI cathode mixing line is subject to the Subpart 7C regulations for the following reasons:

1. The cathode slurry mixture produced by LGCMI meets the definition of "paints and allied products," since the product consists of a solvent and other additives that are intended to be applied to a substrate.

2. The intended use of the cathode slurry mixture is to leave a dried film of solid material on a substrate; Additionally, this cathode slurry manufacturing process can be described by North American Industry Classification System (NAICS) codes 3255 and 3259, and are produced by physical means, such as blending and mixing, as opposed to chemical synthesis means, such as reactions and distillation.

3. The paints and allied products manufacturing process at LGCMI consists of all the equipment which collectively function to produce the cathode slurry mixture. The manufacturing process

[2] https://www.atsdr.cdc.gov/phs/phs.asp?id=243&tid=44

includes any, all, or a combination of, weighing, blending, mixing, grinding, tinting, dilution, or other formulation.

4. Nickel is a "hazardous air pollutant" listed in Section 112(b) of the Clean Air Act.

5. The Holland facility's manufacturing process uses nickel, a "material containing HAP."

6. The Holland facility is an "area source," because it does not emit or have the potential to emit, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.

7. The Holland facility is an affected new source, because LGCMI commenced its construction after June 1, 2009.

We have coordinated this determination with EPA's Office of Enforcement and Compliance Assurance (OECA), Office of Air Quality Planning and Standards (OAQPS), and Office of General Counsel (OGC). If you have any further questions, please contact Louise Gross in the Region 5 Office of Regional Counsel, at (312) 886-6844.

Sincerely,

Digitally signed by SARA BRENEMAN
Date: 2020.04.08 19:47:13 -05'00'

Sara J. Breneman
Chief
Air Enforcement and Compliance Assurance Branch

cc: Jenine Camilleri, Enforcement Unit Supervisor
Air Quality Division
Michigan Department of Environment Great Lakes and Energy

Heidi Hollenbach, Air Quality Division District Supervisor
Grand Rapids District
Michigan Department of Environment Great Lakes and Energy

CERTIFICATE OF ELECTRONIC MAILING

I certify that I mailed a letter in response to Joel T. Bowers requesting Applicability Determination by Electronic Mail, Delivery Receipt Requested, to

Joel T. Bowers
Barnes & Thornburg LLP
joel.bowers@btlaw.com

I also certify that I sent a copy of the letter by E-mail to:

Jenine Camilleri, Enforcement Unit Supervisor
Air Quality Division
Michigan Department of Environment Great Lakes and Energy
CamilleriJ@michigan.gov

And

Heidi Hollenbach, Air Quality Division District Supervisor
Grand Rapids District
Michigan Department of Environment Great Lakes and Energy
hollenbachh@michigan.gov

On the _____ day of _____ 2020.

_____
Kathy Jones
Program Technician
AECAB, PAS

[Be sure to create a PDF copy of the delivery receipt and save it to the archive]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK. NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

NOV 27 1995

Mr. Timothy J. Mohin
Government Affairs Manager
Environment, Health and Safety
Intel Government Affairs
888 17th Street Northwest, #860
Washington, DC 20006-3939

Dear Mr. Mohin:

Thank you for the additional information you provided regarding the exhaust conditioners used in tool operations in the semiconductor industry. We agree with your assessment that, for potential to emit calculations, the exhaust conditioners should be considered as an inherent part of the process.

Criteria for Determining Whether Equipment is Air Pollution Control Equipment or Process Equipment

For purposes of determining a source's potential to emit, it is necessary to calculate the effect of air pollution control equipment. Current Environmental Protection Agency (EPA) regulations and policy allow air pollution control equipment to be taken into account if federally enforceable requirements are in place requiring the use of such air pollution control equipment. There are, however, situations for which case-by-case judgements are needed regarding whether a given device or strategy should be considered as air pollution control equipment, or as an inherent part of the process. The EPA believes that the following list of questions should be considered in making such case-by-case judgements as to whether certain devices or practices should be treated as pollution controls or an inherent to the process:.

1. Is the primary purpose of the equipment to control air pollution?

2. Where the equipment is recovering product, how do the cost savings from the product recovery compare to the cost of the equipment?

3. Would the equipment be installed if no air quality regulations are in place?

If the answers to these questions suggest that equipment should be considered as an inherent part of the process, then the effect of the equipment or practices can be taken into account in calculating potential emissions regardless of whether enforceable limitations are in effect.

Analysis of the criteria for the semiconductor tools listed

No information supplied to date by Intel suggests that product recovery by the exhaust conditioners is significant. That EPA believes that the first and third criteria are satisfied.

Criteria 1. The exhaust conditioners described in your letter are small treatment systems that are local to the point-of-use of process tools such as etching and deposition processes. The primary purposes are to: (1) increase the uptime of the process tools, (2) to minimize safety hazards, and (3) to prevent impurities from entering other processes.

Criteria 3. The information you have provided suggests strongly that air quality regulations are not the driving factor for installation of the equipment. Moreover, the fact that they are "interlocked" with the process chambers suggests that the process cannot operate unless the exhaust conditioner is in use.

Therefore, based upon a review of the information presented the exhaust conditioners are considered by the EPA to be inherent to the process and can be considered in potential emission calculations without federally enforceable requirements.

Cautions

The above determination regarding the use of the localized exhaust conditioners in the semiconductor industry is case-specific. This determination is not intended to set a precedent for localized pollution control equipment for other source types without a similar case-specific review.

While many types of point-of-use and interlocked treatment device may be considered as "inherent," there does exist, of course, air pollution control equipment at semiconductor facilities that may not meet the above criteria. For example, a remote water scrubber located at the roof of a building would generally be considered an air pollution control device.

If you have any further questions regarding this matter, please call Timothy Smith at (919) 541-4718, or Tony Wayne at (919) 541-5439.

sincerely,

David Solomon
Acting Group Leader
Integrated Implementation Group

cc: Chief, Air Branch, Regions I-X
Regional PTE Contacts