NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits, Region 4
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Mr. David Maguffin
Norlite LLC.
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Cohoes, NY 12047
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2/26/2021

Re: Notice of Incomplete Application
Norlite, LLC.
City of Cohoes, Albany County

Air Title V Permit Application
DEC ID Number 4-0103-00016/00048

RCRA Part 373 Permit Application
DEC ID: 4-0103-00016/00016
EPA ID: NYD080469935

Dear Mr. Maguffin:

On July 1, 2020, New York State Department of Environmental Conservation (DEC or the Department) received the applications to renew Norlite, LLC's existing Air Title V permit and Part 373 hazardous waste permit for the facility located at 628 South Saratoga Street in the City of Cohoes, New York. The Department sent a Notice of Incomplete Application on August 28, 2020 and resubmissions documents were received in December 2020. Upon review of the resubmitted application materials, DEC has determined that further information is required.

The following comments have been provided from the Department of Environmental Conservation, New York State Department of Health (DOH), and United States Environmental Protection Agency Region 2 (EPA).

CP-29 Environmental Justice Public Participation Plan (PPP) –

DEC comments:

- Please provide to the Department a copy of any presentation or educational materials that will be used in the PPP.
- Within the presentation materials, please acknowledge past violations identified here https://www.dec.ny.gov/chemical/121815.html as well as plans or actions taken to mitigate these violations.
- Please add regularly scheduled office hours during which the public can come to express concerns in person at the facility, and clearly define these hours in the PPP.

- Please clarify within the PPP that at least one environmental justice public meeting will be held prior to UPA completeness, and at least one environmental justice public meeting will be held post UPA completeness during the 30-day UPA public comment period.
- Please note that the UPA public comment period for the Part 373 permit application will be extended to 30-days. This should be noted in the PPP. Additionally, the Department retains the discretion to require additional environmental justice meetings at any point in the permitting process.
- Office of Environmental Justice cannot approve the PPP until the comments raised by Department staff within this notice have been addressed in the next draft of the HHERA protocol. Until these concerns have been addressed, the PPP cannot be considered final as the public cannot meaningfully participate in the process without being given all the relevant information.
- Please move the heading "Appendix B – List of Stakeholders" to above the stakeholders list.
    - Add the following to the List of Stakeholders:
        - Kate Tarbay, kathrynmtarbay@gmail.com
        - Spencer Keable, spencer.keable@gmail.com
        - Keri Powell, kpowell@powellenvironmentallaw.com
        - Patrick Anderson, panderson@powellenvironmentallaw.com
        - Chris Sevinsky, sevinskyc@gmail.com
        - David Walker, dwalker@ldeo.columbia.edu
        - Frank Bielawa 84 Cohoes Rd, Watervliet, NY 12189
        - Jordan Gougler, DEC Environmental Program Specialist, 518-424-8420, Jordan.gougler@dec.ny.gov

<u>Health Outcome Data Analysis (HOD)</u> –

DOH comments:

- The submitted protocol lacks sufficient detail to allow for a meaningful review and determination that the methods, data sources, analyses and data presentation follows Department of Health Guidance (NYSDOH, 2017). DOH recommends that Norlite revise the protocol to provide more details including descriptions of HOD review methods for displaying and comparing data for asthma emergency department visits, cancer incidence and low birth weight, including the data sources for the impact study area and comparison areas. Additional information on the selection of the study area and comparison areas should also be provided in the protocol. Norlite may wish to submit the selected ZIP codes for each area to the Department prior to the conduct of analyses to facilitate demographic and HOD data accuracy.
- The first paragraph of Norlite's HOD protocol cites both DEC Commissioner Policy 29 (CP-29) and 6NYCRR Part 487 as the basis for requiring the HOD. Part 487 pertains to the siting of major electric generating facilities and does not apply to DEC's regulatory process for permitting the Norlite facility. Please revise.
- The bulleted list in the first paragraph of Norlite's protocol refers to two guidance documents for the HOD. These are not the correct citations. Norlite should follow DOH

guidance (2017) for the HOD data analysis in support of CP-29, which is included as Attachment 1 to this notice.

- NYSDOH (New York State Department of Health), 2017. Updated Guidance for Health Data Review and Analysis Relating to NYSDEC Environmental Justice Requirements for CP-29 and 6 NYCRR 487. Albany, NY. June 2017. Available online at: https://www.health.ny.gov/environmental/investigations/environmental_justice/docs/new_guidance_ej_rev2017.pdf

Human Health and Ecological Risk Assessment (HHERA) -

EPA comments:

- Section 3 - An expert in incinerator chemistry byproducts should be consulted to determine if there should be additional COPCs included in the permit human health and ecological risk assessments due to the past burning of PFAS waste.
- Section 1.2 states that "The final HHERA report corresponding to this Protocol will present a completely updated human health and ecological risk assessment, including related background information on analysis methods and assumptions. The report will reiterate the primary steps of the risk analysis previously performed in 2002 and will provide a comprehensive update of results, to draw conclusions about potential long-term and short-term risks. Section 7 states that "However, if modeled risks are found to be higher than target levels, site-specific assumptions included in the analysis will be carefully reviewed to provide perspective on the reliability of the modeled risk estimates."
    - In order to reduce uncertainty, there should be an effort to field-truth the modeled media concentrations estimated from the AERMOD model with actual media samples collected from the terrestrial and aquatic habitats that will be evaluated. For Wright/Bradley Lake, sediment, surface water, and fish can be collected and for Green Island, soil, sediment, and surface water samples can be collected. It might also be possible to sample soil from the areas of maximum emission deposition for potential human receptors.
    - Fish sampling results from selected aquatic habitats (local waterbodies) as well as any fish advisories should be presented in the HHERA report.
- Section 1.1 indicates that the Final 2002 MRA report addressed a concern that USEPA had about the prediction of potential effects upon human receptors, and those for avian species at or near the top of the local food chain, which could provide a reasonable index of whether other habitats and species would be challenged by airborne emissions. As a result, comparative trends will be identified in the current HHERA to indicate whether there is potential for particular ecological effects to either increase or decrease in the future, after the latest improvements in air pollution control technology are fully operational. USEPA would like to be provided with the original comment pertaining to this issue.
- The 2005 HHRAP recommends that current and future land use is described and mapped. Since the last version of the HHERA was from the early 2000's, it is important to ensure that the most current land uses are included in the report and provided in Figures.

- Section 5 of the HHERA presents the proposed acute benchmarks hierarchy as NYSDEC DAR-1, CALEPA, Protective Action Criteria (PAC), and ATSDR. The 2005 HHRAP's Section 7.4.2 presents the recommended hierarchy of acute toxicity values as CALEPA, AEGL-1, ERPG-1, TEEL-1, and AEGL-2. Proper justification needs to be provided as to why the proposed values other than the NYSDEC DAR-1 and CALEPA acute values are proposed instead of the values recommended in the 2005 HHRAP.
- Section 2.3 of the USEPA HHRAP lists seven different constituent categories of COPCs including: Polychlorinated dibenzo(p)dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), Polynuclear aromatic hydrocarbons (PAHs), Polychlorinated biphenyls (PCBs), Nitroaromatics, Phthalates, Other organics, and Metals. This HHERA document should present appropriate justifications for not including PCBs, nitroaromatics, pentachlorobenzene, barium, silver, thallium, and zinc as COPCs.
    - USEPA's risk assessment approach for lead is unique because a reference dose (RfD) value for lead is not available. An RfD is typically derived from a concentration below which no adverse effects have been observed. Existing evidence indicates that adverse health effects occur even at very low exposures to lead (e.g., subtle neurological effects in children have been observed at low doses). Since the toxicokinetics (the absorption, distribution, metabolism and excretion of toxins in the body) of lead (Pb) are well understood, lead is regulated based on blood lead concentration (PbB).
    - For assessing lead exposure at residential properties, EPA currently recommends two models, depending upon the age of the receptor population:
        - The IEUBK model: for children, exposure assessments should be performed using the IEUBK model.
        - The ALM: For adults, EPA's 1996 ALM (Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, EPA-540-R-03-001, OSWER Dir #9285.7-54) should be used.
        - Both account for intake and uptake components of lead exposure and allow the user to input site-specific data (e.g., exposure frequency, sources of lead) and predict blood lead concentrations (PbBs).
- Section 6.1 of the HHERA presents a paragraph on proposed fish ingestion rates for both adult and child recreational and subsistence fishers. Proposed adult fish ingestion rates are based on values used in the 2002 MRA (AECOM 2002), which specified a rate of 18 g/day for a recreational fisher and 60 g/day for a subsistence fisher. Child fish ingestion rates were scaled based on the ratio of adult-to-child ingestion rates provided in Connelly 1992. Applying that ratio (0.33) results in child fish ingestion rates of 5.9 g/day and 19.8 g/day for the recreational and subsistence fishers, respectively. The Upper Hudson River HHRA used a recreational adult fish ingestion rate of 31.9 g/d; which is higher than the one proposed for this HHERA. Proper justification needs to be presented to explain why a higher adult recreational fish ingestion rate is not proposed for this risk assessment as well as for the other recommended fish ingestion rate values.
- Section 9.3.1 Hudson River states that "The fish assemblage in the Hudson River near the confluence of the Mohawk and Hudson Rivers (i.e., the segment of the river closest to the areas of high modeled air deposition from the kilns) is selected as an ecological receptor for the Norlite SLERA." The 1999 SLERA Protocol identifies three categories of fish (herbivorous, omnivorous, and carnivorous) that could be selected as aquatic

receptors. It seems that fish will only be evaluated in the SLERA as a food item for avian and mammals piscivores. Fish species should be identified in Section 10.3.1 and Figure 9-1 as wildlife receptors to be evaluated in the food web models via direct contact with surface water, ingestion of sediment, and ingestion of contaminated prey items (bioaccumulation).

- Sections 10.2.1, 10.2.2 and 10.2.3 of the HHERA present the proposed soil, sediment, and surface water screening value sources to be used in the SLERA. Tables 10-1 and 10-2 present several potentially important chemical species that are expected to be included in the SLERA and their screening values. There should be a footnote added indicating that if there are more than one media-specific screening value for a chemical, the most conservative (lowest) value will be used.
- Section 10.3.1 lists the wildlife receptors that will be considered in the food web models. The Great blue heron (Ardea herodias) is identified as a TL3 insectivorous bird foraging in the aquatic and wetland exposure areas. The SLERA Protocol document on both Figure 4-7 and Table 4-1 identify the Great blue heron as a "carnivorous shore bird." Please change the designation of this bird and ensure that the appropriate prey items are used in the food chain models for this avian species.
- The Short-tailed shrew (Blarina brevicauda) is listed in Section 10.3.1 as a TL3 insectivorous mammal foraging in the terrestrial area. The shrew should be identified as an omnivorous mammal.
- Table 5-1 - USEPA uses the current Regional Screening Levels (RSLs) – Generic Tables as a resource for toxicity values to be used in human health risk assessments. The information in these tables including the toxicity values used to create the RSLs represent the most current science for the COPCs.
- Table 6-1 presents the proposed food ingestion rates based on values selected from the 2005 HHRAP and Exposure Factors Handbook. Recommended food ingestion rates in Section 6 of the HHRAP are presented as mean consumption rates based on number of servings per week and g/kg-day. Please include the conversion equations and inputs to convert the proposed ingestion rates from the HHRAP to the values presented in Table 6-1.
- Section 10 lists hydric soil as an abiotic media that will be used to determine future facility emissions using AERMOD and IRAP. There should be a definition of the term "hydric soil" if one is not already provided.

DOH comments:

- General comment - New York State Department of Health (NYSDOH) staff reviewed the Human Health and Ecological Risk Assessment (HHERA) Protocol for the Norlite Lightweight Aggregate Kiln Facility in Cohoes (Albany County), prepared by AECOM and dated December 2020. NYSDOH staff limited its review to the human health risk assessment (HRA) protocol and did not review the ecological risk assessment protocol. Although Norlite's December 2020 human health risk assessment (HRA) protocol appears generally consistent with the methodology presented in United States Environmental Protection Agency's (USEPA) Human Health Risk Assessment Protocol (USEPA, 2005a), several aspects of the protocol could not be verified. In general, NYSDOH relies on the Department of Environmental Conservation (NYSDEC) to determine whether the list of evaluated chemicals is complete, and whether the chemical-specific emission rates and modeled air concentrations and deposition rates

are appropriate for the purpose of risk assessment. Additionally, we rely on the NYSDEC to verify that the selection of receptor locations, as determined by dispersion modeling, is representative of facility impacts and reasonably considers future land use and natural resources in the surrounding area. Any estimates of human health risk in the forthcoming risk assessment will be dependent on these parameters.

- Facility Emissions (Section 1.2, page 1-3) - In this section, the protocol states that "The purpose of the updated HHERA will be to demonstrate that the Norlite facility continues to be in compliance with NYSDEC, NYSDOH, and USEPA health protection guidelines…" We recommend that this language be revised to state that the purpose of the updated HHERA is to evaluate the potential risks associated with estimated air impacts of facility emissions. It is the purview of the regulatory agency (NYSDEC) to determine compliance and stating that showing compliance is the objective unnecessarily implies a predetermined outcome of the risk assessment. Please revise the protocol accordingly.
- Statement on Risk Assessment (Section 1.3, page 1-3): The statement "The continuously changing science of risk assessment has produced a long series of guidance documents and updates, some of which are described below" is not particularly useful. We recommend removal or revision to avoid giving the impression that the risk assessment is a moving target or not a useful tool for making risk management decisions.
- Continuous Emissions Monitoring System (Section 1.0, page 1-1) - The protocol states that exhaust gases from the kilns are monitored continuously for oxygen and carbon monoxide concentrations as an indicator of whether high combustion efficiency is being maintained. Please improve this section of the protocol with additional explanation of whether other emission components are captured by this monitoring, or whether the monitoring is done only for the purpose of determining combustion efficiency.
- Radius of Study Area (Section 2.0, page 2-1) - The protocol indicates that the study area will cover a radius of 20 kilometers but does not explain the basis for this. The protocol's transparency would be improved if a rationale were provided for the size of the study area. The USEPA's (USEPA, 2005a) HRA guidance refers to various study areas for different purposes (e.g., to inform the dispersion modeling evaluation of complex terrain, land use, evaluation of waterbodies and watersheds and identification of sensitive receptors). Additional information should be provided in the protocol.
- Source Data (Section 3.1, page 3-1) - NYSDOH staff noticed differences in source characteristics when comparing the 2020 HHERA protocol against the 2002 health risk assessment (HRA). The NYSDOH is aware of recent facility upgrades, called Project Delta, that may have changed source characteristics. Specifically, in the 2020 protocol, it was reported that the stack height for each of the two kilns is 125 feet with an exit diameter of 2.95 feet, and the base elevation is 59 feet above sea level. In the 2002 HRA, the stack height was 120 feet with an exit diameter of 4 feet and a base elevation of 30 ft above sea level. The NYSDOH relies on the NYSDEC to verify this information because predicted facility impacts are sensitive to these inputs.
- Air Dispersion and Deposition Modeling (Section 3.0, page 3-1) - This section of the protocol describes various elements for estimating chemical-specific air concentrations and depositions at various receptors as determined by the air dispersion model used. However, it is not clear from this description whether any consideration was given to using a reasonable maximum exposure value (e.g., an upper confidence limit on the

mean) for a particular receptor (e.g., resident, farmer, fisher), as opposed to a simple long-term average for chronic exposure estimates. Norlite should revise the protocol for transparency.

- Land Use Classification (Section 3.2, page 3-2) – This section of the protocol indicates that the area within 3 kilometers of the facility is classified as rural based on visual inspection of satellite images. The revised protocol should provide supporting details on how the classifications were made (i.e., more than simply "visual inspection"), consistent with USEPA (USEPA, 2005a) guidance, in order to provide a basis to assess the validity of these classifications, including consideration of reasonably-anticipated future land use.
- Section 3.3.2 Vapor (Gas) Deposition Chemical Specific Parameters (Section 3.3.2, page 3-2) - This section describes an approach for derivation of a generic vapor-phase deposition for non-mercury compounds for use in the IRAP-h program by using a risk-ranking approach to select a conservative model input value. NYSDOH staff question the need to select a generic value since USEPA guidance (USEPA, 2005a) provides a database of chemical-specific values that are incorporated into the IRAP-h model. Although, the NYSDOH relies on NYSDEC to verify the results of the dispersion modeling, we suggest that this approach may not be necessary, overly complicated and lacks transparency. Norlite should provide a scientifically defensible rationale and supporting information about this proposal to generate this "generic" input value rather than using chemical-specific values available in the IRAP-h (HRA) model.
- Evaluation of Elevated Receptors (Section 3.7, page 3-5) - Chapter 4 of USEPA's Human Health Risk Assessment Protocol (USEPA, 2005a) presents guidance on the consideration of site-specific sensitive receptors for the purpose of risk assessment. The USEPA includes in the list of sensitive receptors daycare centers, schools, hospitals, nursing homes, community centers and public parks. Norlite's HHERA protocol presents a list of elevated sensitive receptors within two (2) kilometers of the facility (see Table 3-2). Section 6.0 of the protocol (page 6-1) states that inhalation exposures will be evaluated for "elevated sensitive receptors." However, Section 3.6 describes dispersion model grids without mentioning these sensitive receptors. In addition, a receptor included in the 2002 Norlite HRA named "St. Colman's School" is not included in the 2020 HHERA protocol. An internet search identified "St. Colman's Home" that may have replaced this facility. Please confirm that all elevated receptors such as those identified in USEPA guidance are included as sensitive receptors for air dispersion modeling and for consideration of potential health risks. We also suggest that the NYSDEC consider having the consultant include Saratoga Sites as a possible sensitive receptor. Lastly, Table 3-4 is referenced in this section but based on context, the NYSDOH believes Table 3-2 contains the information described. Please correct this apparent typographical error.
- Assessment of Acute Exposure to Respiratory Irritants (Section 3.8, 3-5, Section 4.1.1, page 4-2; Section 5, page 5-1) - Section 3.8 indicates that modeled short-term air concentrations (1-hour and 24-hour) will be used to assess acute inhalation exposure for chemicals evaluated in the HHRA. For this analysis, the applicant indicates that predicted short-term air concentrations will be compared to NYSDEC's Short-term Guideline Concentrations (SGCs). For any SGC that is derived from an occupational guideline, NYSDOH staff requests that the applicant consider other available health-based comparison values that are derived by authoritative bodies that include margins-of-protection such as acute inhalation reference concentrations derived by the California

Environmental Protection Agency and acute inhalation minimal risk levels (MRLs) derived by the Agency for Toxic Substances and Disease Registry.
Additionally, NYSDOH staff requests that the HHRA include a plan for assessment of risks associated with acute exposures to respiratory irritants (e.g., fine particulates, oxides of nitrogen and sulfur, ammonia, chlorine, bromine, fluorine and acid gases), including those risks associated with periods of increased short-term facility emissions due to start-up, shut-down and emission control by-pass/upset conditions. In the 2020 HRA protocol, the applicant states that since the stack tests were conducted under "stressed conditions that maximize emissions," annualized emissions will be lower than short-term rates. In Section 4.1.2 of the HRA protocol, the applicant states that automatic waste feed cut-offs minimize increased kiln emissions due to upset conditions and their effect on emissions is insignificant. We rely on the NYSDEC to verify the accuracy of these claims but request this additional analysis of short-term human exposure to respiratory irritants in the HRA.

- Reduction of Emissions Data (Section 4.1.1, page 4-2) - The 2020 HRA protocol states that "Table 4-1 gives a qualitative summary listing of all measured compounds expected to be considered in the "Chemicals of Potential Concern" (COPC) selection process." It is unclear what is meant by "qualitative." This table contains compounds with their associated Chemical Abstract Service Numbers (CAS); however, the USEPA recommends that the quantitative estimates for COPCs should be included in the HRA. The list of compounds in Table 4-1 does not include all the compounds identified in USEPA (USEPA, 2005a), Table A-1 and USEPA's companion database. Some compounds not listed in Table 4-1 but identified in EPA guidance include polychlorinated biphenyls, barium, silver, thallium, and zinc. Chapter 2 of USEPA's guidance (USEPA, 2005a) offers guidance on how to quantitatively consider detected and tentatively identified compounds (TICs) from facility trial burns, fugitive emissions, as well as, qualitatively consider total organic carbon emissions for the facility. Norlite should amend the HHERA to be consistent with USEPA guidance or provide scientifically defensible support for any deviations. Finally, because of the enhanced public visibility of per- and polyfluorinated alkyl substances (PFAS) and the Norlite facility, the NYSDOH recommends that the revised protocol include a statement indicating that PFAS compounds will not be handled or treated at the facility to support omission of this class of chemicals in the HRA.
- Selection of Chemicals of Potential Concern (Section 4.2, page 4-2) - As stated above, NYSDOH staff rely on the staff at the NYSDEC to verify that the chemicals evaluated in the multi-pathway HRA are appropriate and emission rates and predicted air concentrations/deposition rates are accurate and representative of facility impacts. The submitted protocol indicates that a risk-ranking scheme will be used to limit the chemicals considered in the multi-pathway human health risk assessment. NYSDOH staff found the full description of the ranking scheme to lack clarity and recommend that Norlite not limit the risk assessment to a subset of chemicals that contribute greatest to the overall risk estimates for this facility. Given the expected public scrutiny and the ease of use of the IRAP-h model, we suggest that all emitted chemicals be evaluated in the HRA to demonstrate full transparency.
    - Norlite's proposed ranking procedure will consider ratios of the predicted maximum offsite air concentrations to NYSDEC DAR-1 guidelines, presumably NYSDEC's Annual Guideline Concentrations (described as "quantitative toxicity reference value of acceptable air concentrations"), and include in the risk

assessment chemicals for which the ratio exceeds “one percent” (N.B., Department staff believe that “percent” may be a typographical error). The protocol indicates that this risk ranking method was recommended by NYSDEC in DAR-1, with consideration of USEPA guidance (USEPA, 2005a). However, NYSDOH staff believe that Norlite is incorrectly applying NYSDEC’s process for assigning an “Environmental Rating” to a facility, per 6 NYCRR 212 1.3. Norlite should consult with the NYSDEC on this matter. The protocol also indicates that bioaccumulative and persistent chemicals shown to be important in the 2002 HRA will be included in the updated HRA. The current 2020 protocol states that this list “automatically” includes polynuclear aromatic hydrocarbons (PAHs) and polychlorinated dibenzo-p-dioxins and dibenzofurans (dioxins/furans).

    - Because of recent facility modifications, NYSDOH staff suggest recent emissions data be given greatest weight for risk assessment purposes and that all emitted persistent, bioaccumulative and toxic compounds be evaluated in the multi-pathway HRA (e.g., mercury, polychlorinated biphenyls (PCBs), certain bromodiphenyl ethers, etc.). NYSDOH staff also note that barium, silver, thallium, and zinc were evaluated in the previous (2002) HRA but are not listed in Table 4-1 (page 4-4). The IRAP-h model contains information to evaluate the chemicals identified in Table A-1 of USEPA’s HRA protocol (and companion database) and provides flexibility for users to add chemicals, if necessary.

- Use of Site-Specific Norlite Mercury Speciation (Section 4.2.1, 4-3) - The protocol indicates that site-specific mercury speciation data, rather than USEPA defaults, will be used to evaluate the environmental fate of mercury for the purposes of human health risk assessment. The NYSDOH suggests that site-specific mercury emissions data be used for this assessment and requests that all the supporting scientific data are provided with the submittal of the HRA for any deviations from USEPA guidance.
- Toxicity Values (Section 5, page 5-1) - Section 5 of the protocol provides a tabular summary of toxicity values for select contaminants of potential concern to be used in the health risk assessment. Since these were presented as examples and the lists are not complete, we will evaluate these and any additional toxicity and exposure parameters when the full health risk assessment is submitted for agency review. Additionally, the NYSDOH will review the application of Toxic Equivalency Factors for dioxins/furans and co-planar PCBs (USEPA, 2010a), Relative Potency Factors for PAHs (USEPA, 1993), and the use of age dependent adjustment factors for chemicals that cause cancer by a mutagenic mode of action (USEPA, 2005b; 2006). For identification of potential toxicity values, the NYSDOH recommends following the hierarchy of authoritative bodies identified in USEPA’s protocol (USEPA, 2005a).
- Human Exposure Assessment (Section 6.0, page 6-1) - According to the protocol, Norlite’s consultant will use Lakes Environmental Incorporated software, IRAP-h View (Version 4.5.5). According to the company’s website, there is a more recent version (V 5.1; released 11/19/2019) of the software available. The most recent version of the model should be used for the submitted HRA. NYSDOH staff are familiar with this software as it contains all the algorithms and default parameter values identified in USEPA’s (USEPA, 2005a) protocol. However, the model results are highly sensitive to model inputs such as the results of the air dispersion modeling and the choice of receptor locations (including future land use), amongst other parameters. As such, it is important that NYSDEC verify the accuracy of facility emissions and predicted air concentrations and deposition rates, and that the locations of the exposure scenario

receptors are appropriate for the purposes of risk assessment.
    - In addition to using the most recent version of the IRAP-h software, Norlite's consultant should identify and justify any modifications to EPA-default parameter values and use the most up-to-date toxicological information per the hierarchy identified in USEPA's protocol. The submitted HRA should include all the information necessary to verify exposure and risk estimates using USEPA protocol. NYSDOH staff will review the application and use of this model, as well as the exposure and toxicological parameters when the HRA final is submitted. Since changes to the facility have occurred and more recent meteorological data will be used, NYSDOH staff suggest that the selection of receptor locations should not be pre-determined based on the 2002 previous HRA.
- Recreational and Subsistence Fisher Exposure Scenarios (Section 6.1, page 6-2) - The protocol states that Wright/Bradley Lake in Troy is not likely to support a fish habitat large enough for subsistence fishing but provides no justification for this statement. It will be assumed that the subsistence fisher exposure pathway consumes fish caught in a portion of the Erie Canal north of the facility. This portion of the protocol would be improved if it articulated a clear and verifiable basis for these assumptions. NYSDOH staff also recommend that Norlite's consultant engage with NYSDEC, including staff from the regional fisheries program, to select appropriate waterbodies, guided by the results of the most recent air dispersion modeling, for evaluation of these exposure pathways in the HRA.
- Proposed Ingestion Rates (Table 6-1, page 6-3) - Several differences in ingestion rates were identified when values in Table 6-1 were compared to parameter values identified in the USEPA's HRA protocol (USEPA, 2005a; see Appendix B). For example, the fish ingestion rates for the adult and child resident/subsistence fisher are considerably lower than those listed in USEPA (USEPA, 2005a), citing sources which do not fully support the values listed in the protocol. The infant's assumed breastmilk consumption rate and adult body weights are not consistent with values listed in the USEPA protocol (USEPA, 2005a) as well. Norlite should provide additional scientific support for deviating from available USEPA HRA guidance. The USEPA's Exposure Factors Handbook (USEPA, 2011) and peer-reviewed scientific literature can be consulted for more recently developed and robust exposure parameters for use in the risk assessment.
    - Despite being considered as an exposure pathway for the 2002 HRA, the 2020 HRA protocol indicates the HRA will not evaluate potential exposures and risks associated with consumption of local drinking water. The NYSDOH recognizes that USEPA guidance (USEPA, 2005a) explains that the drinking water exposure pathway does not need to be assessed when drinking water systems are filtered, treated and standards are applied to public systems. However, the protocol would be improved by references to the Cities of Cohoes, Troy, Watervliet, Waterford, etc. Annual Water Quality Reports for public information about their drinking water (see text on page 6-1) and compliance status to support this assumption and for transparency.
- Assessment of Non-cancer Health Risks for Lead (General Comment)
  The HHERA protocol lists lead as a chemical to be evaluated. Table 5-1 lists the cancer slope factor for lead consistent with the value in USEPA's (USEPA, 2005a) guidance but does not present how risks for non-cancer effects will be assessed. USEPA's 1998 addendum to the agency's protocol suggests that facility lead impacts for non-cancer endpoints can be evaluated by comparing estimates of lead concentrations in soil and

air to “target levels” for these media (which were developed prior to CDC’s downward revision of the “blood lead reference value” to 5 micrograms of lead per deciliter of blood).
    - NYSDOH staff request that, for each exposure scenario, the HRA present an analysis of potential blood lead levels associated with estimated lead exposures in various environmental media and food. An assessment of non-cancer impacts can be developed by using USEPA’s Integrated Exposure Uptake Biokinetic (IEUBK) model and the Adult Lead Methodology (ALM) to estimate blood lead levels in children, pregnant women and their developing fetuses who might be exposed to lead-contaminated environmental media (USEPA, 2003; 2010b).
- Section 7.0 Human Health Risk Characterization (Section 7.0, page 7-1) - This section of the protocol describes how exposure assessments will be combined with the chemical-specific dose-response assessment to yield quantitative estimates of human health risks. As indicated above, NYSDOH staff will review the dose-response assessment when the full HRA is submitted. The NYSDOH will review the tabular presentations of estimated cancer and non-cancer risk estimates for each exposure scenario, along with the lead evaluation, acute exposure assessment and the infant breastmilk exposure evaluation, when the HRA is submitted. Additionally, the discussion of “acceptable risk” in this section of the protocol requires context and should identify NYSDEC as the permitting authority and decision-maker. The NYSDEC will consider the results of this HRA, as well as other available information (e.g., USEPA regulations, etc.), as part of the permitting process.
- See footnote 1 for DOH references for the above-listed comments.[1]

[1] References for DOH's HHRA comments:

USEPA (US Environmental Protection Agency). 1993. Provisional guidance for quantitative risk assessment of polycyclic aromatic hydrocarbons. EPA/600/R-93/089. Washington, DC: Office of Research and Development.

USEPA (US Environmental Protection Agency). 1998. Region 6 Risk Management Addendum - Draft Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. USEPA: Washington, DC. EPA-R6-98-002.

USEPA (US Environmental Protection Agency). 2003. Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. USEPA: Washington, DC. EPA-540-R-03-001.

USEPA (US Environmental Protection Agency). 2005a. Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. USEPA: Washington, DC. EPA/530/R-05/006.

USEPA (US Environmental Protection Agency). 2005b. Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens. Risk Assessment Forum. EPA/630/R-03/003F. Available at http://www.epa.gov/ttn/atw/childrens_supplement_final.pdf.

USEPA (US Environmental Protection Agency). 2006. Implementation of the Cancer Guidelines and Accompanying Supplemental Guidance - Science Policy Council Cancer Guidelines Implementation Workgroup Communication II: Performing Risk Assessments that Include Carcinogens Described in the Supplemental Guidance as Having a Mutagenic Mode of Action. Memo from William H. Farland to Science Policy Council.

USEPA (US Environmental Protection Agency). 2010a. Documents for Recommended Toxicity Equivalency Factors for Human Health Risk Assessments of Dioxin and Dioxin-Like Compounds. Available at https://www.epa.gov/risk/documents-recommended-toxicity-equivalency-factors-human-health-risk-assessments-dioxin-and

USEPA (US Environmental Protection Agency). 2010b. Integrated Exposure Uptake Biokinetic Model for Lead in Children, Windows Version (IEUBKwin V1.1 Build 11).

USEPA (US Environmental Protection Agency). 2011. Exposure Factors Handbook 2011 Edition. USEPA: Washington, DC. EPA/600/R-09/052F.

Screening-Level Ecological Risk Assessment (SLERA) –

DEC comments:

- Pages 9-1 and 9-2, ecological habitat characterization. For each aquatic habitat, the only receptors identified were fish, benthic communities, and piscivorous bird and mammal species. Other aquatic species with significant ecological importance such as freshwater mussels and amphibians should be considered as receptors. Insectivorous terrestrial species that may feed on emergent insects (e.g., aerial insectivorous songbirds) should also be considered as receptors.
- Page 9-2, Green Island. The site reconnaissance survey was conducted in 2002, which was more than 18 years ago. A new survey should be conducted to update the previous observation.
- Page 9-3, species of special concern. It was only stated that correspondence from NYSDEC Natural Heritage Program and USFWS "will be presented in the SLERA". It should be clarified whether sensitive communities and threatened and endangered species, if identified by the NYSDEC Natural Heritage Program and USFWS, should be included as affected habitat and ecological receptors to be evaluated in the SLERA.
- Page 9-4, Terrestrial receptors. Deposition onto leaves were not quantitatively evaluated as a plant exposure pathway for risk to plants. However, contaminants deposited onto leaves in the plants can be ingested by herbivorous animals including insects, birds, and mammals, which will contribute the dietary exposure to these organisms. Therefore, the deposition on plant leaves is not only a risk to plants but also a risk to animals through direct ingestion or bioaccumulation. This exposure pathway should be evaluated for terrestrial invertebrate, avian, and mammalian receptors.
- Page 9-4 to 9-5, wetland biota. Similar to previous comment, deposition to emerging portion of the plants may be consumed by herbivorous animals and should be evaluated as a dietary and bioaccumulation pathway. Hydric soil was named as the only solid phase medium. However, wetlands receive substantial amount of surface water runoff and it is not uncommon for wetlands to have permanently flooded areas. Therefore, sediment may be present in wetland as well should also be considered as one of the media.
- Page 9-5, aquatic and benthic biota. Additional invertebrate species with ecological importance should be (e.g., freshwater mussels) added as receptors. Fish should also be evaluated as receptors through bioaccumulation as did in the 2002 SLERA instead of being considered just as food items.
- Page 9-8, ecological conceptual site model. All potentially complete exposure pathway that could occur in nature should be identified and acknowledged in the CSM. Exclusion of a complete pathway in the SLERA should be justified. E.g., why inhalation and direct contact with air were not considered complete exposure pathway for all ecological receptors? Why bioaccumulation from plant consumption is not considered a complete exposure pathway for terrestrial invertebrates? Why bioaccumulation is not considered a potential exposure route for fish? Leaching through ground water to sediment was listed as one of the "Secondary Release and Transport Mechanisms" but Leaching through ground water to surface water is not considered. Exclusion of this mechanism as a major pathway should be justified.

- Page 10-2, soil screening values. The DEC soil cleanup objectives (6NYCRR Part 375) should also be considered.
- Page 10-5, Food web modeling. Fish species should be modeled for food chain effects as did in the 2002 SLERA, after the request from EPA reviewer.
- Page 10-5, wildlife receptors for food web models. Great blue heron was inappropriately listed as an insectivorous bird foraging in the aquatic and wetland exposure areas. Great blue herons are strictly carnivorous whose diet consists mostly of fish but may also include other vertebrates such as amphibians, snakes, and small mammals. It should be reclassified as TL4 receptor. Species like red-winged blackbird or tree swallows should be use as TL3 avian species in aquatic and wetland exposure.
- General comments:
    - The new SLERA should include retrospective evaluation of results from 2002 SLERA based on actual emission data, quantitative analyses of current COPC levels in the selected ecological habitat. Particularly the bioaccumulation of persistence contaminants through the food web. Environmental (water, soil, sediment) and biota (plants, fish, invertebrates, birds, small mammals, etc.) sampling at current and previously identified ecological habitats should be carried out for determination of realistic contaminant level due to past dispersion and deposition.
    - Considering the recent disclosure that chemicals not included in the COPCs may have been released from the kilns (PFAS, etc.), there should be oversight on new material with unknown risk as burning material.

<u>Climate Change –</u>

DEC comments:

- Climate Leadership and Community Protection Act (CLCPA) –
    - The Governor signed the CLCPA into law in July 2019, which became effective January 1, 2020. (Chapter 106 of the Laws of 2019). Among other requirements, the CLCPA directs state agencies to determine if the decisions they make are consistent with the Statewide greenhouse gas (GHG) emission limits established by the CLCPA in Environmental Conservation Law (ECL) Article 75 which requires a Statewide reduction in GHG emissions from 1990 levels of 40% by 2030 and 85% by 2050. For DEC, this includes determining if permits issued are consistent with or would interfere with the attainment of the Statewide GHG emission limits in ECL Article 75. This requires DEC to review applications for Title V permit renewals for consistency with the requirements and goals of CLCPA. Your project is subject to this review.
    - To address Section 7(2) of CLCPA, please identify each GHG and calculate the GHG and carbon dioxide equivalent emissions for the project using the 20-year global warming potentials found in 6 NYCRR Part 496.5. Discuss how these will be mitigated or reduced consistent with the goals of CLCPA. For purposes of the CLCPA, Statewide GHG emissions include “upstream” out-of-state GHG emissions associated with the generation of electricity imported into the State, or the extraction, transmission, and use of fossil fuel imported into the State. For your use, listed as Attachment 2 to this notice are GHG emission factors

associated with “upstream” emissions impacts. Note that these factors do not include direct emissions resulting from the combustion of fossil fuels. If there are no feasible ways to reduce GHGs, please provide supporting information in the evaluation.
    - In addition to the GHG requirements outlined above, Section 7(3) of CLCPA requires that all state agencies shall “prioritize reductions of GHG emissions and co-pollutants in disadvantaged communities”. Climate Justice Working group co-pollutants are defined as hazardous air pollutants (HAPs) emitted by GHG sources. While the Climate Justice Working Group has not yet finalized its designation of disadvantage communities, please provide calculations and a discussion of mitigation measures for any co-pollutants as discussed above. Because Norlite is already subject to applicable requirements that may address these emissions, it is acceptable to discuss the existing mitigation measures and explain that further reductions may not be feasible.
- Floodplain Evaluation -
    - 100-year Flood Hazard Evaluation: There was a new flood insurance study released in 2015. The Salt Kill was not re-studied so the numbers are the same, but the flood maps were updated, the distances in the floodway data table were changed, and the elevations were converted to NAVD88. Please update the evaluation.
    - In the evaluation the terms 100-year rainfall, 100-year storm and 100-year flood seem to be used interchangeably. Technically they are not. For consistency, the 100-year flood event, or today's preferred term, the 1-percent flood event, should be used throughout the report.
- Flood Risk Management, Flood Response Plan for the Salt Kill –
    - For consistency, as explained above, the 100-year flood event, or today's preferred term, the 1-percent flood event, should be used throughout the report.
    - The National Weather Service link does not work.
    - National Weather Service has a river forecasting station nearby:
        - “National Weather Service Advanced Hydrologic Prediction Service” link: https://water.weather.gov/ahps2/hydrograph.php?wfo=aly&gage=tryn6
    - Please link the forecast river stages with actions to be taken at the site.

Air Title V Permit Application –

DEC comments:

- Page 3, Compliance Statements - Please check the appropriate boxes in the revised renewal application.
- Project Delta Modeling Report – Comments received from the Bureau of Air Quality & Research in the Division of Air Resources resulting from a review of the Project Delta Modeling Report dated April 2020 are listed as Attachment 3 to this notice. Norlite has yet to address the issues with the report requested in Department emails to the facility dated June 30, 2020 and November 14, 2020. Please address comments 1, 3, and 5 within Attachment 3. Submit a revised report addressing these comments to Mr. Ben Potter in DEC Region 4 and Ms. Denise Prunier in the Central Office DAR.

Part 373 RCRA Permit Application –

DEC comments:

- Comments from the Division of Materials Management on the Part 373 RCRA permit renewal application which was submitted June 30, 2020 are listed as Attachment 4 to this notice.

This Notice of Incomplete Application does not waive or restrict DEC from requiring, by further written notice, additional information for administrative completeness or technical review. If you have any questions, please feel free to contact Kate Kornak, Deputy Regional Permit Administrator, at Kate.Kornak@dec.ny.gov or (518) 357-2459.

Sincerely,

Kate Kornak

Kate Kornak
Deputy Regional Permit Administrator

Attch: 1. DOH Guidance for Health Data Review in Support of CP-29 (2017)
2. DEC Fuel Emission Factors for CLCPA (2021)
3. DEC Div. Air Resources Comments on Project Delta Modeling Report (2020)
4. DEC Div. Materials Management Comments on Part 373 RCRA Permit Renewal Application (2021)

ecc: Norlite/Tradebe
NYSDEC Region 4
NYSDEC Central Office
NYSDOH
USEPA R2
City of Cohoes
Town of Colonie

New York State Department of Health
Updated Guidance for Health Data Review and Analysis Relating to NYSDEC Environmental Justice Requirements for CP-29 and 6 NYCRR 487

(updated October 2014, revised 1-26-15, updated June 2017; links updated January 2021)

Table of Contents

SECTION I.

A. Introduction

New York State Department of Environmental Conservation (NYSDEC) regulations relating to Environmental Justice analysis under 6 NYCRR 487.9(b)(4)(i) require that a comprehensive description of information on public health be included in applications for a Certificate of Environmental Compatibility and Public Need pursuant to Public Service Law Article 10. 6 NYCRR 487.9(c) indicates that in presenting the required health data, applicants shall use a protocol approved by NYSDEC and the New York State Department of Health (NYSDOH). This document contains the protocol to be followed.

This document should also be followed in fulfilling the requirements of NYSDEC Commissioner Policy 29 Environmental Justice and Permitting (CP-29). This document updates previous guidance entitled "Guidance for Health Outcome Data Review and Analysis Relating to NYSDEC Environmental Justice and Permitting" and the earlier Report of the Health Outcome Data Work Group.

B. Health Outcome Data Analysis and Environmental Review: Overview of the Method

NYSDEC CP-29 specifies that health outcome data review be conducted when it is determined that a proposed action may affect the community of concern, and an environmental justice area is included. 6 NYCRR Part 487.9 requires that an applicant prepare comprehensive demographic, economic, and physical descriptions of the impact study area and comparison areas, including descriptions of health data, with asthma and cancer being noted. (Note that in this document the term "impact study area" will be used for both the community of concern in CP-29 and the impact study area in 6 NYCRR Part 487.9). A review of health outcome data can provide information on the current health status of the study area. If the population of an impact study area has a higher rate of health-related outcomes than comparison areas, it may be more vulnerable to the effects of environmental exposures. A separate guidance document for screening an impact study area for the presence of an environmental justice area as mentioned in 6 NYCRR Part 487.5 is available at the NYSDOH website.

This document provides a method for comparing the health status of the study area with that of selected comparison areas. A more detailed discussion about the method and its development can be found in the Report of the Health Outcome Data Work Group. For this method, the study area and comparison areas must be identified as one or more ZIP codes because health outcome data for small areas are tabulated at the NYSDOH website by ZIP codes. The method specifies tabular displays of demographic and health outcome data for the study area and at least four comparison areas. (The Work Group defined health outcome data as counts and rates of health-related events.) The rates of health outcomes in the study area are compared to rates in comparison areas by calculation of rate ratios and confidence intervals. The results of these analyses are summarized and discussed.

Although a display of health outcome data can provide information on the number and percentage of people in a community who have a variety of diseases or health outcomes, and on how this community compares in disease rates to other areas, it cannot tell us what is causing the disease in the community. Many factors influence the risk of disease including heredity, age, lifestyle factors such as smoking and diet, adequacy of nutrition, housing, health care, health behavior, and exposures to chemicals in environmental media. However, if the population of a community has low health status, it may be more vulnerable to the effects of environmental exposures.

C. Demographics

A table of demographic data describing the populations of the study area and each comparison area must be created. Instructions for preparing this table are provided in **Section II**. This table must include information on age, sex, race/ethnicity, population density, and poverty. This information is available for ZIP Code Tabulation Areas (ZCTAs) defined by the U.S. Census Bureau. The elements to be shown in the demographic table and the specific Census files that contain the needed elements are described in Section II. Note that for these analyses the definition of a minority population included in NYSDEC's CP-29 is used: a population that is identified or recognized by the U.S. Census Bureau as Hispanic, African American or Black, Asian and Pacific Islander, or American Indian. This definition includes both race and ethnicity.

The U.S. Census Bureau's five-year American Community Survey (ACS) was the source of information on poverty and income in the demographic tables. This survey is conducted on a sample of the nation's population each month. For the five-year ACS, five years of data are combined and averaged. For areas with small populations, such as some ZCTAs, there are wide margins of error around the estimates (which are included in the ACS data tables), sometimes leading to questions about the accuracy of the estimates. NYSDEC and NYSDOH are exploring other indicators of social vulnerability and social determinants of health, and in the future other measures may be used.

D. Impact Study Area and Comparison Areas

a. *Selecting ZIP codes for the impact study area.* Because the health outcome data at the NYSDOH public website are displayed for ZIP codes, the impact study area must be approximated by selecting ZIP Code Tabulation Areas (ZCTAs) defined by the U.S. Census Bureau. Overlay a map of ZIP codes onto a map of the study area using commercial mapping software. Some ZIP codes may clearly be within the study area. Other ZIP codes may be partially within the study area and partially outside the study area. For each of these latter ZIP codes, the proportion of the population that lies within the study area should be estimated by summing the population of the 2010 census blocks whose geographic centers (centroids) fall within the study area. ZIP codes with greater than 50% of the population within the study area should be included. (If necessary [e.g., in rural areas with large ZIP codes], you may adjust the criterion to 40-45% of the population.)

b. *Comparison areas.* Use all of the following comparison areas. Areas 1-3 and 5 are included in the Report of the Health Outcome Data Work Group and in the previous guidance; area 4 was added in 6 NYCRR Part 487.

   1) The county in which the study area is located. If the study area is located in more than one county, use each of those counties as a separate comparison area; there will be multiple county comparison areas.

   2) A large regional comparison area. If the study area is in New York City, use New York City. If the study area is located outside of New York City, use New York State excluding New York City.

   3) An area, composed of ZIP codes, with population density similar to that of the impact study area and located in the same general geographic area (e.g., county or contiguous counties). See method below.

   4) A comparison area composed of the ZIP codes that surround the study area. These ZIP codes will be contiguous with the study area.

   5) If specific alternative locations for the facility are being considered, each alternative location should be a comparison area composed of ZIP codes.

c. *Selecting ZIP codes for the population density comparison area.* Population per square mile is one of the fields in the table of demographic data to be prepared for the impact study area and each comparison area (see Section II. Generating the table of demographic data). While accessing data for this table, you should also download area (land) and population for every ZIP code (ZCTA) in the county (or counties) containing the impact study area. Calculate the population per square mile for each ZIP code. Choose ZIP codes (ZCTAs) within the relevant county (or counties) that have population per square mile that is ±10% of that of the impact study area. (If there are no ZIP codes in that range, you may have to use ±15% or ±20 %.) A reasonable number of ZIP codes is six to eight, but in some areas there may be more or fewer.

d. *Selecting ZIP codes for the surrounding ZIP codes comparison area*. Choose those ZIP codes that surround the impact study area ZIP codes.

E. Selection of Health Outcomes for Display

The following health outcome data should be used in the data display and analyses since they are currently available as counts and rates at the ZIP code level on the NYSDOH web site. (These data meet the criteria discussed in the Report of the Health Outcome Data Work Group.) The most recent data available are posted on the web site and should be used. Since the last guidance document was issued, data on low birth weight and asthma emergency department visits have become available by ZIP code. It is recommended to use emergency department visit data rather than asthma hospital discharge data because asthma emergency department visits are more

frequent than asthma hospital discharges, leading to potentially more stable rates for statistical testing. It is anticipated that additional health outcome data at the ZIP code level will become available in the future and will be added to the list.

1. Emergency department visits for asthma from SPARCS available at New York State Asthma Dashboard (ny.gov) (find sub-county data links under data views column) Asthma Emergency Department Visits in New York State by County and ZIP code); includes admission to the hospital directly from the emergency department with admitting diagnosis of asthma (ICD-9-CM code 493) and outpatient emergency department visits with principal diagnosis of asthma (ICD-9-CM code 493)

2. Cancer incidence for male and female colorectal, female breast, male and female lung and bronchus, and male prostate cancer from the New York State Cancer Registry available at http://www.health.ny.gov/statistics/cancer/registry/zipcode/index.htm

3. Low birth weight from the New York State County/ZIP Code Perinatal Data Profile available at http://www.health.ny.gov/statistics/chac/perinatal/index.htm

F. Health Outcome Data Displays

The tables in the examples in **Section III** provide examples of health outcome data displays with the most recently available data. Use the age and gender groupings shown for each health outcome when creating health outcome data tables.

When data are divided into many categories, the number of events in each cell of the table becomes smaller. In highly populated areas or when the health outcome is relatively common, this may not present a problem. However, if the outcome is rare or the population is small, the number of events in some cells of the table may become so small that rates based on these events may be unstable and fluctuate dramatically from year to year. A discussion of the issue can be found at the NYSDOH web site at Rates Based on Small Numbers. A graph is included which shows that with 20 cases, the relative standard error (a measure of statistical uncertainty or random variability around the rate estimate) is 20% and with 10 cases it is 30%. One should be cautious about drawing conclusions from rates based on small numbers of events because, due to the influence of random variability, they may not reliably represent the underlying risk of disease.

These general guidelines should be followed when displaying data:

- Do not display information in a way that could identify an individual and constitute a breach of confidentiality. A count of one or two events in a small population could unintentionally disclose confidential information. For example, if there is one person in a small community who is frequently hospitalized, a table that shows one case of a serious illness, such as cancer, in this community could inadvertently reveal confidential information.

- Avoid the presentation of rates for cells with 10 or fewer events. Cells with 10 or fewer events should be displayed, but rates based on 10 or fewer cases may be unstable and should be interpreted cautiously. When possible, combine the number of cases over several years so that the rates are based on a larger number of cases. For example, use three-year or five-year average annual rates instead of single-year rates. It may also be possible to combine the number of cases across geographic areas to obtain a larger number of cases, for example, by combining ZIP codes or using the rate for a county; however, in the process the ability to characterize the health status of the specific geographic area of interest may be lost. If rates based on 10 or fewer cases are displayed, highlight these rates with a footnote stating that these rates may be unstable.

- If there are enough cases that small numbers are not an issue, the data can be displayed in sub-categories as appropriate:
    - If the outcome has differences in rates between males and females, the data should be displayed separately for males and females, e.g., cancer.
    - If there are known differences in rates by specific age groups, these age groups should be used when displaying the data, e.g., asthma rates are higher in children 0-4 years of age.
    - If reliable data are available by race/ethnicity and there are known differences in rates by race/ethnicity, the data should be displayed by race/ethnicity.

- The categories used to display data for specific outcomes at the New York State Department of Health web site (http://www.health.ny.gov) or the U.S. Centers for Disease Control and Prevention web site (http://www.cdc.gov) may be used as a guide.

G. Data Comparisons

In accordance with the recommendations of the Report of the Health Outcome Data Work Group, rate ratios and confidence intervals are calculated to compare disease rates between the impact study area and comparison areas. The rate ratio is the ratio of the rate in the impact study area to the rate in the comparison area. When the two rates being compared are the same, then the ratio is equal to 1.0. When the rate is higher in the impact study area than in the comparison area, the ratio is greater than 1.0, and when the rate is lower in the impact study area than in the comparison area, the ratio is less than 1.0.

When the two rates are compared, a confidence interval can be calculated to gain a sense of certainty about the estimated difference between the rates. The confidence interval is the range around the ratio in which the true measurement lies with a certain degree of confidence. The confidence interval is a measure of the variability in the data; in this case variability is contributed by the two rates in the ratio. One reason for variability is because there are random fluctuations in the number of cases in an area over time or between different communities. If there were little variability (i.e., the rates were relatively stable), the value of the ratio would be close to the same if the measurement were repeated.

Confidence intervals can be calculated using commercial statistical software or spreadsheet software. **Section IV** contains the formulas for calculating confidence intervals and a link to pre-

programmed spreadsheets for calculating confidence intervals when working with the asthma, low birth weight, and cancer data described in this document.

A confidence interval that does not include the number 1 provides an indication that the difference between the rates being compared is not likely to be due to the random-like variability mentioned above. If the confidence interval includes the number 1, then the difference in the two rates is likely to be due to random variability. (More information on confidence intervals can be found at the web sites http://www.doh.wa.gov/DataandStatisticalReports/DataSystems/HealthyYouthSurvey/TechnicalNotes/ConfidenceIntervals and http://www.health.ny.gov/diseases/chronic/confint.htm and in Appendix F of the 2006 Report of the Health Outcome Data Work Group).

The use of rate ratios and confidence intervals is best shown in the examples in **Section III**; the impact study area in Example 1 is in an urban area, and the impact study area in Example 2 is in a rural area. In the examples, comparison areas for the impact study area are selected, and tables for asthma emergency department visits, four types of cancer, and low birth weight in the impact study area and the comparison areas are developed. For asthma and low birth weight, rates in the impact study area are compared to those in the comparison areas. For cancer, a different type of comparison is conducted.

The following sections describe the methods for displaying and comparing data for asthma emergency department visits, cancer incidence, and low birth weight.

a. Asthma emergency department visits.

Impact study area and ZIP code comparison areas. ZIP code data for asthma ED visits are collected as part of SPARCS and are available at New York State Asthma Dashboard (ny.gov) (find sub-county data links under data views column). The asthma ED visit data include patients admitted to the hospital from the ED and patients seen in the ED but not hospitalized. At the DOH website, data are presented for age groups and the total population of the ZIP code. Use the following age groups: 0-4 years, 0-17 years, 18-64 years, 65+ years, and total population. The sum of the last three age groups is the total population; the 0-4 years age group is included because asthma ED visit rates are higher in this age group, particularly in low income and minority areas. The DOH data tables display, for each ZIP code, the number of asthma ED visits during a three-year period and the average annual rate of asthma ED visits per 10,000 population per year. Select these fields for each ZIP code in the impact study area and in each ZIP code comparison area and copy data to a spreadsheet or database. For each ZIP code calculate the average annual population for each age group and the total population as follows and create a column for average annual population:

$$\text{Average annual population} = \frac{\text{no. of asthma ED visits over 3 years}/3}{\text{asthma ED visit rate}} \times 10{,}000$$

For the impact study area and each ZIP code comparison area, calculate the number of ED visits and the population for each age group and the total population by summing the data for the

individual ZIP codes. For the impact study area and each ZIP code comparison area, calculate the average annual rate of ED visits per 10,000 population for each age group and the total population as follows:

Average annual rate of asthma ED visits per 10,000 population	=	no. of asthma ED visits over 3 years/3 average population	X	10,000

The rate ratio is the rate in the impact study area divided by the rate in the comparison area. Calculate confidence intervals using the method described in **Section IV**, using the appropriate spreadsheet provided.

County and regional comparison areas. For the county comparison area, do not use the county total in the asthma ZIP code data tables because data may not be displayed for ZIP codes with small numbers of cases and there may be problems with ZIP codes that cross county lines. Access data tables on Asthma Emergency Department Visits by region and county at New York State Asthma Dashboard (ny.gov) (find sub-county data links under data views column) for the county or counties of interest. Use the following age groups: 0-4 years, 0-17 years, 18-64 years, 65+ years, and total population. The DOH data tables display, for each county, the number of asthma ED visits for each of three years and the three-year total, the average population for the three years, and the average annual rate of asthma ED visits per 10,000 population per year. Select and copy data for the relevant counties to your spreadsheet or database.

If New York State is the regional comparison area, select and copy the data for New York State, which is the last line of the region/county table. If New York City is the regional comparison area, select the Region 7 New York City, Region Total, and copy the data from the table. If New York State exclusive of New York City is the regional comparison area, you will have to deduct the number of ED visits in New York City from the number of ED visits in New York State to calculate the number of ED visits in New York State exclusive of New York City. Perform a similar calculation to get the average population for the three-year period for New York State exclusive of New York City. Calculate the average annual rate of asthma ED visits per 10,000 population per year for New York State exclusive of New York City for each age group and the total population as follows:

Average annual rate of asthma ED visits per 10,000 population for New York State exclusive of New York City	=	no. of asthma ED visits over 3 years/3 average population	X	10,000

The rate ratio is the rate in the impact study area divided by the rate in the comparison area. Calculate confidence intervals using the method described in **Section IV**, using the appropriate spreadsheet provided.

b. Cancer incidence.

Tables showing cancer incidence by ZIP code for female breast, lung, colorectal, and prostate cancers are available at the NYSDOH web site http://www.health.ny.gov/statistics/cancer/registry/zipcode/index.htm. These data are tabulated in a different way from the asthma emergency department visit data discussed in the previous section. With the asthma data, the data are presented by age group, and the number of visits and rate are provided. For the cancer data, the number of cases of the specific type of cancer in the total population of the ZIP code (all ages) is presented as the observed number. For each ZIP code an expected number of cases of all ages is shown. The cancer rate for the entire state of New York and the number of people in a ZIP code are used to estimate the number of people in each ZIP code that would be expected to develop cancer within a specified five-year period if the ZIP code had the same rate of cancer as the state (for more information, see "Frequently Asked Questions" at http://www.health.ny.gov/statistics/cancer/registry/zipcode/faq.htm). Age and population size are taken into consideration when determining the expected number; this process is called age-adjustment.

For some ZIP codes in the cancer tables, there were too few cases to be shown for confidentiality reasons. These ZIP codes are combined with neighboring ZIP codes, and data are provided for the combined groups of ZIP codes. In sparsely populated areas, ZIP codes are frequently combined. If a ZIP code in the study area or a comparison area has been combined with other ZIP codes, include these additional ZIP codes in the study area or comparison area and make note in the text and table notes of these additional ZIP codes.

Because of the way the cancer data are presented, the cancer data for the impact study area cannot be compared directly to the cancer data for the comparison areas; instead, since the expected number of cases is based on the cancer rate for New York State, the state is the comparison area for the impact study area and for the three areas that are referred to as comparison areas. From the cancer incidence by ZIP code table, for each site of cancer, copy to your spreadsheet the number of cases observed and the number of cases expected for each ZIP code in the impact study area and ZIP code comparison areas. Calculate the total numbers of cases observed and total number of cases expected for the impact study area, the population density ZIP code comparison area, and the surrounding ZIP codes comparison area. Calculate the standardized incidence ratio (SIR), which is the ratio of the number of cases observed to the number of cases expected. Calculate confidence intervals using the method described in **Section IV**, using the appropriate spreadsheet provided.

To obtain the observed and expected numbers for the county, you must sum the observed and expected numbers for the ZIP codes. If there is a notation that one or more ZIP codes cross county boundaries, the ZIP code(s) should be included in your county total. However, if you are summing ZIP codes to create a New York City comparison area (five counties), you must be careful to count a ZIP code that crosses county lines only once in the New York City total. (It will be listed in more than one county.) The same will be true when summing ZIP codes to create a comparison area that is New York State excluding New York City. For assistance with summing ZIP codes to create these large comparison areas, contact DOH at beoe@health.ny.gov (reference EJ health data review and facility name).

c. *Low birth weight (LBW)*

Impact study area and ZIP code comparison areas. The percent of LBW births during a three-year period by ZIP code is included in Perinatal Data Profiles at the DOH website http://www.health.ny.gov/statistics/chac/perinatal/index.htm. Some ZIP codes are not included in the table because there are fewer than 10 births in the three-year period. If a ZIP code in the study area or in a comparison area is not included in the table, leave this ZIP code out, noting the exclusion in the text and table notes, and use the data for the other ZIP codes.

The Perinatal Data Profiles also include the total number of births in each ZIP code during the three-year period, allowing for the calculation of the number of LBW births in each ZIP code. Using this information, ZIP codes can be combined and the percentage of LBW births can be calculated for the impact study area and each ZIP code comparison area. A rate ratio can then be calculated for each comparison.

From the Perinatal Data Profile for each relevant county, copy to a spreadsheet the number of total births and the percentage of LBW births for each ZIP code in the impact study area and in each ZIP code comparison area. From these two numbers, calculate the number of LBW births in each ZIP code, and round to the nearest whole number:

$$\text{No. LBW births} = \frac{\text{Percent LBW X number of births}}{100}$$

Calculate the total number of LBW births and total number of births in the impact study area and in each ZIP code comparison area by summing data for the relevant ZIP codes. Calculate the percent LBW in the impact study area and each ZIP code comparison area by dividing the number of LBW births by the number of births, and multiplying by 100. Calculate the rate ratio for each ZIP code comparison area by dividing the percent LBW in the impact study area by the percent LBW in the comparison area. Calculate confidence intervals using the method described in **Section IV**, using the appropriate spreadsheet provided.

County comparison area. The last row of each County Perinatal Data Profile provides the number of total births and percentage of LBW births for the county; from these data calculate the number of LBW births as described above. Calculate the rate ratio and the 95% confidence intervals as described above.

Regional comparison area. For New York City and New York State exclusive of New York City, the number of births during a three-year period and percent LBW births can be found in the New York State Regional Perinatal Data Profile at http://www.health.ny.gov/statistics/chac/perinatal/index.htm. Calculate the rate ratio by dividing the percent LBW in the impact study by the percent LBW in the relevant regional comparison area. Calculate confidence intervals using the method described in **Section IV**, using the appropriate spreadsheet provided.

H. Discussion and Conclusions

When evaluating the results of the analyses, we focus on the rate ratios (greater than 1.0 or less than 1.0), the number of comparisons for which rate ratios are greater than 1.0, and the confidence intervals around the rate ratios (whether or not 1.0 is excluded). We also look at the number of health outcomes for which we see higher rates in the study area and consider the specific types of health outcomes that show elevations.

The 2006 Report of the Health Outcome Data Work Group indicates that the health outcome data are to be considered as part of the permitting process, recognizing that the data provide no information about the causes of any increase or decrease in rates between the study area and comparison area populations. The more often the observations fall into the same pattern, the greater the likelihood that the observations suggest a real difference in health status between the study area and comparison area populations. The report states that, if any of the following conditions are met, consideration of additional options for the permitting conditions should be reviewed as part of the permitting process because of the health outcome data displays and comparisons. The greater the number of conditions that are met, the greater the likelihood is that the health status of the study area is actually lower than that found in other areas.

1) A disease rate is higher in the study area than in any comparison area population for any health outcome;
2) A disease rate is higher in the study area than in multiple comparison area populations for any health outcome;
3) The confidence intervals are greater than 1.0 (A greater elevation in health outcome in the study area compared to the comparison area population and a larger number of events will increase the likelihood that the confidence interval will not include 1.0.);
4) There is a pattern of higher rates of multiple health outcomes in the study area; and
5) Health outcomes that result from an acute exposure (e.g., asthma exacerbations) are elevated rather than those that result from a chronic exposure (e.g., cancer). Health outcomes resulting from an acute exposure may be more relevant to current place of residence than those that result from a chronic exposure. For a chronic effect such as cancer, a crucial exposure or risk factor may have occurred decades earlier when the individual resided at a different location.

The information on the health status of the community provides a more complete picture of the area under study and may suggest the need for action, including more stringent permit conditions, voluntary pollution reduction, or other corrective measures. Therefore, the health outcome data displays and comparisons should be used in making a permitting decision along with other considerations such as regulatory standards, environmental impacts, mitigation, benefits, needs, and costs. The significance of the difference between the study area and the comparison area populations should be considered in determining which action is appropriate. Possible actions may include, but are not limited to:

- Considering alternative siting locations**,** especially outside of the study area;

- Applicant evaluation and implementation of pollution prevention options, such as chemical substitution; changes in work practice standards, such as evaluating ways to reduce fugitive emissions; emission reductions by the installation of best available control technology to achieve the lowest achievable emission rates (LAER) possible; the implementation of holistic environmental management system; or the purchase of emission reduction credits.

- Providing assistance beyond the permit review process by using agency regulatory authority to evaluate the feasibility of reducing existing exposures from other sources that may be contributing to a health outcome of concern, such as obtaining offsets from other sources of air pollution in the study area;

- Providing assistance that may be beyond the permit review process by using agency regulatory authority to prevent, diagnose, monitor or treat the health outcome of concern or improve health status of the study area; and

- Taking no action based on the results of the health outcome comparisons.

Outside of these recommendations, there are state and federal environmental justice grant programs for community groups that could enter into partnerships with government, business, and the academic sector to work on projects to address local environmental and/or public health concerns (see http://www.dec.ny.gov/public/31226.html and https://www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance). Regardless of which options are considered, the local and state health departments may be able to identify services that might improve the health status of the study area.

SECTION II. Generating the Table of Demographic Data

ELEMENTS IN THE TABLE (see sample demographic tables in examples in **Section III** and summary table at the end of this section)

- Total population
- Population per square mile
- Number of households
- Sex: percent male and percent female
- Age distribution (%): less than five, 5-14, 15-19, 20-44, 45-64, and 65+ years
- Race/ethnicity (%):
  - One race
    - White
    - Black or African-American
    - American Indian/Alaska Native
    - Asian
    - Hawaiian/Pacific Islander
    - Some other race
  - Two or more races
  - Hispanic or Latino (of any race) (%)
  - Total minority (%)
- Income
  - Median household income ($)
  - Persons below poverty (%)

INSTRUCTIONS FOR A SINGLE ZIP CODE TABULATION AREA (ZCTA)

Step 1: Go to the U.S. Census website at https://www.census.gov/ . On the top menu bar, select Data > Data Tools and Apps > American FactFinder

Step 2: Use Community Facts and enter the ZCTA in the search box.
Under Population (2010 Census), select General Population and Housing Characteristics (Population, Age, Sex, Race, Households and Housing…). From this table you should acquire:

- Total population
- Sex: percent male and percent female
- Age distribution (%): **combine age groups** so that you have these groups – less than five, 5-14, 15-19, 20- 44, 45-64, and 65+ years
- Race/ethnicity (%):
  - One race
    - White
    - Black or African-American
    - American Indian/Alaska Native
    - Asian
    - Hawaiian/Pacific Islander
    - Some other race
  - Two or more races
  - Hispanic or Latino (of any race) (%)
  - Total minority (%): calculate by subtracting the percentage of "Not Hispanic or Latino-White Alone" from 100%

Step 3: Return to Community Facts (if you have to, enter the ZIP code again). Under Income, select American Community Survey, **Income in the Past 12 Months (Households, Families...)** (table S1901 ACS 5-year estimates). Find Total (number of households) and Median Income (dollars) – Households

Step 4: Return to Community Facts (if you have to, enter the ZIP code again). Under Poverty, select American Community Survey, **Poverty Status in the Past 12 Months (Age, Sex, Race, Education, Employment...)** (table 1701 ACS 5-year estimates). Find Population for whom poverty status is determined – percent below poverty level.

Step 5: To calculate population per square mile, you will acquire ZCTA land areas. Go to American FactFinder >**Advanced Search**, click "show me all"

Step 6: In the box for "Topic or Table name," enter G001
Select the table listed below and click View

Table	ID	Dataset
Geographic Identifiers	G001	*2010 SF1 100% Data*

Step 7: Click the **Geographies** tab on the left
Under **Geographic type**: select 5 Digit ZIP Code Tabulation Area
Under **State**: select NY
Under **One or more geographic areas**: select the ZCTA of interest, click "add to your selections," and close the box

Step 8: Click View. Find the row for Area (land) under AREA CHARACTERISTICS. This will give you the area in square meters. To convert it to square miles, **divide by 2,589,988**. Divide the Total population of the ZCTA (acquired previously) by the area to get population per square mile.

INSTRUCTIONS FOR MULTIPLE ZCTAs

Demographic information on population age, race, sex

Step 1: Go to the U.S. Census website at https://www.census.gov/ . On the top menu bar, select Data > Data Tools and Apps > American FactFinder. Select Guided Search.
Step 2: Select Get Me Started and choose **I'm looking for information about people**

Step 3: From **Topics** Select >Basic Counts/Estimates > Population Total

Step 4: From **Geographies,** use the second option.
Under **Geographic type**: select 5 Digit ZIP Code Tabulation Area
Under **State**: select NY
Under One or more geographic areas: Select the ZCTAs of interest
(use <Ctrl> + <Caps Lock> to select multiple ZCTAs)
Click **"Add to Your Selections,"** then **"Next"**

Step 5: Click "**Skip this step"**

Step 6: Select the table listed below and click view

Table	ID	Dataset
Profile of General Population and Housing Chars:2010	DP-1	*2010 SF1 100% Data*

Step 7: To download the data
Click Modify table tab and uncheck the Percent box at the top of the table
Click on the Download tab
Select Comma delimited (.csv) format

- Data and annotations in a single file
- ✓ Include descriptive data element names

The file will be downloaded as .zip file. Unzip the file and open the file named "DEC_10_SF1_SF1DP1_with_ann.csv" in MS Excel. Rename and save as an MS Excel file since the census download reuses the same name for subsequent downloads.

Step 8: The columns of interest can now be summarized to tabulate the total population, number of households, and the percentages of the age/race/sex groups. To calculate total minority (%), subtract the percentage of "Not Hispanic or Latino-White Alone" from 100%.

Information on poverty and median household income

Step 1: Go to American FactFinder> **Advanced Search**, click "show me all"

Step 2: In the box for "Topic or Table name," enter both S1701 and S1901, click Go. From the list, **s**elect the following tables/datasets

Table	ID	Dataset
Poverty Status in Past 12 Months	S1701	*2011 ACS 5-Year Estimates*
Income in the past 12 Months	S1901	*2011 ACS 5-Year Estimates*

Step 3: Click the **Geographies** tab on the left

Under **Geographic type**: select 5 Digit ZIP Code Tabulation Area

Under **State**: select NY

Under **One or more geographic areas**: select the ZCTAs of interest (use <Ctrl> + <Caps Lock> to select multiple ZCTAs)

Click **Add to Selections**, then close this box

The tables and ZCTAs should be showing up under the "Your Selections" box in the upper left-hand corner.

Step 4: Select the check boxes next to each of the two tables listed in Step 2 and select View from the tabs on top

Step 5: For the Poverty table

- Select the modify table tab on top and uncheck all Margin of error and Percent below poverty estimate columns
- You should end up with two columns under each ZCTA – One with the "Total" Population and one with the "Below poverty level" population
- You are interested in the line "Population for whom poverty status is determined"
- At this point you can copy and paste the column headings and data into a spreadsheet or you can go through the download procedure outlined above

Step 6: For the Household income

- In the same table viewer Select result 2 of 2 (Arrows on top right of Viewer)
- Select the modify table tab on top and uncheck columns except for household estimate (the first column) for each ZCTA
- You can also unselect some rows so you just have "Total" (number of households) and "Median Income - households"
- You should end up with one columns under each ZCTA with the number "Households" and median income
- At this point you can copy and paste the column headings and data into a spreadsheet or you can go through the download procedure outlined above
- To calculate percent below poverty of a group of ZCTAs, sum the Population below poverty level for the individual ZCTAs and divide by the Total population for which poverty was determined for the group of ZCTAs (multiply by 100)
- To calculate the median household income of a group of ZCTAs, take a weighted average of the median household income of each ZCTA weighted by the number of households in the ZCTA (the weights are the number of households in a ZCTA divided by the total number of households in all ZCTAs – these weights should add up to 1.0).

Calculation of population/square mile

Step 1: Go to American FactFinder> **Advanced Search**, click "show me all"

Step 2: In the box for "Topic or Table name," enter G001
Select the table listed below and click view

Table	ID	Dataset
Geographic Identifiers	G001	*2010 SF1 100% Data*

Step 3: Click the **Geographies** tab on the left
Under **Geographic type**: select 5 Digit ZIP Code Tabulation Area
Under **State**: select NY
Under **One or more geographic areas**: select the ZCTAs of interest (use <Ctrl> + <Caps Lock> to select multiple ZCTAs)
Click "**Add to Selections**," then close this box

Step 3: Click View. Find the row for Area (land) under AREA CHARACTERISTICS. This will give you the area in square meters. Copy and paste the appropriate rows or download as described above. (The population per square mile will be used individually for each ZCTA in the county to determine the ones most similar to the impact study area. They will also be combined to determine the overall population per square mile of the comparison areas.)

Step 4: To get the area per square mile, divide the area per square meter **by 2,589,988**. To calculate the population/square mile of a group of ZCTAs, find the sum of the populations of the individual ZCTAs to find the Total population. Sum the area in square miles of the individual ZCTAs to get the Total area in square miles. Divide the Total population by the total area to get the Total population per square mile.

COUNTY AND REGIONAL COMPARISON AREAS

The same process can be followed to obtain demographic data for the county and regional comparison areas, except that the geographic unit will be the county. For New York City or New York State exclusive of New York City, counties will have to be combined.

SUMMARY TABLE: additional notes for generating the table of demographic data.

Element	Source (U.S. Census American FactFinder)	Notes
Total population	Table DP-1 (SF-1)	
Population per square mile	Table G001 (SF-1)	To convert square meters to square miles divide by 2,589,988
Number of households	Table S1901 - 2011 ACS 5-Year Estimates	
Sex (%)	Table DP-1 (SF-1)	
Age distribution (%)	Table DP-1 (SF-1)	Combine age groups to display six groups: less than 5, 5-14, 15-19, 20-44, 45-64, 65+
Race/ethnicity (%)	Table DP-1 (SF-1) for one race (White, African-American, American Indian/Alaskan, Asian, Hawaiian/Pacific Islander, some other race), two or more races, and Hispanic or Latino (of any race).	Show percent one race (subdivided into White, African-American, American Indian/Alaskan, Asian, Hawaiian/Pacific Islander, and some other race) and two or more races (this will yield 100%, except for rounding). Show percent Hispanic or Latino (of any race). Calculate percent minority by subtracting the percentage of "Not Hispanic or Latino-White Alone" from 100%.
Median household income ($)	Table S1901 - 2011 ACS 5-Year Estimates	For multiple ZCTAs - weight the median household income of each ZCTA by the # of households in the ZCTA/ total # of households in all ZCTAs
Persons below poverty (%)	Table S1701 - 2011 ACS 5-Year Estimates	Use the "Population for whom poverty status is determined" field

SECTION III. Examples

A. Example 1

a. Impact study area. The impact study area chosen for this example is ZIP code 11105, which is located in Astoria in Queens County. This ZIP code includes areas identified by NYSDEC as Potential Environmental Justice Areas (see CP-29 and County Maps Showing Potential Environmental Justice Areas). This impact study area is in New York City.

b. Comparison areas. Four comparison areas were selected to evaluate the disease rates in the impact study area in the context of a number of different settings (*see Section I.D Impact Study Area and Comparison Areas*).

1. A comparison area made up of ZIP codes in Queens County that are similar to ZIP code 11105 in population density. This area may be similar to ZIP code 11105 in land use and urban/rural characteristics.
2. A comparison area that is composed of the ZIP codes surrounding ZIP code 11105.
3. Queens County, which is the county that contains ZIP code 11105. This is a larger area and represents average health status, but it is smaller than New York City and will be familiar to the community because it is in close proximity to the study area.
4. New York City is a large area chosen to represent the average health status.

Two of these comparison areas are made up of ZIP codes. The ZIP codes for the population density comparison area were chosen by the method described in Section II.D Impact Study Area and Comparison Areas: ZIP codes 11412, 11418, 11420, 11423, 11428, 11429, and 11436. The following ZIP codes are in the surrounding ZIP codes comparison area: 11102, 11103, 11370, and 11377. The other two comparison areas are Queens County and New York City.

c. Table of demographic data. **Table A1** displays demographic information for the impact study area and the four comparison areas (*Section II. Generating the Table of Demographic Data*). The table at the end of Section II indicates the specific Census files to be used to complete the table. Note that the definition of a minority population included in NYSDEC's CP-29 is used: a population that is identified or recognized by the U.S. Census Bureau as Hispanic, African American or Black, Asian and Pacific Islander, or American Indian. This definition includes both race and ethnicity.

d. Asthma emergency department (ED) visits. Instructions for display and analysis of asthma ED visits are included in Section I.G. **Table A2** displays asthma ED visit data for 2010-2012 for four age groups and the total population (0-65+ years) for ZIP code 11105 (part 1) and four comparison areas (parts 2-5). Parts 2-5 also provide rate ratios and 95% confidence intervals (CI). The rate ratio compares the rate in ZIP code 11105 to that in the specified comparison area. In the last row of Table A2, showing the data for all age groups combined, all rate ratios are less than 1.0, indicating that the asthma ED visit rate is lower in the study area than in each comparison area. For some age group comparisons,

rate ratios are greater than 1 (ZIP codes surrounding ZIP 11105, 65+ years; Queens County, 65+ years). However, the CIs include 1.0, indicating that the difference between the rates may be due to random fluctuation.

e. Cancer incidence. Instructions for display and analysis of cancer incidence data are included in Section I.G. Data are for the years 2005-2009. **Table A3** displays incidence of breast cancer in females, colorectal cancer in males and females, lung cancer in males and females, and prostate cancer in males for the impact study area ZIP code 11105, the two ZIP code comparison areas, and Queens County. The comparison for cancer data is different from that used for asthma ED visit data in Table A2 in that the cancer data for ZIP code 11105 are not compared directly to the cancer data for the comparison areas; instead the number of observed cancer cases in ZIP code 11105 is being compared to the expected number of cases for ZIP code 11105, which is calculated based on the cancer rate for New York State. Similarly, the number of observed cases in each comparison area is compared to the number of cases expected in that comparison area, which is calculated based on the cancer rate for New York State. In this table, the ratio represents the ratio of the observed number of cases to the expected number of cases. Because the data have been age adjusted, the ratios are standardized incidence ratios (SIRs). (The SIRs in the table should not be compared with each other because of the different age distributions of the populations of each area.)

The SIRs in Table A3 for the study area (ZIP code 11105) show that the SIRs for all the cancer sites are less than 1.0, indicating that the number of cases observed was lower than the number expected based on cancer rates in New York State. Some of the CIs exclude 1.0, and others include 1.0, indicating that some of the differences may be due to random variation. When the SIRs for the other areas (ZIP codes with similar population density to ZIP code 11105, ZIP codes surrounding ZIP code 11105, and Queens County) are examined, almost all of the SIRs are less than 1.0 (or close to 1.0) and the CIs include 1.0. For prostate cancer in ZIP codes with similar population density to ZIP code 11105 (shown in bold type), the SIR is greater than 1.0 and the CI excludes 1.0, indicating that the number of prostate cancer cases observed in this area was greater than the number expected based on the prostate cancer rate in New York State, and the difference is not likely due to chance.

f. Low birth weight (LBW). Instructions for display and analysis of LBW data are in Section I.G. **Table A4** shows the LBW data for 2009-2011 for ZIP code 11105 and the four comparison areas. The rate ratio compares the rate of LBW births in ZIP code 11105 to that in the specified comparison area. All of the rate ratios are less than or close to 1.0. The CIs include 1.0, indicating that the differences could be due to random variation.

B. Example 2

a. Impact study area. For the second example, an impact study area in Allegany County in western New York State was chosen. The study area is composed of ZIP codes 14735 and 14744. These ZIP codes includes areas identified by NYSDEC as Potential

Environmental Justice Areas (see CP-29 and County Maps Showing Potential Environmental Justice Areas). This impact study area is outside of New York City.

b. Comparison areas. Four comparison areas were selected to have enough information to evaluate the disease rates in the study area in the context of a number of different settings (*see Section I.D Impact Study Area and Comparison Areas*).

1. A comparison area made up of ZIP codes in Allegany County and contiguous counties that are similar to ZIP codes 14735 and 14744 in population density. This area may be similar to ZIP codes 14735 and 14744 in land use and urban/rural characteristics.
2. A comparison area that is composed of ZIP codes surrounding ZIP codes 14735 and 14744.
3. Allegany County, which is the county that contains ZIP codes 14735 and 14744. This is a larger area and represents average health status, but is a smaller area than New York State excluding New York City and will be familiar to the community because it is in close proximity to the study area.
4. New York State excluding New York City is a large area chosen to represent the average health status.

Two of these comparison areas are made up of ZIP codes. The ZIP codes for the population density comparison area were chosen by the method described in Section II.D Impact Study Area and Comparison Areas: ZIP codes 14065, 14711, 14737, and 14777. The following ZIP codes are in the surrounding ZIP codes comparison area: 14024, 14060, 14065, 14066, 14536, 14709, 14711, 14717, 14777, 14836, and 14846. The other two comparison areas are Allegany County and New York State excluding New York City.

c. Table of demographic data. **Table B1** displays demographic information for the impact study area and the four comparison areas (*Section II. Generating the Table of Demographic Data*). The table at the end of Section II indicates the specific Census files to be used to complete the table. Note that the definition of a minority population included in NYSDEC's CP-29 is used: a population that is identified or recognized by the U.S. Census Bureau as Hispanic, African American or Black, Asian and Pacific Islander, or American Indian. This definition includes both race and ethnicity.

d. Asthma emergency department (ED) visit data. Instructions for display and analysis of asthma ED visits are included in Section I.G. **Table B2** displays asthma ED visit data for 2009-2011 for the impact study area and the four comparison areas. ZIP codes 14735 and 14744 are sparsely populated, with only 45 asthma ED visits among residents of all ages during the three-year period 2009-2011. Data are not broken down into age groups because of the small number of ED visits. Table B2 also displays rates, rate ratios, and 95% CIs. The rate of asthma ED visits is lower in the impact study area than the rate in each of the four comparison areas. All of the CIs except for one exclude the numeral 1.0 indicating that, for most of the comparisons, the difference between the rates is not likely due to random fluctuation. The conclusion that can be drawn from Table B2 is that the

asthma ED visit rate in the study area during this period was lower than the rate in an area with similar population density, the rate in the surrounding ZIP codes, the rate in Allegany County, and the rate in New York State excluding New York City.

e. Cancer incidence. Instructions for display and analysis of cancer incidence data are included in Section I.G. Data are for the years 2005-2009. As discussed in Example 1, observed and expected numbers of cancer cases are tabulated by ZIP code for certain cancer sites at the NYSDOH web site (http://www.health.ny.gov/statistics/cancer/registry/zipcode/index.htm). When there are too few cases to be shown for confidentiality reasons, the New York State Cancer Registry combines ZIP codes with neighboring ZIP codes and provides the data in maps and tables for the combined groups of ZIP codes.

Table B3 displays incidence of breast cancer in females, colorectal cancer in males and females, lung cancer in males and females, and prostate cancer for the years 2005-2009. In the NYSDOH cancer data tables, an additional ZIP code has been combined with ZIP code 14735; therefore, the study area for this analysis includes ZIP codes 14735 and 14744 plus the additional ZIP code 14745. The population density comparison area includes seven ZIP codes rather than four because three additional ZIP codes were combined with a ZIP code that was selected for this comparison area. For the surrounding ZIP codes comparison area, 11 ZIP codes had been selected; because some ZIP codes were combined in the NYSDOH cancer data tables, this comparison area now includes 16 ZIP codes.

As discussed in the previous example, Table B3 is different from the table of asthma ED visits in that the cancer data for the study are not compared directly to the cancer data for the comparison areas. Instead the number of observed cancer cases in the study area is being compared to the expected number of cases for the study area, which is calculated based on the cancer rate for New York State. Similarly, the number of observed cases in each comparison area is compared to the number of cases expected in that comparison area, which is calculated based on the cancer rate for New York State. In Table B3, the ratio represents the ratio of the observed number of cases to the expected number of cases. Because the data have been age-adjusted, the ratios are SIRs. (The SIRs in the table should not be compared with each other because of the different age distributions of the populations of each area.)

The SIRs in Table B3 for the study area (ZIP codes 14735 and 14744 plus another ZIP code) show that the SIRs for all the cancer sites are less than 1.0 or close to 1.0, indicating that the number of cases observed was lower than (or similar to) the number expected based on cancer rates in New York State. There were very few colorectal cancers in males or females and very few lung cancers in females in the study area during this period. With such small numbers of cases, an increase or decrease of one or two cases per year can cause a dramatic fluctuation in the rate; thus, the rates for these sites of cancer are considered too unstable for analysis and should be interpreted with caution.

In the second part of Table B3 (ZIP codes with similar population density to the impact study area), the SIRs are greater than 1.0 but the CIs include 1.0. This indicates that the observed numbers of cases are greater than those expected based on the cancer rates in New York State, but the differences could be due to random variation.

In the third part of Table B3 (ZIP codes surrounding the impact study area), some SIRs are greater than 1.0, but only one CI excludes 1.0 (in bold type). For female breast cancer, the number of cases observed is greater than the number expected based on the breast cancer rate in New York State, and this difference is unlikely due to random variation.

In the fourth part of Table B3 (Allegany County), some SIRs are greater than 1.0, and three CIs exclude 1.0. For colorectal cancer in males and lung and bronchus cancer in males and females, the observed numbers of cases are greater than those expected based on the cancer rates in New York State, and the differences are unlikely due to random variation.

f. Low birth weight (LBW). Instructions for display and analysis of LBW data are in Section I.G. **Table B4** shows the LBW data for 2009-2011 for the impact study area (ZIP codes 14744 and 14735) and the four comparison areas. All of the rate ratios are greater than 1.0, indicating that the rate of LBW is greater in the impact study area than in all of the four comparison areas. The CIs for the two ZIP code comparison areas exclude 1.0, indicating that these differences are unlikely due to random fluctuation. However, the number of LBW births is quite small in both the impact study area and these two ZIP code comparison areas, leading to less stable rates.

Table A1. Example 1: demographic data for ZIP code 11105 in Astoria, NY, and four comparison areas.

Group	ZIP code 11105	ZIP codes in Queens County with population density similar to ZIP code 11105*	ZIP codes surrounding 11105†	Queens County	New York City
Total population	36,688	207,701	202,431	2,230,772	8,175,133
Population/mi^2	22,508	21,455	36,701	19,935	26,419
No. of households§	16,120	62,382	71,800	780,117	3,109,784
Sex (%)					
Male	48.7	47.5	48.7	47.5	48.7
Female	51.3	52.5	51.3	52.5	51.3
Age distribution (%)					
Less than 5 years	4.5	5.9	5.1	5.9	6.3
5 - 14	7.4	12.8	9.2	11.1	11.5
15 - 19	3.9	7.5	5.6	6.2	6.6
20 - 44	48.8	35.6	47.2	38.1	39.0
45 - 64	21.9	26.8	22.6	25.8	24.4
65+	13.6	11.4	10.3	12.8	12.1
Race/ethnicity (%)					
One race	96.5	93.0	95.8	95.5	96.0
White	75.5	15.4	49.5	39.7	44.0
African - American	2.2	49.0	7.0	19.1	25.5
American Indian / Alaskan	0.3	1.1	0.8	0.7	0.7
Asian	11.2	14.4	24.9	22.9	12.7
Hawaiian/Pacific Islander	0.1	0.2	0.1	0.1	0.1
Some other race	7.2	13.0	15.7	12.9	13.0
Two or more races	3.5	7.0	4.2	4.5	4.0
Hispanic or Latino (%)	19.7	20.5	34.6	27.5	28.6
Total minority (%)‡	35.5	92.4	68.3	72.4	66.7
Income/poverty					
Median household income ($)§	57,576	64,390	51,145	56,780	51,865
Persons below poverty (%)§	13.6	11.4	14.7	14.4	19.9

Source: U.S. Census Bureau; unless otherwise noted, Census 2010.
*ZIP codes with similar population density include ZIP codes 11412, 11418, 11420, 11423, 11428, 11429, 11436.
†Surrounding ZIP codes include ZIP codes 11102, 11103, 11370, 11377.
‡Minority includes Hispanic, African American or Black, Asian and Pacific Islander, or American Indian (see New York State Department of Environmental Conservation Commissioner Policy CP-29.
§From 2012 American Community Survey 5-year estimates, 2008-2012.

Table A2. Example 1: asthma emergency department (ED) visits by age group, 2010-2012, for ZIP code 11105 and four comparison areas.

Age group (years)	Part 1: ZIP code 11105			Part 2: ZIP codes in Queens County with similar population density to ZIP code 11105					Part 3: ZIP codes surrounding ZIP 11105				
	ED visits	2010- 2012 average population	Rate	ED visits	2010- 2012 average population	Rate	Rate ratio	95% CI	ED visits	2010- 2012 average population	Rate	Rate ratio	95% CI
0-4	61	2,019	100.7	1,437	15,606	306.9	0.33	(0.25, 0.42)	639	11,864	179.5	0.56	(0.43, 0.72)
0-17	161	6,925	77.5	3,301	52,326	210.3	0.37	(0.31, 0.43)	1,621	39,952	135.2	0.57	(0.49, 0.67)
18-64	340	27,508	41.2	3,954	142,306	92.6	0.44	(0.40, 0.49)	1,843	136,508	45.0	0.92	(0.82, 1.02)
65+	64	5,644	37.8	375	25,532	49.0	0.77	(0.59, 0.99)	255	22,833	37.2	1.02	(0.78, 1.30)
TOTAL	565	40,071	47.0	7,507	225,059	111.2	0.42*	(0.38, 0.45)	3,815	202,053	62.9	0.75*	(0.69, 0.81)

Age group (years)	Part 4: Queens County					Part 5: New York City				
	ED visits	2010- 2012 average population	Rate	Rate ratio	95% CI	ED visits	2010- 2012 average population	Rate	Rate ratio	95% CI
0-4	10,371	135,839	254.5	0.40	(0.30, 0.51)	56,458	532,274	353.6	0.28	(0.22, 0.37)
0-17	24,105	463,809	173.2	0.45	(0.38, 0.52)	134,469	1,776,157	252.4	0.31	(0.26, 0.36)
18-64	27,081	1,494,202	60.4	0.68	(0.61, 0.76)	178,547	5,459,200	109.0	0.38	(0.31, 0.39)
65+	2,914	292,646	33.2	1.14	(0.88, 1.45)	16,838	1,007,636	55.7	0.68	(0.52, 0.87)
TOTAL	53,847	2,261,761	79.4	0.59*	(0.54, 0.64)	321,539	8,270,641	129.6	0.36*	(0.33, 0.39)

NOTE. Rate = average annual rate of asthma ED visits per 10,000 population. Rate ratio = rate of ED visits in the impact study area (ZIP code 11105) divided by the rate in the comparison area. CI = 95% confidence interval. Source: Statewide Planning and Research Cooperative System (SPARCS).
* Age-adjusted standardized incidence ratio using three age groups (0-17, 18-64, 65+ years).

Table A3. Example 1: incidence of four types of cancer for ZIP code 11105 and for three areas that are referred to as comparison areas, 2005-2009. Cancer rates in the study area are not compared directly to rates in these three areas.

Cancer site		No. of cases observed	No. of cases expected*	SIR	95% CI
ZIP code 11105					
Breast (female)		125	154.0	0.81	(0.68, 0.97)
Colorectal (male)		49	56.3	0.87	(0.64, 1.15)
Colorectal (female)		49	54.7	0.88	(0.65, 1.16)
Lung (male)		62	78.9	0.79	(0.60, 1.01)
Lung (female)		28	71.1	0.39	(0.26, 0.57)
Prostate		106	177.3	0.60	(0.49, 0.72)
Zip codes with similar population density to ZIP code 11105					
Breast (female)		573	776.3	0.74	(0.68, 0.80)
Colorectal (male)		237	233.9	1.01	(0.89. 1.15)
Colorectal (female)		226	253.1	0.89	(0.78, 1.02)
Lung (male)		231	326.1	0.71	(0.62, 0.81)
Lung (female)		188	336.3	0.56	(0.48, 0.64)
Prostate		897	763.5	**1.17**	**(1.10, 1.25)**
ZIP codes surrounding ZIP code 11105					
Breast (female)		517	666.6	0.78	(0.71, 0.85)
Colorectal (male)		201	219.2	0.92	(0.79, 1.05)
Colorectal (female)		210	224.3	0.94	(0.81, 1.07)
Lung (male)		276	300.1	0.92	(0.81, 1.03)
Lung (female)		195	292.2	0.67	(0.58, 0.77)
Prostate		465	689.6	0.67	(0.61, 0.74)
Queens County					
Breast (female)		7,489	8,781.3	0.85	(0.83, 0.87)
Colorectal (male)		2,785	2,888.4	0.96	(0.93, 1.00)
Colorectal (female)		2,930	3,071.1	0.95	(0.92, 0.99)
Lung (male)		3,207	4,022.4	0.80	(0.77, 0.83)
Lung (female)		2854	3,993.1	0.71	(0.69, 0.74)
Prostate		8,134	9,111.8	0.89	(0.87, 0.91)

NOTE. SIR = standardized incidence ratio: ratio of the number of cases observed to the number of cases expected. Because the data have been age-adjusted, the ratios are standard incidence ratios. CI = confidence interval. Rate ratios greater than 1.0 with confidence intervals that exclude 1.0 are shown in bold type. Source: New York State Cancer Registry.

*The cancer rate for the entire state of New York and the number of people in a ZIP code are used to estimate the number of people in each ZIP code that would be expected to develop cancer within the five-year period 2005-2009 if the ZIP code had the same rate of cancer as the state.

Table A4. Example 1: rates of low birth weight (LBW) births for ZIP code 11105 and four comparison areas, 2009 – 2011.

Area	No. LBW	No. births	Rate LBW (%)	Rate ratio	95 % CI
ZIP code 11105	85	1,153	7.37	-	-
ZIP codes with similar population density to ZIP code 11105	856	8,087	10.6	0.70	(0.56, 0.85)
ZIP codes surrounding ZIP code 11105	535	7,304	7.33	1.01	(0.80, 1.23)
Queens County	7,393	91,264	8.1	0.91	(0.73, 1.11)
New York City	30,729	357,635	8.59	0.86	(0.69, 1.05)

NOTE. Rate ratio = rate of LBW births in the impact study area (ZIP code 11105) divided by the rate in the comparison area. CI = confidence interval. Source: New York State Vital Statistics.

Table B1. Example 2: demographic data for the impact study area in Allegany County, NY (ZIP codes 14744 & 14735), and four comparison areas.

Group	ZIP codes 14744 & 14735	ZIP codes in Allegany County with population density similar to 14744 & 14735*	ZIP codes surrounding ZIP codes 14744 & 14735†	Allegany County	New York State excluding New York City
Total population	4,845	4,252	11,770	48,946	11,202,969
Population/mi	48.3	38.6	31.4	47.3	207
No. of households§	1,425	2,653	11,764	26,140	4,207,971
Sex (%)					
Male	47.3	50.1	51.3	50.7	47.5
Female	52.7	49.9	48.7	49.3	52.5
Age distribution					
Less than 5 years	5.9	6.6	6.2	5.3	5.7
5 - 14	11.7	13.3	13.1	12.0	12.8
15 - 19	14.6	7.1	7.5	11.0	7.4
20 - 44	32.7	27.7	27.4	30.1	31.2
45 - 64	21.6	30.5	31.1	26.6	28.4
65+	13.5	14.8	14.6	15.0	14.5
Race/ethnicity (%)					
One race	99.2	99.0	99.2	99.2	97.7
White	95.9	97.8	98.1	96.3	83.6
African - American	0.9	0.3	0.3	1.2	8.8
American Indian / Alaskan	0.4	0.3	0.2	0.3	0.4
Asian	1.7	0.4	0.3	0.9	3.4
Hawaiian/Pacific Islander	0.0	0.0	0.0	0.0	0.0
Some other race	0.3	0.3	0.2	0.3	3.4
Two or more races	0.8	1.0	0.8	0.8	2.3
Hispanic or Latino (%)	1.5	1.2	0.9	1.4	9.6
Total minority (%)‡	5.2	3.1	2.5	4.5	23.4
Income					
Median household income ($)§	42,498	39,755	43,667	41,900	61,110
Persons below poverty (%)§	18.2	14.7	9.7	16.6	10.9

Source: U.S. Census Bureau; unless otherwise noted, 2010 Census.
*ZIP codes with similar population density include ZIP codes 14065, 14711, 14737, and 14777.
†Surrounding ZIP codes include ZIP codes 14024, 14060, 14065, 14066, 14536, 14709, 14711, 14717, 14777, 14836, and 14846.
‡ Minority includes Hispanic, African American or Black, Asian and Pacific Islander, or American Indian (see New York State Department of Environmental Conservation Commissioner Policy CP-29).
§From 2012 American Community Survey, 2008-2012 5 year estimates.

Table B2. Example 2: asthma emergency department (ED) visits by age group, 2009-2011, for the impact study area in Allegany County, NY (ZIP codes 14744 & 14735), and four comparison areas.

Area	ED visits	2009-2011 average population	Rate	Rate ratio	95% CI
ZIP codes 14744 & 14735	45	4,759	31.5	-	-
ZIP codes in Allegany County with population density similar to ZIP codes 14744 & 14735	132	7,941	55.4	0.57	(0.41, 0.76)
ZIP codes surrounding 14744 & 14735	110	8,780	41.8	0.75	(0.55, 1.01)
Allegany County	642	48,694	43.9	0.72	(0.52, 0.96)
New York State excluding New York City	168,774	11,218,940	50.1	0.63	(0.46, 0.84)

NOTE. Rate = average annual rate of asthma ED visits per 10,000 population. Rate ratio = rate of ED visits in the impact study area (ZIP codes 14744 & 14735) divided by the rate in the comparison area. CI = 95% confidence interval. Source: Statewide Planning and Research Cooperative System (SPARCS).

Table B3. Example 2: incidence of four types of cancer for a study area including ZIP codes 14744, 14745 & 14735, and for three areas that are referred to as comparison areas, 2005-2009. Cancer rates in the study area are not compared directly to those in these two areas.

Cancer site	No. of cases observed	No. of cases expected*	SIR	95% CI
Impact study area (3 ZIP codes including 14744, 14745 & 14735)				
Breast (female)	15	15.2	0.99	(0.55,1.63)
Colorectal (male)	3	6.3	0.48†	(0.10, 1.39)
Colorectal (female)	1	5.7	0.17†	(0.00, 0.98)
Lung and Bronchus (male)	9	9.1	0.99†	(0.45, 1.88)
Lung and Bronchus (female)	4	7.3	0.55†	(0.15, 1.4)
Prostate	18	19.9	0.90	(0.54, 1.43)
Zip codes with similar population density to ZIP codes 14744, 14745 & 14735 (7 ZIP codes)				
Breast (female)	37	31.0	1.19	(0.84, 1.65)
Colorectal (male)	18	12.2	1.48	(0.87, 2.33)
Colorectal (female)	14	10.4	1.35	(0.74, 2.26)
Lung and Bronchus (male)	22	17.4	1.26	(0.79, 1.91)
Lung and Bronchus (female)	20	14	1.43	(0.87, 2.21)
Prostate	42	40.1	1.05	(0.75, 1.42)
ZIP codes surrounding ZIP codes 14744, 14745 & 14735 (16 ZIP codes)				
Breast (female)	65	48.2	**1.35**	**(1.04, 1.72)**
Colorectal (male)	28	19.4	1.44	(0.96, 2.09)
Colorectal (female)	14	16	0.88	(0.48, 1.47)
Lung and Bronchus (male)	30	27.4	1.09	(0.74, 1.56)
Lung and Bronchus (female)	22	21.1	1.03	(0.64, 1.56)
Prostate	67	64.1	1.05	(0.81, 1.33)
Allegany County				
Breast (female)	277	281.3	0.98	(0.87, 1.11)
Colorectal (male)	139	109	**1.28**	**(1.08, 1.51)**
Colorectal (female)	118	102.9	1.15	(0.95, 1.37)
Lung and Bronchus (male)	185	156.1	**1.19**	**(1.02, 1.37**)
Lung and Bronchus (female)	171	133.7	**1.28**	**(1.09, 1.49)**
Prostate	293	351.4	0.83	(0.74, 0.93)

NOTE. Because of small numbers of cases, some ZIP codes have been combined; see text. SIR = ratio of the number of cases observed to the number of cases expected. Because the data have been age-adjusted, the ratios are standardized incidence ratios. CI = confidence interval. Rate ratios greater than 1.0 with confidence intervals that exclude 1.0 are shown in bold type. Source: New York State Cancer Registry.

*The cancer rate for the entire state of New York and the number of people in a ZIP code are used to estimate the number of people in each ZIP code that would be expected to develop cancer within the five-year period 2005-2009 if the ZIP code had the same rate of cancer as the state.

†SIRs are based on fewer than 10 cases; rates may be unstable and should be interpreted with caution.

Table B4. Example 2: rates of low birth weight (LBW) births for ZIP codes 14744 & 14735 and four comparison areas, 2009 – 2011.

Area	No. LBW	No. births	Rate LBW (%)	Rate ratio	95 % CI
ZIP code 14744 & 14735	16	172	9.3	-	-
ZIP codes with similar population density to ZIP code 14744 & 14735	12	317	3.8	**2.46**	**(1.40, 3.99)**
ZIP codes surrounding ZIP code 14744 & 14735	21	439	4.8	**1.95**	**(1.11, 3.16)**
Allegany County	122	1,609	7.6	1.23	(0.70, 1.99)
New York State excluding New York City	29,501	375,385	7.9	1.18	(0.69, 1.92)

NOTE. Rate ratio = rate of LBW births in the impact study area (ZIP code 11105) divided by the rate in the comparison area. CI = confidence interval. Rate ratios greater than 1.0 with confidence intervals that exclude 1.0 are shown in bold type. Source: New York State Vital Statistics.

Section IV. Calculating Confidence Intervals

A basic spreadsheet such as Microsoft's Excel can be used to calculate confidence intervals using standard equations found in many epidemiology textbooks. This is especially useful if you will be repeating the calculation numerous times. There are also many web-based statistical calculators which can calculate confidence intervals, although the results may vary slightly depending on which method is used. While Excel does have the capability to calculate a number of descriptive statistics and statistical functions itself, including confidence intervals, many of these assume you have access to the raw data needed to calculate the variance and standard deviation. Since we are only given the either the observed and expected cases or rates among the study area and comparison populations, preprogrammed spread sheets with formulas that allow the user to calculate confidence intervals can be used without having all of the data points. Selection of the appropriate spreadsheet will depend on how your data are organized and the measure around which the confidence interval is being developed. So far there are two specific types of examples that have been given, asthma rates and cancer incidence. Each one needs to be approached slightly differently; however, the same general formula can be applied to both. The confidence limits are based on the Byar's approximation of the exact Poisson distribution which is extremely accurate even with small numbers.[1]

$$SIR = \frac{O}{E}$$

$$SIR_L = SIR\left(1 - \frac{1}{9O} - \frac{Z_{\alpha/2}}{\sqrt{3O}}\right)^3$$

$$SIR_U = SIR\left(\frac{O+1}{O}\right)\left(1 - \frac{1}{9(O+1)} + \frac{Z_{\alpha/2}}{\sqrt{3(O+1)}}\right)^3$$

SIR = Standardized Incidence Ratio
O = Observed number of cases
E = Expected number of cases
$Z_{\alpha/2}$ = Value of the standard normal distribution for a given significance level (alpha).
(For a 95% confidence interval alpha = 0.05 and $Z_{\alpha/2}$ =1.96)

Links to spreadsheets to calculate confidence intervals are included in the sections below.

Asthma Hospitalizations or Emergency Department Visits: For asthma hospitalization or emergency department visit data we are comparing two rates against each other using a *rate ratio (RR - the ratio of the study area hospitalization or emergency department visit rate to a comparison area's rate).* We have information on the number of hospitalizations or emergency

[1] Breslow NE, Day NE. Statistical methods in cancer research: Volume II. The design and analysis of cohort studies. International Agency for Research on Cancer, Lyon, France, 1987.

department visits and the rate per 10,000. With this information the population size for each area; the rate ratio; and its corresponding confidence interval can be calculated. The same equations can be used simply by applying the comparison area's rate to the study area population size to determine the expected number of cases. However, to calculate an expected number for the standardized (age-adjusted) rate in the final row it will be necessary to weight each age group and sum the individual age specific expected values. The formula for this is given below. The spreadsheet for asthma automatically makes these calculations plus it calculates the overall age-adjusted rate ratio for the comparison.

$$E^* = \sum_j^J n_j \lambda_j$$

E^* = Age-adjusted expected number of cases
n_j = Study area population of age group *j*
λ_j = Hospitalization rate of comparison population in age group *j*

Cancer Incidence: For cancer data the expected rates have already been calculated and the observed rates for an area are supplied. Thus all that you need to do to calculate the *standardized incidence ratio* (SIR - the ratio to the observed vs expected number of cases) is to enter the observed and expected numbers in the spreadsheet for your study area. The spreadsheet for cancer incidence will calculate the standardized incidence ratio and generate 95% confidence intervals.

Low Birth Weight: For low birth weight (LBW) births, the percent of LBW births during a three-year period by ZIP code is included in Perinatal Data Profiles at the DOH website along with the total number of births in each ZIP code during the three-year period. With this information, the number of LBW births in each ZIP code can be calculated then summed to calculate the number of LBW births and the total number of births in each comparison area. These numbers can then be used to calculate the rates of LBW in the comparison areas; the rate ratios comparing the study area to the comparison areas; and the confidence intervals around each rate ratio. There is no age adjustment done for LBW births, but the spreadsheet for LBW will calculate the confidence intervals.

Preliminary Interim Draft Emission Factors for Use by State Agencies and Project Proponents

NYSDEC Version 02/2021

The preliminary emission factors provided in Table 1 and 2, below, represent presumptive and generic (non source-specific) factors that can be applied to the high heating content[1] of fossil fuels. The emission factors included in this document are being provided on an interim basis to facilitate ongoing reviews and assessments by State agencies and project proponents. These values should be considered interim draft values, as they are subject to change.

Pursuant to the Climate Leadership and Community Protection Act (Climate Act), the Department is required to issue an initial Statewide Greenhouse Gas Emissions Report by January 1, 2022, and thereafter to update the report on an annual basis.[2] This report will include information regarding upstream emissions associated with the extraction, production, and transmission of fossil fuels, along with information relating to fugitive emissions associated with fossil fuels. The Department is currently engaged with its State partners in the development of the initial report and will be seeking stakeholder input in 2021 regarding the methodology and analysis used in determining Statewide greenhouse gas emissions. Therefore, the preliminary emission factor values in both Table 1 and Table 2 may change as a result of that process.

Overall, the emission factors presented in this document are a work in progress, subject to future stakeholder comment, and will be subject to a continual improvement process that will update the values over time as additional information becomes available. Additional fuels and emission sectors may be added as analysis continues. These factors do not include the direct emissions resulting from the combustion of the fuel.

Finally, the values provided in Table 1 and 2 are intended to be presumptive, meaning that a State agency or project proponent may use a different value in a given context, provided that a different value is supported by appropriate justification and analysis.

[1] Select high heating values from https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf have been included in this document Appendix A. Project sponsors should identify if they are using different energy content, particularly if the energy content is provided by the fuel supplier.

[2] Chapter 106 of the Laws of 2019; Environmental Conservation Law (ECL) § 75-0105.

Table 1. Current Upstream and Out-of-State Emission Factors for Imported Fossil Fuels

These factors reflect greenhouse gas emissions associated with the extraction, production, and transmission of fossil fuels imported into New York State for the most recent year available, or 2018.[3] This does not include extraction, production, or transmission of fuels within New York State.

	Greenhouse gas emission rate (g/mmbtu)*			
Fuel Type**	**CO_2**	**CH_4**	**N_2O**	**CO_2e (20 yr GWP)+**
Natural Gas	11,913	384	0.136	44,205
Diesel/ Distillate Fuel	15,164	121	0.258	25,375
Coal	3,279	397	0.103	36,650
Kerosene/Jet Fuel	10,071	109	0.170	19,270
Gasoline (E85)	5,097	33	0.085	7,905
Gasoline***	18,349	119	0.306	28,459
LPG	17,295	121	0.270	27,553
Petroleum Coke	11,612	112	0.204	21,096
Residual Fuel	11,799	111	0.194	21,184
Asphalt and Road Oil	8,487	105	0.128	17,325

*Sums or products may not match due to independent rounding. Units in grams(g) can be converted to pounds by dividing by 453.6.

** Users may wish to adjust the specified emission factors for blended fuels

*** The gasoline emission factors represent 100% fossil fuel content gasoline, equivalent to gasoline blend stock, if evaluating blends with oxygenates (e.g., ethanol) these blends can be apportioned to the fraction of emissions associated with the energy fraction of the blend that is from fossil fuels (e.g. E85 is a blend of ethanol and gasoline estimated here to have the energy content of approximately 28% gasoline and 72% ethanol).

+ CO_2e is calculated by multiplying the mass of each gas by its global warming potential(GWP) and adding the products together(CO_2 GWP is 1, CH_4 GWP is 84, N_2O GWP is 264).

Sources: Emission factors are derived from the same sources used for 6 NYCRR Part 496[4], but for the most recent year available (2018). This analysis was conducted by Eastern Research Group on behalf of NYSERDA and NYSDEC using Department of Energy fuel data and lifecycle analysis tools. The lifecycle models used were the Argonne National Laboratory's "Greenhouse gases, Regulated Emissions, and Energy use in Transportation" (GREET) model for imported petroleum products and the National Energy Technology Laboratory (NETL) models for imported coal and natural gas. For natural gas, the leakage rates from Alzarez et al. (2018)[5] were also used to address additional fugitive methane sources.

[3] For purposes of accounting for Statewide greenhouse gas emissions under the Climate Act, consideration of upstream and out-of-state emissions is focused on the "greenhouse gases produced outside of the state that are associated with the . . . extraction and transmission of fossil fuels imported into the state." ECL § 75-0101(13).

[4] NYSDEC. 2020. Regulatory Impact Statement, 6 NYCRR Part 496.

[5] Alvarez,R.A., et al. 2018. Assessment of methane emissions from the U.S. oil and gas supply chain. Science.361: 186-188.

Table 2. Current Downstream In-State Emission Factors for Natural Gas/RNG Distribution

These factors reflect fugitive emissions within New York State associated with fuel throughput for the most recent year available, or 2018.

	Greenhouse gas emission rate (g/mmbtu)			
Fuel Type	**CO_2**	**CH_4**	**N_2O**	**CO_2e (20 yr GWP)**
Natural Gas/RNG	n/a	23	n/a	1,932

Source: Emission factor generated by summing emissions from natural gas distribution reported in NYSERDA (2019) New York State Oil and Gas Sector Methane Emission Inventory and dividing by energy content of natural gas consumed in residential, commercial, and industrial sectors of New York as reported by EIA.

Appendix A. High Heating Value of Select Fuels Per Unit of Mass or Volume

Fuel	High Heating Value (mmbtu)	Volume or Mass unit
Natural Gas/RNG*	0.001026	Standard cubic foot
Diesel/Distillate Fuel	0.138	U.S. gallon
Coal	21.39	Short Ton
Kerosene/Jet Fuel	0.135	U.S. gallon
Gasoline E85**	0.095	U.S. gallon
Gasoline	0.125	U.S. gallon
LPG	0.092	U.S. gallon
Petroleum Coke	0.143	U.S. gallon
Residual Fuel	0.145	U.S. gallon
Asphalt and Road Oil	0.158	U.S. gallon

*RNG is assumed to be pipeline quality gas and equivalent energy content to pipeline natural gas. Raw landfill gas has substantially different energy content per standard cubic foot.

**E85 is assumed to have the energy content of approximately 28% gasoline and 72% ethanol.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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MEMORANDUM

To: Denise Prunier, Section Chief, Permitting & Compliance Section

From: Steven DeSantis, Research Scientist, Air Toxic Section, BAQAR

Date: May 12, 2020

Subject: Norlite, LLC, A Division of Tradebe Environmental Services, LLC

Background:

On behalf of Norlite, LLC, a division of Tradebe Environmental Services, LLC (Norlite), Trinity Consultants, Inc. (Trinity) submitted a modeling report to the NYSDEC. Norlite operates two hazardous waste-burning lightweight aggregate rotary kilns and accepts off-site liquid waste for energy recovery at their facility in the city of Cohoes, Albany County, New York.

The facility is classified as a major source for hazardous air pollutants (HAPs) and certain criteria pollutants which subjects the facility to the Title V permit process. Operations at this facility are authorized under a Title V Operating Permit 4-0103-00016/00048, Mod 6, issued on October 7, 2019 and a Part 373 permit 4-0103-00016/00016 which went into effect on January 1, 2016.

Required as part of the air permit application submitted in 2018 and to satisfy condition 6-2 of the Mod 6 permit, an air dispersion modeling analysis was required under the following requirements:

1. Part 212: Part 212 applies to process emission sources (non-combustion sources) associated with a process operation upon issuance of a new, modified, or renewal permit/registration for a facility. A Toxic Impact Assessment is required for High Toxicity Air Contaminants (HTACs) emitted from sources subject to National Emission Standards for Hazardous Air Pollutants (NESHAPs) as required by § 212-1.5(e)(2);

2. National Ambient Air Quality Standards (NAAQS) compliance evaluation for criteria pollutants; and

3. An air dispersion modeling analysis comparing the proposed and existing scrubbers.

The emissions from each toxic air contaminant known to be emitted from the kilns and other Part 212-subject process emission sources on site have been included in the air dispersion analysis.

For each of the process emission source and compounds, an evaluation was completed to determine if modeling was required for the emission of each individual contaminant from process emission sources subject to Part 212. The evaluation included consideration of the following special cases for which modeling **may not** be required:

- Site-wide potential to emit (PTE) of HTAC below the Mass Emission Limit (MEL) in §212-2.2 Table 2. For compounds that meet these criteria, Part 212 is satisfied per §212-2.1(a). For these compounds, no further evaluation is required under Part 212.

- HTACs regulated by an applicable National Emission Standards for Hazardous Air Pollutants (NESHAP) for which the facility is in compliance. For these compounds, a Toxic Impact Assessment (TIA) was completed illustrating that off-site impact fall below appropriate guideline concentrations and the Persistent & Bioaccumulative (PB) Trigger cannot be exceeded, per §212-1.5(e)(2).

- Non-HTAC HAP regulated by an applicable NESHAP for which the facility is in compliance. For these compounds, Part 212 is satisfied per §212-1.5(e)(2).

- Non-HTAC, compounds with PTE <100 pounds per year (lbs/yr). For these compounds, there are no substantive Part 212 requirements as described in DAR-1.

Each compound that is required to be modeled under Part 212 and that is required to be compared to the AGC and SGC threshold in DAR-1 is listed in Table below.

New York State's SGC/AGC for Part 212 Compounds to be modeled.

Pollutant	Model per 212?	SGC (µg/m3)	AGC (µg/m3)
Hydrogen Fluoride	Y	5.6E+00	7.1E-02
Arsenic	TIA	--	2.30E-04
Cadmium	TIA	--	2.4E-04
Lead	TIA	--	3.8E-02
Mercury	TIA	6.0E-01	3.0E-01
1,1,1-Trichloroethane (methyl chloroform)	Y	9.0E+03	5.0E+03
Benzene	TIA	1.3E+03	1.3E-01

Carbon tetrachloride	TIA	1.9E+03	1.7E-01
Dichlorodifluoromethane	Y	--	1.2E+04
Vinyl chloride	TIA	1.8E+05	1.1E-01
1,3-Butadiene	TIA	--	3.3E-02
POM[a]	TIA	--	2.0E-02

Modeling Report Review:

1. John Kent, chief of the Impact Assessment and Meteorology section, was able to successfully recreate the modeling submitted by Trinity. He did have comments about the new storage silo (PSH_NEW) that was modeled as a volume source. He had difficulty envisioning what the setup looks like, and the aerial view isn't detailed enough to tell. Their building setup in the model shows a cylindrical building with a height of 26.52 meters, and the silo source is placed in the middle. It was unclear how Trinity determined a release height of 30.5 meters. NYSDEC believes the correct height to be one-half of 26.52 meters.

2. Trinity used meteorological data which was available at the time of submission, however the data would be considered outdated at this time so NYSDEC re-ran the model with the most recent available meteorological data and the results were similar.

3. The unitized modeling analysis that Trinity performed for the criteria air contaminants looked only at the impact of the two scrubbers, it did not include the emissions from other sources at the facility. In table 2-2 they show an emission rate for NO2 but it's actually the emission rate for NOx. It should be labeled NOx. The impacts are NO2.

4. Table 2-2 shows emission rates of NOx and SO2 of 22.4 and 28.0 lbs/hr., respectively, for each of the two stacks. These emission rates become significant because when modeled for the one-hour NAAQS standard they are 94% and 95 % of their respective standards. See Table 4-4 and Table 4-6. These emission rates were established to meet Part 231 applicability.

5. NYSDEC identified issues with the protocol and now in the final report regarding the emission rates of the Air Toxic Metals. The stated emission rates do not add up correctly for all air contaminants. Using lead as an example:

   For the emissions from the kiln, the report shows a pound per hour emission rate after 99.998% control of 0.00306 lbs/hour per kiln. For the emissions from the clinker cooler, the report shows an emission rate after 98% control of 6.79E-5 lbs/hour per cooler.

   (0.00306 *2) + (6.79E-5*2) * 8760 hr/year = 54.8 lbs/yr. The report shows 18.9 lbs/year.

Conclusion:

Based on NYSDEC's review, the modeling design is correct and NYSDEC was able to reproduce the methodology. NYSDEC requires that the above concerns be addressed before final approval.

cc: Margaret LaFarr
John Kent
Thomas Gentile

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Division of Material Management comments on Norlite's Part 373 RCRA permit renewal application dated June 30, 2020

1. Executive Summary

a. Section 1.1 Facility Permit Information page 3 – Please revise the Table to eliminate the rows for the DEC Contact/Permit Writer and the on-site Environmental Monitor. The estimated costs for closure should be provided instead of referring to Attachment C which is not included.

There is an estimated corrective action cost of $109,438 (February 2020). Where does this figure come from and what is the corrective action?

6 NYCRR Part 373-2.8(a)(5) requires that the total cost estimate for a facility include all applicable financial assurance obligations for closure, post-closure, and corrective action. On-going corrective action costs (e.g. monitored natural attenuation) and post-closure care costs for 30 years are required at the time of permit renewal unless there is a definitive end-date for these costs. The table lists NA for these costs yet there is a SMP associated with a corrective action that is under DEC's review. Post closure care costs typically include maintaining engineering or institutional controls and any monitoring and reporting required for closed units or remediated areas of the facility.

b. Section 2.0 RCRA Permitted Units, page 5. Footnote 2 is missing within the Table.

c. Section 3.0 Corrective Action Summary, Page 5. A table of all Solid Waste Management Units (SWMUs) and/or Areas of Concern (AOCs), the unit/area number, a description of the unit/area and its status must be included in the application. This is required regardless, even for units/areas already determined to be "No Further Action." DEC recently determined that Norlite had several areas that are SWMUs and need to be included in the listing, including but not limited to the recently closed wastewater treatment plant units and the newly installed air pollution control equipment. Additionally, Norlite needs to provide a Current Conditions Report which summarizes the history for each SWUM/AOC. This summary should include the SWMU/AOC number, the description, the status, the approximate period of operation, the general type of waste handled (e.g., liquid waste), the general constituents (e.g., heavy metals, organics), any method of containment (e.g., none, secondary), the media of concern for possible contamination, and a site investigation summary with any past sampling and/or next step(s) toward corrective action.

d. Section 4.0 Post-Closure Care/Site Management, page 6. The summary table of the post closure care and site management activities has not been populated. Please populate the Table.

e. Section 5.1 Human Health and Ecological Risk Assessment, page 7. Norlite has been asked to update the Human Health and Ecological Risk Assessment. Please update this section to reflect the current status. In addition, a health outcome data analysis report protocol has been submitted. Please include this report in Section 5.1.

2. Operations Plan

Certification and Facility Description

a. Section 1.0 on page 5 references specific sections of Norlite's current RCRA permit. All references to the current RCRA permit must be removed from the permit renewal application. The permit renewal application must reflect current operations at the Facility with the necessary detail, and all supporting documents, to allow the Department to draft the renewal permit. The currently referenced permit will be replaced with a new RCRA permit, negating the specific references used in the renewal application. The information that Norlite is refencing in the current permit must be provided in the revised permit renewal application.

b. Section 1.3.1 Capacity Authorized (Existing), pages 8 and 9. The table has four footnotes which are not labeled to the corresponding footnote text below the table. Please correct.

c. Section 1.6 Traffic Information, page 11. Figures B-1 and B-2 referred to in the text are not labeled as Figures B-1 and B-2 in the Figures section of the operations plan. Please label these figures.

Procedures to Prevent Hazards

d. Section 2.6.3 Management of Ignitable or Reactive Waste in Containers, pages 18 and 19. This section specifies the measures to prevent accidental fire and explosion of ignitable wastes. Are the current building and fire codes being met for storage of these waste? Specify what the requirements are and how Norlite meets these requirements.

The second paragraph states that prior to storage each container is sealed to prevent precipitation from entering the drum. Is this for all drums generated on-site as well as for those accepted from off-site? Does this apply to both indoor and outdoor storage of drums? Is this done to verify that all containers are closed, tightly, prior to storage or is an actual seal placed on the drum. Please provide additional details to explain this procedure.

Management of Wastes in Containers

e. Section 3.0 of the Operations Plan, page 20, states that Section 1.3 has the secondary containment area capacities for the container storage areas. The secondary containment capacities are not in Section 1.3, please revise the Table in Section 1.3 or refer to the Table in Section 3.2 for the secondary containment capacities.

f. Section 3.2.2, page 23, states that the scupper between the drum storage area and the unloading area allows any large spills greater than 340 gallons to overflow into the truck unloading/containment area. DEC would view this as an interconnected containment area not tertiary containment. Why do spills greater than 340 gallons overflow into the truck unloading/containment area when there is adequate containment, over 2,000 gallons, in the drum storage area? Conversely, spills from the truck unloading containment area would flow into the drum storage area as well. At what amount would a spill in the truck unloading area enter the drum storage area secondary containment?

g. Section 3.2.3, page 23, states that the secondary containment calculations for the storage areas are provided as an attachment to the Part 373 Permit. As previously discussed, these calculations need to be provided in the permit renewal application.

h. General Comment - The information in the Operations Plan sections for the Tanks and the Kilns include closure for these units. Why isn't closure included in the section of the Operations Plan for Containers?

Tanks

i. Section 4.1.1, page 25-27. Please specify the standard(s) that the professional engineer uses to evaluate the integrity of the hazardous waste tanks. The overfill controls on Tanks 200A, B, C and 100 A, B, C each have a high-level switch that is activated 12 inches from the top. What is the volume contained in each tank (gallons) after the switch activates? Are there any overfill controls installed on Tanks 300, 400, 500 and 600? Please provide this information. What is the schedule and procedure for inspecting overfill controls on the tanks? Specify the test procedures or standards used for the monthly and annual cathodic protection system testing. Page 9 of the Security and Inspection Plan states that the sources of impressed current to the cathodic protection system are tested and recorded on a bimonthly basis (i.e., every two months). Correct this discrepancy.

j. Section 4.5, page 29 and 30, General Tank Operating Requirements. Why is the tank level in Tank 200A determined by manual gauging and sampling whereas all other tanks have ultrasonic or radar level indicators with digital readouts? Describe how Tank 200A's level is determined by manually gauging and sampling. SOP #4-007 which

describes tank sampling could not be located in the application. Please include this SOP in the renewal application. It is unacceptable for any tank to be filled to capacity prior to automatic shut-off. DEC limits the fill level to a maximum of 90 percent of the tank capacity.

k. Section 4.8, page 32, Tank Inspection. This section specifies containment for the tanks. The inspections identified are for daily spill containment. “The spill containment for loading/unloading areas, container sampling areas, and drums stored in the unloading areas will be inspected for any spills.” Please provide a detailed description of the inspection of the entire tank system including the tank, ancillary equipment and secondary containment.

Incinerators

l. Section 7.0, page 35, Management of Wastes in Boilers and Industrial Furnaces. The operating limits for the industrial furnaces are no longer found in the RCRA Part 373 Permit. Please provide this information.

m. Section 7.1, page 35, Design and Operation. The last paragraph states that virgin fuel oil, specification used oil and comparable fuels are fed from Tanks R1, R2, M1 and M2; and that no hazardous wastes or nonhazardous wastes is delivered to the kiln through this system. The state regulation regarding comparable fuels, Part 371.1(e)(1)(xvi), has been removed from DEC’s regulations with the FedReg5 rulemaking because the equivalent Federal regulation, 40 CFR 261.4(a)(12), was vacated in June 2014. Please revise this paragraph and the permit renewal application to remove all references to comparable fuels. DEC reached out to Norlite in the past regarding comparable fuels and was informed that Norlite does not use the comparable fuels provisions.

n. Section 7.3, Performance Standards and Operating Requirements, page 42. Both kilns were required to conduct a CPT after Project Delta hence the 2017 CPT operating limits table should be updated when the CPT test results are available, and a Table should be provided for both Kilns. Note that the DEC is requiring Norlite to update their human health and environmental risk assessments prior to renewing the RCRA permit. Additional conditions to control emissions based on the risk assessments may be added to the RCRA permit if needed to reduce risks.

o. Section 7.5, Closure, page 43. All current equipment associated with the Kilns and their air pollution control systems must be listed as these units were used to treat hazardous waste. There may be remaining waste residues within the kilns, air pollution control equipment and ancillary equipment after burnout. Ash and dusts remaining in the kiln are derived from the treatment of hazardous waste and are hazardous waste residues. The closure plan must specify removal of all hazardous waste residues. This

may require washing and decontaminating the equipment if initial wipe samples do not meet the cleanliness standards. Samples will need to be taken to verify cleanliness so DEC can make an environmental decision if the units have been clean closed prior to any repurposing of these units to produce light weight aggregate using non-hazardous waste fuels.

Note that soil samples, to determine possible contamination from the previous APC units, were not taken prior to installation of the pads for the new air pollution control equipment were installed. Norlite will need to sample the soil under the pads when available or if repurposing of these units. The wash waters must be disposed of as hazardous waste or sampled and disposed of at a wastewater treatment facility that can accept the contaminant levels present in the wash waters.

Rinsate samples that verify cleanliness must meet the Class GA standards, for groundwater effluent limitations, in 6 NYCRR Part 703 or in the absence of established water quality standards, numeric guidance values derived and compiled in Division of Water guidance in Technical and Operational Guidance Series (TOGS) 1.1.1.

Wipe samples must be taken in accordance with the Pace Technical Bulletin for Collection of Wipe Samples for the Determination of Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (PCDDs/PCDFs). If there are DEC-accepted cleanliness standards for the wipe samples, they must be met otherwise the contaminants must be non-detect and DEC will need to know the laboratory's method detection limits for the contaminants analyzed using wipe samples.

The sampling and analysis plan for closure must be reviewed and approved by DEC when the Facility anticipates that the units are to be closed.

Appendices

p. Appendix 1 SOP#4-011. Norlite Standard Operating Procedures Section 2.2 page 4 of 10, Containerized Waste Receiving Procedures (SOPs). The statement is made that "For each waste stream received in a shipment, 100% of the drums of a waste stream will be sampled for visual inspection and compatibility." How are the drums sampled for visual inspection? Table C-01 is not located within this SOP, please include it. What parameters are analyzed for in Norlite's fingerprint analysis? In section 5.1 on page 8 of 9 Norlite references SOP#4-005, which is also not provided, please provide. Note that the page numbering goes from page 4 of 10 to page 5 of 9, please correct.

q. Appendix 2 - SOP# 6-001 Transfer Station Scenarios Practiced at Norlite - Transfer F on page 2 of 3 refers to SOP# 4-010, this SOP is not in the application, please provide.

r. Appendix 5 – Horizontal Tank Plan. The Operations Plan references many additional engineering drawings specifically NY003-373-1, NY003-2475-1, NY003-3008, NY003-1311, NY003-1312, NY003-1314, NY003-1315, NY003-5010, NY003-1317(HI), NY003-1903, NY003-5430, and NY003-D3202 which are not included in the appendices, please include or state where the drawings are located in the application. Some of these drawings are in the engineering drawings section of the permit renewal application but others are not. Specifically, drawings NY003-1314, NY003-5010, NY003-1903, and NY003-D3202 could not be found. All referenced drawings must be provided.

s. Appendix 8 Shell thickness measurements - The estimated service life is calculated for Tanks 300, 400, 500 and 600 based on the ASME Section VIII recommendations for glass lined tanks. Please also provide the estimated service life for all other permitted tanks. Include the integrity test reports which were used for these calculations. How is the shell thickness measured (i.e. points measured and method used) and what value does the shell thickness represent (e.g. lowest measured value)?

In addition, provide the latest annual assessment report for the secondary containment for the tank systems.

t. Appendix 10 Cathodic Protection. The report had several recommendations on the bottom of page 2. Please provide the inspection report after repairs were made based on the HMI recommendations and include this report with the renewal application. The June 20, 2020 memo to file states these reports will be shared with DEC.

u. Appendix 16 Subpart BB compliance. The Applicability box, row 1 for the Air Emissions requirements table states that Norlite has established a set of drawings which indicates a unique ID # for each piece of regulated equipment. Please provide these drawings or a list of the unique equipment ID #s for all equipment subject to the Air Emissions Standards.

3. <u>Waste Analysis Plan</u>

a. Section 1.2.1 on page 3, references S[OP]#04-063. This document is not included in the permit renewal application, please provide.

b. Section 1.3, page 12, Description of Hazardous Waste Management Units. Norlite stated that there are “four (2)” 1,174-gallon aboveground storage tanks. Please correct to “two (2)”

c. Section 3.1.1, page 16, Sampling Strategies and Equipment, Incoming Bulk Loads. This section states that the sampling of LLGF from tankers is accomplished

using SOP#4-004 found in Appendix 1 of the Operations Plan. This SOP was not found in Appendix 1 of the Operations Plan or elsewhere in the permit renewal application. Please provide.

d. Section 3.4, page 19, Health and Safety Protocols. Have Norlite employees taking the samples been properly trained (HAZWOPER training (29 CFR 1910.120)) and respirator fit tested as required by OSHA (29 CFR 1910.134). What are the titles of the employees who are authorized to take samples?

e. Section 4.1, page 20, Laboratory Testing and Analytical Methods, Selected Laboratory. Norlite states "…national ELAP programs." The national program is "NELAP", which stands for "National Environmental Laboratory Accreditation Program". Please use the correct acronym.

f. Under section 6.1.1, Procedures for Receiving Wastes from Off-Site Generators, Generator, Paragraph (b), page 28. Norlite states, "The analysis must achieve the method's detection limit, corrected for any dilution required for the extract of the sample's matrix." Technically, DEC believes that it is the reporting limit (CRQL) that is corrected from a dilution step and not the detection limit (MDL). The CRQL is usually a multiple of the laboratory's MDL (x3, x5…). The MDL is usually determined using method 40 CFR, Part 136, Appendix B. This language is also found on page 29 Section(b) where the MDL is being treated like the CRQL. Please correct.

g. Section 6.1.3, page 32, Onsite Generated Wastes. The last paragraph in that Section states that stormwater that collects in the Tanker Truck & On Site Roll Off Staging Area is shipped off-site for treatment. The last paragraph of Section 1.2.8 on page 8 states that water from all secondary containment systems is collected and pumped to the LLGF storage tanks and managed as LLGF. This may include stormwater from the outside staging area. Correct the discrepancy.

h. Section 6.7.2 LLGF Kiln Feed Analysis, page 38. It is stated that the results of the ten regulated boiler and industrial furnace (BIF) metals plus four additional metals are used to prepare the WAP-2 form which documents these feed rates. The WAP-2 form in the Tables, Sheets and Forms Section of the WAP only list the metals which are regulated by 40 CFR 63 Subpart EEE. Please correct.

i. Table WAP-4, List of Laboratory SOPs in the Tables, Sheets and Forms Section of the WAP, lists the SOPs the lab uses but these documents are not included as part of the WAP. Please include the SOPs.

j. WAP Appendix 5, Sample Calculation for Used Fuel Oil Contribution. Where is the sample calculation? What are the units of measure?

4. Integrated Contingency Plan (ICP)

The comments provided only relate to the hazardous waste contingency plan and emergency procedures required by 6 NYCRR Part 373-2.4, therefore Annex 8 which states that the signature of the permit will convey acceptance of the ICP is only true for the parts of the ICP that are required to be included by the hazardous wastes regulations. The other two parts of the contingency plan, specifically the Emergency Action Plan and the Spill Prevention, Control and Countermeasure Plan are not under the purview of Part 373/RCRA for review and acceptance.

DEC provided comments on Norlite's June 2020 updated Integrated Contingency Plan on August 13, 2020 in response to Norlite's minor permit modification request. These comments are provided in Enclosure 1. Please provide responses to these comments in addition to the additional comments based on review of the ICP in context with the permit renewal application.

a. Section 1.3 page 4. Drawing #NY003-3731 is not part of the ICP. The ICP is a standalone document provided to outside responders therefore all referenced drawings should be contained within the ICP. In the last bullet it is stated that the layout of the facility, including entrances and roads inside the facility, evacuation routes, emergency shut off valves, response equipment, facility topography, nearby environmentally and economically sensitive areas (e.g. schools, nursing homes, hospitals commercial district) and muster station is included in Facility Drawing NY003-3731, as well as the facility drawing. Is the facility drawing that Norlite is referring to the ICP Appendix A Drawing #51235SPCC002? Note that the evacuation routes are not easily identifiable. The emergency shut off valves cannot be located on the P&IDs. Nearby environmentally and economically sensitive areas should be easily identified by using a color to shade these areas on the map or some other means to readily identify these areas. The muster stations are not specifically labeled as such on the drawings.

The P&IDs are inserted after page 16 with no page numbering although they appear to be pages 17-21 of the ICP. Please number these pages.

b. Section 2.2.2.1 – Preliminary[y~~y~~] Assessment and initial Response Procedures. Step 2 bullet 4 on page 10 states that small spills (less than 55 gallons) with known materials will be handled under the direction of the Emergency Coordinator whereas large spills will be handled by the Incident Commander. Is this also true if a small spill of an acute toxic waste has occurred?

In step 4 on page 11 and page 51 it is stated that if the PPE is not already selected the Equipment officer will determine the correct PPE. Annex 3, page 32, item 4.b. states it is the risk assessment officer who determines the PPE. This task is not listed in item 5 on page 32 as a responsibility of the equipment officer. Please correct.

c. Section 2.4, page 13, Termination and Follow-up Actions. Once the emergency is declared over the final notification letter after the root cause analysis is submitted to the Region 4 Regional Remediation Engineer. Be advised, this copy should now be sent to the Region 4 Regional Materials Management Engineer. Additionally, the facility is required to send a copy of all Part 373/RCRA-related submittals to the DMM RCRA Permitting Section Chief. The next bullet states that from the results of the root cause analysis, the company will institute corrective action measures which will help ensure a similar situation does not occur again. Please change the wording from 'corrective action measures" to "measures" since Corrective Action Measures in RCRA indicate that a remedial action to address environmental contamination has occurred. Will an investigation be performed to determine if any corrective action measures are needed after an incident where a release to the environment has occurred?

d. Annex 1, page 15, Facility Location and Layout. Item a. Facility Map. The rally points aren't marked as such on Drawing NY003-3731.

e. Annex 3, Response Management Plan Spill/Discharge or Material Release Response Procedures, page 40, Item B.2.c. What is a "carbon release" to the air? Is Norlite only considering releases which contribute to greenhouse gases as air emissions? Inorganic air releases could also be an issue (e.g., acid gases)? Small releases of acute toxic gases are also a concern. Some contaminant releases require that people muster in place versus evacuating. Provide more information for air releases which provide the procedures for directing staff in the event of a material release until outside assistance is on site for response.

f. Annex 5 Training/Exercises/Drills and Records Item 2, page 61. It is unclear whether the 24-hour initial training is the 24-hour HAZWOPER initial training or the 24-hour MSHA training, please specify. Do any Norlite employees other than personnel trained for incident response, see Section 3.2.1 of Annex 3 on page 35, receive the 40-hour initial HAZWOPER training? The training matrix spreadsheet in Exhibit B of the Personnel Training Plan Section does not specify who has the 24-hour initial HAZWOPER training and who has the 40-hour initial HAZWOPER training. Please present the two initial HAZWOPER training courses as separate line items in the training matrix spreadsheet to clarify. Page 35 states that all Norlite personnel trained for emergence response have the MSHA 24-hour training course. This training is not included on the training matrix spreadsheet, please include. On pages 64-69, each Item "B. Training Requirements:" for the 14 job titles provided only lists "24-hour Initial" training, Norlite must be specific about what this training entails. None of these job titles list the 40-hour initial HAZWOPER training even though some titles are trained for incidence response. Please clarify and correct.

g. Appendix C Weekly Environmental (RCRA) Inspection Report. Items A, B and C refer to Tanks 3, 4, 5, and 6. Are these Tanks 300, 400, 500, and 600? If so, please correct. Additionally, pumps are labeled as 3, 4, 5, and 6 on the Fuel Farm Operator's Workplace Exam Inspection Form. P&ID drawing NY003-1317 shows transfer pump PC-301 associated with Tank 300, transfer pump PC-401 associated with Tank 400, transfer pump PC-601 associated with Tank 500, and another transfer pump also labeled PC-601 associated with Tank 600. Please correct the discrepancies.

Item Q, Equalization Tanks, contains Tanks 101A and 101B which are not part of this renewal application. Tanks 102A and 102B are not included on the Fuel Farm Operator's Workplace Exam Inspection Report. Are they inspected daily? P&ID NY003-1315 specifies on Tank 102A that "102A Equalization Tank Reported as Out of Service 2020". Additionally, the drawing states that the "Lower portion of the piping/pump area was flooded and could not be reviewed as part of the 2020 RCRA permit renewal". Is Tank 102A back in service? Has the flooding issue been resolved? Has the tank system been certified by an independent, qualified professional engineer registered in New York State as to the structural integrity and suitability for handling hazardous waste, as required by 373-2.10(b) and (c)? Please update the drawings and provide the certification if these tanks are to be permitted. Also, there does not appear to be a place to record inspection of Pumps 106A and 106B which are associated with Tanks 102A and102 B. If Equalization Tank 101A and 101B are not part of this application and Equalization Tank 102A is out of service where does Norlite mix the LLGF fuels to obtain the correct feed composition prior to burning the LLGF that cannot be directly fed from the LLGF storage tanks?

6 NYCRR Part 373-2.10(f) requires that the above ground portions of the tanks are inspected for corrosion or signs of leaks. It appears that only the pressure is noted on the inspection forms. Are any visual inspections for corrosion performed?

Inspection of the tank agitators is not included on the forms other than the Tank 3, 4, 5, and 6 "Circulators" on the Fuel Farm Operator's Workplace Exam Inspection Form. The agitators on Tanks 100 A, B, and C and 200 A, B and C and Tank 102 A must be inspected and recorded.

Why aren't the inspection report forms for the permitted RCRA units included as part of the operations plan?

5. <u>Security and Inspection Plan</u>

a. Section 3.1, Inspection Schedule table, pages 4 and 5. It does not appear that the above ground portions of the tanks themselves are being inspected daily for signs of corrosion and leaks. However, in Section 3.5.6 on page 10 Norlite states that that the

above ground portions of the tanks are being inspected daily for signs of deterioration, corrosion and leaks. Please correct.

b. Section 3.2, General Inspection Requirements, page 6. The statement is made that specific inspection schedules for the landfill, container storage areas, tanks, and incinerators are presented in each unit's specific section. There are no general inspection requirements provided for the landfill. Please include.

Also include the latest integrity assessment reports required by external professionals such as the annual container secondary containment assessment report.

c. Section 3.5.3 Burner Operator's Shift Log, page 8. Figure F-3 referred to in this section is draft. Please submit the final form.

d. Section 3.5.5. LLGF Tank Inspection Report. Item 3 on page 9 identifies the National Fire Protection Association (NFPA) publication Number 329 as the criteria utilized to perform the integrity test on hazardous waste storage tanks. The scope of NFPA publication Number 329 is described on the internet as follows:

> "This recommended practice provides methods for responding to fire and explosion hazards resulting from the release of a flammable or combustible liquid, gas, or vapor that can migrate to a subsurface structure. 1.1.2 Although this recommended practice is intended to address only fire and explosion hazards, other authorities should be consulted regarding the environmental and health impacts and other hazardous conditions of such releases. 1.1.3 This recommended practice outlines options for detecting and investigating the source of a release, for mitigating the fire and explosion hazards resulting from the release, and for tracing the release back to its source. 1.1.4 The options outlined in this recommended practice are not intended to be, nor should they be considered to be, all-inclusive or mandatory in any given situation. If better or more appropriate alternative methods are available, they should be used. 1.1.5* The procedures outlined in this recommended practice can apply to hazardous substances other than flammable and combustible liquids that might have adverse human health effects. However, the physical characteristics of the specific hazardous substance released must be understood before any action is taken. (See also 1.1.2.) A.1.1.5 Guidance regarding maximum acceptable levels of these substances can be found in the Material Safety Data Sheet (MSDS); OSHA 29 CFR 1910.1000, Subpart Z; other OSHA substance-specific standards; ACGIH Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices; and the NIOSH Pocket Guide to Chemical Hazards."

Please provide the criteria in this standard that is used to perform the test and the specifications for passing the integrity test.

Page 9. How is the annual integrity assessment conducted on the transfer lines from the pumps to the kilns? Is there a standard used for this assessment? Please provide an explanation and said standard.

Page 10. Where is the form which is used to record the bimonthly (or monthly) sources of impressed current to the cathodic protection system for the covered tanks? The Inspection Schedule in Section 3.1 on pages 4 and 5 does not include this inspection, please include. Please refer to comment 2.i. regarding whether the frequency is monthly or bimonthly.

e. Section 3.5.6 on page 10 states the that the above ground portions of the tanks including the piping, pipe fittings, and valves are inspected daily for deterioration, corrosion and leaks and the results are recorded on the Kiln Field Operator's Daily LLGF Inspection Report. This report is not included in the Figures section where the other reports are located, please provide.

6. Closure Plan Norlite has an open closure plan minor modification request. The enclosed comments were sent to Norlite, via email, on March 29, 2019 regarding the proposed revisions to the closure plan dated February 2019. Please ensure these comments (see Enclosure 2) are addressed in the closure plan provided in the RCRA permit renewal application.

a. Closure Plan Introduction, page 2. Specify exactly when the rinsate will be analyzed, sampled or characterized using previous knowledge of the waste for purposes of offsite reuse or disposal. How is rinsate reused off-site?

b. Section 2.0. Closure Performance Standard page 3. The last bullet cites 373-2.1 O(h), please correct.

c. Section 3.3. Verification of Decontamination, page 5, states that "Rinsate samples to be analyzed for metals will be filtered to remove solid particles prior to preserving the samples. "It also specifies that total RCRA metals will be analyzed in accordance with the waste analysis plan and quality assurance project plan. Review of the methods in the WAP/QAPP for metals (6010 or 6020) as well as for volatiles (8260) and semi-volatiles (8270) do not include a filtering step for any of these samples. If a filtering step is necessary due to solids or sludges remaining in the rinsate sample after cleaning, then both matrices would need to be analyzed. An exception may be made if for example Norlite is concerned with rust particles which are not able to be removed by cleaning are contaminating the sample, but DEC would need to approve this on its merits for each rinsate sample. Note that the type of filter that is proposed to be used

should be thoroughly described in the QAPP and the WAP. Please revise your metals rinsate sampling requirement for filtering to address DEC's comment.

d. The statement is made on page 5 that sample handling, storage, and chain-of-custody procedures will be followed as outlined in the permit. Sample handling, storage, and chain-of-custody procedures should be part the QAPP and the WAP.

e. It is stated on page 5 that the requirements for discarded materials such as ancillary equipment, ducting and APC equipment are not as stringent as that for the HWMUs. This statement is inaccurate. DEC allows the use of alternate disposal which follows all of the regulatory requirements for proper disposal of hazardous waste. An example which has been used in the past was when DEC allowed Norlite to use the hazardous waste debris rule for metal waste which was recycled. Please revise this paragraph.

f. Section 5.3.3, Rotary Kiln & Ancillary Equipment, page 12. The statement "Since LLGF is filtered prior to burning and the kilns have a very high destruction efficiency, there is no remaining hazardous waste residues within the kilns." is not accurate. Any ash or remaining dusts in the kiln are hazardous waste residues which are derived from the treatment of hazardous waste in the kilns. Please revise this paragraph accordingly.

g. Section 5.3.3.1, page 13. Add a statement that Norlite will submit a sampling and analysis plan for DEC's review and approval prior to closure or partial closure of any HWMU or SWMU.

h. Section 5.4 SWMU, AOC and Site Management, pages 13 and 14. DEC has previously informed Norlite that the oil tanks storage area is a SWMU that must be added to the SWMU list. For the closed WWTP, this area must be identified as a SWMU as discussed during the closure of the WWTP and recognizing that the Facility may request "No Further Action" status for this SWMU. Please provide a list of all SWMUs with a description of the SWMU, its usage, any associated corrective action work/review and the current status. Figure 5 does not contain SWMUs 2, 3, 10, 13, 14 and 15 and there are two SWMU 12s, the Scrap Yard Area and the Transformer Pad Area. Please correct.

i. Section 5.5, Soil Sampling and Analysis, page 14. During partial closure of the lightweight aggregate kilns' air pollution control equipment no soil samples were taken prior to installation of the concrete pad for the new air pollution control equipment. As such, this area needs to be included in the SWMU/AOC listing and when this area is accessible, i.e., the units are closed, repurposed or replaced, soil samples must confirm that the area is not contaminated.

Financial Assurance for Closure

j. Sections 7.1 and 7.2 on page 17 states that the closure trust fund's standby trust agreement and the surety bond for closure are both pending approval. Please provide the approved, in-place documents.

k. Attachment 1 Closure Cost Estimate. The costs calculated for the Rotary Kilns and Air Pollution Control Equipment closure should include the costs for removal and disposal of these units. These are costs DEC would incur if DEC were to close the units via a third-party contractor. The costs for closure of all units should include the costs for cleaning, sampling and removal and disposal of each unit, it's ancillary equipment, and any secondary containment systems or supporting structures for these units as well as the of disposition the maximum permitted storage inventory of hazardous waste. Please ensure all costs, in current dollars, are included for each unit.

l. Updated costs associated with on-going corrective action measures and post closure care must also be provided. The costs for thirty years of operation and maintenance of any engineering or institutional controls and required monitoring and reporting must be provided unless it can be shown, and the DEC concurs, that there is a definitive end date to any on-going requirements. Include an estimate of these costs and provide additional financial assurance for these costs.

8. Engineering Drawings

a. It is indicated on the drawings for the kiln burner and clinker production that these drawings are in progress. Please submit the final drawings.

b. Although the tank drawings were done by a professional engineering firm, Harvey M. King P.E., the tank drawings lack the engineering stamp required by 6 NYCRR Part 373-1.5(a) (1) which requires that design drawings and specifications are certified by a professional engineer register in New York State. Please provide a stamped drawing for all hazardous waste tanks.

c. It is stated on many of these drawings that they are for permit purposes only. Please provide a detailed explanation of why this statement is made. If any of the drawings provided are not actual operation as-built drawings, these drawings must be provided.

Enclosure 1

Previous ICP Comments

1. Please provide context as regards to the bullet point “Updates as part of the July 1, 2020 373 Permit Application.”

2. Typographical errors including, but not limited to, font color changes, double letters, lack of spaces between words/bullet points, missing words, pluralized words, and extra spaces must be corrected.

3. Page 8 of 118 – Please correct reference to the processing of water used in spill cleanup through the facility’s wastewater treatment plant.

4. Page 45 of 118 – Reference to “an automatic AFFF fire suppressant system.” Please clarify if this is a PFAS-containing foam or is it intended to refer to an alternate FFF that is in use.

5. Page 72 of 118 – Please note that contact information for emergency coordinators must be kept current via minor modifications of the plan. Drawings must also be kept current not just updated annually.

Enclosure 2

Previous Closure Plan Comments

1. The closure plan should include discussion of the worst-case scenario for closure and Norlite's intended plan for closure:

    a. The closure plan should describe the worst-case closure scenario, that being where Norlite is unable to perform closure of the facility and the Department would need to step in and perform closure of the facility using a third party. Under this scenario, all permitted hazardous waste management units would be closed under RCRA by full removal from the facility and properly disposed at a permitted TSDF. The closure cost estimates for this closure option must include the costs for any on-going and final work at SWMUs and AOCs listed in the current permit. This plan must include cost to perform a RCRA Facility Investigation of any SWMUs or AOCs that are not directly covered by full removal in the closure plan. In this scenario, Norlite would not continue to operate the units (e.g. kilns) thereby facilitating closure. The two kilns, all APCE, ancillary equipment, secondary containment, mounting pads, dust silos etc. must be removed and properly disposed. This closure must be based upon the need to dispose of the maximum inventory of waste at all permitted hazardous waste management units. Closure must include costs for materials that were previously used to make product such as the dusts being used to make cement block which would be a hazardous waste if abandoned.

    The closure cost estimate must be based on the maximum inventory of waste that would need to be sent off-site for proper hazardous waste disposal at a permitted TSDF. In Norlite's case since the permit allows for storage of acute hazardous waste and there are no permit limits as to how much of this waste can be stored in the permitted areas, Norlite would have to assume worst case disposal costs where the maximum inventory is all acute hazardous waste. The closure costs estimate must be updated to reflect third party closure costs assuming maximum waste inventory of the acute hazardous waste with the highest disposal costs for the closure costs estimate.

    It was noticed that there is an annual cost for site management for the corrective measure chosen for corrective action. Please note that Norlite must be able to provide monitoring data that demonstrates that the groundwater protection standards have been met as required by 373-2.6(k)(6) when the corrective measure is concluded. If the ground water standards are not met Norlite will need to provide financial assurance monies for continued operation of the monitoring network for post closure for 30 years.

    b. The second closure plan scenario must describe how Norlite will close the facility. This is the plan that, upon Department approval, Norlite must use to close the facility or perform a partial closure of the regulated units. It must delineate how Norlite will dispose of the maximum inventory of all hazardous waste. In this option Norlite may continue to operate the kiln(s) to make light weight aggregate as allowed by their permits using the hazardous

waste inventory as an alternate fuel. It must include the option for final disposition of all hazardous waste management units, but it may also include an option for clean closure and continued use of the units or for recycling clean salvageable materials. This plan must provide more details for the specific types of inventory of wastes. For example, Norlite's current permit specifies containerized waste in 5, 15, 30, or 55-gallon plastic or fiber containers, or 275-gallon totes and 85-gallon overpack containers. How much of each container type does the facility typically store based on past operations? How will each container type be disposed? How will the secondary containment be closed? What about the possibility of contamination to the underlying soils? For each tank, specific information must to be provided regarding the material of construction, whether it is covered in earthen material, and whether the tank is lined. Table A, depicting the waste inventories, must specify all scenarios for closure. The ancillary equipment must be also be addressed. The secondary containment must specify options if the containment is or is not intact. A plan to address contaminated underlying soils must be included. The light weight aggregate kilns closure must specify how the APCE and all ancillary equipment will be sampled and closed. Note: Dust samples for the kiln closure are not acceptable because dust is a hazardous waste residue and must be removed. The plan must specify where the wash waters generated during closure will be disposed and any testing that will be performed prior to disposal. All testing options including sample collection, preservation, chain of custody, laboratory test methods used, the contaminants being test, etc. must be provided. Several options for sampling may be included in the plan (see Comment 2. below for more details regarding sampling and testing).

2. The plan must include a site-specific list of contaminants for analysis to confirm clean closure. The current laboratory test methods and the closure standards that must be met need to be specified. The plan can specify that the Department will be consulted to update the closure standards or test methods prior to initiating closure. Norlite may propose alternate sampling and test methods with the associated standards for use in the closure plan. For example, Norlite currently proposes to use wipe samples. Norlite must describe how the samples will be taken, how the sample is analyzed and the standards for clean closure for this type of sample. The standard that Norlite will need to meet for wipe samples is non-detect for all contaminants unless there is a specific standard (i.e. PCB and dioxin/furans). Norlite may also include options for rinseate samples, chip samples etc. Norlite may also include the option to use the hazardous waste debris rule. The plan does not specify that confirmation samples will be analyzed by an independent laboratory with current NYSDOH ELAP certification for the analyses being performed.

3. The current plan does not have the specific details necessary for Department approval. This also means there is insufficient detail for the Professional Engineer overseeing closure to provide certification acceptable to the Department that the facility was closed in accordance with the closure plan. Norlite's statement "Decontamination will be deemed successful if the resulting analytical results for the specified parameters, using appropriate methods of analysis in accordance with SW-846, do not exceed regulatory standards in effect at the time of closure." is too vague and the Department would need to be consulted regarding the specific details of the closure plan every time a closure or partial closure is performed.

4. It was noticed that Norlite's list of SWMUs in the current permit is incomplete since it does not include the used oil tank storage areas as SWMUs. Norlite's list of SWMUs in the permit must be updated to include all units managing any type of solid waste, regardless of whether it is a hazardous waste, and all areas where releases could result in hazardous wastes or constituents being released into the environment which could impact human health or the environment. In addition, the designation of no further action needs to include a footnote which states. "A determination of No Further Action shall not preclude the Department from modifying this Permit at a later date to require further investigations, studies, monitoring, or corrective measures, if new regulations, information or subsequent analysis indicates the release(s) or likelihood of release(s) that could pose a threat to human health or the environment."

5. The document needs to be correctly formatted. For instance, in the Table of Contents the sections are numbered with a whole number followed by ".0" except the General Closure Activities and Liability Requirements Sections which start at 5.1 and 8.1 respectively. Section 3.1 bolds the "1" and the font is a different type and Inventory is mis-spelled. Section 7.1 uses a capital I for the 1. The section on the Rotary Kilns now has two subsections which are not identified in the Table of Contents or entitled in the document. Within the plan Section 2.0 is labeled 2.1 and Section 4.0 is labelled 4.1. Sometimes the subsections are in bold type, other times they are not. Sometimes there is additional spacing after a line, other times there is no additional spacing. Please format the document correctly and correct any spelling errors, for example, Section 3.1 of the Table of Contents should be "Waste Inventory", not "Waste Inventoly" and the last bullet in Section 2.1 [sic] the regulatory citation should be "373-2.10(h)" not "373-2.1O(h)".

6. Once the revised closure plan addressing the Department's comments is approved, Norlite should request a minor permit modification to replace the current closure plan with the revised plan. Additionally, Norlite's closure costs will need to be updated as well as the financial assurance documents to support the revised closure costs. The revised closure plan must address the closure of the Kilns' APCE and the associated ancillary equipment that will be removed and disposed of for Project Delta. This partial closure will need to be overseen and certified by an independent P.E. registered in New York State. Please note that the revised closure plan must also provide details adequate to close the new APCE and ancillary equipment associated with Project Delta, but the closure costs estimate can be based on third party disposal of the new APCE and ancillary equipment associated with Project Delta.