



Global Risk Advisors

Todd Dresser, CHMM, CEA
Practice Leader
603.921.0913

August 15, 2022

Mr. Ethan Parsons
Planning Director
Town of Ipswich
25 Green Street
Ipswich, MA 01938
ethanp@ipswichma.gov

Subject: Review of Supplemental Information Provided by New England Biolabs as Part of Special Permit Application for the Storage and Use of Toxic and Hazardous Materials at 240 County Road in Ipswich, Massachusetts

Dear Mr. Parsons:

New England Biolabs (NEB) seeks approval from the Town of Ipswich Planning Board (Town of Ipswich) to store and use toxic and hazardous materials at 240 County Road in Ipswich, Massachusetts. The Town of Ipswich has contracted Chubb Global Risk Advisors (CGRA) to complete a technical review of the permit application submitted by NEB. CGRA reviewed and compared the initial permit application submitted by NEB to the terms and intent of Section IX, Subsection N of the Ipswich Protective Zoning Bylaw. CGRA provided written comments and recommendations upon the completion of this review to the Town of Ipswich on June 3, 2022.

The Town of Ipswich convened a conference call on June 16, 2022, involving: Ethan Parsons, Ipswich Planning Director; Todd Dresser/CGRA; and Barry Cohen and Patrick Norton/NEB to review and discuss the initial review comments prepared by CGRA. At the conclusion of this discussion, it was agreed that NEB would submit supplemental information for review in an attempt to address and resolve questions raised during the initial permit review. CGRA has reviewed the supplemental materials submitted by NEB. This letter report summarizes the findings and recommendations noted during the review of the supplemental permit information provided by NEB.

Summary of Findings and Recommendations

CGRA has prepared the following comments and recommendations for consideration and use by the Ipswich Planning Board.

1. The initial permit application did not contain a detailed chemical inventory that accurately summarized the types, amounts and hazards associated with the chemicals stored on site. NEB provided a chemical inventory in the supplemental data package that lists approximately fifty (50) chemicals stored and used on site. This list is much more detailed and informative when compared to the information originally provided for review, however when CGRA reviewed and compared the inventory to the hazardous waste routinely disposed by NEB during the past year, CGRA noted a number of reagents were repeatedly disposed by NEB but were not listed in the chemical

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inventory. In addition, the following high-hazard materials were disposed by NEB, but have not been listed as part of the site chemical inventory:

Chemical Name	Chemical Hazard
Sodium Borohydride	Reacts with water to release flammable gas – fire hazard
Boron Trifluoride diethyl etherate	Water reactive – explosion hazard
Dimethyl dichlorosilane	Water reactive, flammable – fire hazard
Sodium Cyanoborohydrate	Water reactive, releases spontaneously combustible gas
Diethyl azodicarboxylate	Reactive – explosion hazard
Ethyl Ether	Peroxide former – explosion hazard
Benzene	Confirmed carcinogen
Carbon Tetrachloride	Confirmed carcinogen
Ethidium Bromide	Respiratory toxin
Methyl Iodide	Inhalation poison

The use of these types of materials is not uncommon at life science facilities such as NEB. The key is ensuring that both the facility and local emergency responders have a strong and current understanding of the chemical hazards present at the facility and conditions to avoid. NEB should provide the Town of Ipswich with a detailed and accurate understanding of the chemical inventory present on site. The inventory should clearly identify all water reactive materials, inhalation hazards, and potentially explosive materials. This information is needed to ensure a safe and effective response in the event of a fire or spill at the facility. In addition, the Ipswich Fire and Building Departments should use this information to ensure that all high-hazard materials are stored and managed in accordance with applicable fire and building codes.

Further review of the revised chemical inventory determined that the record did not list the presence of any compressed gases or chemicals related to the operation or maintenance of the facility. It is also unclear if the chemicals used in the wastewater treatment facility operated on site have been listed in the chemical inventory. CGRA anticipated that some type of initial chemical treatment would have been used to disinfect the sanitary wastewater generated by the facility. No such materials were listed in the inventory. CGRA also noted that a collection of common lab reagents that had been disposed as hazardous waste by NEB during the past year had not been listed in the amended inventory provided for review.

Recommendation: NEB should provide a complete and current chemical inventory that lists all chemicals stored on site. Note: NEB is required by the federal Occupational Safety and Health Administration (OSHA) under the Hazard Communication Standard to maintain an accurate and complete inventory of the chemicals stored/used on site, and to assess the hazards of these materials. The revised inventory should list the following: chemical name, hazard(s) associated with the chemical, size of each chemical container, total amount stored on site, storage location(s) for the material (building and room), and special safety/response concerns (e.g., water reactive, potential explosive, inhalation hazard, radioactive). The inventory spreadsheet should include searchable filters that will enable the Fire Department to search by chemical name, hazard, or storage location. NEB should provide an electronic copy of the inventory in MS Excel format to maximize the usefulness of this information by the Fire Department. The Town of Ipsich should consider requiring NEB to provide an annual update each year by a specified date.

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2. Based on the chemical usage at NEB, the facility is subject to OSHA Chemical Hygiene Standard 29 CFR 1910.1450. This standard requires facilities that use hazardous chemicals in a laboratory setting to identify hazardous materials utilized by their employees and to implement precautions to prevent exposure. As part of this, the employer is required to draft a written program and to identify high-hazard materials used in the workplace such as carcinogens, mutagens, teratogen, severe inhalation hazards, reactive materials or potential explosives, and to develop controls and management strategies for these materials. While reviewing the NEB Chemical Hygiene Plan, CGRA noted that Appendix B, the section used to identify high-hazard chemicals, had not been completed and was blank. Based upon a review of the hazardous waste disposal records provided by NEB, a variety of high-hazard materials are stored and used at the facility.

Recommendation: The Town of Ipswich should seek confirmation from NEB confirming that the facility has reviewed and evaluated its chemical inventory and identified all high-hazard materials and initiated effective control measures for these materials. It may also be advisable for the Town to seek to have NEB provide annual chemical safety training to local emergency responders who may be called upon to respond to the facility, so these individuals will have a better understanding of the materials, labeling and hazards they could encounter at the facility. The training should also include a review of where the high-hazard materials are stored and used, as well as the monitoring and control systems used to secure and contain these materials.

3. The updated information provided by NEB did not describe how the proposed expansion will impact the amount or type of chemicals that will be stored on site once the expansion has been completed.

Recommendation: NEB should provide a detailed summary that outlines how the chemical inventory will expand or change upon completion of the proposed 100,000 sf expansion of the research/production facility. NEB should also provide a detailed description summarizing what materials will be stored in the new expansion and the volume of materials to be stored in these areas.

4. NEB provided a letter to the Ipswich Fire Department dated June 17, 2022, reporting that the facility does not store hazardous materials above the Threshold Planning Quantity (TPQ) as defined in the federal Emergency Planning and Community Right to Know Act, commonly known as SARA Title III. Based on this, NEB has not submitted a Tier II Notification to the Ipswich Fire Department. CGRA reviewed the revised chemical inventory provided by NEB and found that NEB reported that it used 20 gallons of sulfuric acid on a weekly basis for pH neutralization as part of the site wastewater treatment system. Assuming that NEB maintains at least a two-week supply of sulfuric acid on hand (approximately 40 gallons), then NEB would exceed the TPQ of 500 pounds for sulfuric acid and would need to submit an annual Tier II to the Ipswich Fire Department.

Recommendation: When preparing an updated chemical inventory, NEB should confirm the total amount of each chemical product stored on site and compare these totals to the applicable TPQ for each substance to determine if annual reporting is required. Special emphasis should be placed on identifying Extremely Hazardous Substances as defined in the federal regulation because these substances have low TPQs, and more stringent reporting requirements. If materials are found to be stored in excess of the TPQ, then NEB should prepare and submit the required notifications in accordance with the federal regulation.

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5. NEB provided a copy of the permit application the facility submitted to the Ipswich Fire Department dated June 16, 2022, seeking to renew its Hazardous Materials Processing permit pursuant to the Massachusetts Fire Code 527 CMR 1 Chapter 60. This regulation gives the local fire department and/or the senior elected municipal board the authority to permit or license the use of hazardous materials based on the type and amount of hazardous materials involved in a regulated process. The regulation establishes a tiered permitting/licensing protocol to enable the community to more aggressively regulate high-hazard materials stored or used in larger quantities. The intent of the regulation is to promote information share and public safety.

The application package submitted by NEB included a cover letter, state permit application, and a summary spreadsheet prepared by NEB. The information provided did not identify a) the hazards associated with the chemicals or processes listed; b) conditions to avoid; or c) identify safety controls implemented to prevent process upset. The information provided lacks the detail needed to adequately assess the nature and hazard of the processes NEB is seeking to permit. In addition, the permit application lacks the detail the Fire Department would need to evaluate the regulated process or to develop a response plan for these processes.

Recommendation: The Ipswich Fire Department should tour the facility and review the processes that NEB is seeking to permit. The Fire Department should seek the information needed to properly understand, assess and permit all regulated processes present at the facility. The Fire Department should verify that all regulated processes present at the facility are identified and properly permitted.

6. The intent of Section IX, Subsection N of the Protective Zoning Bylaw is to support the protection of local groundwater quality. NEB operates a private well on site. NEB reports the well is used for non-potable purposes but has not provided any additional information describing the construction or use of the well. The Ipswich Board of Health reported that the installation of the well pre-dates the adoption of the Ipswich Private Well regulation and has not been subject to local regulation.

Based on the information provided, it is not currently possible to evaluate the use or potential impact of this well on water resources in Ipswich. The Town of Ipswich should be aware that private wells are not subject to state regulation under 310 CMR 36.00, the Massachusetts Water Management Act, until the daily rate of withdrawal exceeds 100,000 gallons/day. As a result, many private wells used for irrigation, process water and other purposes tend to operate outside of any regulatory controls or restrictions.

Recommendation: Ipswich should seek a completed copy of the groundwater certification form and water quality test results for the past 3 years. NEB should provide information that answers the following: How is the private well used? What is the rate of groundwater withdrawal? Is the well cross-connected to any buildings or processes on site. What control measures have been implemented to prevent a cross-connection between the private well and the public water supply? The Town should seek plans that clearly identify all connections to the well, as well as controls used to prevent a cross connection with the public water supply. What is the construction of the well? The Town of Ipswich should also require the installation and maintenance of a non-resettable water meter and require annual reporting so the Town can monitor the rate of withdrawal. This data will help the Town monitor potential impacts on the municipal water resources, identify conditions that could promote the migration of contaminants from nearby spill sites, and to potentially regulate water withdrawals during periods of drought.

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7. NEB should provide a detailed analysis prepared and signed by a Massachusetts Professional Engineer that outlines how the proposed 100,000 sf expansion will impact future water use/withdrawal by the facility. In addition, the analysis should review and describe how the expanded water use will impact the site wastewater treatment system. Can the existing wastewater treatment system manage the increase, or will the treatment system need to be expanded? If expanded wastewater treatment is required, how and when will this be accomplished?
8. Depending on the rate and volume of withdrawal from the private well located on site, it may be advisable to request NEB to provide a geotechnical assessment that estimates the recharge area for the private well utilized by NEB. This may be needed to determine if the recharge area for the well at NEB overlaps with any existing or pending municipal recharge areas, or if it might intersect areas of known contamination and impact the treatment or migration of the contaminants.
9. NEB uses radioactive materials on site and generates radioactive waste. Currently, there are few disposal options for radioactive wastes. Many facilities in Massachusetts store radioactive waste on site to decay over time. This is allowed and supported by the Massachusetts Department of Public Health (MADPH) Radiation Control Program. NEB is licensed by MADPH to store radioactive waste on site to allow it to decay to background levels.

The NEB Radioactive Management Plan indicates that NEB generates both short- and long-lived radioactive waste. Short- and long-lived refers to the length of time needed for the isotope to decay and decrease in relative radioactivity. The NEB Radioactive Management Plan indicates that long-lived materials will be sent off site for disposal and short-lived waste will be stored on site to allow these materials to decay to background concentrations. No records were provided for review to indicate that any radioactive waste had been sent off site for disposal. In addition, the records provided did not clearly indicate the total volume of radioactive waste stored on site or where/how this waste is isolated, secured and monitored while in storage.

Recommendation: NEB should provide a more detailed description in terms of how much radioactive waste is generated monthly; where the waste is stored; how the waste storage area is identified and secured; and control measures utilized to monitor or warn of a breach of containment or cross contamination. The information provided should be in an understandable format so that it can be readily used by local fire and building officials. Local fire and building officials should review and evaluate the area(s) used to store radioactive waste to ensure that the storage area(s) have been designed and constructed in accordance with applicable building and fire codes. It may be advisable for the Town of Ipswich to consider requiring the installation and maintenance of radiation sensors at strategic locations where radioactive materials are shipped, received, transported or stored at the facility so that site personnel and emergency responders would be alerted in the event of release of radioactive materials.

10. A review of the waste manifests provided by NEB, determined that the facility has routinely operated as a Small Quantity Generator (SQG) of hazardous waste for the past year. That means the site generates somewhere between 200 to 2,200 pounds of hazardous waste monthly. The hazardous waste includes a mixture of flammable, corrosive, reactive, and toxic hazardous wastes. NEB can store up to 2,200 pounds of hazardous waste on site without exceeding its generator status.

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Recommendation: Local fire and building officials should review and evaluate the area(s) used to store hazardous waste to ensure that the storage area(s) have been designed and constructed in accordance with applicable building and fire codes.

11. NEB provided wastewater sampling results with its permit application. No additional information was provided describing the wastewater treatment system, the wastewater discharge permit or sampling requirements.

Recommendation: The Planning Board should seek a copy of the current NEB wastewater treatment and discharge permit so that the Town can review and compare the sampling results to the permit sampling requirements and discharge limits. It is not possible to determine if the discharge meets the applicable permit limits without this information.

12. NEB has provided a variety of internal management plans that outline procedures for the handling and use of hazardous materials. These plans provide instructions and guidance for site employees. The permit application did not include a written Pre-Plan prepared by the facility in conjunction with the Fire Department. The intent of the Pre-Plan is to help identify critical conditions to avoid and key response measures to be implemented in the event of a fire, chemical spill, or release of radioactive materials. Pre-Plans often identify the three highest hazard scenarios related to on-site chemical processes that a facility should avoid to alleviate the risk of a fire/explosion or atmospheric release. The Pre-Planning process is an opportunity to conduct realistic hazard analysis during a non-emergency, and to potentially initiate hazard mitigation/control measures to prevent or lessen the impact of a potential event. Pre-Planning is a proactive hazard prevention strategy the Town should promote.

Recommendation: NEB should be directed to coordinate with the Fire Department and the Local Emergency Planning Committee to constructively review site hazards and to develop and maintain a Pre-Plan. This approach will help ensure the information is objectively reviewed and amended as needed, and to support the sharing of critical information with local emergency responders.

13. The research and production environment at NEB is fluid in nature and can change over time. No records were provided to indicate that the Massachusetts Department of Environmental Protection or the U.S. Occupational Safety and Health Administration had inspected the facility within the past five years. Records indicate that MADPH reviews and evaluates the management of radioactives at the facility on an approximately five-year basis.

Recommendation: Based on the limited amount of regulatory oversight that is currently occurring, the Town of Ipswich may wish to consider initiating an annual or biannual inspection and review of the storage and use of hazardous materials at NEB to ensure local officials are receiving timely and accurate information regarding the storage, management and handling of biological, chemical and radioactive substances used at the facility. The Town may wish to consider having the facility inspected by an individual who is trained and experienced in the storage and handling of hazardous materials and is knowledgeable in emergency planning and the operation life science facilities. This approach will support efforts to provide the community with timely and understandable information that local officials can use effectively.

Chubb Global Risk Advisors appreciates the opportunity to support the Town of Ipswich Planning Board in reviewing the Special Permit Application submitted by New England Biolabs. Should you have any

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questions about the comments or recommendations provided, please do not hesitate to contact me at Todd.Dresser@Chubb.Com, or 603.921.0193.

Sincerely,

Todd Dresser

Todd Dresser, CHMM, CEA
Practice Leader
Chubb Global Risk Advisors

Reviewed by:

James D. Jones

James D. Jones, MS, CHMM
Vice President
Chubb Global Risk Advisors

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