New York State Environmental Quality Review (SEQR)
Draft Public Scoping Document

for

Generic Environmental Impact Statement (GEIS)

for

Cryptocurrency Mining Operations that use Proof-of-Work Authentication Methods to Validate Blockchain Transactions

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I. OVERVIEW

Chapter 628 of the Laws of 2022 (also referred to as "the cryptocurrency mining law" or "the cryptocurrency moratorium") directed the New York State Department of Environmental Conservation (DEC or the Department), in consultation with the New York State Department of Public Service (DPS), to prepare, pursuant to Article 8 of the Environmental Conservation Law (ECL), a Generic Environmental Impact Statement (GEIS) on cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions (hereinafter "cryptocurrency mining operations"). This law also established a two-year moratorium on the issuance of certain permits to certain cryptocurrency mining operations.

The cryptocurrency mining law requires DEC to post a draft GEIS to its website and provide 120 days of public comment from the date of issuance. The law also requires DEC to conduct at least one public hearing on the draft GEIS in eight regions, including Western New York, Finger Lakes, Southern Tier, Central New York, Mohawk Valley, North Country, Capital Region/Hudson Valley, and New York City/Long Island, as defined by the Empire State Development Corporation. Finally, the law requires DEC to issue a final GEIS after the close of the public comment period and hearings.

Article 8 of the ECL, State Environmental Quality Review Act (SEQR), and the associated regulations under 6 NYCRR Part 617, establish a process to comprehensively and holistically consider potential environmental impacts of discretionary actions that are directly undertaken, funded, or approved by local governments, state agencies, and public corporations. SEQR establishes the requirements and processes for the development of environmental impact statements which are required where an action may have a potentially significant impact on the environment. A GEIS is a type of environmental impact statement that is used to consider broad-based actions or related groups of actions that agencies may approve, fund, or directly undertake. A GEIS may be used to, among other purposes that are relevant to Chapter 628 of the Laws of 2022, examine the environmental impacts of separate actions having common impacts (also referred to as "cumulative impacts").

In this instance, the cryptocurrency mining law directs DEC to prepare a GEIS and sets forth 10 topics that it must address, at a minimum, related to cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions. These topics are listed in *Section III. Potentially Significant Impacts* and cover the overall state of cryptocurrency in New York, as well as the impacts of proof-of-work cryptocurrency mining operations on energy, greenhouse gas emissions and co-pollutants, water quality, public health, and the social and economic costs and benefits of these operations. Thus, the purpose of the GEIS is to broadly consider the impacts of the industry as described in the legislation and not a particular operation.

The first step in preparing the draft GEIS is for DEC to prepare a "scope" or outline of its contents. The scope refers to the outline of what the draft environmental impact statement will contain. The process of creating an outline is called "scoping" to develop a written outline or "scope" of topics and analyses of potential environmental impacts of an action that will be addressed in the draft GEIS. More precisely, the job of scoping is to narrow issues that will be addressed in the draft environmental impact statement to ensure that it will be a concise, accurate and complete document that is adequate for public review. More about scoping is available in DEC's SEQR Handbook.

DEC will provide a 30-day period for the public to review and provide written comments on this draft scope. While the legislation is prescriptive as to the minimum scope and topics the GEIS shall address, this document seeks to ensure an opportunity for public input. The scoping process concludes with the preparation of a final scope that will serve as the outline of the GEIS.

II. DESCRIPTION OF PROPOSED ACTION

Cryptocurrencies (also known as "crypto assets") are digital currencies that are implemented using cryptographic techniques. The energy intensity of the specific technology used to generate or "mine" for cryptocurrency, as well as how the associated energy is generated, are key factors in assessing overall environmental impacts. Some cryptocurrency technologies currently require a considerable amount of electricity for "mining." Nearly all electricity usage for cryptocurrency mining is driven by consensus mechanisms: the distributed ledger technologies used to mine and verify crypto assets. Currently, the dominant consensus mechanism is called proof-of-work. The proof-of-work mechanism is designed to require more computing power as more entities attempt to validate transactions for coin rewards. Since more computing power is required by design, this also means that utilization of the proof-of-work mechanism is inherently energy intensive regardless of the source of electric energy. If the associated electric energy is generated using fossil fuels, then this mechanism will also contribute to increased greenhouse gas emissions.[1]

III. POTENTIALLY SIGNIFICANT IMPACTS

The following are impacts that the draft GEIS will consider based on the requirements of Chapter 628 of the Laws of 2022. Section 3 of the law requires that the GEIS address, at a minimum, ten topics. Due to the nature of these topics and the requirement under the Climate Leadership and Community Protection Act (CLCPA or Climate Act) that the electricity sector be zero emissions by 2040, the evaluation of these ten topics will be focused on cryptocurrency mining operations that have on-site generation capacity to meet their electricity needs. Issues related to operations that wholly or substantially utilize grid-supplied electricity will be addressed separately in the GEIS. The following list states these topics and describes the extent and quality of information needed to adequately address each impact.

1. The number and location of existing cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions in the state
    a. The GEIS will utilize data from existing sources to determine the number and location of existing cryptocurrency mining operations
    b. The GEIS will identify large commercial cryptocurrency mining operations
2. The amount of electric energy consumed by each cryptocurrency mining operation that uses proof-of-work authentication methods to validate blockchain transactions
    a. The GEIS will include a database of electric generation capacity at existing operations using data that is readily available from existing sources
3. The sources of electric energy consumed by each cryptocurrency mining operation that uses proof-of-work authentication methods to validate blockchain transactions and the type of fuel used by each energy source

[1] OSTP (2022). Climate and Energy Implications of Crypto-Assets in the United States. White House Office of Science and Technology Policy. Washington, D.C. September 8, 2022.

   a. The GEIS will use existing data to determine the source of electric energy consumed by each facility and organize that data by energy source, including but not limited to natural gas, fuel oil, hydropower, or other renewable energy
4. The amount of greenhouse gas emissions and co-pollutants released by each energy source attributable to providing electric energy to cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions
   a. The GEIS will utilize the generation capacity data from number 2 above and the energy source data from number 3 above to calculate potential greenhouse gas emissions and co-pollutant data for each operation
   b. This data will be calculated using greenhouse gas emissions factors published by DEC, as well as any available permit information (e.g., Title V air pollution control permits issued subject to 6 NYCRR Part 201)
5. The anticipated increase, if any, of cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions in the state and the anticipated expansion, if any, of existing operations
   a. The GEIS will utilize existing sources to identify or make reasonable projections on the potential for new operations or expansion of existing operations based upon the data from number 1 above
   b. To the extent practicable, this may also include a literature review related to basic market research on the general state of proof-of-work cryptocurrency mining operations in New York and elsewhere in the United States
6. The potential impacts of electric energy consumption by cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions on the state's ability to meet the greenhouse gas emission reduction goals set forth in article seventy-five of the environmental conservation law
   a. To the extent practicable, the GEIS will utilize the data from number 4 and 5 above to estimate potential greenhouse gas emissions in 2030 and 2050 from cryptocurrency mining operations
   b. The GEIS will explain the context surrounding climate change in New York, including the Climate Act that requires reductions in greenhouse gas emissions by 2050, with an interim 2030 mandated target
7. The amount of water usage, water quality and other ecological impacts, if any, of cooling water use by cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions
   a. The GEIS will describe the various water-cooling technologies typically used by cryptocurrency mining operations, which may include open-loop cooling, closed-loop systems that use evaporative cooling, or dry cooling methods
   b. The GEIS will discuss the impacts of raw water intake for cooling purposes on aquatic species
   c. The GEIS will discuss the impacts on overall water quality including from elevated temperature in receiving waters from facility cooling and discharge of any other pollutants
8. The potential public health impacts, if any, due to reduced air and water quality in communities near cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions
   a. The GEIS will provide an overview of air quality control regions and attainment levels with air quality standards, and the state of overall air quality in New York, as well as the location and overall quality of water sources in proximity to the identified cryptocurrency mining operations identified in this process
   b. The GEIS will utilize data from number 4 above to characterize greenhouse gas emissions and co-pollutants emissions released by each energy source

attributable to providing electric energy to cryptocurrency mining operations that reduce air quality
    c. The GEIS will utilize data from number 7 above to characterize any potential water quality impacts by cryptocurrency mining operations
    d. The GEIS will use existing data and studies to describe how reduced air and water quality may impact public health
9. The potential statewide public health impacts, if any, from increased greenhouse gas emissions released by cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions
    a. The GEIS will use existing data and studies to describe the impact of greenhouse gas emissions, such as carbon dioxide and methane, on public health
10. The social and economic costs and benefits, if any, of cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions
    a. To the extent practicable, the GEIS will provide an overview of the social and economic costs and benefits of proof-of-work cryptocurrency mining operations in New York and elsewhere in the United States using case studies or other publicly available studies
    b. The draft GEIS will utilize the Value of Carbon guidance developed by DEC[2] to estimate the societal damages incurred as a result of the greenhouse gases released calculated for number 4 above
    c. The discussion of social and economic impacts in the GEIS are expected to be qualitative and include an overview of the type and magnitude of potential costs and benefits

IV. AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

In addition to identifying any potential impacts, the draft GEIS will evaluate and make recommendations on opportunities to avoid, minimize, or mitigate the significance of impacts. In the development of these measures, the lead agency will review or consider policies, programs, or regulations that other jurisdictions have proposed or implemented. Some or all recommendations may be outside of DEC's authority to implement. Authority to implement recommendations may be with other agencies or the Legislature. The following reflect examples of potential mitigation measures that the draft GEIS may consider.

1. Mitigation measures to reduce or eliminate the impact that cryptocurrency mining operations may have on the achievement of the greenhouse gas emissions reduction requirements in the Climate Act could include the requirement to utilize primarily or solely grid-supplied electricity or on-site renewable energy or zero-emission resources.
2. Mitigation measures to reduce or eliminate the impact that cryptocurrency mining operations may have on air quality could include the requirement to utilize primarily or solely grid-supplied electricity or on-site renewable energy or zero-emission resources to minimize impacts from greenhouse gas and co-pollutant emissions that result from the combustion of fossil fuels.
3. Mitigation measures to reduce or eliminate the impact that these cryptocurrency mining operations may have on water quality could include the requirement to reduce thermal load, thereby eliminating the need for large raw water intakes for cooling that may have negative impacts on water quality and aquatic species.

[2] New York State Department of Environmental Conservation (2021). Establishing a Value of Carbon: Guidelines for Use by State Agencies. Accessed at https://extapps.dec.ny.gov/docs/administration_pdf/vocguide23final.pdf.

4. For any potential socio-economic impacts identified as part of the GEIS, targeted mitigation measures should be identified. This may include measures to eliminate any adverse impacts to host communities.

V. ALTERNATIVES

The draft GEIS will discuss alternatives to maintaining the existing state of cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions in New York, including the no action alternative. The goal of analyzing alternatives in a GEIS is to investigate means to avoid or reduce potentially adverse environmental impacts identified in the environmental impact statement.

The alternatives discussion may overlap or be consolidated with the discussion of avoidance, minimization, and mitigation measures since the purpose of an alternative is to avoid or minimize impacts. The "no action" alternative must always be discussed to provide a baseline for evaluation of impacts and comparisons of other impacts of alternatives. The substance of the no action discussion should be a description of the likely circumstances if no governmental action is taken. The existing state of these cryptocurrency mining operations includes the number of facilities, current electric energy consumption, and current level of greenhouse gas and co-pollutant emissions.

Alternatives include:

1. No action alternative.
2. Transition of the industry to utilizing renewable or zero-emission energy resources for electricity.
3. Limit, or limit the expansion of, cryptocurrency mining operations that use proof-of-work authentication methods or require the use of alternative technologies that reduce energy consumption, such as proof-of-stake mining. Proof-of-stake verification is an alternative mechanism of securing cryptocurrency transactions that does not require machines to solve the same volume of complex puzzles, and hence uses only a small fraction of proof-of-work algorithms.[3]

VI. CUMULATIVE IMPACTS

This section of the draft GEIS will evaluate the potential cumulative impacts of these cryptocurrency mining operations from an environmental policy basis on a statewide, long-term perspective.

VII. OTHER INFORMATION

The draft GEIS will contain other generic components, listed below.

1. Executive Summary: Brief description of the study and a summary of the potential impacts, mitigation measures, and reasonable alternatives.
2. Unavoidable adverse impacts that cannot be mitigated: Summary and description of the significance of all impacts for which mitigation is either not available, feasible, or insufficient to completely mitigate the impact.

[3] DeRoche, M., Fisher, J., Thorpe, N., and Wachspress, M. (2022).The Energy Bomb: How Proof-of-Work Cryptocurrency Mining Worsens the Climate Crisis and Harms Communities Now.

3. Irreversible and irretrievable commitment of resources: Evaluation of finite resources, such as natural gas, including the consideration of the consumption of limited energy production capacity by cryptocurrency mining operations as compared to alternative economic activities or uses of those resources. As the draft GEIS explores the amount of electric energy consumed by cryptocurrency mining operations that use proof-of-work authentication methods to validate blockchain transactions and any potential future expansion of those operations, it may be important to understand the impact to the electricity grid if these operations solely utilized grid-supplied electricity. This would be considered in the context of New York's overall climate strategy as it electrifies certain sectors and transitions to a clean energy economy.
4. References and list of acronyms
5. Glossary of terms
6. List of appendices, which may include:
    a. Final Scope
    b. Correspondence
    c. Energy consumption data of existing operations
    d. Potential growth in operations energy consumption data
    e. Air and water resources data
    f. Socio-economic data