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STATE OF RHODE ISLAND

IN GENERAL ASSEMBLY

JANUARY SESSION, A.D. 2017

A N A C T

RELATING TO HEALTH AND SAFETY -- THE GEOENGINEERING ACT OF 2017

Introduced By: Representative Justin Price

Date Introduced: March 24, 2017

Referred To: House Environment and Natural Resources

It is enacted by the General Assembly as follows:

1 SECTION 1. Title 23 of the General Laws entitled "HEALTH AND SAFETY" is hereby
2 amended by adding thereto the following chapter:

3 CHAPTER 23.8

4 THE GEOENGINEERING ACT OF 2017

5 **23-23.8-1. Short title.**

6 This chapter shall be known and may be cited as "The Geoengineering Act of 2017".

7 **23-23.8-2. Legislative intent.**

8 (a) "Geoengineering" is defined herein as the intentional manipulation of the
9 environment, involving nuclear, biological, chemical, electromagnetic and/or other physical-agent
10 activities that effect changes to earth's atmosphere and/or surface.

11 (b) The Rhode Island general assembly finds that geoengineering encompasses many
12 technologies and methods involving hazardous activities that can harm human health and safety,
13 the environment, and the economy of the state of Rhode Island,

14 (c) It is therefore the intention of the Rhode Island general assembly to regulate all
15 geoengineering activities as further set forth by the terms and provisions of this chapter.

16 **23-23.8-3. Findings of fact.**

17 (a) Scope of geoengineering. Inclusive of solar radiation management (SRM) and other
18 technologies, geoengineering activities are diverse and vary greatly in their characteristics and
19 consequences. Geoengineering may involve ground-based and/or atmosphere-based deployments,

1 including, without limitation, the use of aircraft, rockets, unmanned aerial vehicles (UAVs),
2 drones, and/or large balloons.

3 (b) Solar radiation management (SRM) geoengineering activities requiring state licensing
4 include, without limitation:

5 (1) Cloud cover production: Aerial releases of water vapor produce manmade cloud
6 cover;

7 (2) Cloud whitening: sea salt or other particulates injected into clouds make the clouds
8 more reflective, after which the salt or other particulates rain out over land areas and freshwater
9 supplies;

10 (3) Salt flare rockets: fired into clouds, these rockets trigger rain downpours containing
11 salt;

12 (4) Space sunshades or sunshields: huge, parasol-like devices reduce the amount of direct
13 sunlight reaching earth's surface;

14 (5) Solar shields or atmospheric sunscreens: reflective particulates such as sulfur dioxide
15 and aluminum oxide, released into the atmosphere, block sunlight from reaching earth's surface,
16 after which such particulates rain down as pollution;

17 (6) Reflective space mesh mirrors: wire-mesh mirrors, deployed in space, reduce the
18 amount of direct sunlight reaching earth's surface over small or large areas, depending on their
19 size;

20 (7) Planetary sunshades: these largest of SRM operations use particulates to cover, over
21 time, the whole Earth, stripping the ozone layer by as much as seventy-six percent (76%) and
22 reducing the amount of direct sunlight reaching earth's surface;

23 (8) Artificial ionosphere: a sustained, high-density plasma cloud is produced in earth's
24 upper atmosphere;

25 (9) Large helium balloons, which release atmospheric contaminants; and

26 (10) Rocket emissions including water vapor, a greenhouse gas.

27 (c) Additional geoengineering activities requiring state licensing include, without
28 limitation:

29 (1) Ocean fertilization by iron or lime seeding, including, but not limited to, ocean
30 sequestration, which processes produce detrimental, artificial algae blooms from pollutants in the
31 ocean;

32 (2) Re-icing or cooling the Arctic and other areas through artificial means;

33 (3) Ocean-cooling pipes;

34 (4) Weather modification involving the release of sea salt, silver iodide, barium and/or

1 other particulates to enhance rain or snow in one area, while reducing the availability of rain or
2 snow in other areas;

3 (5) Genetically modified, CO₂-eating, plastic trees;
4 (6) Glacier-reflecting blanket deployment;
5 (7) Land-based and ocean-based carbon sequestration;
6 (8) Carbon dioxide geo-sequestration and carbon capture or removal, which processes
7 involve capturing what is considered "waste" carbon dioxide (CO₂) and depositing it at storage
8 sites;
9 (9) Nitrogen removal and sequestration;
10 (10) Carbon black or black carbon releases: deliberate, atmospheric releases of soot to
11 produce artificial weather events; and

12 (11) Atmospheric deployment of radiofrequency/microwave radiation other than that
13 needed for safe aviation, and/or deployment of other physical agents, for stated and/or unstated
14 purposes.

15 (d) Aircraft geoengineering activities include those carried out from any type of aerial
16 vehicle, rocket, drone or balloon, that involve the release or deployment of any nuclear radiation;
17 any biologic or trans-biologic agent; any chemical substance other than the aircraft's fuel
18 emissions, which are harmful but necessary for flight or any chemical mixture such as chaff; any
19 electromagnetic radiation other than radar and radio communications necessary for the aircraft's
20 safety; or any other physical agent, shall be subject to regulation including the licensing process,
21 pursuant to this chapter.

22 (e) Consequences. Documented problems arising from geoengineering activities include,
23 but are not limited to:

24 (1) Global dimming, causing reduced vitamin D absorption in humans and animals, and
25 reduced photosynthesis;
26 (2) Changes in distribution patterns and chemical contents of local rainfall;
27 (3) Contamination of air, water, and soil, as particulates fall to earth's surface;
28 (4) Degradation of human, animal and plant health, when people and other living
29 organisms are exposed to falling particulates and other atmospheric contaminants;
30 (5) The acceleration of biodiversity and species losses, especially the loss of endangered
31 and threatened species as identified under the U.S. Endangered Species Act of 1973 (ESA), each
32 one of which species has intrinsic value as well as human resource value;
33 (6) Less direct sunlight reaching the earth, fewer winter freezes, and higher humidity,
34 resulting in increased molds, mildews, fungi, and pest problems;

1 (7) Increases in acid rain loads from the airborne injection or releases of sulfur and
2 aluminum oxide, with human, animal, plant, and water-resource degradation therefrom;

3 (8) The near impossibility of restoring natural resources, with the undermining and
4 devaluation of state-funded conservation programs;

5 (9) Changes in micro-climates, local weather, and larger-scale climates within short time
6 periods, with greater likelihood of increased and cascading effects.

7 (10) Droughts and flooding, which may severely impact state, regional, and global food
8 production;

9 (11) Increases in ultraviolet radiation (UVA, UVB, and/or UVC), to Earth's surface;

10 (12) The delay by decades of the ozone layer's potential recovery;

11 (13) The burden that airborne, reflective particulates must be repeatedly replenished,
12 since their atmospheric time is limited;

13 (14) Visibility impairment and clutter, impeding aviation safety and increasing the
14 likelihood of small- and large-particle collisions;

15 (15) Economic losses to various sectors of society and to the state itself, resulting from,
16 without limitation, human health damages and increased health care needs, contaminated soils
17 and drinking water supplies, decline of fisheries, loss of pollinators such as bees, decreases in
18 agricultural crop yields, dead and dying trees, loss of habitats, pollution clean-up costs, and
19 decreases in solar power production from lack of direct sunlight reaching earth's surface.

20 (f) In view of these facts, the general assembly declares that geoengineering activities
21 must be strictly regulated by the state through a licensing process, within which an environmental
22 impact report (EIR) from the department of environmental management, and preliminary,
23 detailed impact reports from the state agencies, state offices, departments, and programs included
24 in §23-23.8-6, as well as information gathered in public hearings, shall be considered prior to a
25 decision, pursuant to this chapter.

26 **23-23.8-4. Definitions.**

27 As used in this chapter, the following words and phrases shall have the following
28 meanings:

29 (1) "Application" means a submitted, written request by any person, individual or entity
30 seeking to implement, conduct or engage in any form of geoengineering requiring a state license.

31 (2) "Area" means a portion within the confines of the state and/or its territorial waters,
32 which portion includes the atmosphere above it.

33 (3) "Atmospheric contaminant" means any type of aerosol, chaff, biologic and/or trans-
34 biologic agent, genetically modified agent, metal, radioactive material, vapor, particulate down to

1 or less than one nanometer in diameter, and any air pollutant regulated by the state including
2 without limitation those deemed "unnecessary" pursuant to the general laws, including xenobiotic
3 (foreign-to-life) electromagnetic radiation, or any combination of these released contaminants.

4 (4) "Chaff" means aluminum-coated fiberglass particulates.

5 (5) "Conditions" means any limitations and safeguards to be placed on a geoengineering
6 activity that is licensed by the director of the state department of environmental management.

7 (6) "Department" means the Rhode Island department of environmental management.

8 (7) "Director" means the director of the state department of environmental management.

9 (8) "Geoengineering" means the intentional manipulation of the environment, involving
10 nuclear, biological, chemical, electromagnetic and/or other physical-agent activities that effect
11 changes to earth's atmosphere and/or surface.

12 (9) "License" means a license issued by the director pursuant to this chapter to engage in
13 geoengineering activities.

14 (10) "Person" means any individual, trust, firm, joint stock company, corporation,
15 including a quasi-governmental corporation, partnership, association, syndicate, municipality,
16 municipal or state agency, department, program, fire district, club, nonprofit agency, or any
17 subdivision, commission, bureau, agency, military group, university, armed services or
18 department of state or federal government (including quasi-government corporation), or region
19 within the United States, or inter-state or international body.

20 (11) "Release" means any activity that results in the issuance of atmospheric
21 contaminants such as the emitting, discharging or injecting of one or more nuclear, biological,
22 chemical, and/or physical agents into the ambient atmosphere, either intermittently or
23 continuously.

24 **23-23.8-5. Declaration of geoengineering policy.**

25 (a) Procedure. Due to the potential for significant harm, any and all contemplated
26 geoengineering activities shall require the submission of a written license application to request a
27 license to engage in a specific type of geoengineering activity on a specified date or on several
28 specified dates during a period of time not to exceed ninety (90) days. Every submitted license
29 application shall be on the public record within twenty-four (24) hours of submission. Where a
30 license is granted, it cannot lawfully be used for any activity other than that specified in that
31 license, which constitutes a contract. The regulatory framework herein requires thorough review
32 of each license application by the relevant Rhode Island state agencies, state offices, departments,
33 programs, and other parties named in §23-23.8-6(b) in this chapter. The director may grant or
34 deny a license, may modify conditions of a license, and may revoke a license for cause. A

1 licensee must file a report of the activity after having conducted the activity.

2 (b) Evaluation. Under the licensing process, any contemplated geoengineering activity
3 must first be evaluated according to factors including any trans-boundary effects; any impacts of
4 reduction of sunlight reaching earth's surface; the planned methods of release, dispersal or
5 deployment of substances and/or physical agents into the environment; and the direct and indirect
6 effects, actual and potential, upon humans and other organisms, populations, ecosystems, human
7 structures, aviation, and the state economy.

8 (c) Regulatory oversight. This chapter's regulatory regimes for any and all contemplated
9 geoengineering activities, which may be extremely consequential, are tailored accordingly, with
10 license applications granted or denied only on a case-by-case basis, following the submission of
11 impact evaluation reports by the various state agencies, state offices, departments, and programs
12 of the State as listed in this chapter; following the director's EIR report, and following the public
13 hearings and comment periods.

14 (d) Impact evaluation reports shall assess specific, potential effects upon human health
15 and safety, aviation safety, agricultural, biodiversity, coastal conservation, endangered species,
16 energy, environment, fishing, forestry, habitat, water resources, wildlife, and oceanographic
17 consequences. Any and all anticipated economic impacts of these effects must be at once
18 evaluated by each state agency, state office, department, program, and other party named in this
19 chapter.

20 (e) Public comment. Comments from the general public, as well as from the scientific,
21 public health science, medical, agricultural, coastal, ecology, fishing, forestry, and oceanographic
22 communities, is essential in order that disinterested scientific third parties, and all members of the
23 public who may be affected, may be given a role in the licensing process.

24 **23-23.8-6. Geoengineering license application.**

25 (a) Process. Any person seeking to implement, conduct, or engage in any form of
26 geoengineering within or above any area of the state shall first submit to the director of the
27 department of environmental management an application for a license to engage in a specific type
28 of geoengineering. The application shall include all of the following information, as well as other
29 information deemed pertinent by the director and set forth in regulations for geoengineering
30 activities.

31 (1) A detailed description of the contemplated geoengineering activity potentially to be
32 licensed, including its purpose, scope, and methods. The methods shall divulge the sources and
33 precise chemical formulas of any substances or mixtures to be used and any and all of their
34 resulting derivatives, any type of biological materials to be used, and any type of

1 electromagnetism or other physical agent to be deployed.

2 (2) The license application shall also require the provision of the names, educational
3 backgrounds, and professional backgrounds and qualifications, of any and all persons to be
4 involved in the geoengineering activity, including any previous employment that could bias
5 resulting reports.

6 (3) The license application shall also require criminal background checks and insurance
7 and bonding proposals.

8 (b) The applicant shall provide the director either an electronic submission of the license
9 application or hard copies sufficient for distribution to each one of the relevant Rhode Island state
10 agencies, state offices, departments, programs, and other parties listed herein:

11 (1) Department of health;
12 (2) Division of agriculture within the department of environmental management;
13 (3) Office of air resources within the department of environmental management;
14 (4) Rhode Island airport corporation
15 (5) Rhode Island coastal resources management council;
16 (6) University of Rhode Island coastal institute;
17 (7) Office of water resources within the department of environmental management;
18 (8) Office of energy resources;
19 (9) Water resources board; and
20 (10) Rhode Island emergency management agency.

21 (c) The state agencies, state offices, departments, programs, and other parties referenced
22 herein, shall respond to the director to acknowledge their receipt of the license application; and
23 then, from out of their respective areas of specialization and purview, within a reasonable period
24 of time to be established by the director, shall publish online their respective impact reports
25 naming any and all potential impacts of the proposed geoengineering activity, and providing
26 alongside each of these impacts an estimate of the potential economic consequences thereof.

27 (d) Upon receipt of all of the findings of the impact evaluation reports from the various
28 state agencies, state offices, departments, programs, and other parties listed herein, the director
29 shall commence an environmental impact review (EIR). The director shall also schedule public
30 hearings.

31 (e) In preparing the EIR, the director shall consider all of the information contained in the
32 impact reports' findings, including all public health and safety, aviation safety, and environmental
33 consequences, with their respective economic impacts; and shall publish online the EIR report
34 within a reasonable period of time, indicating the various types of harm and their respective

1 economic consequences, if any, that may result from the geoengineering activity proposed to be
2 conducted by the applicant.

3 (f) Upon completion of the director's EIR report pursuant to this chapter, such report shall
4 be made part of the public record.

5 (g) Following online publication of the director's EIR report, the director shall hold at
6 least two (2) public hearings to receive comment on the license application, the state responses
7 thereto, and the EIR.

8 (h) Within a reasonable period of time, following the last public hearing, the director
9 shall render a decision to grant or deny a license for the proposed geoengineering activity.

10 (i) If the license is granted, the director shall document therein any and all limitations and
11 safeguards as conditions to be placed upon the geoengineering activity, including minimally a
12 report to be submitted to the department by the licensee after the completion of the
13 Geoengineering activity, and steps to be taken to track possible effects and assure prompt public
14 reporting of any observations and objections.

15 (j) Upon receipt of the license, the licensee or its agent shall sign an agreement to fulfill
16 the conditions outlined in the license.

17 (k) Any person aggrieved by a decision of the director may pursue an appeal of such
18 decision through chapter 35 of title 42, the administrative procedures act.

19 **23-23.8-7. Penalties for violations.**

20 (a) Any person, as defined in this chapter, and any officer thereof, who engages in any
21 geoengineering activity within and/or above any area of the state or who fails to comply with the
22 decision of the director, shall be punished by a fine of not less than five hundred thousand dollars
23 (\$500,000) or by imprisonment for not less than one hundred ninety (190) days, or by both fine
24 and imprisonment; and every such person shall be guilty of a separate and distinct offense for
25 each day during which each act of geoengineering has been conducted, repeated or continued.

26 (b) Any person as defined above, and any officer thereof, who engages in geoengineering
27 within and/or above any area of the state or who fails to comply with the decision of the director,
28 shall additionally be deemed to be in violation of the air pollution episode control act, pursuant to
29 chapter 23.1 of title 23, and shall be subject to the provisions of that chapter, including but not
30 limited to, the use of executive orders to limit and restrain the actions of the person or persons in
31 violation thereof.

32 **23-23.8-8. Rules and regulations.**

33 The director shall promulgate rules and regulations to implement the provisions of this
34 chapter, including, but not limited to, rules and regulations governing the license application

1 process for geoenengineering activities, the contents of such application, and the standards to be
2 applied in making decisions when granting or denying a license under this chapter. All licenses
3 issued for any geoenengineering activities must include provisions that applicant must be bonded
4 and have insurance.

5 SECTION 2. This act shall take effect upon passage.

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EXPLANATION
BY THE LEGISLATIVE COUNCIL
OF

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RELATING TO HEALTH AND SAFETY -- THE GEOENGINEERING ACT OF 2017

1 This act would establish a system to regulate the intentional manipulation of the global
2 environment, through various means, that are known as "geoengineering". This act would also
3 provide that a person seeking to engage in geoengineering activities would require a license from
4 the director of the department of environmental management.

5 This act would take effect upon passage.

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