FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Hakes C&D Disposal- Landfill Expansion Project
4376 Manning Ridge Road

Town of Campbell, Steuben County, New York
DEC Facility No.: 8-4630-000010

APPLICANT & PROJECT SPONSOR:

Hakes C&D Disposal, Inc.

Contact: Larry Shilling
Hakes C&D Disposal, Inc.
4376 Manning Ridge Road
Painted Post, NY 14870
Telephone Number: (607) 937-6044
E-mail: larry.shilling@casella.com

LEAD AGENCY AND FINAL ENVIRONMENTAL IMPACT STATEMENT PREPARER:

New York State Department of Environmental Conservation
6274 Avon-Lima Road
Avon, New York 14414

Contact: Kimberly Merchant, Deputy Regional Permit Administrator
Region 8, Division of Environmental Permits
Ph.: (585) 226-5400
Fax: 585-226-2830
E-mail: hakesSEQRhearing@dec.ny.gov

DSEIS Accepted: **January 10, 2018**

FSEIS Issuance Date: **December 5, 2018**

Findings Statement and Decisions After: **December 16, 2018**

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ACRONYMS

AAQS – Ambient Air Quality Standards

BDT – Best Demonstrated Technology

BTU – British thermal unit

C&D – Construction and Demolition

CFM – cubic feet per minute

CFR – Code of Federal Regulations

CO – Carbon Monoxide

CQA – Construction Quality Assurance

CQC – Construction Quality Control

dB – Decibel

dBA – A-Weighted Decibel (see definition section)

DEC – Department of Environmental Conservation (same as NYSDEC)

DEIS – Draft Environmental Impact Statement

DSEIS – Draft Supplemental Environmental Impact Statement

DOT – Department of Transportation

EMP – Environmental Monitoring Plan

EPA – Environmental Protection Agency

FEIS – Final Environmental Impact Statement

GCL – Geosynthetic Clay Liner

HDPE – High Density Polyethylene

LCSWM – Legislative Commission on Solid Waste Management

LDPE – Low Density Polyethylene

MGD – Million Gallons per Day

MLUP – Mined Land Use Plan

MRF – Materials Recovery Facility

MSL – Mean Sea Level

MSW – Municipal Solid Waste

NAAQS – National Ambient Air Quality Standards

NAD – North American Datum

NAVD – North American Vertical Datum

NGVD – National Geodetic Vertical Datum

NMOC – Non-Methane Organic Compounds

N-RPDD – Non-Residential Planned Development District

NSPS – New Source Performance Standards

NYCRR – New York Codes, Rules and Regulations

NYSDEC – New York State Department of Environmental Conservation (same as DEC)

NOx – Oxides of Nitrogen

ppm – Parts per Million

QA – Quality Assurance

QC – Quality Control

RACT – Reasonable Available Control Technology

SAP – Site Analytical Plan

SDWA – Safe Drinking Water Act

SEQR – State Environmental Quality Review

SEQRA – State Environmental Quality Review Act

SOx – Sulfur Oxides

SPDES – State Pollutant Discharge Elimination System

SWMP – Solid Waste Management Plan

SWPPP (or **SWP3**) – Storm Water Pollution Prevention Plan

TOGS – Technical and Operational Guidance System

TPD – Tons per day

TPQ – Tons per quarter

TPY – Tons per year

USACOE – United States Army Corps of Engineers

USEPA – United States Environmental Protection Agency

USGS – United States Geological Survey

VOC – Volatile Organic Compound

DEFINITIONS

Active Landfill Gas Collection System – A gas collection system that uses gas-moving equipment. The gas-moving equipment would normally consist of a blower connected to the gas collection piping, which exerts a vacuum and provides for the collection of more gas than would be treated through a passive collection system.

Airspace – Finite amount of landfill volume allocated for waste containment.

Approved Design Capacity – The average daily tonnage to be received at the solid waste management facility during the quarter in which the most waste is anticipated to be received, as approved by the New York State Department of Environmental Conservation.

Aquifer – A consolidated or unconsolidated geologic formation, group of formations or part of a formation capable of yielding a significant amount of groundwater to wells or springs. Two types of highly productive aquifers in unconsolidated (non-bedrock) formations are defined below:
(i) Primary water supply aquifer or primary aquifer means a highly productive aquifer which is presently used as a source of public water supply by major municipal water supply systems.
(ii) Principal aquifer means a formation or formations known to be highly productive or deposits whose geology suggests abundant potential water supply, but which is not intensively used as a source of water supply by major municipal systems at the present time. Some water supply development has taken place in some of these areas but it is generally not as intensive as in the primary aquifer areas.

A-Weighted Decibel – Sound level measurement that corresponds to the portion of the sound frequency spectrum to which the human ear is most sensitive.

Barrier Layer – A component of the final cover system that is intended to limit the flow of infiltration into the landfill.

Barrier Protection Layer – A component of the final cover system that consists of 18 inches of soil material underlying the topsoil layer to provide protection for the barrier layer below.

Bedrock – Cemented or consolidated earth materials exposed on the earth's surface or underlying unconsolidated earth materials, including decomposed and weathered rock and saprolite. (Saprolite is disintegrated and decomposed rock that lies in its original place.)

Borrow Area – Location where soil is excavated for use at another location.

Cell Areas – Areas of the site which are lined, and have leachate collection systems. All waste disposal at the site is within the cell areas.

cm/sec (centimeters per second) – A common unit of measure, used in Hydrogeology to express the coefficient of permeability or hydraulic conductivity of soil or rock materials.

Coefficient of Permeability (also Hydraulic Conductivity) – The rate of flow of water through a unit cross-sectional area of a porous medium under a unit hydraulic gradient at a standard temperature. Clay and silty soils have low coefficients of permeability, often in the range of 10^{-6} to 10^{-7} cm/sec, while sand has a relatively high coefficient of permeability often in the range of 10^{-2} to 10^{-3} cm/sec. The difference between these ranges indicates that water can move

through sand much more rapidly (approximately 10,000 times more rapidly) than through clay and silty soils. The negative exponents used in the coefficient of permeability values simply denote the inverse of the positive exponent. For example, 10^{-7} means 1 divided by 10^{7}, or 0.0000001.

Construction and Demolition (C&D) Debris – is defined in 6 NYCRR Part 360.2(b)(61) as waste resulting from construction, remodeling, repair and demolition of structures, buildings and roads. C&D debris includes fill material, demolition wastes, and construction wastes. Materials that are not C&D debris (even if generated from construction, remodeling, repair and demolition activities) include municipal solid waste, friable asbestos-containing waste, corrugated container board, electrical fixtures containing hazardous liquids such as fluorescent light ballasts or transformers, fluorescent lights, furniture, appliances, tires, drums, fuel tanks, containers greater than ten gallons in size, and any containers having more than one inch of residue remaining on the bottom.

Critical Stratigraphic Section – All stratigraphic units, both unconsolidated deposits and bedrock, including but not limited to the unsaturated zone, uppermost aquifer and first water-bearing unit into which contaminants that escape from a facility might reasonably be expected to enter and cause contamination.

Custodial Care Period – means the period after the post-closure care period when, as the department will determine, the landfill poses a significantly reduced threat to public health and the environment and environmental monitoring and maintenance can be reduced.

Drainage Swales – Constructed drainage trenches to direct run-off of water that has not contacted solid waste, from areas around the landfill to the appropriate retention basin locations.

Expansion Cell Area – Area measured to the top of the perimeter slope for the landfill liner system in the proposed new permitted landfill cell area.

Final Cover System – means an engineered layer of materials approved by the department in accordance with Part 363 of this Title that is placed on any surface of a landfill where no additional waste will be deposited, and serves to restrict infiltration, prevent erosion, control landfill gas and promote surface drainage.

Geocomposite – means a laminated or composite material comprised of geotextiles, geogrids, geonets and/or geomembranes.

Geogrid – means a netlike polymeric material used with subgrade materials, soil, rock, earth or any other geotechnical engineering-related materials as an integral part of the structure or system to provide reinforcement to soil slopes

Geomembrane – An essentially impermeable membrane used with foundation, soil, rock, earth or any other geotechnical engineering-related material as an integral part of a structure or system designed to limit the movement of liquid or gas in the system.

Geonet – A type of a geosynthetic material that allows planar flow of liquids and serves as a drainage system.

Geosynthetics – The generic classification of all synthetic materials used in geotechnical engineering applications, including geotextiles, geogrids, geomembranes, geonets, geosynthetic clay liners and geocomposites.

Geotextile – Any permeable textile used with subgrade materials, soil, rock, earth or any other geotechnical engineering-related material as an integral part of a structure or system designed to act as a filter to prevent the flow of soil fines into drainage systems, to provide planar flow for drainage or to serve as a cushion to protect geomembranes or to provide structural support.

Geosynthetic Clay Liner – Factory manufactured layered construction material consisting of bentonite placed between geotextiles or adhesively bonded to a geomembrane. This forms a barrier with an extremely low hydraulic conductivity.

Groundwater – Water below the land surface in a saturated zone of soil or rock. This includes perched water separated from the main body of groundwater by an unsaturated zone.

Groundwater Table – The surface of a body of unconfined groundwater between the zone of saturation and zone of aeration at which the pressure is equal to that of the atmosphere. Groundwater table does not include the potentiometric head level in a confined aquifer.

Hertz – A common unit of measure, used in noise evaluations to express the frequency of a sound (cycles per second)

High Density Polyethylene Geomembrane – An impermeable plastic membrane used in the landfill liner system to provide a barrier to leachate migration.

Hydraulic Gradient – Slope of the water table (or potentiometric head level) measured in the direction of the steepest rate of change. The hydraulic gradient is equal to the change in total head of the water table between two points divided by the horizontal distance between these points.

Impermeable – A material that does not allow water to flow through it. Soils with a hydraulic conductivity of 10^{-7} cm/sec or less are considered impermeable.

Industrial Waste – means waste generated by manufacturing or industrial processes.

Infiltration – Water ordinarily derived from precipitation that permeates a soil layer or solid waste.

Intermediate Cover – means a geomembrane or soil layer which will inhibit precipitation from entering the waste mass, contain leachate outbreaks, and inhibit migration of decomposition gases.

Landfill – means a facility where waste is intentionally placed and intended to remain and which is designed, constructed, operated and closed to minimize adverse environmental impacts.

Landfill Cell – means a discrete portion of a landfill which uses a liner and leachate collection and removal system to provide operations isolation from adjacent cells.

Leachate – Any solid waste in the form of a liquid, including any suspended components in the liquid, that results from contact with or passage through solid waste.

Leq – Equivalent steady-state sound level which contains the same acoustic energy as the time varying sound level during a selected time period.

Liner System – A continuous layer of natural and/or synthetic materials, beneath or on the sides of a surface impoundment, landfill, or landfill cell, that restricts the downward or lateral escape of solid waste, any constituents of such waste or leachate.

mil – Unit of length equal to .001 inch.

Municipal Solid Waste – means residential waste, commercial waste, or institutional waste, or a component or combination thereof, excluding construction and demolition debris and biosolids unless they are commingled.

Operating Cover – means a compacted layer of soil placed on all exposed waste.

Passive Gas Collection System – A gas collection system that uses positive pressure within the landfill to move the gas, rather than using gas-moving equipment which creates negative pressure to enhance gas removal (as with an "Active Gas Collection System").

Post-Closure Care Period – means the period after final closure of a landfill that continues until the owner or operator of the landfill can demonstrate to the department that the threat to public health or the environment has been reduced.

Sedimentation Basin – Containment reservoir designed to hold stormwater runoff for a sufficiently long time to allow suspended solids to settle out, and make the stormwater suitable for release to a stream or other natural water body.

Service Area – The geographical area from which the waste is received.

Site – The geographically contiguous property of a solid waste management facility and includes the land area of that facility and its access roads, appurtenances and land buffer areas.

Surface Water – Lakes, bays, sounds, ponds, impounding reservoirs, perennial streams and springs, rivers, creeks, estuaries, marshes, inlets, canals, and all other perennial bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private. Surface impoundments at solid waste management facilities are not surface waters.

Radiation - Radiation is energy, either in the form of energy waves or energized particles.

Radioactivity - The amount of ionizing radiation (radiation with enough energy to knock an electron off of an atom) released by a material. Whether it emits alpha or beta particles, gamma rays, x-rays, or neutrons, a quantity of radioactive material is expressed in terms of its radioactivity (or simply its activity). This represents how many atoms in the material decay in a given time period. The units of measurement for radioactivity are the curie (U.S. unit) or Becquerel (international unit). One curie is roughly the activity of one gram of Radium-226.

Radium – Radium (Ra) is a naturally occurring radioactive metal (atomic # 88) formed by the decay of uranium or thorium. All isotopes of radium are radioactive. The most common isotopes of radium, Ra-226 and Ra-228, are created by the radioactive decay of naturally occurring uranium and thorium respectively.

Radon – Radon (Rn) is a colorless, odorless, radioactive gas (atomic # 86) that is created by the radioactive decay of radium. The radon of primary significance for public health is Rn-222, created by the decay of Ra-226.

Vector – A carrier that can transmit a pathogen from one organism to another including, but not limited to, flies and other insects, rodents, birds and vermin.

Working Face – That portion of a landfill where solid waste is deposited and compacted before placement of operating cover material.

I. INTRODUCTION

A. Contents of the Final Supplemental Environmental Impact Statement

This final supplemental environmental impact statement ("FSEIS") has been prepared for the proposed Hakes C&D Disposal Landfill Expansion Project ("Project") in accordance with the State Environmental Quality Review Act ("SEQR") as contained in the New York State Environmental Conservation Law ("ECL") (see ECL § 8-0101 *et. seq.*) and its implementing regulations (see 6 NYCRR Part 617). The FSEIS contains three (3) sections. Section I summarizes the environmental review process and contains a description of the Project. Section II provides information presented by the project sponsor to the New York State Department of Environmental Conservation (DEC) after the DSEIS was accepted on January 10, 2018. Section III contains the Department's responses to public comments by topic area.

Copies of the public comments are contained electronically in Appendix 1. Appendix 2 of this FSEIS contains an electronic copy of the transcript of the public hearing held on February 13, 2018. The DSEIS accepted by the Department on January 10, 2018 is incorporated herein by reference and provided electronically in Appendix 3.

B. Site Regulatory History and Project Status

Engineering and environmental studies for the Hakes facility began in the late 1980's. Hakes C&D Disposal, Inc. ("Hakes") first received a permit for disposal of C&D debris in January 1989 for a new landfill located at 4376 Manning Ridge Road in the Town of Campbell, Steuben County New York. A Draft Environmental Impact Statement (DEIS), which will be referred to herein as the 1993 DEIS, was prepared in support of a permit modification application for expansion of the landfill, and included an assessment of the environmental resources of the site and surrounding area, as well as an evaluation of potential impacts, and mitigation measures. The Final Environmental Impact Statement (FEIS) related to the 1993 DEIS was also issued in 1993.

Subsequently, a Draft Supplemental Environmental Impact Statement, which will be referred to herein as the 2006 DSEIS, was prepared in support of a permit modification application for additional expansion of the landfill to its current size (57.9 acres), and again included an assessment of the environmental resources of the site and surrounding area, as well as an evaluation of potential impacts, and mitigation measures. The Final Supplemental Environmental Impact Statement related to the 2006 DSEIS was also issued in 2006.

The currently-permitted 57.9-acre disposal area consists of 8 cells. Cells 1 through 8C were constructed between 1999 and 2016, and have been mostly filled. Construction of Cell 8D was completed in 2017 and is estimated to provide disposal capacity through 2019. Additional waste will be placed in currently permitted cells, between now and 2019, to achieve final grades.

The 2006 DSEIS is being supplemented by this Supplemental Environmental Impact Statement (SEIS), which provides an evaluation of actions presently proposed to increase the disposal area and volume, extending the remaining life of the Hakes facility. These actions include a 21.0-acre

landfill expansion and a 22.2-acre on-site soil borrow area. The 2018 Draft Supplemental Environmental Impact Statement (DSEIS) focused on potential impacts of the proposed cell expansion and borrow area. Public scoping was conducted pursuant to 6 NYCRR § 617.8 and the final scope was adopted on August 2, 2017.

The DSEIS was accepted for public review on January 10, 2018. A hearing was held on February 13, 2018 at the Campbell American Legion. A written public comment period was held between January 10, 2018 and February 26, 2018 and was subsequently extended through March 19, 2018. This FSEIS has been prepared in accordance with 6 NYCRR § 617.9(b)(8) to provide responses to substantive comments on the DSEIS.

Several DEC permits will be required for the proposed expansion, including the following:

- Modification of the existing Part 360 permit[1];
- Modification of the existing Air State Facility permit;
- Updated coverage under the SPDES Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (GP-0-17-004); and
- Individual Section 401 Water Quality Certification

The Part 360 permit modification application and the Air State Facility Permit modification application have not yet been submitted. A Joint Application for Permit was submitted to the Department for an individual Section 401 Water Quality Certification in conjunction with the US Army Corps of Engineers Section 404 permit application on March 5, 2018. The Department's 401 Water Quality Certification is required due to the individual federal permit for the proposal to fill federally-regulated wetlands. The US Army Corps of Engineers will be undergoing a separate, but coordinated permit process, which will involve a public notice describing the proposal and mitigation.

When complete applications for the above-referenced DEC permits are submitted by Hakes, the DEC will be required to provide a further public notice and comment period on the applications. In addition, the DEC will be required to issue a SEQR Statement of Findings pursuant to 6 NYCRR § 617.11 prior to making its final decisions on any permit applications.

In addition to DEC approvals, this FSEIS and the DSEIS address the proposed establishment of a Non-Residential Planned Development District (N-RPDD) by the Town of Campbell for the landfill site, and the related local land use approvals under consideration by the Town of Campbell for the landfill expansion. Hakes has submitted applications to the Town of Campbell for these purposes and the Town of Campbell will use this SEQR record to issue its Statement of Findings pursuant to 6 NYCRR § 617.11 prior to making its final decisions on the local applications.

C. Description of Proposed Project

Hakes will be seeking a 6 NYCRR Part 360, Solid Waste Management Facility Permit Modification from the NYSDEC to construct and operate an expansion to an existing C&D debris landfill located at 4376 Manning Ridge Road, in the Town of Campbell, Steuben County, New York. Hakes'

[1] References to "Part 360 Permit", "6 NYCRR Part 360", "Part 360 regulations" in this FSEIS include applicable portions of the New York State Solid Waste Management regulations now identified as the 6 NYCRR Part 360 Series, effective November 4, 2017.

purposes in seeking a future permit modification application are to increase the permitted landfill cell area and disposal volume, thereby extending the life of the facility.

The proposed Hakes Landfill expansion will add 21.0 acres of landfill cell area to the existing 57.9 acres of permitted cell area. The approximate limits of the proposed 21.0-acre expansion are shown on Figures 1-2 and 1-3 of the Draft SEIS (included in Appendix 3). In addition, Hakes is proposing a 22.2-acre soil borrow area on a portion of the site east of the landfill. The soil borrow area would provide an on-site source of materials for construction and landfill cover.

Hakes does not propose an increase in the maximum permitted cell elevation, which is currently fixed at 1829 feet. The elevation datum used in all project related documents is "Site Datum" and is higher than the standard North American Vertical Datum of 1988 (NAVD 88) by 11.66 feet. The existing maximum cell elevation of 1829 feet (Site Datum) would correspond to 1817.34 feet (NAVD 88).

The additional cell volume proposed, and the existing cell volumes, will be used for the disposal of C&D debris. There are no changes proposed in the types of wastes received at the facility. The maximum average waste disposal rate will remain at 1494 tons per day (TPD). This maximum disposal rate (or approved design capacity) establishes the average daily tonnage to be received at the facility during the calendar quarter in which the most waste is anticipated to be received.

The operating hours will continue to be from 7:00 a.m. to 5:30 p.m., and construction activities will continue to be allowed until 7 p.m., consistent with the current permit.

II. ADDITIONAL INFORMATION TO THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

A. Access Road Improvements

The approved design capacity of the landfill is not proposed to change and, therefore, the proposed project will not result in any changes to traffic volumes or patterns. However, there are three areas of concern regarding access to the site that have been identified in prior SEQR reviews, and which the public raised again during the comment period on this FSEIS: Manning Ridge Road, Erwin Hollow Road, and the intersection of Manning Ridge Road and Erwin Hollow Road. See also Appendix 4 regarding access road improvement information.

Manning Ridge Road

Considerable upgrade work has been done on Manning Ridge Road, funded by Hakes, to improve the condition and safety of this access road, including paving the length of Manning Ridge Road from the landfill entrance to Erwin Hollow Road. Road Improvements, including paving portions of Manning Ridge Road and widening a stretch of Erwin Hollow Road on a sharp curve, were performed in the period between 2004 and 2006, as was relocation of the landfill site entrance.

An agreement between Hakes and the Town of Campbell providing funding for road maintenance and other costs related to the landfill was updated and signed on January 9, 2018, and is included in Appendix N of the DSEIS. Also, an agreement between Hakes and the Town of Erwin providing funding for road maintenance was signed on March 25, 2003, and is included in Appendix 4 of this FSEIS. How these funds are spent is under the control of the respective Towns, but Hakes and the Towns have worked cooperatively to ensure the required road maintenance and repairs are implemented.

Erwin Hollow Road

The second area of concern, Erwin Hollow Road, is the portion located in the Town of Erwin between NYS Route 415 and Manning Ridge Road. Safety issues related to tractor-trailers negotiating curve(s) on the road have been studied by a consultant retained by Hakes, and several projects have been completed including repaving portions of the road, and increasing the radius of curvature and pavement width of a sharp curve near the southern end of the road. These improvements, paid for by Hakes, have addressed specific safety conditions expressed by the Town of Erwin and local residents. In the spring of 2018, an additional warning sign near the location of the recent truck turnover on Erwin Hollow Road was installed by the Town of Erwin, after consultation with representatives of Hakes.

The 2003 agreement provided in Appendix 4 of this FSEIS between the Town of Erwin and Hakes, also addresses improvements and future maintenance of Erwin Hollow Road.

Intersection of Manning Ridge Road and Erwin Hollow Road

The remaining area of concern is the intersection of Manning Ridge Road and Erwin Hollow Road in the Town of Campbell. Speakers at the Legislative Hearing identified safety issues

related to trucks cutting the corner on the way up the hill, swinging wide into the northbound lane of Erwin Hollow Road on the way back down the hill, and not stopping at the stop sign at the intersection on the way back down the hill. An analysis of the intersection has been prepared by LaBella Associates ("LaBella") (see Appendix 4) and recommendations for improving the safety situation have been provided. Hakes has evaluated LaBella's recommendations and has discussed them with the Town of Campbell.

In June, 2018, Hakes advised the Department that recent discussions between Robert Kras, General Manager of Hakes, and Tom Austin, Town of Campbell Highway Superintendent, have led to an agreement that improvements at the intersection of Manning Ridge and Erwin Hollow Roads (which is in the Town of Campbell) should include installation of a "Stop Ahead" sign on Manning Ridge Road, a few hundred feet north of the intersection, with flashing lights triggered by a motion detector (solar powered). It has also been agreed that additional improvements will be made, as necessary, until the situation is reasonably controlled. Note that these improvements also require Town Board approval, and may also be subject to State DOT review and approval.

Hakes also reiterates the commitment to take disciplinary action against drivers who create safety problems on the roads leading to the facility, including banning unsafe drivers from the landfill.

B. Town Response to DSEIS Comments

The Town of Campbell provided a response to comments on the DSEIS, which includes a report by Hakes consultant, CoPhysics entitled, "A Review of Drill Cuttings Disposal at the Hakes C&D Landfill and Response to Public Comments". The Town responses and CoPhysics report are included in Appendix 5 of this FSEIS.

III. RESPONSIVENESS SUMMARY

Numerous public comments were received during the DSEIS written public comment period and public hearing held. As noted above, the written comment period on the DSEIS ran from January 10 to March 19, 2018, and a public hearing was held on February 13, 2018. Electronic copies of the public comments are provided in Appendix 1 and a transcript of the public hearing is provided in Appendix 2 of this FSEIS.

This Responsiveness Summary is organized similarly to the DSEIS section outlines and is prepared to fulfill the requirements of 6 NYCRR § 617.9(b)(8). The comments noted below are in bold and represent information in the comment, *as presented to the DEC by the commenter,* and do not represent the position of the DEC nor should they be construed as the DEC's acceptance of the claims or information presented in the comments. The DEC's response to the comments are provided below after the heading "Response".

A. General Comments

Comment A-1: The comment period on the DSEIS should be extended 90 days.

Response A-1: The comment period on the DSEIS was extended from the original comment period deadline of February 26, 2018 to March 19, 2018, an additional three weeks. This provided a total comment period of approximately 68 days, over twice the minimum 30-day comment period required in the SEQR regulations for environmental impact statements (see 6 NYCRR 617.12[a][2]). As also noted above in Section I of this FSEIS, an additional opportunity for public comment will be required for future DEC permit applications associated with this proposal.

Comment A-2: The DSEIS failed to include an evaluation of radioactivity impacts and should be revised.

Response A-2: The wastes accepted for disposal at the facility are not proposed to change. As explained in Section 2.4.9 of the DSEIS, these wastes have historically included drill cuttings and, therefore, the scope of the DSEIS was properly developed. Nevertheless, while the scope of the action before the Department remains the expansion of the landfill (including the borrow area) and does not include any approval related to a change in the acceptable waste streams, the Department has provided responses to all substantive comments related to radioactivity in Section B of the FSEIS below.

Comment A-3: Mr. John Culver has claimed that the property boundaries must be surveyed to establish where his and Casella's boundary lies before any work can be completed.

Response A-3: The project sponsor will have to resolve any dispute pertaining to the location of property boundaries before construction of the facility. Any approval that may be granted by the Department for the proposed expansion, would not authorize the use of property that the sponsor does not own or have legal authority to use for the project. The sponsor would need to obtain whatever legal authority is needed to construct and operate

the landfill. We understand that efforts are ongoing between the sponsor and Mr. Culver to resolve these issues.

Comment A-4: Nobody wants to buy a house up there due to property values across from the landfill. Properties are worth nothing next to the landfill.

Response A-4: Please see the attached Town of Campbell Response Attached in Appendix 5. Also, it should be noted that Host Benefit Agreements, and any associated property value compensations, are not under the purview of the Department as Lead Agency and are not part of a SEQR review; they are under the purview of the host community. In addition, property values do not fall within the scope of "environment", as defined under SEQR at 6 NYCRR 617.2(l), and are not addressed under SEQR. Therefore, we have not evaluated this impact.

B. Drill Cuttings and Radiation

Introduction/summary

Various comments were received related to concerns over the acceptance of drill cuttings and claims regarding radioactivity at the landfill. To the extent that any comments received are related to radioactivity, they are addressed in this section regardless of whether the specific environmental exposure pathway of concern was noted as air, water, particulates, gas emissions, etc. As a result, later sections of this FSEIS dealing specifically with comments on air, water, public health, or other areas of potential environmental impacts focus on those subject areas without regard to radioactivity. In addition, responses to substantive comments related to radioactivity have been organized by comment letter, with headings as noted below.

In May 2015, the Department issued its final environmental impact statement about high-volume hydraulic fracturing in the State of New York entitled, *Final Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program - Regulatory Program for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs*, (2015 HVHF FSGEIS). Many of the comments submitted on the Hakes C&D Landfill Expansion DSEIS related to the disposal of drill cuttings are similar to those that were submitted on the 2015 HVHF SGEIS and addressed by the Department. The 2015 HVHF FSGEIS Response to Comments, Volume 2 of 2 (pages RTC-93 through RTC-106) summarized the comments and included the Department's responses to many questions that were raised during that review pertaining to disposal of drill cuttings in landfills and potential radiation impacts. A link to the 2015 Response to Comments document is available on the DEC website at: https://www.dec.ny.gov/energy/75370.html .

To provide the reader with some of the more relevant responses from the 2015 HVHF FSGEIS that address the disposal of drill cuttings, excerpts from pages RTC-97 through RTC-105 of the document are provided below:

> "NORM is ubiquitous in the environment, and is present in varying concentrations in all environmental media. It primarily comes from two sources, those radionuclides that were present at the time of formation of the earth as well as their decay products, and

radioisotopes created by cosmic ray interactions with the upper atmosphere. Radioactive potassium and uranium, thorium, and their decay products including radium and radon are in the first category." (p. RTC-97)

"With respect to radon in cuttings and attendant potential risks to workers, or others, from landfills accepting cuttings, the Department does not believe that radon emanation from a landfill would pose a significant risk for the following reasons: (1) the relatively low concentrations of radium in cuttings; (2) concentration limits already incorporated into Part 360 permits for New York landfills accepting Marcellus Shale cuttings; (3) the robust design of solid waste landfills in New York; and (4) the rapid dispersal of any Rn gas reaching the surface of a landfill. In addition, studies completed by the U.S. Department of Energy's (DOE) Argonne National Laboratory support this assessment. Limiting a landfill waste mass to an average concentration of 50 picocuries/gram would keep worker exposure below the regulatory limit of 100 mrem/year. As a conservative measure, New York landfill permits are more stringent by halving this average concentration limit to 25 picocuries/gram. In addition, New York's solid waste landfills are required to be more robust in design than those modeled by DOE. These landfills must install a radiation portal monitor at their weigh stations, maintain a Department approved training program, have an equipment calibration procedure, establish a relationship between radiation monitor readings and radium concentrations in loads of cuttings, set their monitor alarm level well below the allowed concentration, and notify the Department whenever the alarm is set off to ensure adequate evaluation of the cause of that alarm." (pp. RTC-100 &RTC-101)

"With respect to those submissions expressing concern about the lack of available data to characterize NORM in the Marcellus Shale, the Department acknowledges that there was limited analytical data available on NORM content in that formation. While it is recognized that significant variability of NORM content within the formation is possible, available data from across the broader formation within and outside New York has been utilized to outline a range of potential impacts across the formation. If levels of NORM in a portion of the formation were found to significantly exceed the anticipated upper range of concentrations, the proposed requirements to test wastes prior to being transported from a well site, combined with limitations on concentrations for landfill disposal in New York State, influent concentration limits for POTWs, and existing concentration limits for liquid discharges from POTWs would serve to reduce the potential impacts of such an exceedance." (pp. RTC-102 & RTC-103)

"The Department does not agree that gamma spectroscopy is an insufficient method by which to determine NORM concentrations in various media. Gamma spectroscopy is broadly recognized as an efficient and accurate method to quantify radium in environmental samples. Radiological analytical laboratories have been quantifying environmental levels of radium and other NORM constituents successfully using gamma spectroscopy for decades. Claims that alpha spectroscopy or delayed-neutron analysis is required to adequately quantify NORM content are based on a misunderstanding of the difference between a radioactive isotope such as radium-226 and the subatomic radioactive particles it emits. The isotope radium-226 gives off gamma rays, beta particles and alpha particles as it decays. However, none of this emitted radiation is present without the actual radium itself. Such radiation exists for infinitesimally short periods of time before their energies are absorbed into surrounding materials. Therefore, although alpha radiation poses the greatest risk of the various subatomic emissions from radium, the simpler, less costly and faster gamma spectroscopy method

is adequate to determine the overall concentration of radium present, and thus the risk posed by all types of radioactive emissions, including alpha particles. Moreover, the discussion of analytical methods in the SGEIS is accurate and sufficient as it employs generally accepted analytical methods for NORM." (p. RTC-103)[2]

"Appropriate precautions should be in place to address the potential risks of disposal of Marcellus Shale drill cuttings, including basic protections such as limiting NORM concentrations in the cuttings sent to a landfill, controlling disposal in a landfill, and monitoring landfill leachate for potential increases in NORM content (in line with the 'as low as reasonably achievable' (ALARA) principle, a fundamental of radiological protection). In New York, radioactive wastes are regulated separately from hazardous wastes under 6 NYCRR Part 380, and are not considered to be hazardous waste. The Department recognizes that the 2009 dSGEIS needed additional information regarding NORM management, particularly with respect to NYSDOH radioactive materials licensing. Therefore, the Department added additional information and mitigation to the SGEIS, including details about NYSDOH licensing requirements." (p. RTC-104)

"As to those comments calling for adherence to EPA remedial guidance concentrations for the disposal of cuttings at landfill, the concentrations that were cited are for cleaning up radium-contaminated sites so that no limits on future use of the sites would exist. These guidance concentrations were, therefore, never intended to apply to a disposal site. In addition, available data shows that radium concentrations of cuttings accepted by New York landfills do fall within those remedial standards. However, applying concentration limits for unrestricted site use is inappropriately restrictive for disposal purposes, particularly when existing or proposed controls would adequately reduce the comparatively low potential risks." (p. RTC-105)

"The acceptability of specific regulatory requirements for a single landfill are outside the scope of the SGEIS. However, it can be noted that the SGEIS proposed to require radiation monitors. In fact, permit conditions require landfills accepting Marcellus Shale cuttings to install and properly operate, calibrate and maintain a portal-type radiation monitor located at the weigh scale for incoming trucks. An additional benefit of the requirement is that all incoming waste would be monitored for radiological content." (p. RTC-105)

In addition, in developing the recent revisions to the Part 360 series concerning the management of solid waste in New York State, the Department prepared responses to comments addressing solid waste management issues related to radioactivity, among other matters. This document is entitled *Assessment of Public Comment for Public Comments Received on the NYSDEC Comprehensive Revisions to the Solid Waste Regulation Found in 6 NYCRR Part 360, Part 364, and Associated Regulations*, dated June 2017. It is currently posted on the Department's website at: http://www.dec.ny.gov/regulations/81768.html. The revised Part 360 regulations include provisions related to the acceptance of drill cuttings. Specifically, 6 NYCRR § 363-7.1(o)(9) prohibits acceptance of wastes that exceed 25 pCi/g of radium-226.

[2] This paragraph indicates that gamma spectrometry is an accurate and efficient method to identify radium in environmental samples. It should be noted the method is accurate and efficient for solid matrix samples. It is not as good a method for liquids, like groundwater and leachate.

In addition to the responses generated in the 2015 HVHF FSGEIS and the Part 360 revision document cited above, the Department is providing responses to comments below.

Sierra Club – Downs, et al., March 19, 2018

Comment B-1: The DSEIS fails to evaluate the high levels of radioactivity shown in the landfill's leachate test results.

Response B-1: See Responses B-10 and B-13.

Comment B-2: The DSEIS fails to evaluate the adequacy of the landfill's entrance monitors.

Response B-2: The landfill radiation portal monitors are an established part of permit requirements for the Hakes landfill, and will continue to be operated to ensure compliance with any applicable waste acceptance limitations.

Nevertheless, the statements and concerns about the efficacy of the radiation portal fail to take into account two important actualities. First and foremost, Ra-226 decaying within the matrix of drill cuttings will retain most of the Rn-222 within the rock matrix, therefore the other progeny will remain within the matrix as well. This is readily seen in many natural materials including shale.

This question was addressed in the 2015 HVHF FSGEIS Response to Comments. On page RTC-103, and as excerpted above, the Department explained that gamma spectroscopy was an efficient and accurate method to quantify radium. Please also see that response for further information and the response to Comment B-10.

Comment B-3a: The DSEIS fails to evaluate the presence of radon gas in the landfill's air emissions, gas collection system emissions, and emissions from flaring.

Comment B-3b: The air permit is especially significant because radon gas will be emitted into the air more and more out of that landfill as the landfill is filled with radioactive waste from horizontal drilling into the Uranium containing Marcellus shale from Pennsylvania and the half-life of radium is 1400 years and will amass as more radioactive waste is deposited.

Response B-3a: While there is no standard for radon emissions from landfills, potential radon emissions from drilling-related wastes were part of the analyses performed by Argonne National Laboratory (Harto et al., 2014, and Smith et al., 1999). The Argonne studies examined the effects of radium-226 activity/concentrations of 50 pCi/g in the waste mass, which is a value twice the allowable limit set by the Department (25 pCi/g). The potential resulting dose from all pathways was identified in the studies, and included direct gamma radiation exposure and emissions to air and water. The modeled radiation exposures in the Argonne studies, which included radon, were below allowable limits.

Each of the Argonne studies cited above reference the International Commission on Radiological Protection's recommended dose limit of 100 millirems per year - the limit

recommended for members of the general public exposed to non-background sources of radiation. For comparison, these studies note that radiation exposures from natural sources (i.e., background sources) result in an annual dose of about 311 millirems per year. Also see responses B-10, B-11, and B-13.

Response B-3b: Radioactive waste is not accepted at the landfill. Only a small portion of the drill cuttings accepted at the landfill originates from the Marcellus formation (see response B-10). Please note that the half-life of Radium-226 is actually 1600 years.

Comment B-4: The DSEIS fails to evaluate the possible presence of radium, radon and their breakdown products in the landfill's stormwater discharges, groundwater suppression system discharges or liner leakage discharges.

Response B-4: The acceptance of drill cuttings, the waste that prompted this comment, is not a new waste stream for the Hakes landfill. There is no change as part of this action related to waste types being accepted for disposal. Therefore, the type of waste being accepted and their potential impacts are outside of the scope of this EIS.

The current Part 360 Hakes landfill permit already requires semi-annual leachate monitoring for radiological content, specifically for radium-226. If the landfill liner has a leak, it would be identified by the presence of Part 360 regulated landfill constituents in groundwater /or surface water samples which are obtained and analyzed quarterly in accordance with the EMP. Monitoring to date has not identified exceedances of groundwater standards for landfill constituents. If there was a buildup of NORM constituents in the landfill, it would be observed in leachate well before it was observed in the groundwater samples.

Stormwater discharges from the facility do not pass through the waste mass, but are instead generated from waters diverted around the site, surface areas already completed with final cover, and other facility areas (e.g., roads). As such, it is not necessary to monitor stormwater runoff for radiological content. Such discharges are subject to the requirements of the SPDES Multi-Sector General Permit for Stormwater Discharges associated with Industrial Activity, Sector L (GP-0-17-004).

Comment B-5: The DSEIS fails to evaluate the adequacy of the landfill's liner system and groundwater suppression system to protect against the radium, radon, and their breakdown products present in the landfill from entering groundwater and surface water supplies adjoining the landfill.

Response B-5: See response B-4.

Comment B-6: The DSEIS fails to evaluate the risk that opening up the landfill to tie-in the proposed expansion will create new pathways for radon and radium in the landfill to be released to the environment.

Response B-6: Based on an analysis performed by Argonne National Laboratory, even at radioactive concentrations of 50 pCi/g (twice the allowable acceptance limit set by the Department), potential public doses from all pathways were still below allowable dose limits.

See also response B-3a.

Comment B-7: The DSEIS fails to evaluate the risk that the fires that have been occurring at the landfill have damaged the landfill's liner system, gas collection system or leachate collection system and have created or will create new pathways for radon and radium in the landfill to be released to the environment.

Response B-7: In the unlikely event of a leak in the liner system, leachate would ultimately migrate to the storm water system or groundwater collection system, which are both monitored. Refer to Responses C-1 through C-4 for discussion of gas collection and fire issues. In addition, See B-4 which discusses potential liner leaks.

Wetherill Comment:

Comment B-8: Appropriate studies need to be done to quantify actual radionuclide levels in and around the site. Testing must be done continually, over a period of time to show actual levels to allow for weather and other conditions affecting emissions. Contamination of air and water cannot be allowed from this site.

Response B-8: The landfill radiation portal monitor is in place and utilized for every load of waste accepted at the landfill. This ensures that both regulated radioactive materials, and other naturally occurring radioactive materials (such as contained in drill cuttings) above allowable levels are not accepted. No drill cuttings containing radium-226 in concentrations above 25 pCi/g have been accepted at the landfill and revised Part 360 regulations prohibit the acceptance of any wastes that exceed 25 pCi/g of radium-226.

Additionally, drill cuttings accepted (after passing through the radiation portal monitor) are covered, thereby eliminating any chance of airborne emissions (which emissions are unlikely in any case due to the nature of these materials, being solid shale.)

Furthermore, the landfill monitors the leachate collected for many potential constituents which would be the most prominent indicator of any potential issues related to concerns over radioactivity. Also see responses B-1, B-3, B-4, B-10, and B-13.

Concerned Citizens of Allegany County, Inc. – Sinclair, February 23 & 25, March 14, 2018

Comment B-9: There are high levels of radioactivity in the leachate leaving the site. Test results indicate radiation is being emitted by progeny of Radium and Radon. Radioactive leachate is also being re-circulated through older landfill cells.

Response B-9: The two isotopes referred to in the comment are Pb-214 and Bi-214, which have half-lives of 26.9 and 19.9 minutes respectively. These isotopes will decay to stable elements before they could reach any potential receptors.

Leachate is not currently recirculated, nor is it routinely recirculated at this landfill. Recirculation is only allowed for special circumstances and requires Department approval.

Comment B-10: Waste loads entering the landfill should have tripped the [radiation] sensors and been denied entry to Hakes.

Response B-10: This statement is based upon apparent misunderstandings about waste being received at Hakes landfill.

First, while cuttings from wells being developed in the Marcellus formation do come to the landfill for disposal, little of those drill cuttings come from the actual Marcellus formation itself. This is because construction and demolition landfills can only accept cuttings from drilling using air or water based drilling fluids, but they cannot accept cuttings from drilling using oil based drilling fluid. The vertical well bore leading down to the Marcellus formation is often drilled using air or water drilling fluids, but the horizontal leg of these wells is completed using oil based drilling fluids, which cannot be accepted at C&D landfills and which is specifically prohibited in the Hakes landfill Part 360 permit.

Second, certain waste streams from Marcellus well development can contain substantially elevated levels of naturally occurring radioactive materials, including flow back water, formation water (brine), and wastes such as filters and sludge from treating these liquids. This is because the formation water has had millions of years of isolation within the formation to become super-saturated with salts of various constituents in the formation, including both radioactive and non-radioactive mineral salts. However, the solid shale that constitutes drill cuttings does not contain significantly elevated levels of NORM, including radium. The radiation detector would allow Hakes to prevent any wastes higher than 25 pCi/g from being accepted by the landfill.

The detectors have been shown to function adequately. Hakes has previously refused to accept a load of C&D related material when the radiation detectors detected a radioactive source. A load of C&D from City Carting and Recycling from Somers, NY triggered the radiation detector at the landfill scale on September 6, 2016. Hakes personnel at the site followed the radiation alarm procedures detailed in the site's Operation and Maintenance manual. The truck and the trailer were moved from the scale and a radiation survey of the trailer was completed. The radiation survey identified radium-226 present in the load. Notification was provided to the DEC and the waste generator. The generator opted to consult with a radiation consultant to identify and remove the radiation source. On September 7, the trailer was staged in the active cell and began unload. The radiation consultant traced the source as the load moved towards the end of the trailer. The radiation consultant identified a radio-luminous ship deck marker containing radium-226 as the source. One half of the ship deck marker was found near the back of the load and the second half was found near the front of the load. The marker and a shovel full of contaminated debris were sealed in a bag inside a metal bucket. The bucket was temporarily staged in a locked storage trailer onsite while the radiation consultant arranged for transportation and disposal to an approved facility. DEC personnel was on site to observe the identification and removal of the source. The remaining waste in the trailer was scanned for potential radiation sources as the trailer unloaded. No additional radiation sources were identified. The radiation source was picked up on September 27, 2016 by Radiac Research Group and transported off site for further processing and disposal at an approved facility.

Finally, there appear to be misunderstandings about what constitutes viable detection methods for NORM. While radium and its decay products do generate various types of

radioactive emissions, gamma, alpha and beta, they are all present within the same waste. Therefore, monitoring for the easier-to-detect gamma emissions is adequate to determine whether significantly elevated levels of NORM exist in the incoming waste.

See the introduction/summary above for further discussion on monitoring for gamma emissions.

Comment B-11: Radioactive contamination bio-accumulates and radium and radon progeny are mobile and can be deposited. Because of the facility's location three miles upstream from the designated Primary Aquifer in Corning, there is potential for radiological contamination of this important groundwater source. The discharge of radon from the landfill and flare will deposit radioactive progeny of polonium and lead on nearby areas.

Response B-11: Again, this is based on an apparent misunderstanding of the types of wastes being accepted in the landfill and the level of radioactivity in these materials. Additionally, aside from Po-210 and Pb-210, all other radon progenies have very short half-lives. Po-210 and Pb-210 break secular equilibrium, which in simple terms means that the resulting amount of these isotopes is a very small fraction of the initial Rn-222 value. Therefore, there is no realistic potential for buildup or accumulation resulting in impacts. See response to B-10.

Comment B-12: It is unknown whether any radiological testing was included in the groundwater testing protocol, and it is not included in the stormwater discharge testing parameters.

Response B-12: Please see response B-4.

Comment B-13: Leachate test results identified significant levels of radium 226 and radium 228 with related progeny of their breakdown present, namely, bismuth 214 and lead 214, which also indicates the presence of radon gas which is not currently tested for.

Response B-13: Leachate test results, using more accurate EPA Methods than those used for the test results referenced by the commenter do not identify significant levels of radium 226 or 228. Results are within background values observed in groundwater and leachate at other facilities and within allowable limits for discharge to sanitary sewer systems.

Radon values can be inferred from the Pb-214 and Bi-214 gamma spectrometry results. That being said, there are inaccuracies with results obtained for leachate and other liquid samples using the method that the comment is based on, which is EPA 901.1 gamma spectrometry. EPA Method 901.1 is a standardized method for soils and other solid matrices and is not appropriate for measuring radiological content in leachate or liquid samples. For these reasons, this methodology was excluded from the High Volume Hydraulic Fracturing (HVHF) Environmental Impact Statement. The revised Part 360 regulations [at 6 NYCRR § 363-4.6(h)] now specify the use of EPA method 903.1 for solid waste leachate testing for radium-226 (and EPA method 904.0 for radium-228).

Furthermore, due to the natural geology of Steuben County, which is known to contribute to indoor radon issues, any elevated radon and subsequent radon progeny in leachate is likely related to the local geologic sources including cover soils, landfill liner soils and clays, as well as radon from below and adjacent to the landfill. Considering there is significantly more volume of native soils and materials in the landfill than drill cuttings, the contribution from the drill cuttings, none of which have triggered the radiation portal monitor, is likely negligible.

For comparative purposes, the allowable limits for regulated discharges of Bi-214 and Pb-214 and Ra-226 under 6 NYCRR Part 380-11.7 Table III (Monthly releases to a sanitary sewer) are as follows:

Bi-214 $3x10^{-3}$ µCi/ml ($3x10^{6}$ pCi/l)
Pb-214 $1x10^{-3}$ µCi/ml ($1x10^{6}$ pCi/l)
Ra-226 $6x10^{-7}$ µCi/ml ($6x10^{2}$ pCi/l)

The maximum observed Bi-214 leachate result was 6067 pCi/l. This is approximately 0.2% of the Table III monthly limit for regulated discharges.

The maximum observed Pb-214 leachate result was 6183 pCi/l. This is approximately 0.6% of the Table III monthly limit for regulated discharges.

The maximum observed Ra-226 leachate result was 4.59 pCi/l. This is approximately 0.8% of the Table III monthly limit for regulated discharges.

Comment B-14: Radioactive leachate is leaving the Hakes Landfill for disposal at ill-equipped waste water treatment plants and the impacts of radioactive leachate on those plants should be evaluated. Radon levels at WWTPs taking leachate should be measured to assure worker safety.

Response B-14: Waste water treatment plants accept large volumes of waste water from a variety of sources, far in excess of the small volume of leachate disposed from the landfill. Any radon and its short-lived decay products present in the leachate will not only be reduced by natural decay before reaching any potential receptor, but will not add significant amounts of natural radioactivity to the large volumes of waste water accepted at WWTP's on a daily basis.

See also Response to B-13.

Comment B-15: Worker exposure to radioactivity in storm water discharges and air quality (landfill gas collection system, workspaces, and gas flare emissions) is a potential impact that should be evaluated.

Response B-15: In the reports issued by Argonne National Laboratory, such pathways were investigated and modeled. There was no indication that levels at 50 pCi/g in the entire waste mass, which is a level twice what the Department allows in NYS Landfills, that worker exposures will result in any significant risk to workers.

Comment B-16: The radioactivity of the buried waste and proposed radioactive load that will be present upon closure should extend the required duration of long-term maintenance to hundreds of years instead of 50 years.

Response B-16: Extended institutional controls, beyond what is required by Part 360, due to the presence of drill cuttings are not necessary. Even at higher concentrations than are allowed at NYS landfills, modeling performed by Argonne National Laboratory has shown that there are no significant long-term risks. Modeling of a 1,000-year period by Argonne National Laboratory demonstrates a lack of significant risk to humans or the environment at values of Ra-226 twice what is allowed for drill cuttings in New York State landfills.

Comment B-17: There is no safe dose of radiation and natural background radiation causes cancer. Adding to the background radiation dose just causes more cancer.

Response B-17: Comment noted. See responses B-3a and B-6.

Earthworks, et al. – Steinzor, March 14, 2018

Comment B-18: DEC should not allow the Hakes C&D Landfill to expand in order to accommodate additional oil and gas waste, in particular from high volume hydraulic fracturing operations in Pennsylvania. Due to the potentially hazardous and radioactive characteristics of oil and gas exploration, development, and production wastes (E&P wastes), we firmly believe that this waste stream is best suited for disposal at hazardous or low-level radioactive waste facilities.

Response B-18: Drill cuttings contain only naturally occurring radioactive materials (NORM). As such they are not considered hazardous or low-level radioactive waste. Hazardous waste is defined by characteristics under Part 371.3; these include ignitability, corrosively, reactivity, and toxicity. Drill cuttings are inert materials that do not exhibit these characteristics.

The Department has determined that the following materials are acceptable for disposal at a C&D debris landfill without prior department approval subject to the limitations set forth above:

a) drill cuttings and drilling muds generated from operations using air. water or water-based drilling fluids.
b) scrap well pad synthetic geomembrane liner material.

These materials are the only E&P wastes (“exploration and production wastes”), that may be accepted at the Hakes facility.

Comment B-19: E&P Wastes contain toxic substances, including benzene, phenanthrene, lead, arsenic, barium, antimony, fluoride, and uranium at “levels that exceed 100 times USEPA’s health based standards”. Drill cuttings, which can display toxic characteristics, make up a large proportion of the E&P wastes accepted at New York landfills, and they also contain radium and heavy metals.

Response B-19: See response B-6 regarding radioactivity and response B-18.

Comment B-20: Drill cuttings meet the definition of Technologically Enhanced Naturally Occurring Radioactive Material (TENORM), despite NYSDEC's inappropriate insistence that they do not.

Response B-20: Drill cuttings do not meet the definition of TENORM. They have not been modified, processed, or concentrated to increase the concentration of NORM in the cuttings. In a matter related to another Part 360-permitted Region 8 landfill, the Chemung County landfill (a MSW landfill also operated by a Casella subsidiary company), the Commissioner of Environmental Conservation determined that, "Based on this record and applicable legal authority, the disposal of Marcellus Shale drill cuttings in a municipal solid waste management facility is not prohibited by the State's solid waste management regulations." See, In the Matter of Chemung County, Applicant, Decision of the Commissioner dated August 4, 2011, DEC Application No. 8-0728-00004/00013, 2011 WL 6934245. (The record of that permit proceeding, particularly as it relates to Marcellus Shale drill cuttings, is described in more detail by the earlier Rulings of the Administrative Law Judge on Issues and Party Status. See, In the Matter of the Application of Chemung County, Rulings of the Administrative Law on Issues and Party Status dated September 3, 2010, DEC Application No. 8-0728-00004/00013, 2010 WL 5612197.)

Comment B-21: Recent studies and testing indicate that the leachate from landfills accepting oil and gas wastes have elevated levels of radioactive substances. Leachate samples from Hakes Landfill contain very high levels of Lead-214 and Bismuth-214, which are by-products from the decay of radium-226 and radon-222. We have asked DEC to prohibit disposal of leachate from landfills accepting oil and gas drilling, exploration, and production waste at Publicly Owned Treatment Works (POTWs). Unless landfills can guarantee that the leachate going to POTWs is free of toxic substances and has a radiological content no greater than drinking water standards (5pCi/g), their leachate should not be disposed of at POTWs. Without treatment methods designed for E&P wastes, New York POTWs may be discharging radionuclides or other E&P pollutants into New York's waterways.

Response B-21: The drinking water standards for Lead-214 and Bismuth-214 are radionuclide specific, and not 5 pCi/g, but rather measured either in pCi/l or by dose (mrem annually) depending on the type of radiation emitted.

Both Lead-214 and Bismuth-214 are short-lived isotopes with half-lives less than 30 minutes, so they will not have any impact on a POTW.

Please also see Responses B-13 and B-14.

Comment B-22: For drilling wastes, fixed radiation detectors are not an effective method to screen whether waste loads meet municipal landfill activity limitations for Radium 226 and/or Radium 228. This is because fixed radiation detectors are designed to detect energy, primarily gamma or neutron waves – not the activity levels (i.e., as measured in pCi/g) for those radioactive isotopes.

Response B-22: The fixed radiation portal monitor detects only gamma radiation, which is the appropriate mechanism for measuring for the presence of radium in the drill cuttings. The levels of gamma radiation can be correlated to the concentration of NORM in the waste load.

See also Response B-10 above.

Grassroots Environmental Education – Weiniger, February 26, 2018

Comment B-23: Expert analyses of leachate from Hakes landfill reveals high levels of radionuclides resulting from Radium decay, known to be present in drill cuttings from the Marcellus Shale. Dustin May states in his affidavit, "Of major concern regarding these results are the concentrations of Lead-214 and Bismuth-214 found in some of the leachate samples analyzed. In 9 of the 79 leachate samples analyzed from 2012 to 2017, Lead-214 and Bismuth-214 concentrations exceeded 1000 pCi/L and all of these samples showed good agreement between Lead-214 and Bismuth-214. . . These results indicate major potential enrichment of leachate with Radon-222 gas; the half-lives of Lead-214 and Bismuth-214, 27 and 20 minutes, respectively, are too short for these radionuclides to exist independently during the time period between collection and analysis, they would have decayed away entirely."

Response B-23: See responses B-13, B-14, and B-21.

Comment B-24: Accepting radioactive fracking waste in the landfills in New York will lead to human exposure to ionizing radiation by various routes. The greatest concern is inhalation of radon. The levels of radon in air above the leachate may potentially be as high as 1.05 million pCi/L, as documented in the report of Dr. Vaughan. This poses a clear hazard to anyone in the vicinity of leachate. Radon will also be released into the air over the landfill. The leachate will migrate into ground water, where radon will be transported and will appear in the drinking water of people on wells and be ingested.

Response B-24: The landfill is not taking fracking waste. Drill cuttings are not fracking waste.

Considering the limited amount of drill cuttings that have been accepted to date at the landfill, and the minimal values of Ra-226 present in those cuttings, there is no plausible manner in which such radon values in air or leachate can be caused by the drill cuttings present.

See also responses B-4, B-10. B-13, B-14 and B-21.

Comment B-25: The Environmental Monitoring Plan for the landfill does not address radioactivity in the leachate, nor or radon levels being emitted from the landfill measured.

Response B-25: The Environmental Monitoring Plan (EMP) does require monitoring; radioactivity in the leachate is analyzed at least semi-annually. Additional monitoring can be required by the Department if warranted.

See also responses B-4, B-13, B-14, and B-21above.

Comment B-26: The operating requirements and radioactive detection plan incorporating a fixed radiation detection device at a location for monitoring all incoming waste is grossly inadequate and does not specifically ensure detection and accurate measurement of all radioactive material present in waste including alpha, beta and gamma emitters. This unspecified device also fails to consider and identify radioactive progeny. The detectors might miss radioactive hotspots because they average the results and the trucks drive through too fast. Therefore, a radioactive area in the bottom of the truck can disappear (Riek).

Response B-26: The primary isotope of concern, Ra-226, is an alpha emitting radionuclide, but it also emits a gamma ray, and decays to several short-lived progenies which emit Alpha, Beta and Gamma radiation. There is no need to be able to detect beta and alpha radiation to detect radium or its progeny. The prevalence of gamma radiation from Ra-226 and its progeny is readily detectable by the device used.

The original industry purpose for these portal monitors was to detect small elevated radiation sources in scrap metal. Due to the potentially significant costs to the scrap recycling industry, they have developed a highly successful truck portal monitoring system. The portal monitors used for solid waste facilities are essentially the same as those used in the scrap metal industry and are adequate to detect hot spots in incoming trucks.

See also Response B-10.

Comment B-27: Of further concern is the Hakes request for a variance from the solid waste management regulation requiring ten feet of separation from the base of the disposal cell and the bedrock. Groundwater pressures and water tables sitting above the bedrock can compromise the integrity of landfill liners, consequently enabling migration of pollutants from the landfill site. The proposed installation of a groundwater suppression system to enable only five feet of separation from bedrock fails to demonstrate the efficacy of such a system in view of the differing types of wastes being disposed at the Hakes landfill and their impacts since the landfill's original siting and construction (including radioactive wastes).

Response B-27: Note: the variance request with respect to groundwater protection is discussed under the groundwater section below. See Comment E-1.

Comment B-28: Exposure pathways from the Hakes landfill to humans have not been identified or adequately evaluated despite high levels of Radon within the landfill and its leachate noted in the analyses. Cumulative impacts of continued landfill disposal of radioactive waste must be evaluated. A comprehensive, independent and transparent Health Impact Assessment (HIA) is imperative before any consideration of landfill expansion. New Yorkers will have an increased risk of cancer.

Response B-28: The 25 pCi/g limit for radium-226 in the revised Part 360 regulations [6 NYCRR § 363-7.1(o)(8)] is half of what was determined by modelling performed by Argonne National Laboratory to be protective of human health (Harto et al., 2014 and Smith et al., 1999). This model (RESRAD) takes into account all applicable pathways, including radon, in determining the overall dose to the anticipated, maximally exposed individual. This included future cumulative exposures with no site controls in place.

Comment B-29: Radioactive wastes could cause radioactive dust which could be inhaled by landfill workers and nearby residents. Polonium and Lead are decay products of Radon, have a half-life of 138 days and 22.3 years respectively and are solids know to attach to dust particles. How will deposition of pollutants and radionuclides on soil, cropland, and surface waters in the surrounding communities be assessed? Testing and air dispersion modelling need to be conducted to determine radon activity at downwind locations and ensure that the landfill radon emissions to not cause residential indoor air to exceed EPA action levels at 4 pCi/L (also raised by Dobny and others).

Response B-29: Radioactive wastes are not accepted at New York State solid waste landfills. Drill cuttings are not radioactive wastes. When drill cuttings are placed as required within the landfill dust will not be generated, and radon emissions from any Ra-226 are significantly retarded, allowing a majority of decay to occur within the landfill. See also response B-3a.

The USEPA 4 pCi/l action level for radon would never be reached in nearby buildings as a result of any negligible radon emanation arising from the landfill. Furthermore, local geology in Steuben county is known to cause elevated indoor radon values (https://health.data.ny.gov/Health/Radon-Test-Results-Basement-by-County-Map/e3zd-c9mw/data). Any elevated indoor radon observed in nearby buildings can be attributed to this and not minimal amounts of radon potentially being emitted from the landfill.

Wilder Comments

**Comment B-30: Any mechanical handling of radioactive material that brings it into the accessible environment is by definition TENORM, "technologically Enhanced Naturally Occurring Radioactive Material (TENORM) is defined as, "Naturally occurring radioactive materials that have been concentrated or exposed to the accessible environment as a result of human activities such as manufacturing, mineral extraction, or water processing."—
"Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM)," U.S. Environmental Protection Agency".**

Siting a further extension of a facility accepting TENORM as well as other "normal" wastes containing unidentified toxins and heavy metals on the steep slopes of wetland seeps that admittedly discharge appreciably during storms into a creek tributary to major rivers and town water supplies is asking for trouble without even knowing it, seemingly: None of their proposal treats the site's position on such terrain as any sort of engineering challenge requiring comment within their Supplemental Environmental Impact Statement or their Wetlands Mitigation Plan. To

read their proposal, one might well conclude they were talking about a facility sited on dry flat land that had only a tangential relationship to a substantial riparian environment.

Response B-30: See the response to Comment B-20 above.

Felhner Comment:

Comment B-31: Leachate generated in landfill is similar to Heap leaching. Metals are thus concentrated in the leachate.

Response B-31: Heap leaching is an industrial mining process to extract precious metals, copper, uranium, and other compounds from ore via a series of chemical reactions that absorb specific minerals and then re-separates them after their division from other earth materials. This is a process that uses specific chemicals to mine metals from ores. Such chemicals are not used in the landfill and thus there is no direct comparison between this industrial process and the generation of leachate at Hakes. Leachate must be managed in accordance with the Department-approved management plan required currently required under 360-2.9(j) and soon to be required the under the new regulations under 6 NYCRR § 363-7.1(f)(1). Some metals are found in leachate; however, these metals are separated out in the wastewater treatment process at any wastewater treatment plant that receives the leachate. Residual biosolids from the treatment process are also tested for metals and managed appropriately.

Reik Comments:

Comment B-32a: Discussed studies in Iowa showed that deeper drill cuttings had more uranium than shallow drill cuttings. The results also showed radionuclides leaching increased with increased acidity. They discussed studies in West Virginia which compared vertical drill cuttings to horizontal drill cuttings. Mud drilling horizontally creates drillings with some chemicals at higher levels, with chloride levels being very high and the mix being lethal to some plants and invertebrates. The chemicals detected in drill cuttings were also present in leachate from landfills. In addition to chloride, arsenic, barium, iron, manganese, strontium, benzene, and fluoride were detected in drill cutting samples. These results should give NYS DEC reason to investigate chemical contaminants in drill cuttings more thoroughly than has been done.

Response B-32a: For the most part, drill cuttings at Hakes are taken from the vertical section of the well only. Regardless, the portal monitor has not been triggered by drill cuttings going into Hakes. Therefore, no drill cuttings with radioactive levels above 25 pCi/g have been accepted at the facility. See also response B-10.

Comment B-32b: In July of 2015 I gathered some water samples from the Erwin Hollow Creek to be sent to a testing site at Duke University. Requests for samples to be tested for strontium were part of the study. After a lengthy time, results were returned and showed positive for strontium. Unfortunately, the type of strontium was not included, even on second request. However, the DEC should consider testing for

radioactive strontium considering that it may well be found at the site as part of the radiation regulations. Sediment samples test results were never sent at all, but a recent request for them was sent again which I will share if significant.

Response B-32b: The only test that could have been conducted by Duke University would have been for elemental Strontium. There is no naturally-occurring radioactive Strontium.

Scott Comment:

Comment B-33: Radioactive waste should be declared a hazardous waste as it is a fact that it is indeed hazardous.

Response B-33: Radioactive waste is not accepted at the facility, nor is it the subject of this DSEIS. Please note that radioactive wastes are not regulated under 6 NYCRR Part 371, which pertains to the listing and identification of hazardous wastes. Instead, they are regulated under 6 NYCRR Part 380, which pertains to the prevention and control of environmental pollution by radioactive materials. Furthermore, Naturally Occurring Radioactive Materials (NORM) present in drill cuttings are not classified as radioactive waste, nor hazardous waste, as per state and federal regulations. See response to comment B-13.

McCaslin comment:

Comment B-34: Drilling muds are known to contain a wide variety of chemicals that impact drinking water resources geological and geophysical. Commenter provides a list of 1063 chemicals.

In September 2010, EPA issued information requests to nine hydraulic fracturing service companies to collect data in the draft are the chemicals used in a day to day drilling operation. The requests were sent to the following companies: BJ Services, Complete Well Services, Halliburton, Key Energy Services, Patterson-UTI, RPC, Schlumberger, Superior Well Services, and Weatherford. All companies have submitted the information. There is a risk from drill cuttings to our water table at and near the HAKES C & D DISPOSAL INC landfill followed by 1063 known chemicals in the drill operations.

Response B-34: First and foremost, it should be noted that drill cuttings are not exposed to hydrofracturing fluids and associated chemicals. See also response B-10.

We looked at the EPA information request referenced in the comment (on EPA website at: https://www.epa.gov/hfstudy/analysis-existing-data-information-requests). On September 9, 2010, EPA issued information requests to nine hydraulic fracturing service providers. The data requested, which is integral to the hydraulic fracturing study, included:

- the chemical composition of fluids used in the hydraulic fracturing process,
- data on the impacts of the chemicals on human health and the environment,
- standard operating procedures used at hydraulic fracturing sites, and
- the locations of sites where fracturing has been conducted.

The companies did indeed provide data per that request. But the data was for hydraulic fracturing, not drilling. Thus, the chemicals would have been in flowback and produced water, if anywhere, and not in drilling muds as such muds are produced prior to the use of the chemicals in question.

The disposal of drilling cuttings is permitted, and disposal of cuttings at landfills regulated under Part 360 regulations is protective of public health and the environment. In addition, the groundwater monitoring and leachate monitoring required at such landfills is designed to ensure that no contaminants are released from landfills.

C. Design, Construction and Operation

Guilfoyle comments

Comment C-1: It is well known that fires have occurred in landfill cells. What about the integrity of the cell membranes? How is the membrane checked to verify it is still capable of protecting the leachate from contaminating the groundwater, wetlands, and surrounding areas? Is the water used in putting out these fires collected in a leachfield and disposed of as potentially hazardous?
It was stated by the USEPA that liners will ultimately fail and the landfill site will remain a threat for thousands of years.
What is the geomembrane made of; HDPE or LLPE?

Response C-1: A landfill fire is not an acceptable condition for a facility subject to New York State solid waste management regulations. Where fires do occur, the DSEIS states that Hakes fights them by introducing water or leachate, which reduces temperatures and oxygen in subsurface fires. The Department monitors subsurface fires closely. Once a subsurface fire has been identified, probes are installed and monitored for temperature and CO levels. Once the temperature and the CO return to safe levels for operation, the water or leachate introduction is suspended. Leachate is then collected and sent to a wastewater treatment plant.

The integrity of the liner is evaluated based on the monitoring of the groundwater and stormwater at the site. At this point, there have been no leachate indicators leaving the site, indicating that no damage to the liner has occurred from a fire. This monitoring will continue during operation as outlined in the facility's Environmental Monitoring Plan.

In 2014, concerns regarding potential damage to the liner system after a subsurface fire prompted an investigation into the liner system integrity. The landfill was excavated in an area where a subsurface fire was suspected of being in contact with the top of the leachate collection layer. The waste and leachate collection drainage layers were removed exposing the top of the geomembrane liner. There were no signs of distress (i.e., holes or obvious defects) in the geomembrane liner indicating that the leachate collection stone provided protection to the underlying layers. The rest of the isolated fires were elevated in the waste mass away from the landfill liner system.

The landfill liner system and gas collection system are periodically monitored to evaluate their integrity. Monitoring includes the following activities;

- The gas collection system is monitored quarterly for several parameters including; temperature, oxygen, carbon dioxide and methane. These parameters can provide early warning signs that conditions are changing that may impact the gas collection system. To date, there have been no signs that the gas collection system has been impacted by the fires.

- The groundwater collection system beneath the base of the liner system is sampled and tested quarterly. The groundwater collection system analytical results would provide an early indication if the liner system was not operating effectively. To date, there has been no indication that the liner system has been compromised by the fires.

- The leachate collection system is cleaned annually. A high-pressure nozzle and hose are passed through each leachate pipe as water is used to flush and clean the pipes. There have been no blockages or signs that the pipes have been impacted by the fires.

Operational measures to control fires and mitigation measures for fires are addressed in Sections 2.4.10 and 3.4 of the DSEIS.

Groundwater monitoring continues in the Post Closure phase as outlined in the Post Closure Plan until it is determined that it is no longer necessary based on stable groundwater conditions, leachate generation has stabilized to steady state, gas generation stabilizes, etc. The requirements of post closure are included in the regulations (Part 363-9) and are further clarified based on the specific Post Closure Plan. The landfill would then go into custodial care.

The single composite liner system at the base of the Hakes landfill consists of a geomembrane underlain by a compacted clay liner and it is designed and constructed to function as containment at the base of the landfill. The geomembrane is manufactured from HDPE into textured sheets having a thickness of 60 mils. The compacted clay liner is a minimum of two feet thick. Both components of the composite liner are tested before and during construction to guarantee optimum operational conditions.

Comment C-2: I am very concerned regarding the spontaneous fires confirmed by the E. Campbell Fire department and witnesses who have reported the same to me. I am firstly very concerned about the source of these fires, what is causing them? Is it a combination of chemical reactions? During periods of drought, which the region has experienced very recently, the source needs to be thoroughly investigated lest greater fires occur.

I have also had a report from a local witness that there may be fires at the landfill that, due to the construction equipment there, are being taken care of at the site by workers there via burying. This saves the fire department from making a run, but also allows the company to keep reports of the fires from becoming public, and maybe something of concern for the health and safety of the workers there.

I believe these fires are of serious concern and add to the exigency that the DEC, at the very least, deny the Hakes expansion request.

Response C-2: There are two types of fires (surface and subsurface). If exposed waste catches fire, it is a surface fire, and it is caused by unusual hot waste or gas that leaks from the gas collection pipe network. When surface fires have occurred, the fire department has been immediately contacted, as well as the DEC. These fires have been immediately addressed and have been put out within a few hours by adding dirt to the waste mass. They have not caused any damage to landfill components. Corrective measures are also implemented to avoid reoccurrence, such as reduction of the working face and monitoring of the area. Operational measures to control fires and mitigation measures for fires are also addressed in Sections 2.4.10 and 3.4 of the DSEIS.

See response C-1 for information pertaining to the integrity of the landfill liner system and information concerning subsurface fires.

Sierra Club Comments:

Comment C-3: The DSEIS fails to evaluate the risk that the fires that have been occurring at the landfill have damaged the landfill's liner system, gas collection system or leachate collection system and have created or will create new pathways for radon and radium in the landfill to be released to the environment.

The DSEIS acknowledges that the landfill "has experienced both surface and subsurface fires." The DSEIS does not describe how many fires have occurred, in which cells the fires have occurred, how long the fires have lasted, or whether any fires are still burning within the landfill. The DSEIS does not evaluate whether the fires could damage or have already damaged the landfill liner system, gas collection system or leachate collection system and thereby create new pathways for radon and radium in the landfill to be released to the environment. Other than stating that the fires "could impact air resources by the release of smoke and other combustion products,"27 the DSEIS contains no risk analysis and evaluation of the types of environmental exposures that could result from damages caused to damage the landfill liner, the gas collection system or the leachate collection system by the landfill fires.

Because the DSEIS does not evaluate the risk that the fires that have been occurring at the landfill have damaged the landfill's liner system, gas collection system or leachate collection system and have created or will create new pathways for radon and radium in the landfill to be released to the environment, the DSEIS fails to take a "hard look" at the risk of radioactivity in the landfill, or to provide a reasoned elaboration for why increasing the capacity of the landfill and allowing it to take more radioactive shale gas drillings wastes will not have an adverse effect on the environment and the health and safety of the people, animals and plants living near the landfill.

Response C-3: See responses C-1 and C-2 for information pertaining landfill fires and the integrity of the landfill liner system.

See Air section for response to comment G-5 on airborne resources impacts due to fires. For radiation Section B, see responses B-11 and B-15.

Comment C-4: I am concerned about these spontaneous fires. Could the expansion make the worse?

Response C-4: See response C-1. The expansion will result in opening up the waste mass in locations where the expansion will tie in to the existing landfill. Hakes has proposed mitigation measures to prevent oxygen from getting into the existing landfill including flaps. The flaps prevent oxygen from getting into the waste mass during the construction period.

D. Geology/Soils

No comments were submitted on geology and soils. See information on groundwater resources and bedrock separation below in Section E.

E. Water Resources – Groundwater

Comment E-1: Frederick Sinclair (Concerned Citizens of Allegany County, Inc.), February 12, 2018: The SEIS assumes that a variance, from Part 360 regulation, for bedrock separation between the cell liner and bedrock, is a done deal based on the fact that an existing system is in place. Testing of the groundwater suppression discharge has occurred, and continuation of testing is included in the proposed Monitoring Plan, however, there is no reporting of the historic test results or discussion of the function of the groundwater system. The level of analysis and competency which occurs at Hakes is in question due to the identification of high levels of radioactivity in test results for leachate leaving the landfill. The SEIS states, regarding the monitoring of leachate for radioactivity, that "at no time have any levels been detected that would indicate any radioactivity beyond those associated with background levels." (DSEIS page 17) Carefull (sp) review of Hakes testing results clearly shows this to be untrue. An in-depth review and an accurate SEIS evaluation of this and other test results regarding groundwater suppression system, air quality and stormwater discharges is in order. CCAC intends to review these results and provide documentation of anomalies in a fully developed comment to be submitted within a hopefully extended comment period."

Response to E1: The proposed variance for 5 feet of separation between bedrock and the liner system is addressed in Sections 2.4, 3.1, 3.2 and 6.4 of the DSEIS and the groundwater collection system is described in Sections 2.4.2, 2.4.3 and 3.2.3 of the DSEIS.

The "Typical Liner Detail," shown on Figure C-4 (Appendix C) of the DSEIS shows the components of the liner system including the 5 feet of engineered fill beneath it. The engineered fill is specified to have a low permeability ($1x10^{-6}$ centimeters per second or less), as compared to the higher permeability of the in-situ overburden soils. Hakes maintains that the low permeability makes the proposed 5 feet of separation with the engineered fill more environmentally protective than 10 feet of separation with more permeable in-situ overburden soils.

As shown on the detail, a groundwater collection layer is included under the entire base of the liner for the proposed 5 feet of separation. The groundwater collection system prevents

groundwater from coming in contact with the liner thereby enabling its construction. As the groundwater collection system underlies the entire base of the liner with the 5 feet of separation, Hakes maintains that it provides additional environmental protection if compared with the 10 feet of separation scenario where the groundwater collection layer would only be necessary beneath a small portion of the liner footprint.

As described in the DSEIS (Section 3.2.1), groundwater in the expansion area flows from the northwest toward the southeast and discharges to Tributary 4 to Erwin Hollow Creek. Groundwater flow occurs in the lower portion of the till and the upper bedrock zone. The groundwater collection layer is located slightly above or slightly below the groundwater table and will collect some of the groundwater from beneath the facility and discharge it to the east of the landfill cells and ultimately into Tributary 4. The result is that the groundwater flow pattern (i.e., from northwest to southeast) will be maintained as well as the groundwater discharge to Tributary 4.

In addition, the groundwater collection layer provides a media for environmental testing which will provide an early indication of potential groundwater impacts. As described in Appendix E of the DSEIS, samples are collected quarterly from the groundwater collection system discharge points (see DSEIS Figure E-1 for locations) and are monitored for the same parameters as the groundwater monitoring wells. Analytical results for these samples have been and will continue to be provided to the Department in a quarterly Environmental Monitoring Report. If changes to the site's normal groundwater conditions occur, they will be detected, and can be addressed, in a timely manner.

The groundwater collection system will be designed to provide groundwater suppression at the base of the landfill liner system. The suppression system will be designed with an appropriate flow capacity based on known site hydrogeologic conditions, including historic data from the existing landfill sections. It consists of several components including; a groundwater collection geocomposite, separation geotextile, stone filled trenches, perforated collection pipes and solid transfer pipes. The groundwater collection system is sized to have adequate structural strength to support the maximum static and dynamic loads and stresses that will be imposed by the overlying material, including the drainage layer, liners, waste material, and any equipment used in the construction and operation of the landfill.

The flow capacity of the groundwater collection system is equivalent to a one foot thick sand layer as required by the NYS Solid Waste Management regulations. During each phase of construction, the groundwater collection system components are tested to verify that they meet the design requirements. This includes completing transmissivity testing (i.e., flow capacity) under normal loads equivalent to final grades. Geotextiles are tested for apparent opening size to verify compatibility with the surrounding soils to allow flow to enter the collection system without becoming clogged. The drainage stone is tested for gradation and permeability.

The groundwater collection system is monitored on a quarterly basis and tested for the same parameters as the groundwater monitoring wells. As part of the sample collection process, a field form documenting conditions at the sample location is completed. Information collected and documented includes estimated flow, condition of the location and a description of the sample. The analytical data, which are reported to the DEC, do not indicate groundwater impacts from existing landfill operations. In addition, the field forms indicate that the groundwater collection system continues to operate as designed.

For SEQR purposes, Hakes has provided adequate information to evaluate potential groundwater impacts associated with the project. This includes an evaluation of bedrock separation and groundwater protection requirements (DSEIS Sections 3.1 and 3.2), mitigation measures, and consideration of alternative design (DSEIS Section 6.4.1). However, it should be noted that the Department will not make SEQR Findings and a decision on the liner system and associated variances until after the complete permit applications and engineering plans have been submitted and reviewed.

Higgins, Bauer, Drobny Comments:

Comment E-2: Hakes Landfill expansion is requesting a variance from the Solid Waste Management Law requiring 10 feet of separation between the base of the disposal cell and bedrock. Groundwater pressures and water tables perched above bedrock can compromise landfill liner integrity and allow for the migration of pollutants from the site. The current site plan is for five feet of separation from bedrock with the installation of a groundwater suppression system. The narrative suggests that approval of said variance is assured based on the use of this approach in previously installed cells. While testing of the groundwater suppression discharge has been routinely performed, absent is any discussion or analysis that those tests confirm the efficacy of the system. The type of wastes being disposed of at Hakes and potential for impact has changed since the original construction which must mandate a review and revision of any earlier protocols. Any evidence of radioactivity needs to be identified.

The need for careful analysis of pollutants, which may have already migrated or pose future threats to groundwater, is amplified by the proximity of the Hakes Landfill to the nearby downstream unconsolidated primary aquifer that supplies Corning and many downstream public water supplies.

Response E-2: The type of waste taken at this landfill has not changed from the start of construction by Casella in that this has always been a C&D landfill. The permitted waste streams have not changed. Hakes has always been able to take C&D including drill cuttings. However, the gas industry has changed and therefore additional C&D from the gas industry had been taken in over the last several years. As stated previously, there is no change in the amount of drill cuttings to be taken in for this expansion.

See also the response to E-1 above.

F. Water Resources – Surface Water

Comment F-1: What is the liquid leaking out of the backs of trucks on to the road when they drive up the hill toward the facility? Are trucks potentially contaminating roads and surrounding areas?

Response F-1: It is possible that during wet periods small amounts of liquids may seep from covered trailers containing C&D waste. See response to Comment L-1. The regulations limit the amount of moisture content of waste. Waste accepted for disposal must exhibit no free liquids and must contain a minimum of 20% solids pursuant to 6 NYCRR 363-7.1(i).

Comment F-2: Siting a further extension of a facility accepting TENORM as well as other "normal" wastes containing unidentified toxins and heavy metals on the steep slopes of wetland seeps that admittedly discharge appreciably during storms into a creek tributary to major rivers and town water supplies is asking for trouble without even knowing it, seemingly: None of their proposal treats the site's position on such terrain as any sort of engineering challenge requiring comment within their Supplemental Environmental Impact Statement or their Wetlands Mitigation Plan. To read their proposal, one might well conclude they were talking about a facility sited on dry flat land that had only a tangential relationship to a substantial riparian environment.

Response F-2: With respect to TENORM, see response B-20 above.

The liner will address these issues. It will prevent leachate which may contain metals and other chemicals (leachate indicators) from seeping out of the landfill. Seeps have been found in older landfills which did not have state of the art liners or appropriate post closure cap or meet post closure of custodial care. There are no seeps in this C&D landfill, which is constructed with state of the art liners. This facility will also implement measures to divert clean stormwater around the landfill and borrow area.

The borrow area will also be on steep slopes next to a stream. This is discussed in Section 3.3 of the DSEIS, along with the stormwater and erosion control measures that will be put in place to protect surface waters during operation. The detailed Stormwater Pollution Prevention Plan (SWPPP) will be submitted during the permit application process, which will address in detail the schedule, staging, and proposed mitigation measures proposed for this borrow area to prevent rainwater to pick up sediment and send it to the creek. For example, these will include stormwater diversions, construction of berms and stormwater ponds before construction, etc.

Comment F-3: Though the three wetlands areas cited in the landfill's "Wetlands Mitigation Plan" are considered to be small and of little impact, they do exist - in those places - because they are ecologically useful. No human put them there, so no human should be permitted to destroy them. On paper, they may appear to serve a limited role, but they exist for an ecological purpose, the full impact of which will not be known until the damage to wildlife served by the wetlands and the watershed area that it serves becomes irreparable. This area also serves as the headwaters for Erwin Hollow Creek. How will this impact the creek?

Response F-3: The wetland impacts are responded to below in Section J. This response deals only with the surface water/creek.

Regarding potential impacts to the creek, see response F-2.

Comment F-4: I have to replace my well pump because the water is bad; this is the 7th one.

Response F-4: This Comment does not provide sufficient detail (e.g., location, quality, etc.) to determine whether the well issues have any connection to the Hakes landfill. See responses in Section E regarding groundwater.

Comment F-5: Hakes received in 2012: 3,360 gals. (80 Bbl.) of frack brine. received this information from the Riverkeeper organization which got it from FOILing (Freedom of Information Act.). In other words, the area was further contaminated with radiation, excessive levels of chloride salts, and other toxins. (The Leachate from the landfill has already tested positive for high levels of radiation and other contaminants.). This just adds to the burden the landfill poses on surrounding communities and the Corning aquifer because the run off eventually pollutions the land and the drinking water. If the landfill is expanded, this extra pollution may continue. It appears the needed permits have already been granted and do not have an expiration date. The specific brine does not have to be tested as long as some representative samples are tested. Testing for radioactivity is not required even though it is likely to exist. There is no follow-up monitoring.

Response F-5: Hakes C&D landfill does not accept brine. Those records were the result of errors in recording by the waste generators of either the type of waste or the final destination. Pennsylvania DEP records have been updated to account for those recording errors. The Pennsylvania records now show the correct information, which is that most of the wastes which had been incorrectly referred to as being sent to Hakes as fluids were actually drill cuttings, not fluids, and the remaining materials that actually were fluids were sent to a treatment facility. None of the wastes in question that were disposed of at Hakes were flowback or production fluid or brine. See the letter dated February 22, 2018 (and its attachments) in Appendix 6 of this FSEIS.

Comment F-6: In July of 2015 I gathered some water samples from the Erwin Hollow Creek to be sent to a testing site at Duke University. Requests for samples to be tested for strontium were part of the study. After a lengthy time, results were returned and showed positive for strontium. Unfortunately, the type of strontium was not included, even on second request. However, the DEC should consider testing for radioactive strontium considering that it may well be found at the site as part of the radiation regulations. Sediment samples test results were never sent at all, but a recent request for them was sent again which I will share if significant.

One of the samples was taken from a site adjacent to the landfill, the owner of the property mentioned a discharge pipe coming from the landfill into the creek where it was on his property. I did not walk upstream to see this. The landowner reported a complaint to me but also reported he was told by the landfill management that as the creek went onto the landfill "what difference did it make where the discharge pipe was"? I observed that the water at that part of the creek was milky and unclear, whereas in the part of the creek where I took the second sample the water appeared clear.

Response F-6: The commenter contends that part of the creek was milky and unclear while the rest was clear. At this point in time, there is no evidence to support a claim that the facility caused a water quality violation or contravention of Water Quality standards. However, should any event happen in the future, it can be photographed and called in the

Department's spill hotline at 1-800-457-7362 or the Division of Materials Management office at 585-226-5411.

See response B-32b regarding strontium.

Comment F-7: The Finger Lakes, including Hemlock, Conesus, and Canadice, will be contaminated by this landfill.

Response F-7: Hakes must comply with permit and stormwater regulatory requirements to prevent runoff and contamination from entering surface water bodies. Regardless, Hakes is located within the Chesapeake Bay Watershed and streams drain to the south. The Finger Lakes identified in the comment are not part of the same watershed; they are part of the Lake Ontario Watershed which drains to the north.

Comment F-8: The Alleghany River and tributaries will be contaminated by the landfill.

Response F-8: Hakes must comply with permit and stormwater regulatory requirements to prevent runoff and contamination from entering surface water bodies. The facility is not located in the Alleghany River watershed.

Comment F-9: I have methane gas in my well.

Response F-9: There is not a pathway for gases to travel from the landfill to surrounding wells as the liner system and gas collection system would prevent this migration. However, a United States Geological Survey report in 2013 indicates that methane occurs naturally in the groundwater of South-Central New York State (USGS 2013).

Methane, carbon dioxide and small concentrations of hydrogen sulfide and other organics are generated by the landfill. These gases can escape into the air during waste placement and installation of new gas wells. During operations, soil and other materials are used occasionally as "daily cover" which helps keep gases inside the landfill where they are collected by the gas collection system and burned in the flare. Landfill gas is also prevented from migrating laterally through the surrounding soil by the liner system. Without surface controls, landfill gas would migrate out of the waste to the atmosphere. Controls to limit surface emissions include application of intermediate cover, the eventual construction of the final cover system in areas filled to final grade, and active horizontal and vertical system collections of landfill gas.

Comment F-10. An in-depth review and an accurate SEIS evaluation of this and other test results regarding groundwater suppression system, air quality and stormwater discharges is in order.

Response F-10: In-depth discussions of these components of the landfill are included in the DSEIS. See responses E-1 and F-2.

G. Air Resources

Finneran and Little Comment

Comment G-1: Research published in the International Journal of Epidemiology in 2016 showed that health is at risk for those who live within five kilometers of a landfill site. Researchers in Italy evaluated the potential health effects of living near nine different landfills in the Lazio region, and therefore being exposed to air pollutants emitted by the waste treatment plants. 242,409 people were enrolled in the cohort from 1996 to 2008. The results showed a strong association between Hydrogen Sulphide [sic] (used as a surrogate for all pollutants co-emitted from the landfills) and deaths caused by lung cancer, as well as deaths and hospitalizations for respiratory diseases. The results were especially prominent in children. The annual average exposure levels of Hydrogen Sulphide [sic] was 6.3 ng/m3, compared to people living close to larger landfills in Rome whose levels averaged 45.ng/m3. At the end of the follow-up period there were 18,609 deaths.

Response G-1: The Department is unfamiliar with the study cited and it is not clear that the conditions of the study are comparable to the Hakes facility and its surrounding environment. DEC staff are tasked with implementing the New York State air regulations.

Per 6 NYCRR Part 257-10.3, for any one-hour period, the average concentration of hydrogen sulfide shall not exceed 0.01 ppm (14 micrograms/cubic meter). The regulation states that this standard was developed to prevent disagreeable odors (see 6 NYCRR Part 257-10.2), which is well below concentrations that affect health. See also response G-2. Surface scans performed onsite at the landfill and background readings taken off-site (upwind and downwind of the facility) indicate that the facility is compliant with this standard. The facility will be required to continue to monitor to ensure that they are compliant with this standard.

Also see Response G-2

Biesanz Comments:

Comment G-2: Odors in landfill gas are caused primarily by hydrogen sulfide and ammonia, which are produced during breakdown of waste material. For example, if construction and demolition debris contain large quantities of wallboard (also called drywall or gypsum board), large amounts of hydrogen sulfide can be formed. Hydrogen sulfide has the foul smell of rotten eggs, while ammonia has a strong pungent odor. Humans can detect hydrogen sulfide and ammonia odors at very low levels in air, generally below levels that would cause health effects.

Short-term exposures (typically up to about two weeks) to elevated levels of ammonia and hydrogen sulfide in air can cause coughing, irritation of the eyes, nose, and throat, headache, nausea, and breathing difficulties. These effects usually go away once the exposure is stopped. Studies have been conducted in communities near landfills and waste lagoons to evaluate health effects associated with exposure to landfill gases. These studies lasted for several months and reported health complaints which coincided with periods of elevated levels of hydrogen sulfide and landfill odors. The reported health complaints included eye, throat and lung irritation,

nausea, headache, nasal blockage, sleeping difficulties, weight loss, chest pain, and aggravation of asthma. Although other chemicals may have been present in the air, many of these effects are consistent with exposure to hydrogen sulfide."

In this article, you see mention of Construction and Demolition debris in particular and the affects from its decomposition.

Response G-2: We have reviewed the online information cited in the comment, which, at the time of this writing, can be viewed at https://www.health.ny.gov/environmental/outdoors/air/landfill_gas.htm . This information also describes various measures landfills may employ to control and manage landfill gas. Casella has implemented an active gas collection system at Hakes, which directs the collected gas to a flare to combust the gas.

Furthermore, the belief that all odorous landfill emissions are toxic is unsupported and incorrect. Landfill gases include odorous substances that may or may not be toxic at the concentration found offsite (e.g., sulfur containing compounds). The toxicity of an air contaminant and its capability to elicit an adverse health effect is not linked with the air contaminant's ability to produce a detectable odor. The hydrogen sulfide ambient air quality standard for New York state is set at a concentration that the majority of individuals will not detect odors, however some individuals may still detect odors. For example, ammonia and hydrogen sulfide at low concentration can have strong offensive odors while its toxicity is limited to irritation which is a reversible adverse health effect. Air emission modeling contained in Appendix H of the DSEIS using the SCREEN3 modeling program indicate that the worst-case concentration for hydrogen sulfide offsite would comply with the hydrogen sulfide standard of 0.01 ppm (14 $\mu g/m^3$) contained in 6 NYCRR Part 257-10.3, which is the New York State ambient air quality standard. The US Department of Labor, Occupational Health and Safety Administration (OHSA), indicates that the hazards of hydrogen sulfide and health effects start to occur at levels well above the New York ambient air quality standards (see https://www.osha.gov/SLTC/hydrogensulfide/hazards.html for more information) Therefore, it is improper to conclude that detectable landfill odors expose individuals to toxic air emissions.

As mentioned above, Hakes employs an active gas collection system which sends collected landfill gas to a flare. The facility is required to comply with 6 NYCRR Part 257-10.3 as indicated in response G-1. The facility will continue to perform surface scans to monitor hydrogen sulfide fugitive emissions, complete corrective action as necessary, and to operate the gas collection and control system (flare) as needed to remain below this standard.

As indicated by a conservative model of the estimate of emissions from the peak year in which the maximum gas is generated at the landfill, the facility emissions are below the 6 NYCRR Part 257-10.3 standard for hydrogen sulfide.

Scott Comment:

Comment G-3: DEC of NY explains that the permit for this expansion will be granted and the Title V Air permit will then be requested from the EPA. Should it not be the other way around as the air permit is presented with an already approved permit of this expansion. if the air permit fails to be approved, the land permit does not have to

be done and could save a lot of time and money. How will 6 NYCRR Part 203, Oil and Gas Sector Emissions be applied in the air permit?

Response G-3: NYSDEC is responsible for issuance of Air State Facility permits and Title V air permits in New York State. USEPA does not issue these permits. There is an EPA 45-day review period requirement for Title V permit applications, during which time EPA has the opportunity to comment and prevent issuance, where they deem it appropriate. The facility has an existing Air State Facility Permit and has indicated that they will submit an application to modify this permit in the future. Once the air application is submitted for review, a determination will be made as to the type of permit that is required (Air State Facility versus Title V). If this does indeed turn out to be a modification to the Air State Facility permit, then an EPA 45-day period will not be required.

The Department will process both the solid waste permit application and the air permit application at the same time. The landfill expansion would require the issuance of all necessary DEC permits to proceed.

6 NYCRR Part 203 has been repealed, and would not have applied to this air permit in its prior form. As noted in the comment, a future 6 NYCRR Part 203 is being developed that would regulate certain emissions from the oil and gas sector in New York State. The process is at the pre-proposal stage and stakeholder input is being gathered at this time. There are no draft Part 203 regulations currently available, however, the regulation of drill cuttings under a future Part 203 is not anticipated. For further information concerning the Part 203 stakeholder outreach you may consult our website at https://www.dec.ny.gov/chemical/113887.html, which provides an overview of the targeted emission sources and identifies the DEC contact person.

Comment G-4: What are the impacts of exhaust from trucks? The trucks cause diesel fumes and dust which affect air quality.

Response G-4: The landfill design capacity is not proposing to increase, therefore, the number of trucks and hence the fumes and dust, will not increase. See also response L-8.

Comment G-5: How are the fumes of combustion from the wide range of materials that are dumped in the landfill contained during a fire? I am very concerned regarding the spontaneous fires confirmed by the E. Campbell Fire department and witnesses who have reported the same to me. I am secondly very concerned about the smoke these fires emit, especially due to the preponderance of very recent evidence that the landfill has been receiving a great deal of radioactive material; does the smoke from these fires cause the radioactive elements to become more airborne than might otherwise be the case?

Response G-5: Fires are prohibited under 6 NYCRR § 215.2, and under the conditions of the facility's Air State Facility permit. Fires are required to be put out as soon as possible. See also responses C-1 and C-2. Drill cuttings containing naturally occurring radioactive material (NORM) are not combustible and would result in no significant release of radioactive air emissions due to fire. See also response B-10.

The DSEIS describes the operational measures the Hakes facility implements to control fires (Section 2.4.10), significant environmental impacts associated with fires (Section 3.4.2) and fire impact mitigation (Section 3.4.3).

The combustible nature of some of the waste received at the Hakes facility creates the possibility of fires, which could impact air resources by the release of smoke and other combustion products. Fires that occur within the waste disposal areas are reported to the NYSDEC–Region 8 and local fire responders. Although combustion products are released due to the fires, the impacts are temporary, since the fires are extinguished. Hakes, on occasion, has experienced both surface and subsurface fires. Technically, subsurface fires are not “combustion”. Combustion occurs in an atmosphere with abundant oxygen. Anything below the surface would have limited oxygen, which results in relatively slow rates of thermal oxidation of the waste.

It should be noted, however, that little smoke has been released from fires experienced at the landfill since most of the time the issue is below the surface of the landfill and well controlled. Soil is immediately placed on the area of concern. If the event continues for more than a few days, injection wells/monitoring points are installed throughout the area. Water or leachate is introduced into the buried waste to cool, contain and extinguish any thermal oxidation.

H. Odors

Comment H-1: Hydrogen Sulfide health study. Odors in landfill gas are caused primarily by hydrogen sulfide and ammonia, which are produced during breakdown of waste material. For example, if construction and demolition debris contain large quantities of wallboard (also called drywall or gypsum board), large amounts of hydrogen sulfide can be formed. Hydrogen, sulfide has the foul smell of rotten eggs, while ammonia has a strong pungent odor. Humans can detect hydrogen sulfide and ammonia odors at very low levels in air, generally below levels that would cause health effects.

Response H-1: See responses G-1 and G-2 above.

Comment H-2: Odor - The "odor" is absolutely obnoxious whenever there is a weather Low Pressure System present. This odor is enough to make a person physically sick.

Response H-2: See responses G-1 and G-2 above.

Comment H-3: Nobody wants to buy a house up there due to the odors, dying trees, and land property values.

Response H-3: See responses G-1 and G-2 above. There is no evidence that any tree death is related to the landfill. Regarding property values, see response A-4 above.

Comment H-4: Hundreds of properties are downwind of the odors from the landfill.

Response H-4: See responses G-1 and G-2 above.

I. Terrestrial and Aquatic Ecology

Comment I-1: There are known rattlesnake nests in the proposed area of expansion that should not be disturbed unduly. There is at least one colony of timber rattlesnakes living very close to the landfill. When I was gathering water samples near the landfill in July I was warned to be very aware of their existence. Timber rattlers are on the threatened list of the DEC.

Response I-1: The DSEIS states that the project area does not contain timber rattlesnake nest sites (dens). This was verified by NYSDEC Biologist out of the Department's Bath Suboffice who specializes in timber rattlesnakes. The project area may contain foraging habitat for timber rattlesnakes. Therefore, the DSEIS includes a timber rattlesnake management plan, which will be required to be implemented. The purpose of the plan is to protect the snake and the workers.

Comment I-2: At least one new stream crossing will be impacted, and the threat of surface water contamination is a serious concern.

Response I-2: The intent of the comment is not quite clear as there are no stream crossing permit applications being submitted for this project. However, the statement regarding the threat of surface water contamination being a serious concern is addressed. The DSEIS states that the main potential impacts are sediments released to surface water during construction and operation activities, and accidental releases of leachate or petroleum products. These releases must be controlled in such a way as to eliminate releases to the environment. The DSEIS discusses the existing and proposed sedimentation (settling) ponds that do and will receive runoff from the site collected by a system of stone lined ditches. Release from the ponds flow through a sand filter that further reduces the hard to settle fine particles. Section 3.3 and Appendix D thoroughly address surface water controls. The streams at the project site are just upstream of a C(TS) or trout spawning reach, therefore the stormwater plan to be submitted during the application process will need to be very detailed and thorough as well as provide built in contingencies.

J. Wetlands Ecology

Wilder Comments

Comment J-1: Reading the wetland mitigation proposal, I was immediately alerted by the reference to 'palustrine emergent wetlands.' These are very valuable wildlife resources, largely snow free during winter, affording access to grasses and other ground-based food. "Part 1: Wet land Wildlife Values," Amy Marrella, Acting Commissioner, Connecticut Department of Environmental Protection, Wildlife Division, pg. 20:

Seeps are a relatively common Palustrine forested wetland sub-class found in the ledge rock and basalt hill areas of CT. They are often inconspicuous in the landscape [emphasis added]. Never the less, these shallow areas can be important for wildlife during severe winters as they tend be snow free and have very early vegetation.

And from "Conclusions," (pg. 46) "Riparian zones connect fragmented habitats, provide cover, and protect stream banks." —Part 1: Wet land Wildlife Values," pg 20, Amy Marrella, Acting Commissioner, Connecticut Department of Environmental Protection, Wildlife Division.

All the palustrine emergent wetland areas that will be permanently lost (.95 acres) are noted in Casella's wetland remediation plan to be just such wetland seeps.

Secondly, this plan does not propose any mitigation of the loss other than compensatory action. An in Lieu Fee (IF) arrangement is proposed with The Wetlands Trust, in the Cohocton/Chemung Service area. That seems reasonable until one sees, in Figure 2 Area Maps beginning on page 10, that both the cell expansion area and the soil borrow area are located on opposing steep hillsides which drain into Erwin Hollow Creek, and contain the palustrine emergent wetlands which "discharge into the Tributary during storm events."

It seems on the face of the matter that both the proposed cell and the soil borrow area are poorly chosen from the standpoint of terrain, soils, surrounding vegetation and wildlife impacts. The attempt to keep a landfill cell isolated from discharging into the creek during storms seems like a deliberate exercise in defeating gravity and hydraulics both at once. And taking soil from across the hollow to build, maintain and daily cap the cell likewise seems doomed to cause the loss of a substantial environment well outside the perimeter of the proposed permitted area.

On page 6, the remediation proposal states "Wetlands to be impacted by the proposed project were emergent wetland types with limited environmental functions due to their individual small sizes and lack of vegetative diversity (B&L, 2016)." Here again the proposal ignores both the unique value of these palustrine emergent wetlands but also the consequences of locating both a landfill cell and an associated Soil Borrow Area within about 250 yards of each other on the opposing steep hillsides of a creek running through a hollow. Digging and construction in such a geology inherently destroys the vegetative root system complex which has held the hillside relatively stable for decades and likely centuries.

There are no stated intentions to minimize damage to the surrounding environment. Indeed, there are no specified traffic routes between the proposed expansion and Soil Borrow Area. Since both are within Casella's property line one might well surmise that the vehicles moving soil from the Borrow Area to the expansion cell will simply traipse the shortest distance — making the trip some 250 yards down the ravine and across the creek rather than a much longer road trip —completely fouling and interrupting the integrity of the entire ravine and its waters from there downstream. This, in the middle of Erwin State Forest!

In positing that Casella's operations will disturb only a small area the authors of the remediation proposal admit they have no idea of the critical nature of the geological terrain they are dealing with, and conceive of no need to assure the Department of Environmental Protection ("Department") or the public of how their operations will be performed to minimize damage to the surrounding environment. Such ignorance sets the stage to precipitate a large sudden loss of soils, terrain, habitat, flora and fauna far exceeding the area they are asking permission to operate in…

(note: discussions on TENORM added to Section B above.)

… Siting a further extension of a facility accepting TENORM as well as other "normal" wastes containing unidentified toxins and heavy metals on the steep slopes of wetland seeps that admittedly discharge appreciably during storms into a creek tributary to major rivers and town water supplies is asking for trouble without even knowing it, seemingly: None of their proposal treats the site's position on such terrain as any sort of engineering challenge requiring comment within their Supplemental Environmental Impact Statement or their Wetlands Mitigation Plan. To read their proposal, one might well conclude they were talking about a facility sited on dry flat land that had only a tangential relationship to a substantial riparian environment.

Response J-1: Hakes provided the following response in an e-mail from Michael J. Mann of McMahon & Mann Consulting Engineers to the Department dated May 16, 2018.:

"The wetland resources proposed to be impacted as a result of the Hakes Landfill Expansion total 0.672 acres. These wetlands (K, L, and M) were characterized in the field as palustrine emergent wetlands (PEM), a wetland type included in the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al., 1979 and Federal Geographic Data Committee, 2013). Emergent wetlands, which include marshes, wet meadows, fens, etc., are the most prevalent and widely distributed wetlands in the United States (Classification of Wetlands, Environmental Protection Agency (EPA)). Though common, emergent wetlands, and more specifically the PEM wetlands delineated within the Survey Area, are acknowledged to provide certain functions and values to their surrounding environment. An assessment of the delineated wetlands' functions and values was completed (Appendix C of the Wetland Delineation Report – B&L, 2016) in support of the proposed Landfill Expansion. A wetland's size, physical characteristics, amount of proposed impact, and documented functions and values are considered when determining the mitigative approach proposed to compensate for impacts to the wetland.

After avoidance and minimization of wetland impacts have been reviewed for a project, compensatory mitigation is required for unavoidable adverse impacts that remain. The compensatory mitigation process looks to replace the loss of wetland function within the watershed (Compensatory Mitigation Factsheet, EPA). For the Hakes Landfill Expansion, the loss of wetland function is proposed to be mitigated through the purchase of 0.672 acres of wetland credits from The Wetland Trust's (TWT) In-Lieu Fee Program. The TWT's Cohocton/Chemung Service Area includes the Hakes Landfill Facility. Since a wetland bank that services this watershed does not exist, the use of an In-Lieu Fee Program to provide the necessary wetland mitigation is the next preferred option in accordance with the EPA's and U.S. Army Corps of Engineers' 2008 Mitigation Rule (Compensatory Mitigation for Losses of Aquatic Resources; Final Rule, EPA, 2008). Mitigation banks and In-Lieu Fee Programs are often the environmentally preferable compensatory mitigation option because they involve the consolidation of mitigation projects, which has many benefits as detailed in the 2008 Mitigation Rule.

The proposed footprints of the Expansion Area and the Soil Borrow Area are included in the DSEIS. The DSEIS details the wetland and water impacts that would result from the proposed project and also considers the potential for secondary and adjacent

impacts. The site geology and soils are also detailed in this document. The boundaries of the Soil Borrow Area were established to avoid direct impacts to on-site wetlands and waters. Direct access between the Expansion Area and the Soil Borrow Area is not proposed as part of the project. Soil will be transported from the Soil Borrow Area using the existing access point at the southern extent of the current facility, which includes an existing crossing of Tributary 4 to Erwin Hollow Brook/Creek. The construction of a traffic route through the ravine (as suggested in the comment) is not practicable due to the steep grades associated with the ravine that houses Tributary 4, the substantial amount of fill that would be required to construct a passable road through the ravine, and the review that would be required to permit such an activity."

The Department must consider the direct and indirect impacts of the proposed wetland fills. To this end, we will be receiving an application for a Clean Water Act, Section 401 Water Quality Certification (401 WQC) during the permit application process. A 401 WQC will be required because the project will need an individual Clean Water Act, Section 404 permit from the US Army Corps of Engineers ("Corps"). The US Army Corps of Engineers has requested additional information from Hakes pertaining to the wetland fill. This information will need to be submitted and reviewed by the US Army Corps so they can determine the amount of actual in lieu fee mitigation that will be required. Their review will consider a number of factors, including wetland areas that may be indirectly impacted.

The 1:1 mitigation ratio proposed by the project sponsor has not been approved by the Corps, therefore, this ratio may be increased to reflect additional indirect impacts, the quality of the wetlands to be impacted, or other factors. Once this is determined, the Department will defer to the Corps' mitigation as appropriate mitigation for the wetland impacts. If the in-lieu fee mitigation is approved, this will be accepted by the Department as appropriate mitigation for the project. This approach will ensure consistency with the requirement pertaining to federally-regulated wetlands contained in 6 NYCRR § 360.8(c). For further information, the reader may also wish to refer to the federal 2008 Final Compensatory Mitigation Rule, available on-line at https://www.epa.gov/cwa-404/compensatory-mitigation#regulations .

The Department understands that the landfill is proposed to be located on some steep topography and within and adjacent to headwater wetlands. The DSEIS appendix D, includes surface water controls and other erosion and sediment prevention measures which elaborate on how the landfill and associated structures will be constructed in such a way as to protect water quality of the remaining wetlands and streams onsite.

The stormwater diverted from the new expansion area and the new soil borrow area will be diverted just downstream of these areas, into Erwin Hollow Creek, therefore, amount of water in the trout spawning reach will remain the same.

Prior to permit issuance and Findings, the Department will need to review the Stormwater Pollution Prevention Plan (SWPP) and will assure that the fills and changes to wetland hydrology will be conducted in such a way as to avoid downstream water quality issues to remaining wetlands and streams.

See response B-20 concerning TENORM.

Little Comments:

Comment J-2: Though the three wetlands areas cited in the landfill's "Wetlands Mitigation Plan" are considered to be small and of little impact, they do exist - in those places - because they are ecologically useful. No human put them there, so no human should be permitted to destroy them. On paper, they may appear to serve a limited role, but they exist for an ecological purpose, the full impact of which will not be known until the damage to wildlife served by the wetlands and the watershed area that it serves becomes irreparable. This area also serves as the headwaters for Erwin Hollow Creek. How will this impact the creek?

Though it may be legal for the landfill to purchase credits which may serve to preserve other areas, the action does not make a difference in the immediate area that is affected. To suggest that preserving a larger area in Burdett will mitigate wetland loss in East Campbell is akin to suggesting that - under the right circumstances - it might considered legal to destroy Lamoka or Waneta Lakes because the Finger Lakes or the Great Lakes are being preserved. Though this extrapolation may seem far-fetched, it is only the scale of this concept that is different.

It is not far-fetched to imagine that the landfill will request another expansion in 5 - 10 years, with additional impact to the local ecosystem. According to the Project Location Map in the "Wetlands Mitigation Plan," the border of the proposed expansion area appears to be set back several hundred feet from the northern border of the property. Reality may be different. It is my understanding that the landfill has breached that northern border and that excavation activity is occurring along that border.

Response J-2: See response J-1 above. Any application for a further landfill expansion would be subject to a full review of all associated impacts, including any additional potential wetland impacts.

Culver Comments:

Comment J-3: Wetlands - The proposed filling in of the Wetlands that originate on property (Map # - 244.00-01- 037.111) as a Spring, will change the flow of the Erwin Hollow Creek and force the water to go somewhere else. Will this redirection of the flow of water turn our land into a swamp. How will this affect the woods, stream, wildlife and plant life?

Response J-3: Hakes has provided the following response in an e-mail from Michael J. Mann of McMahon & Mann Consulting Engineers to the Department dated May 16, 2018.:

"*The sole wetland that was delineated onto the noted property (tax map number 244.00-01-037.111) is Wetland O. No temporary or permanent impacts to Wetland O are proposed as part of the landfill expansion. Only permanent impacts to delineated Wetlands K, L, and M are proposed as part of the action. These three wetlands, in addition to Wetland O, drain to non-relatively permanent waters (non-RPW), identified as Streams 8, 9 and 10 during the site delineation. Unnamed Streams 8 and 10 flow into Stream 9, which discharges into the fourth Tributary to Erwin Hollow Brook/Creek. Erwin Hollow Brook does not begin until the confluence of its Tributaries 3 and 4, located south and west of the proposed Soil Borrow Area. Since the flow from Wetlands K, L, M, and O*

moves down-gradient and drains into Streams 8, 9 and 10 within the Survey Area, no impacts to the woods, stream, wildlife, and plant life is anticipated to the north of the Survey Area. Potential impacts to these resource categories within the Survey Area (which included expanded boundaries outside the perimeters of the proposed Landfill Expansion Area and Soil Borrow Area) are detailed in the Draft Supplemental Environmental Impact Statement (DSEIS)."

See the responses to J-1 and J-2 above. See also response E-1 for discussion on the groundwater collection system. Hakes has indicated that the system will not divert significant amounts of groundwater flow from the remaining wetlands.

***Sinclair – CCAC Comments*:**

Comment J-4: The impact to regulated wetlands is greater in extent than what the SEIS discusses within the boundaries of the proposed Hakes expansion and borrow area. Although the wetland impact areas within the footprint of the proposed expansion area are small in acres, these wetlands are directly connected to much larger off-site wetlands and disturbances onsite will impact the recharge and characteristics of the wetlands on and off site. They are hydraulically connected and any evaluation of impact under SEQR pending COE/DEC permit assessment must evaluate these impacts and propose mitigation measures. The Hakes SEIS fails to do this. (See Exhibit A).

The wetlands, impacted by the proposed expansion, are hydraulically connected to the groundwater suppression system beneath Hakes and to the nearby tributaries of a protected Trout stream which eventually discharges into an unconsolidated Primary Aquifer. The wetland disturbance areas are dismissively described in section 4.1, Baseline Information on page 5 of the Wetland Mitigation Plan (WMP) where it states: "Although limited in their ability due to their small sizes, the principle functions of these wetlands are Groundwater Recharge/Discharge, Floodwater Alteration, Sediment Toxicant Retention, Production Export, Sediment/Shoreline Stabilization and Wildlife Habitat." The WMP makes an erroneous assumption and conclusion regarding the size and connection to the quite expansive wetland. In regard to the leadoff statement " Although limited in their ability due to their small size". Hakes own Landfill Expansion Area Wetland Impact Plan map (Exhibit A) shows that wetlands and groundwater recharge/discharge areas are connected and indeed don't start and stop with project or property boundaries. These Recharge/Discharge, Flood flow Alteration, Sediment Toxicant Retention, Production Export, Sediment/Shoreline Stabilization and Wildlife Habitat areas are, at points, also directly connected to tributary 4 of Erwin Hollow Creek (PA 3-58-1-4) a Class C stream which within 3,000 feet becomes a Classified and DEC protected Trout Stream (PA 3-58-1) Class C(T). Potential disturbance to the wetland, acting as recharge of this fishery resource, has not been fully examined. How, and to what extent; the suppression of groundwater beneath the nearby disposal cells, in conjunction with surficial collection and diversion of stormwater, will affect the wetlands is unknown. What "Sediment Toxicant Retention" discharges might occur is also not discussed in the SEIS.

Response J-4: See response J-1 above.

K. Archaeological and Historic Resources

No comments were received concerning archaeological and historic resources

L. Transportation/Traffic

Comment L-1: Trucks leave mud slicks and unsafe roads. Truck traffic is excessive.

Response L-1: The current Operations and Maintenance Manual requires that the onsite gravel road dust and mud is managed by the application of additional gravel and routine watering. It also requires that paved surfaces be cleaned as required to collect/remove silty soil and mud deposits to prevent mud from entering the roadway. Hakes uses sweeping and watering of the road next to the landfill to remove mud so it is not tracked further.

Measures that have been implemented to address traffic problems are discussed in Section 4.2 of the DSEIS, and include upgrades to both Erwin Hollow Road and Manning Ridge Road, funded by Hakes. Hakes also has agreements with the Towns of Campbell and Erwin to provide funding for road maintenance and cleanup on a continuing basis, and has installed a magnet on one of the facility's self-propelled sweepers to remove metal objects from nearby road surfaces.

Hakes is working with the Town of Campbell to improve the intersection of Erwin Hollow Road and Manning Ridge Road, as described Section 2 and in Appendix 4 – Access Road Improvements.

Since the approved design capacity is not proposed to increase as part of this project, traffic conditions will not change significantly from current conditions. However, if violations of the regulations are observed (such as waste falling from trucks or liquids leaking from trucks) both the police and Hakes management should be notified.

See also Section II above.

Comment L-2 (Culver): Ever since the original landfill was opened and active we have not driven on Manning Hill road due to debris and truck traffic on the road. We now use West Hill Road to go to our property when we come to visit my brother.

Response L-2: Manning Hill Road and other roads nearest the landfill are Town roads thus are managed and permitted by the towns. The town has not posted the road to prohibit trucks.

Traffic is not changing and therefore, it is not required to be addressed in this SFEIS. Traffic at the current rate was reviewed and addressed under the previous SEQR record.

Trucks are required to have tarps covering the waste to minimize any escape of debris, therefore, landfill trucks should not be a source of debris on the roads. Hakes is required to sweep the roads to move mud, stones, and any debris.

See also Section II above and response L-1 above.

Comment L-3: It is my understanding that 2 - 5 motor vehicle accidents occur each year involving tractor trailers traveling to and from the Hakes landfill on Erwin Hollow and Manning Ridge Roads. if the landfill is permitted to expand, extending the life of the landfill for another 5 - 10 years, then an additional 10 - 50 motor vehicle accidents can be estimated to occur over this time. Regardless of the hazard to local residents who travel these roads, it would be inappropriate to overlook the potential hazard to children who ride the school bus that travels these roads twice a day.

Response: See Section II above and response L-1 above.

Miller Comments:

Comment L-3: Trucks cause a spill. Two accidents coming off the hill were sent in to the Department with pictures.

Response: See Section II, Appendix 4, and response L-1 above.

Comment L-4: A speed bump was requested but requestor was laughed at.

Response L-4: Hakes provided an updated assessment of traffic mitigation measures, which is described in Section II above. These measures, which do not include the use of speed bumps, have been provided to the Town for their consideration. The Town would be responsible for requiring the implementation of the appropriate measures. It would be the determination of the of the Town whether a speed bump would be the proper and appropriate. They are not typically used on major roads or roads where speeds over 30 MPH are allowed. Such measures are more commonly used in private residential and school parking areas for instance where traffic is already limited to lower speeds. For further information on proposed mitigation measures, see Section II above and Appendix 4.

Comment L-5: Trucks drive other vehicles off the road.

Response L-5: If this happens, it is highly recommended that the observer immediately get the plate numbers and contact the landfill, the Town of Campbell and police Department or 911. See also Section II, Appendix 4, and Response L-1 above.

Comment L-6: The nature of the road including the steep hill and curves, make the truck traffic unsafe for tractor trailers and thus for other vehicles.

Response L-6: See Section II, Appendix 4, and Response L-1 above.

Comment L-7: Trucks rattle the house when they drive by which affects quality of life.

Response L-7: Truck traffic is not increasing as part of this modification. See Section II above for additional information concerning traffic. In addition, see response M-1 below concerning property values and the town's response on the host benefit agreement.

Comment L-8: Trucks idle on Erwin Hollow Road at 6:30 in the morning.

Response L-8: Idling is not allowed for more than five minutes per state law. See 6 NYCRR Part 217-3.2 which states, "No person who owns, operates or leases a heavy duty vehicle including a bus or truck, the motive power for which is provided by a diesel or non-diesel fueled engine or who owns, leases or occupies land and has the actual or apparent dominion or control over the operation of a heavy duty vehicle including a bus or truck present on such land, the motive power for which said heavy duty vehicle is provided by a diesel or non-diesel fueled engine, shall allow or permit the engine of such heavy duty vehicle to idle for more than five consecutive minutes when the heavy duty vehicle is not in motion, except as otherwise permitted by section 217-3.3 of this Subpart."

There are exceptions to that rule stated in 217-3.3 one of which states, "(f) A diesel fueled truck is to remain motionless for a period exceeding two hours, and during which period the ambient temperature is continuously below 25°F."

Hakes has a sign up at the facility at the scale house which states that there is no idling per state law 6 NYCRR Part 217.

Trucks are not authorized to idle on Erwin Hollow Road or other town roads. If this situation is observed, then you may contact the town or appropriate law enforcement agency, which will investigate the matter in accordance with the above requirement and applicable traffic laws. The landfill may also be contacted in the event trucks are parked or idling improperly.

M. Land Use and Zoning

Comment M-1 (Cook): The Hakes landfill is destroying property values.

Response M-1: Please see the attached Town of Campbell Response attached in Appendix 5. Also, it should be noted that Host Benefit Agreements, and any associated property value compensations, are not under the purview of the Department as Lead Agency and are not part of a SEQR review; they are under the purview of the host community. In addition, property values do not fall within the scope of "environment", as defined under SEQR at 6 NYCRR 617.2(l), and are not addressed under SEQR. Therefore, we have not evaluated this impact.

Weber Comment:

Comment M-2: The zoning action by the Town of Campbell to establish a Non-Residential Planned Development District is not supported by the Town's comprehensive plan. It also could be considered spot zoning, which is not legal.

Response M-2: Please see the Town of Campbell response regarding zoning and the comprehensive plan, which is attached in Appendix 5. Any final decision on the zoning designation is the responsibility of the Town of Campbell, as SEQR does not change the fundamental jurisdiction between agencies (see 6 NYCRR § 617.3[b]). Nevertheless, the environmental reasonably foreseeable impacts of the proposed landfill expansion and

establishment of the Planned Development District (PDD) have been evaluated in this DSEIS and FSEIS. Specifically, potential noise impacts were evaluated for the entire extent of the proposed PDD. However, other potential environmental impacts of future proposals, beyond the currently proposed landfill expansion, will need to be evaluated further to determine whether such impacts are adequately addressed in this SEQR record, or whether further review is required (e.g., supplemental EIS).

Comment M-3 (Little): Though it may be legal and common practice for the host community to receive financial benefit, such financial benefit puts the host community in a position to be included to grant continued expansion…. I question whether any concerns of local residents can be truly heard or seriously considered over such a loud voice.

Response M-3: Please see the Town of Campbell response attached in Appendix 5 (see specifically the response to their numbered comment 2). Also, it should be noted that Host Benefit Agreements, and any associated property value compensations, are not under the purview of the Department as Lead Agency and are not part of a SEQR review; they are under the purview of the host community. Therefore, we have not evaluated this impact.

Comment M-4 (Bauer): there is little quality of life remaining on our property as well as the neighbors in the area…After recently being made aware of radioactive materials being deposited in the landfill, I fear it is harmful to our health to even visit our land.

Response M-4: Please see the Town of Campbell response, which includes a report: "A Review of Drill Cuttings Disposal at the Hakes C&D Landfill and Response to Public Comments", attached in Appendix 5. Also, see Section III.B responses, in which the Department addresses radioactivity and Section Q where the Department addresses health impacts.

N. Noise

Comment N-1: Constant noise from before 7 am to 5 at night causes homeowner impacts. Noise is now on Saturdays as well due to Saturday operation.

Response N-1: Measures that have been implemented to address noise are discussed in Section 4.4 of the DSEIS, and include use of mufflers on all heavy equipment operated at the facility, and maintaining adequate buffer distance from sensitive receptors. Noise simulations, also described in Section 4.4 of the DSEIS, indicate the applicable noise impact criteria will be met at sensitive receptor locations. A real-time monitoring system, combined with active management of noise sources, will be implemented to ensure compliance with noise impact criteria. As is currently required, the facility will still be required to undertake all necessary measures to ensure compliance with the noise limits in the solid waste management regulations for rural areas (see 6 NYCRR 360.19[j]).

Comment N-2: Noise Levels - When we are visiting my brother, all we hear all day long (week days/Saturdays) is "beep, beep, beep", in spite of being surrounded by forest. Any expansion will significantly increase the noise level. This is very annoying.

Response N-2: See response N-1 above.

O. Visual

Comment O-1: No comments other than related to viewing trucks.

Response O-1: A visual assessment was conducted; however, it did not include trucks because views of vehicles do not need to be addressed pursuant the Department's visual policy.

P. Socioeconomic

Comment P-1: One of the benefits of the expansion of the landfill that is cited in the DSEIS is the "maintaining jobs at the facility..." if those few jobs (that will eventually be gone when the disposal site reaches maximum capacity) are to be seriously considered, then the significant concerns of the people who live in this area (many of whom were settled here long before the disposal site was purchased by Casella and who intend to live here long after the waste site is aged out) should also be considered important and as contributing to the economic and neighborhood stability of the community.

Response P-1: See the Town of Campbell response in Appendix 5. Specifically, in their response to their numbered comment 3, they state:

> "The Town Board and Planning Board, as involved agencies in the SEQR process, do consider the concerns of the people of the Town in the review of the project and in the ultimate approval or disapproval of the Non-Residential Planned Development district. The details of the Town's approval process are described in Section 4.3 of the DSEIS and also summarized in the response to Comment 4 below. The Town also believes that there is a benefit from the jobs created at the landfill. Like any business, conditions change over time and there is no guarantee how long a given business or category of jobs can be maintained in perpetuity."

Q. Public Health

Comment Q-1: Concerns were expressed in public comments on the potential health impacts of hydrogen sulfide emissions.

Response Q-1: See responses G-1 and G-2 above.

Dyrszka Comments

Comment Q-2: A process called the Health Impact Assessment could evaluate the risks, and benefits, if any, to human health from the Hakes expansion. I have included a paper on a generic HIA for any infrastructure project, and it could be used for this one as well. Unfortunately, health is often not fully taken into consideration when making these environmental decisions, and the HIA is an opportunity to do just that.

Response Q-2: See comment B-28 and response B-28 above.

Comment Q-3: A neighbor less than half a mile down the road from the landfill, reported that her very healthy vegetable garden completely died one week after one of the worse odor/dust events from the landfill, brown and dead. She has had a garden in the same place for decades and while some bad years have occurred this was especially concerning, and well after the last frost; she reports she likely will not try this year.

Response Q-3: The comment does not provide any information which could lead the Department to link the plant mortality described above with the Hakes landfill.

***Sierra Club Comments*:**

Comment Q-4: The DSEIS fails to evaluate the health impacts of the landfill expansion project. Although the DSEIS states that "[a] major public concern regarding the construction or expansion of any solid waste facility is potential adverse impact on human health and the environment,"28 the DSEIS fails to provide any meaningful analysis of the potential adverse impact on human health and the environment of the landfill expansion project.

A number of studies have documented the adverse health impacts of living near waste landfills. Research published in the International Journal of Epidemiology in 2016 showed that health is at risk for those who live within five kilometers of a landfill site. Researchers in Italy evaluated the potential health effects of living near nine different landfills in the Lazio region, and therefore being exposed to air pollutants emitted by the (landfill).

A key component of a health impact analysis is the study of the health impacts experienced by landfill workers and people living near the landfill, but no such studies are included in the DSEIS. The DSEIS excuses the failure to conduct studies of the health risks of working at the landfill or living near the landfill by stating that, "No specific health studies were included in the Consolidated Scope (Appendix B) prepared for this DSEIS, so none were performed." The DSEIS also states that, "[t]he absence of specific health studies for the Town of Campbell or the landfill area makes it difficult to assess existing health conditions in the vicinity of the Hakes facility."

While it is the case that the scope states that, '[the health issues section of the DSEIS] will be limited to regulatory requirements put in place by state and federal regulations to protect human health, and how the applicant will meet these requirements for the proposed expansion. This will include a discussion of the

various air emission and water discharge limits and associated standards that are applicable to a facility of this type and how they were established to be protective of human health," [footnote 33] the DSEIS does not discuss the various air emission and water discharge limits and associated standards that are applicable to the Hakes landfill and how they were established to be protective of human health.

Because the DSEIS makes no attempt to evaluate the health risks of exposure to the levels of radioactivity shown to be present in the landfill or to evaluate the possibility of additional exposures not identified by the testing methodologies used by the landfill's laboratories, it is apparent that the DSEIS fails to take a "hard look" at the health impacts of the landfill expansion or to provide a reasoned elaboration for why increasing the capacity of the landfill and allowing it to take more radioactive shale gas drillings wastes will not have an adverse effect on the environment and the health and safety of the people, animals and plants living near the landfill now and in the future.

Response Q-4: The landfill project before the Department does not include increasing the capacity of the landfill in terms of tonnage taken in per day. Nor does the project include a request to increase the amount of drill cuttings. The landfill is proposing to expand to take in the same types and overall daily amount of materials. The expansion would allow the landfill to operate for an estimated 5-10 additional years.

Exposures to potential air emissions were described in Section 3.4 and Appendix H of the DSEIS, and specific comments related to air impacts are addressed in this FSEIS in Section G above (see especially responses G-1 and G-2). This information includes an inventory of potential particulate matter emissions, and a description of the various emissions from landfill gas and landfill gas control system. This record sufficiently identifies the potential impacts and relevant environmental standards that apply to this facility, which are protective of human health.

Information on potential impacts to groundwater and surface waters are discussed in the DSEIS in Sections 3.2 and 3.3, respectively. With respect to water quality standards, the facility will be subject to the standards identified in Sector L of the State Pollutant Discharge Elimination System (SPDES) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (GP-0-17-004). Surface water discharges authorized under this permit are those which will occur through the sedimentation basins identified in the DSEIS. These basins discharge filtered and treated stormwater to surface waters. The facility is not, nor will be, authorized to discharge to groundwater. The leachate collection system, landfill liner, and groundwater monitoring requirements of the solid waste management regulations are in place to ensure no unauthorized discharges to groundwater occur.

For information related to potential environmental impacts of drill cuttings, please see Section B above.

Comment Q-5: I am aware of at least three cases of cancer, I cannot say what kind, in three separate households close to the Casella owned Hakes landfill.

Response Q-5: The comment does not provide any information to correlate the cases to activities at the Hakes landfill.

Comment Q-6: Research published in the International Journal of Epidemiology in 2016 showed that health is at risk for those who live within five kilometers of a landfill site. Researchers in Italy evaluated the potential health effects of living near nine different landfills in the Lazio region, and therefore being exposed to air pollutants emitted by the waste treatment plants. 242,409 people were enrolled in the cohort from 1996 to 2008. The results showed a strong association between Hydrogen Sulphide (used as a surrogate for all pollutants co-emitted from the landfills) and deaths caused by lung cancer, as well as deaths and hospitalizations for respiratory diseases. The results were especially prominent in children. The annual average exposure levels of Hydrogen Sulphide was 6.3 ng/m3, compared to people living close to larger landfills in Rome whose levels averaged 45.ng/m3. At the end of the follow-up period there were 18,609 deaths.

Response Q-6: See response G-1.

Comment Q-7: What is the industry percentage of acceptable additional cancer cases?

Response Q-7: Management of landfills is carried out in compliance with applicable environmental regulations. Such regulations are designed to protect public health and the environment. See response Q4 above.

Regarding potential health risks of various compounds, one source of available information is the US Department of Health and Human Service's Agency for Toxic Substances and Disease Registry (ATSDR) (https://www.atsdr.cdc.gov/). This website includes an index of frequently asked questions (ToxFAQs) about various substances.

The ATSDR ToxFAQs indicates that hydrogen sulfide has not been shown to cause cancer in humans, and its possible ability to cause cancer in animals has not been studied thoroughly. Again, data in the Department's records reflects that the landfill complies with the regulatory standard for hydrogen sulfide; see Response G-1.

For information on cancer risk in New York State, please refer to the NYS Department of Health website on cancer at: https://www.health.ny.gov/diseases/cancer/ .

REFERENCES

Harto, C. B., et al., U.S. Department of Energy's (DOE) Argonne National Laboratory. Nov, 2014. "Radiological Dose and Risk Assessment of Landfill Disposal of Technologically Enhanced Naturally Occurring Radioactivity Materials (TENORM) in North Dakota", ANL/EVS-14/13.

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Smith, K.P., D.L. Blunt, G.P. Williams, J.J. Arnish, M. Pfingston, J. Herbert, and R. Haffenden, 1999. An Assessment of the Disposal of Petroleum Industry NORM in Nonhazardous Landfills, DOE/BC/W-31-109-ENG-38-8 (OSTI ID: 13061), prepared for U.S. Department of Energy, National Petroleum Technology Office, Tulsa, OK.

USGS 2013. "Occurrence of Methane in Groundwater of South-Central New York State, 2012 – Systematic Evaluation of a Glaciated Region by Hydrogeologic Setting. Scientific Investigations Report 2013-5190.

APPENDICES

APPENDIX 1

Public Comments on CD

APPENDIX 2

Transcript of Public Hearing on CD

APPENDIX 3

Electronic version of DSEIS on CD

APPENDIX 4

Access Road Improvement Information
Attached in Hard Copy and on CD

APPENDIX 5

Letter from Underberg & Kessler LLP Providing Town of Campbell responses to comments Attached in hard copy and on CD

and

CoPhysics Corporation Report, "Report: A Review of Drill Cuttings at the Hakes C&D Landfill and Response to Public Comments on CD

APPENDIX 6

February 22, 2018 Letter from Hakes C&D Disposal, Inc. Regarding Drilling Wastes

Attached in Hard Copy and on CD