DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT (DSEIS)

Finger Lakes LPG Storage, LLC
LPG Storage Facility

Location:	Route 14/14A Town of Reading, Schuyler County, New York
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Firms Involved in Preparation of the DSEIS

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O'Brien & Gere Engineers, Inc. 333 West Washington Street Box 4873 Syracuse, New York 13202	**Inergy Midstream, LLC** 7535 Eagle Valley Road Savona, New York 14879
JESS Engineering, PLLC 2121 County Route 10 Alpine, New York 14805	**AK Environmental, LLC** P.O. Box 7853 32 West Upper Ferry Road West Trenton, New Jersey 08628
Superior Energy Systems, Ltd. 13660 North Station Road Columbia Station, Ohio 44028	

1.0 INTRODUCTION AND BACKGROUND

Finger Lakes LPG Storage, LLC (“Finger Lakes”) plans to construct a multi-cycle Liquid Petroleum Gas (“LPG”) storage system with a major pipeline connection and rail and truck load/unload racks in the Town of Reading, Schuyler County, on two properties owned by the Project Sponsor, Finger Lakes and its affiliate, US Salt, LLC. A general location map is included as Figure 1.

Finger Lakes submitted an Application for Special Permit Approval to the Town of Reading Planning Board on September 1, 2009 (See Appendix A). Shortly thereafter, the Town sent out State Environmental Quality Review Act (“SEQRA”) lead agency coordination letters to other involved agencies, including to the New York State Department of Environmental Conservation (“DEC” or “Department”). Finger Lakes applied to the DEC for an underground storage permit[1] on October 9, 2009 pursuant to Article 23 of the Environmental Conservation Law (“ECL”).

The Town Planning Board held public hearings on October 15, 2009 and November 19, 2009. The Schuyler County Planning Commission issued a Notice of County Recommendation for the project on October 6, 2009.

In response to the Town’s lead agency coordination request, on October 28, 2009, DEC Region 8 requested that the DEC Commissioner make a determination regarding Lead Agency status. On

[1] In a letter dated October 7, 2009, DEC determined that, among other things, an Article 15 Dam Safety Permit was required for the proposed brine pond. In a reversal of its October 7 determination, DEC determined on October 9, 2009 that a Dam Safety Permit would not be required.

February 2, 2010, Commissioner Grannis issued a lead agency determination designating DEC as lead agency for the entire project stating that: (1) "…the DEC through its jurisdiction over major components of the underground storage system and its greater capacity to conduct the review, should serve as lead agency for the environmental review of the proposed Finger Lakes LPG facility" and (2) "segmentation of the project is not appropriate here as the brine pond and loading areas (and perhaps other proposed operation areas) are dependent upon, and an integral component of, the larger project that also includes underground storage."

On November 17, 2010, DEC issued a Positive Declaration for the project. In its Positive Declaration and again in the Final Scope, the DEC emphasized that it had finalized a review under SEQRA of underground gas storage projects in 1992 in the form of a Generic Environmental Impact Statement (1992 GEIS) on the Oil, Gas and Solution Mining Regulatory Program. As an outcome of that process, the DEC determined that new underground gas storage projects, including related surface facilities, must be evaluated to determine whether they may have a significant adverse impact on the environment and may require a supplemental EIS depending on the scope of the project. According to the 1992 GEIS, a supplemental EIS may be required if the proposed action is not adequately addressed in this document and if the subsequent action involves one or more significant adverse environmental impacts.

The DEC, as lead agency for the Finger Lakes LPG storage project, has determined that the scope of the proposed action described below and its potential for significant adverse environmental impacts is such that a draft Supplemental Environmental Impact Statement (DSEIS) should be prepared. DEC has determined that the project may result in adverse impacts, beyond those addressed in the 1992 GEIS, sufficient to require preparation of a site-specific, project-specific DSEIS. These issues will be presented and discussed in this DSEIS.

In its November 17, 2010 Positive Declaration, the Department determined that the Finger Lakes LPG facility may have a potentially significant adverse impact on the environment based on the following list of issues and concerns, and that these potential adverse impacts and concerns are not sufficiently evaluated and addressed in the 1992 GEIS:

Impacts on land

- Integrity and stability of the proposed brine pond and its associated impoundment structure.
- An impoundment structure with a maximum height of 50 feet above its down slope toe is proposed to impound a 2.19 million barrel (91.98 million gallons) capacity brine pond on a site with variable slopes in the 8 to 12 percent range. The slope tends to steepen downhill in the area under the proposed impoundment structure. When full, the pond surface will be approximately 400 feet above Seneca Lake elevation, at a horizontal distance from the lake of approximately 2400 feet.
- Potential for catastrophic structural failure of the surface impoundment.
- Potential for subsidence associated with underground storage operations.

Impacts on water

- The potential for surface water contamination in the event of an impoundment structure failure due to its proximity to Seneca Lake.
- The potential for ground water contamination in the event of impoundment structure leakage, subsidence, or loss of cavern integrity.

Impacts on transportation

- Additional road and rail traffic.
- Potential truck traffic impacts to SR 14 & 14A.
- Additional train traffic over Watkins Glen Gorge bridge.

Noise impacts

- Operation of a new rail and truck loading facility in a sparsely developed rural area. where none currently exist.

Visual impacts

- New rail and truck loading facility.

- Brine pond.
- Compressor building.

Impacts on public safety

- LPG handling and containment.

Finger Lakes submitted a draft scoping document to the DEC on December 17, 2010. Following revisions, the DEC issued its own draft Scope for public review on January 5, 2011 with a public comment period to expire on January 31, 2011. Notice of availability of the DEC's draft Scope was published in the Watkins Glen Review and Express on January 12, 2011. A final Scope was issued by the DEC on February 15, 2011. See Appendix B.

SEQRA requires agencies to assess potential environmental impacts of proposed projects during the permitting process. The DSEIS for this project is intended to function as a disclosure document to reveal information about the expected environmental effects of the proposed action and provide a basis for informed decisions. The DSEIS identifies and addresses the potential environmental impacts of a project and reasonable alternatives to the project and its component parts, if any, and identifies ways to avoid or mitigate any potential adverse impacts to the maximum extent practicable. Also addressed are irreversible and irretrievable commitments of resources, growth inducing aspects, and the use and conservation of energy.

The DSEIS must be written to a level of detail to properly assess the impacts identified and that allows involved agencies to make a reasoned decision on the action. Many of the issues will also be reviewed in accordance with NYS statutory requirements relating, for example, to the Mineral Resources permitting program. In general, the DSEIS will follow the content requirements of SEQRA, 6 NYCRR Part 617.9(b) Environmental Impact Statement Content.

With regard to Finger Lakes' application for an ECL Article 23 Underground Storage Permit, many impacts related to underground storage facilities have already been addressed in the 1992 GEIS. Therefore, as noted above, instead of a DEIS here, a DSEIS will be prepared to address potential adverse impacts and concerns that are not sufficiently evaluated in the 1992 GEIS. Because the permitting of drilling, conversion and plugging of wells, associated potential impacts and mitigation measures have already been evaluated in the 1992 GEIS, related discussion and analysis is unnecessary in the DSEIS.

Prominent issues were raised during public scoping that were determined by the lead agency not to be relevant or not environmentally significant or that have been adequately addressed in a prior environmental review and they will not be addressed in the DSEIS for this project. Such issues and potential impacts include those related to hydraulic fracturing, storage of hydraulic fracturing fluids/flowback fluids in brine pond, and natural gas drilling and production and project-related issues that have been addressed in the 1992 GEIS.

2.0 PROJECT DESCRIPTION

Finger Lakes plans to construct a multi-cycle LPG storage system with a major pipeline connection and rail and truck load/unload racks in the Town of Reading, Schuyler County. See General Location Map included as Figure 1. The facility will consist of a rail siding and truck loading area with associated offices and storage tanks at a surface facility located on NYS Route 14A, a plant area (located on US Salt property adjacent to the driveway to its existing brinefield) that will transfer gas between the storage caverns and the rail siding and truck loading area, underground storage caverns (located on US Salt property) which will store the gas, and a brine storage pond that will store the brine displaced from the caverns as LPG gas is pumped in. Figure 2 includes an overall Site Operations Plan which shows all of the sites that constitute the Project and a separate site plan for the surface facility where the rail siding and truck loading area will be located. The system will utilize new pipelines that will interconnect all of the sites, in addition to the neighboring Texas Eastern Products Pipeline Company ("TEPPCO") facility to allow for transfer of LPG and brine.

2.1 Underground Storage Caverns

LPG (consisting of butane or propane) will be stored in two (2) underground caverns or galleries in the Syracuse Salt formation on company owned property. One gallery or cavern will store a maximum of 1.5 million barrels of LPG (propane or butane) and the other gallery or cavern will store a maximum of 600,000 barrels of LPG (propane or butane). The caverns were created by solution mining salt for consumer and other uses by US Salt (and its predecessors), an affiliate of Finger Lakes.

The caverns will initially be full of brine (as they are now). Injection pumps (specifications for which are included in the sound study discussed below) will be used to transfer product to the caverns directly from the TEPPCO pipeline. Product being brought in by rail will be unloaded into the aboveground storage bullet tanks using approximately six (6) small 40 hp compressor units.[2] Two (2) electric 75 hp pumps will be used to pump product from the tanks into the pipeline to the electronically driven injection pumps where those pumps will then be used to inject the product into the cavern(s). During the injection cycle, brine will be displaced out the bottom of the cavern as the LPG is pumped in the top. The process will be reversed during the withdrawal cycle when brine is pumped into the bottom of the cavern and LPG is withdrawn from the top. A surface pressure of approximately 1000 psi will be maintained when LPG is in the cavern, depending on the surface elevation of the well and depth of the cavern.

LPG will be withdrawn as brine is injected into the cavern. The LPG will have adequate head to directly enter the TEPPCO pipeline, railcars or aboveground bullet tanks at a controlled rate through a variable choke system with pressure over rides and shut-ins. The electric 75 hp pumps will be used to pump LPG into trucks through the truck unloading rack.

All design elements will be in accordance with applicable NFPA, OSHA (PSM), DOT and DEC guidelines or regulations. The pumps and compressors will be powered by electricity to minimize noise. The interconnecting pipelines will utilize high tensile steel pipe and fittings, with corrosion preventing coating when installed below grade.

[2] These 40 hp compressor units will be located near the aboveground bullet tanks. They are designed to pull vapors out of the tanks, inject those vapors into the rail cars so that the LPG from the rail cars can be injected into the tanks.

2.2 Rail/Truck Area – Surface Facility

There will be a new entrance to this site located on NYS Route 14A (per a Highway Permit from NYSDOT) to access the rail/truck loading and unloading area. This area will include the following buildings/structures:

- 6 rail spurs
- 5 aboveground storage bullet tanks (30,000 gallons each). The tanks will be on concrete footers and will be 65 feet long and 8 feet in diameter.
- Three (3) 75 hp electric pumps to transfer product from the aboveground bullet tanks to the truck unloading rack or to the pipeline to the injection pumps for injection into caverns.
- Six (6) 40 hp compressor units to be used in the rail car unloading process.
- Control building of 24x32 feet
- Truck canopy (not fully enclosed) of 30x40 feet
- 3 kiosk buildings (approximately 6x8 feet each) enclosed, heated and cooled
- Approximately 3,100 feet of chain link fence

The rail siding and associated offices will be located on a parcel comprised of 36.91 acres. The property is currently mostly moderate brush with a small portion of the south edge having larger trees.

A runaround rail track will be constructed to allow for the delivery of railroad cars. This runaround track will be located north of the Route 14A railroad overpass and will encompass a total of 2.0 acres. A further description of rail operations is contained in Section 4.4.2 below.

The railrack is projected to be capable of loading or unloading 24 rail cars in 12 hours with space to park 32 rail cars. Surge capacity (bullet storage tanks) will consist of five 30,000 gallon vessels, which can be used for butane or propane. The truck rack is projected to be capable of loading 30 trucks/day with 2 bays, expandable to 4 bays.

2.3 Plant Area

The Plant Area will consist of a canopy building to house four (4) 700 hp electrically driven pumps (to be used to inject product in and displace brine out of the caverns). The Building will be approximately 40x60x15 feet (height).[3] There will also be a small control building (10x12 feet) and a 10x40 foot motor control center (MCC). The total area of disturbance for the Plant Area will be approximately 300x400 feet, but leaving a buffer along NYS Route 14. This will include parking.

The plant will be located on a 28.92 acre parcel directly adjacent to a 385.6 acre parcel containing the caverns that will be utilized for gas storage. The plant will be located in a wooded area while the pipeline to the caverns and brine ponds will be installed through a wooded area as well. Access to the plant area will be via the existing driveway off of NYS Route 14 that is used to access US Salt's property and NYSEG's Underground Natural Gas Seneca Storage Facility.

2.4 Brine Pond

Brine displaced from the caverns will be stored in an above ground pond that will be double lined with leak detection. All brine will be circulated through a separator with an active flare

[3] There will be a 3-sided 6-8 foot berm around this building to provide additional visual and sound buffering and attenuation.

before being transferred to storage in the pond. The brine pond will be an irregularly shaped pond and will hold approximately 91.98 million gallons of brine. It will be 35 feet deep from the top of the berm to the bottom inside of the pond, 1,300 feet in length to the top inside of the berm and 600 feet wide to the top inside of the berm. The pond itself will encompass a total of approximately 13 acres to the top inside of the berm. The acreage of the limits of disturbance/grading limit for the brine pond is approximately 27 acres. It will be located on property owned by US Salt and Finger Lakes.

The area is currently farmed, with grass hay removed on an annual basis. The area does have some brush and larger trees that the farm mows around.

2.5 Pipeline and Transmission Line

There will be several sections of pipeline that will bring in product and in some instances allow product to be moved to market from storage as follows:

- approximately 10,625 total linear feet of 8 and 10-inch diameter steel pipe consisting of:
    - TEPPCO to Plant Area – 1,805 feet;
    - Plant Area to Caverns –2,635 feet;
    - Caverns to Brine Pond – 1,485 feet; and
    - Plant Area to Rail/Truck Area – 4,700 feet.

The pipeline will feed the suction of the injection pumps directly into the cavern in the injection cycle at an initial design rate of 5,100 Barrels Per Day (BPD) to 20,000 BPD.

3.0 EXECUTIVE SUMMARY

3.1 Introduction

Finger Lakes plans to construct a multi-cycle LPG storage system with a major pipeline connection and rail and truck load/unload racks in the Town of Reading, Schuyler County, on two properties owned by the Project Sponsor, Finger Lakes and its affiliate, US Salt, LLC.

3.2 Application Process

Finger Lakes submitted an Application for Special Permit Approval to the Town of Reading Planning Board on September 1, 2009 (See Appendix A). Shortly thereafter, the Town sent out lead agency coordination letters in compliance with SEQRA to other involved agencies, including to DEC. Finger Lakes also applied to the DEC for an underground storage permit on October 9, 2009.[4]

In response to the Town's lead agency coordination request, on October 28, 2009, DEC Region 8 sought to take lead agency status from the Town of Reading. On February 2, 2010, Commissioner Grannis ruled on the matter and issued a lead agency determination designating DEC as lead agency for the entire project.

On November 17, 2010, DEC issued a Positive Declaration for the project. A Draft Scope for the Environmental Impact Statement was issued by DEC on January 5, 2011 with a public

[4] DEC issued a Notice of Incomplete Application ("NOIA") on January 11, 2010. Finger Lakes responded to this NOIA on May 14, 2010. DEC issued a second NOIA on August 12, 2010. Finger Lakes responded to this second NOIA on September 28, 2010 and provided additional information on October 28, 2010 and November 17, 2010. DEC issued a third NOIA on March 28, 2011. Finger Lakes submitted response to this third NOIA on April 20, 2011. DEC cannot issue this permit until SEQRA is complete. The portions of the underground storage application that have not been deemed confidential by the Department are contained in Appendix O.

comment deadline of January 31, 2011. The Final Scope outline was issued by DEC on February 15, 2011.

3.3 Project Need and Benefits

3.3.1 Purpose and Need for the Proposed Action

LPG is stored by producers to meet fluctuating or variable demand while distributors use storage facilities to supply customers with a constant supply. Large scale consumers of LPG benefit from bulk storage by ensuring themselves of a constant supply during times of shortage. LPG is stored in solution mined salt cavities, conventionally mined caverns in impervious rock, and confined porous reservoirs. (DGEIS, p 14-1)

The Northeast propane market is approximately 43 million barrels (mmbbls) or 1.8 billion gallons (bgls). Approximately 70% or 1.25bgls is consumed during the October to March period. During this period, as much as 40% or 720 million gallons (mmgls) of demand may occur during the December to January period.

The main arteries of supply are the following (with approximate volumes):

- TEPPCO pipeline system - 17mmbbls
- Waterborne imports - 7mmbls
- Canadian Rail Cars - 7mmbls
- Gas Plants - 6.5mmbls
- Refineries - 5.5mmbls

Due to the supply traveling such long distances and the finite capacity of the TEPPCO system there are imbalances where demand exceeds local available supply during peak periods. In severe winters this can be extreme. There is only approximately 1.7mmbls (71mmgls) of local storage. Additionally, it is not readily available to the market as it is used to supplement the TEPPCO pipeline deliveries throughout the winter period which are apportioned based on shippers summer deliveries. The TEPPCO pipeline has been fully allocated 9 of the past 10 years for approximately 63 days each year. The apportioned gallons are approximately 1.7-2.0 times the shippers' summer deliveries and the retail marketers' demand profile is generally 2.5-3.0 times their summer requirements.

Retailer tertiary storage is tight at approximately 2 days and they cannot withstand disruption in supply.

The combination of pipeline allocation and any disruption from waterborne imports (i.e. late ships which occur frequently) or stranded tank cars, and refinery outages during peak winter demand creates a shortfall in supply that causes demand for spot market product that is immediately available by truck or tank car. This drives local pricing spreads from the approximate average of 15 cents per gallon (cpg) over the Mt. Belvieu, Texas pricing index to 60cpg. In more severe winters these spreads can eclipse 90-100cpg.

Based on the average retail propane prices as referenced in United States Energy Information Administration (EIA) data, these spreads could cause increases in retail prices to consumers between 20-35% which would increase the average price of a 400 gallon winter tank fill from

$1000 to $1350. Not only is this an economic burden for the consumer but it often drives consumers to seek cheaper and less clean sources of fuel. Because these spreads are driven by transportation and spot product economics they do not change with energy prices. When overall energy prices are lower, the percentage increase in prices to consumers due to the spot spread can be in the 50-60% range.

Finger Lakes will ultimately make available 2.1 million additional barrels or over 88 million gallons of local supply that will be immediately available with large scale truck, rail, and pipeline access. The ability to make product available to the market is a function of how much is in storage and immediately available along with a robust loading facility, which Finger Lakes' project will provide.

The need of the Finger Lakes project is that pipeline allocations and the need for large volumes of spot product at high pricing spreads will be dramatically reduced relieving millions of dollars of potential burden from consumers and helping to ensure the use of clean burning fuels.

3.3.2 United States Propane Industry – Overview

According to the EIA, on an annual basis, the United States consumes roughly 18.5 billion gallons of propane. The two largest components of propane demand are from the petrochemical industry and the residential/commercial sectors.

The petrochemical industry consumes roughly 40% of the propane in the United States. Propane is one of many raw materials, or feed stocks, consumed by the petrochemical industry to create plastics-based products. The petrochemical industry can switch between other products, such as ethane and butanes, to optimize the difference in value between feedstock and final product. Thus, petrochemical demand may be driven by other commodity pricing, seasonal volatility, and world/domestic economics factors.

The U.S. residential and commercial demand for propane is roughly 60%. The residential sector provides propane to areas not serviced by the natural gas distribution system. Of the 107 million households in the U.S., 9.4 million use propane for home heat or cooking purposes, not including outdoor gas grills. Much of the home heating demand is supplied at a summer to winter ratio of 1:2, using the 6 months of spring/summer volume consumed vs. the 6 months of fall/winter demand. Most areas of the U.S. will result in a ratio of 1:2, and many in the Northeast U.S. will be 1:3. The colder the winter region, the higher the ratios of summer vs. winter propane demand.

Understanding the summer to winter ratio is a key element to understanding the infrastructure required to meet this seasonal demand. Propane production is generally the byproduct of two much larger industries. Propane is a hydrocarbon molecule that is contained in two different sources: crude oil and natural gas. When a refinery consumes crude oil in its process of making gasoline and diesel fuels, one of many byproducts is propane. The propane must be contained and transported, or it will shut down the refinery. Fortunately, residential and commercial markets need this byproduct. Propane is also a byproduct of the natural gas industry. Raw natural gas, sourced directly from the ground could not be efficiently transported along a pipeline without removing the additional molecules. The process that prepares natural gas for distribution through our nation's pipeline infrastructure creates propane as a byproduct. Once the raw natural gas is "processed", the natural gas goes to market and the by-product stream is further processed into individual components; ethane, propane, butane, and pentanes.

The refining and natural gas production sources for propane are flat in regards to the demand ratio. Refiners tend to make more gasoline in the summer driving months than the winter period, thus producing more propane in summer than winter, and directly opposite of the propane demand ratio. Natural gas production is consistent and has less capability to turn wells on and off with seasonal demand. In order for the supply of propane to meet the demand ratio, storage infrastructure must be utilized.

3.3.3 New York Propane Infrastructure, Capacity and Need

In New York, there is a great demand for propane. The New York State Energy Plan Petroleum Assessment (December, 2009) characterizes propane fuel as a "small volume, essential source of energy for New York residents and business owners." Similarly, the New York State Energy Research and Development Authority (NYSERDA) has stated that "[p]ropane is an important heating fuel in NYS and the strong demand during the winter hearing season puts a strain on the industry's ability to meet that demand." See NYSERDA 2010-11 New York State Winter Fuels Outlook Meeting, October 28, 2010, presentation of Matthew Millford, Assistant Project Manager, Energy Analysis Group, New York State Propane Infrastructure Study (attached as Appendix C). In fact, 370 million gallons of propane will be consumed by New Yorkers each year, through an infrastructure of truck, rail, pipe, and storage terminals. The New York Propane Gas Association reports 233 retail locations serving New York. Over 220,000 New York Households use propane for primary space heating, mostly in suburban and rural areas. In addition, approximately 287,691 New York Households use propane as primary fuel for heating water. Moreover, approximately 514,000 New York state Households use propane for cooking. See generally Purvin & Gertz, 2010.

New York has the last 4 propane truck terminals on the TEPPCO (Enterprise Products) Pipeline originating from the storage and production regions in Texas. They are located in Watkins Glen[5], Harford Mills, Oneonta, and Selkirk, New York. New York has 16 rail terminals, both private and common carrier use. New York has a total of 72,534,000 gallons of primary storage capacity.

Each year, with truck and rail terminals operating at optimal capacity, New Yorkers will consume the propane in storage and import additional supply depending on the severity of winter. Current storage capacity of New York is not enough to off set imports. For the past 12 winters, the TEPPCO propane terminals in New York have allocated the propane supplied via pipeline during 40 % of the peak winter demand period, November through February. Current pipe capacity is not enough to offset imports.

To meet the seasonal demand for propane, retailers import propane from sources in Canada, Midwestern US, and Texas at significantly higher transportation costs. New York state primary propane storage and distribution capacity currently is inadequate to meet existing and future demand. Purvin & Gertz, 2010.

[5] The Watkins Glen facility refers to the existing LPG terminal and underground storage facility located on NYS Route 14 less then ½ mile south of Finger Lakes proposed facility and owned by TEPPCO. This facility has been in existence since the 1960s with the underground LPG storage cavern being constructed in the 1980s.

3.3.4 New York Benefits from Additional Propane Storage Infrastructure

Propane consumers in the state of New York will directly benefit from the addition of 63[6] million gallons of new propane storage capacity at Finger Lake's LPG Storage Facility in Reading. Access to more storage in New York remedies 3 key areas of concern for the winter home heating season:

1) Lowers propane supply cost to New York Consumers - Access to local storage will decrease need to pay the higher transportation fees associated with truck and rail car supply imported into the market to meet winter demand.

2) Increases Efficiency – Increasing storage capacity will allow the pipeline to operate more efficient east of Watkins Glen, NY, thus improving total propane supply to the state and region.

3) Security of Supply –more propane available within the state, rather than hundreds of miles away, will minimize the distribution risk associated with using other methods of propane transportation. In addition, the pipeline infrastructure bringing propane to the region is old and requires updating. This is most relevantly illustrated by the summer 2010 TEPPCO pipeline disruption. See NYSERDA 2010-11 New York State Winter Fuels Outlook Meeting, October 28, 2010, Presentation of Charles M. Wesley, Project Manager, Energy Analysis Group, TEPPCO (Enterprise) Propane Pipeline Disruption (attached as Appendix D). Should a similar failure or leak event occur in the future, the Finger Lakes Storage Facility will significantly increase supply security to the State of New York, minimize truck and rail logistics, and ultimately optimize consumer dollars spent on home heating demand.

3.3.5 Economic Benefits of the Finger Lakes Project

The total estimated project cost is $40 million. It is expected that approximately 50 construction jobs and 8-10 permanent full time jobs paying approximately $40-50,000/job will be created. In addition, the facility will result in indirect job creation, including jobs for railroad employees and

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[6] The Finger Lakes project is composed of two (2) underground storage caverns. Gallery 1 will contain 1.5 million barrels of propane or 63 million gallons. Gallery 2, a smaller storage cavern, will primarily store butane but it could also be used for propane storage.

trucking industry. Finger Lakes' operations in Schuyler County and the Town of Reading will also generate real property tax revenues for the County, Town and local school district.

3.4 Potential Impacts

Any potential impacts associated with the project, including impacts on land, water, transportation, noise, visual and public safety have been analyzed and mitigated where applicable. During the public scoping process, there were numerous comments related to the safety of the brine pond and the impacts that could result if there is a breach of the pond; the location of the brine pond; the underground storage of LPG and impacts to groundwater; rail transportation of LPG; traffic from the project; and other similar concerns. These potential impacts, as well as others, have been addressed in this DSEIS and, where appropriate, mitigation has been provided. In many cases, particularly with regard to the brine pond, mitigation is in the form of a conservative design and monitoring.

Finger Lakes considered several alternatives, in terms of location, configuration and size before concluding on the size and location of the proposed brine pond given the size of brine storage needed.

The 1992 GEIS contains chapters on well siting, drilling, and plugging, underground storage and solution mining. Those sections are incorporated by reference herein and, to a certain extent, updated to account for this specific project and location. As noted elsewhere in this DSEIS, details regarding cavern integrity, geology, well construction, geomechanical analysis, finite element models, sonar and other logging results are contained in Finger Lakes' underground storage permit application currently under review by the Department. The focus of such a review includes, but is not limited to, public safety and potential contamination to groundwater and drinking water. However, certain specific details of Finger Lakes' submissions to support its underground storage permit application, including for example its Reservoir Suitability Report, have been deemed to be confidential by the Department. Such submissions, however, are fully incorporated herein by reference.

Prominent issues were raised during scoping that were determined by the lead agency not to be relevant or not environmentally significant or that have been adequately addressed in a prior environmental review and they will not be addressed in the DSEIS for this project. Such issues and potential impacts include those related to hydraulic fracturing, storage of hydraulic fracturing fluids/flowback fluids in brine pond, and natural gas drilling and production and project-related issues that have been addressed in the 1992 GEIS.

3.5 Permits and Approvals

Table 1 below provides an overview of the permits, approvals and reviews presently anticipated to be necessary for the project, the agencies responsible for the approvals and the applicable law or regulations associated with each approval.

Table 1		
Agency	**Permit/Interest**	**Applicable Law/Regulation**
NYS DEC	Underground Storage permit Stormwater SPDES permit Well Drilling, Conversion and Plugging permits	ECL 23-1301 ECL 17-0801 ECL 23-0501
NYS DOT	Curb cut: highway permit(s) (if required)	Highway Law §52 Vehicle and Traffic Law §1220-a
NYS Office of Parks, Recreation and Historic Preservation	Cultural resources, historic preservation review	Parks, Recreation and Historic Preservation Law Article 14
Federal Agencies		
US Environmental Protection Agency	Underground Injection Control (UIC), Class II X	42 U.S.C. Part 300 et seq. Safe Water Drinking Act

4.0 ENVIRONMENTAL SETTING, SIGNIFICANT ENVIRONMENTAL IMPACTS, AND MITIGATION MEASURES TO MINIMIZE ENVIRONMENTAL IMPACTS

The section describes the environmental setting of the proposed project. Environmental impacts of the proposed project will be evaluated along with mitigation measures to minimize those impacts.

4.1 IMPACTS ON LAND

4.1.1 Ecological Resources

4.1.1.1 Existing Environmental Setting

The Finger Lakes facility will be constructed on sites owned by US Salt and formerly by Casella Waste Systems, Inc. See Figure 2 for a more detailed outline of the property areas. As noted above, the underground storage caverns and most of the brine pond are located on US Salt property. The surface facilities, including the rail/truck unloading area, and the northern portion of the brine pond, are located on Finger Lakes property.

US Salt Property

Soils

The US Salt portion of the proposed facility is located within the Schoharie-Hudson-Rhinebeck Soil Association. The Schoharie-Hudson-Rhinebeck Soil Association is predominantly gently sloping and sloping, deep, well drained to somewhat poorly drained, moderately fine textured and medium textured soils on lowlands and valley sides. This soil association consists of soils that formed in glacial lake deposits high in content of clay and silt. The landscape is dominantly a series of knolls, low hills and ridges interrupted by a few broad flats and drainage ways. Association soils are found on some areas on the valley sides adjacent to Seneca Lake. The slope is dominantly 3 to 5 percent but ranges from 0 to 25 percent. In some areas the bedrock is within 20 to 40 inches of the surface. Many areas of this unit are used for agricultural purposes. The more sloping and wetter soils are generally idle or are woodlands.

Association soils cover 6 percent of the County. Schoharie soils make up about 30 percent of the association, Hudson soils 20 percent, Rhinebeck soils 10 percent, and soils of minor extent 40 percent. The soil series of the Schoharie-Hudson-Rhinebeck Soil Association encountered by the proposed project are Schoharie silty clay loam (ScC3) and Schoharie variant silty clay loam (ShD3). (Schuyler County Soil Survey)

Wetlands and Waterbodies

The US Salt portion of the project is located within the Finger Lakes drainage basin, which is part of the larger Oswego River basin. The aquatic resources of this drainage basin are diverse, ranging from small streams and ponds to large lakes and rivers. Waterbodies in the drainage basin are inhabited by a correspondingly diverse fish community, with 95 species identified in the Oswego River drainage basin. Depending upon habitat conditions, streams typically contain blacknose dace, white sucker, creek chub, common shiner, brown trout, brook trout, and smallmouth bass. The ponds contain pumpkinseed, yellow perch, brown bullhead, golden shiner, chain pickerel, and largemouth bass. Many other species are found in the drainage basin, but most are less common than those previously mentioned.

More specifically with regard to the area of the US Salt property where the proposed brine pond is to be located, a wetland delineation was recently conducted (there will be little additional surface disturbance on the US Salt property for the Project) utilizing the 1987 Corps of Engineers Wetlands Delineation Manual (Manual) and 2009 Interim Regional Supplement to the Manual. See Appendix M.

One emergent wetland, W1, was identified within the Project area. The data point was positive for vegetation; soils and hydrology (see data forms and photos in Appendix M). The wetland is fed by drainage pipe and runoff from U.S. Route 14 to the west. W1 is dominated by souring rush horsetail (*Equisetum hyemale*) and narrow-leaf cattail (*Typha angustifolia*). Soils within W1 included a dark grayish brown (10YR 4/2) silty clay loam with dark yellowish brown (10YR 4/6) mottle to approximately 16 inches below ground surface (bgs.). See Appendix M, Figure 4.

There are also four ephemeral swales (SWA1 – SWA 4) and an intermittent Stream (S1) located within the Project Area. SWA1 is situated at the outfall of W1. SWA1, as it flows east towards Seneca Lake, becomes S1 as it becomes more incised and sustains additional flow downslope. SWA2 is a short channelized feature that enters SWA1 in the general vicinity of where it becomes S1. Swales 1 and 2 are approximately 1 to 2 feet wide, while S1 ranges from one to three feet wide. S1 exits the Project area at a culvert pipe under an access road leading to the proposed brine pond. See Appendix M, Figure 4.

Swales 3 and four also originate at culvert pipes under U.S. Route 14 along the western boundary of the Project area. They too flow west to east towards Seneca Lake. Swale SWA3 bisects the southern half of the study area and swale SWA4 bisects the northern half of the study area. See Appendix M, Figure 4.

The above delineation will be subject to a confirmation by the US Army Corps of Engineers and their determination regarding the jurisdictional status of the water bodies identified under Section 404 of the Clean Water Act. The impacts to any federally regulated wetlands and waterbodies located on the brine pond property will be identified in the Final Supplemental EIS, along with any additional information about associated federal and state approvals and mitigation that may be required.

Wildlife

There are limited habitat types located within the US Salt portion of the project area. The nature and distribution of these habitats are the result of both physical and biological influences. The most dominate influences are the affects of man's activities on the landscape and vegetative succession. The project area is composed predominantly of old field and brushland habitat. There are no wetland habitats located in the project area. The proposed facilities are located primarily in old field habitat.

The wildlife community in old fields and brushland can contain a diversity of species. This is because these habitats represent an ecological edge, which is utilized by both farmland and forest wildlife communities. In the project area, wildlife species typically found in these intermediate successional habitats include meadow vole, white-footed mouse, cottontail rabbit, golden-winged warbler, yellow warbler and indigo bunging. (Burt, 1964 and DeGraff, 1980)

Vegetation

The vegetative cover types of the US Salt portion project area reflect the influence of both natural conditions and man's activities. Solution salt mining activities have disturbed much of the land, which has reverted to old fields or brushland.

The habitat in the southern portion of the Project area is typically dominated by a mix of early successional shrub species and open, fallow field, clearings. The northern portion of the Project area includes an actively mowed hay field. The shrub layer is dominated by Autumn olive (*Elaeagnus umbellate*), honeysuckle (*Lonicera spp.*), multiflora rose (*Rosa multiflora*), and hawthorne (*Crataegus spp.*). The herbaceous layer throughout the Project area is dominated by yellow rocket (*Barbarea vulgaris*), garlic mustard (*Allaria officinalis*), goldenrod (*Solidago spp.*), and Queen Anne's lace (*Daucus carota*). The area slopes gradually to the east toward Seneca Lake. <u>See</u> Appendix M, A-K Environmental, 2011.

Finger Lakes (former Casella) Property

Soils

The former Casella property, where the surface facility will be located, is currently a fallow field. The property consists of gently rolling topography with elevations ranging from 945 feet in the east to 1060 feet on the western portion of the property.

Based on field reconnaissance and a review of applicable mapping, five soil types were identified for the site area (Burdett silt loam (BuB), Conesus silt loam (CsB), Lansing gravelly silt loam (LnB), and Volusia channery silt loam (VoB) all have a 3 to 8 percent slopes. The fifth soil type is Valois soils, steep (VEE), which is located at the southeast end of the property. The

Coneus soil series has a water table within 18 to 36 inches of the soil surface while the Burdett and Volusia soil types have a water table located within 6 to 18 inches of the soil surface. Lansing and Valois soil types have a water table located greater than 72 inches below the soil surface. None of the soils identified on the National or State hydric soils list. See Appendix N.

Wetlands and Waterbodies

A wetland delineation was recently conducted on the Casella property. See Appendix N. Initially, review of the NYSDEC Freshwater Wetland Maps indicated no State level wetlands on the Casella property. Two other wetlands were identified within the Casella property area. The data points were positive for vegetation; soils and hydrology. Wetland W1 is a small 0.02-acre Palustrine Emergent wetland (PEM). The wetland is fed by surface runoff from the surrounding area where it settles in a shallow depression. It is an isolated wetland with no connectivity or adjacency to another regulated waterbody. W1 is dominated by sensitive fern (*Onoclea sensibilis*) and Sphagnum peat moss. Wetland W2 (which is also shown on the Site Plan contained in Figure 2) is a 0.62-acre transitional wetland from PEM to Scrub-Shrub wetland (PSS). It appears on the NWI map as a freshwater pond, however, its character has changed through the years. The depressional wetland receives water from a swale (S2) in the western side of the property. It is dominated by redosier dogwood (*Cornus sericea*) and reed canary grass (*Phalaris arundinacea*).

A small pond, palustrine open water wetland (POW) W3, was also identified in the eastern side of the study area. It appears on the NWI map as a freshwater pond. W3 is approximately 0.08-acres in size.

One unnamed perennial stream was confirmed at the southern boundary of the study area. Stream S1 appears as a blue line on USGS and NWI maps. The gravel and sediment bottom stream originates off site and west where it is piped under railroad tracks and allowed to continue flowing east to Seneca Lake. The Ordinary High Water Mark ("OHWM") within the stream is approximately 6 feet wide with a width from bank to bank being approximately 15 feet. S1 is surrounded by hardwood forest. It exists on site for approximately 1,100 linear feet until it leaves the property to the southeast. A swale, S2, carrying ephemeral flow was identified in the northwestern portion of the study area. It originates offsite to the west, is piped under the railroad tracks, and continues flowing until it disperses into W2. It exists on site for approximately 880 linear feet. S2 does not display bed and banks features or an OHWM, but it displays connectivity to a wetland.

The above delineation will be subject to a confirmation by the US Army Corps of Engineers and their determination regarding the jurisdictional status of the water bodies identified under Section 404 of the Clean Water Act. The impacts to any federally-regulated wetlands and water bodies located on the Casella property will be identified in the Final Supplemental EIS, along with any additional information about associated federal and state approvals and mitigation measures that may be required.

Both Finger Lakes Sites (US Salt Property and Finger Lakes Property)

Threatened and Endangered Species

A review of the U.S. Fish & Wildlife Service website for Schuyler County identified one threatened species in the vicinity of the entire Project: Leedy's Roseroot. According to a U.S.

Fish & Wildlife Service fact sheet the Leedy's Roseroot is a cliffside wildflower found in only two places in New York State; on cliffs along the west shore of Seneca Lake and a single plant in Watkins Glen State Park. It will only live in cliffside habitats. No part of the Finger Lakes LPG Storage project will affect the cliffside shores of the Seneca Lake, therefore, the Leedy's Roseroot habitat does not occur within the project area and no further action is required.

On November 11, 2010, a letter requesting a determination on the presence of any state-listed species of plant or animal life that are identified as threatened or endangered at the sites of the proposed Finger Lakes LPG Storage site was sent to the DEC's New York Natural Heritage Program. On November 22, 2010, a response was received from the Natural Heritage Program. The report included with the Natural Heritage Program response indicates that the Seneca Lake area is a waterfowl winter concentration area (a long and narrow inland lake of glacial origin, with a mean depth of 291 feet). It does not, however, indicate the presence of endangered and/or threatened species in the area of the project. (See Appendix E, Relevant Correspondence)

Archeological and Historic Resources

A review of the New York State Office of Parks, Recreation and Historic Preservation online resources indicates that the project sites are not included within any archaeologically sensitive areas and there are no properties that are listed or eligible for listing on the State or National Register of Historic Places in the immediate vicinity of the project locations. There are also no buildings or structures older than 50 years on or immediately adjacent to the project area. After a review of the project, the New York State Office of Parks, Recreation and Historic Preservation concluded on October 14, 2009 that the project will have no impact upon cultural resources in or eligible for inclusion in the State and National Register of Historic Places. (See Appendix E)

4.1.1.2 Potential Impacts

Soils and Vegetation

Project construction activities affecting soils located in the US Salt property area will include, but will not be limited to, grading along the construction path, trenching, backfilling, site cleanup, and restoration. All construction is planned to be completed during one construction season. Soil excavated from the interconnection pipeline trench will be replaced promptly after the interconnection pipeline is installed. Construction of the storage facilities and brine pond will, for the most part, result in the temporary disturbance of old field community and unvegetated land. Following construction, the disturbed vegetated area will be restored to a grass community.

The brine pond itself will result in a permanent conversion of such vegetative communities of approximately 13 acres. Although the limits of disturbance for the brine pond total approximately 27 acres, the acreage beyond the 13 acres for the pond itself will be reseeded or otherwise allowed to revegetate. At the surface facility site, approximately 14 acres of the 37 acres owned by Finger Lakes will be permanently affected by components of the operation (rail siding, truck/rail unloading rack, truck staging area, storm water structures, small control room building, driveways, storage tanks).

Waterbodies and Fisheries

The project will not cross or impact any regulated streams or other natural waterbodies. The construction and operation of Finger Lakes' facilities, therefore, will not impact any fishery resource. While there is a small federal wetland on the surface facility site and on the brine pond site, the project layout has been designed to avoid this wetland. See Figure 2. Other wetlands identified on the Casella site will be avoided. None of the swales or streams identified on either site are regulated waterbodies.

Wildlife

Wildlife may be subject to some disturbance during the construction of the project. The sensitivity of a particular wildlife species to construction is partially dependent on the animal's home range. Those species with a larger home range will experience minimal impact from construction operations by moving to other portions of their home range when disturbed. Small mammals with small home ranges may experience greater impact during construction because a significant portion of their home range could be destroyed or altered during construction.

4.1.1.3 Potential Mitigation Measures and Alternatives

No ecological, terrestrial or aquatic resources have been identified where there is an impact which cannot be avoided and thereby require mitigation measures or alternatives. Temporary disturbances will be mitigated to the maximum extent practicable through the implementation of a storm water pollution prevention plan (discussed below in Section 4.2), restoration activities including reseeding, and allowing those areas temporarily disturbed to revegetate naturally.

4.1.2 Proposed Brine Pond

Finger Lakes is proposing to construct a pond that is designed to contain a brine solution. The brine pond will be an irregularly shaped pond and will hold approximately 91.98 million gallons of brine. It will be 35 feet deep from the top of the berm to the bottom inside of the pond, 1,300 feet in length to the top inside of the berm and 600 feet wide to the top inside of the berm. The pond itself will encompass a total of approximately 13 acres to the top inside of the berm. The acreage of the limit of disturbance/grading limit for the brine pond is approximately 27 acres. It will be located on property owned by US Salt and Finger Lakes.

Already existing caverns are filled with brine solution. The brine solution will be removed from nearby subsurface caverns to develop storage volume for LPG. The amount of brine solution in the pond will be dependent on the amount of gas that is being stored in the underground caverns. During the fall season, the brine pond will be its fullest as gas storage at that time is at its maximum volume in anticipation of the winter heating season. Conversely, the water surface elevation in the brine pond will be the lowest in the spring when much of the gas has been withdrawn from the caverns to satisfy the winter heating demands.

The brine solution will be displaced from the underground caverns when the LPG is injected into them. The brine will flow up the tubing string into the brine line at the surface, which is a sealed system, and through the flare stack to remove any possible gas product that may accompany the brine solution and into the proposed brine pond. The caverns will always have fluid in them.

Product will be injected directly into the caverns when received by pipeline with the use of electronically driven injection pumps. When product (LPG) is received by rail, it will first be transferred to the aboveground bullet tanks using 40 hp compressor units. Two (2) electrically driven 75 hp pumps will be used to pump product from the tanks into the pipeline before being injected (using electrically driven injection pumps) into the caverns. Product withdrawal from the cavern containing propane will go through a mole sieve dryer (taking the moisture out of the propane) and moving up the pipeline to either the aboveground bullet tanks to be loaded onto trucks or directly to tank cars for shipment by rail. Product withdrawal from the cavern containing butane will go up pipeline to the tank cars directly for shipment. Propane can also be received from the TEPPCO pipeline during the winter and loaded onto trucks after first being transferred from the TEPPCO pipeline to the aboveground bullet tanks where the 75 hp pumps will assist in loading the trucks.

During normal operations, product will be injected into the caverns over the summer months when the demand for heating fuel greatly diminishes. During the injection season, the brine solution will be displaced from the cavern into the brine pond with the use of the 4 electrically driven injection pumps located on the east side of Route 14 until it is needed to displace the LPG back to the above ground facilities. The design has included the welding of a 10-foot by 12-foot piece of reinforced polypropylene geomembrane at the discharge point as added protection of the upper liner against the brine solution's relatively high temperature discharge point.

The three (3) small brine pumps are low pressure high volume pumps which pull the brine from the base of the pond and inject it into the brine pipelines which are connected to the wells. The displaced LPG will either be stored in above ground bullet tanks or be pumped into rail cars or tanker trucks for delivery. The tank, rail car and truck filling will occur on Finger Lakes' property located off of State Route 14A.

In order to meet the anticipated gas demand, the brine pond needs to have a minimum volume of 2.1 million barrels (88.2 million gallons). In fact, as noted above, the brine pond has been designed to hold 2.19 million barrels (91.98 million gallons) plus freeboard. Information contained in this section of the DSEIS is based on an Engineer's Report prepared for the Finger Lakes Storage Brine Pond. See Appendix F.

4.1.2.1 Existing Environmental Setting

Surface Conditions

Land Cover

The land cover in the area of the proposed brine pond site is mostly brushy with some patches and rows of trees. There are a few pathways that have been cut to facilitate access to monitoring wells.

Wetlands, Waterbodies, and Drainage Patterns

As noted in the previously discussed wetland and waterbodies section of this dSEIS (see Section 4.1.1.1), four (4) drainage swales cross the brine pond site from west to east. The primary source of runoff to these swales is from uphill areas located west of the project site. Runoff from these areas is piped through culverts that pass under State Route 14 and the entrance/exit ramps of State Route 14A. In addition, the runoff from a portion of these roads (State Route 14 and the entrance ramp to State Route 14A) drains across the project site. On the project site's downhill side, water in the swales flows through culverts under a gravel road and eventually under the railroad, both of which are oriented in a north-south direction. As also noted, one wetland exists on the brine pond site. See Appendix M.

Subsurface Conditions

The brine pond site's subsurface conditions were determined through the advancement of test borings, excavation of test pits, installation of groundwater monitoring wells and the performance of in-situ and laboratory tests. See Appendix F. This work was conducted in two phases, with the first being conducted to provide an overall characterization of the overburden and groundwater conditions present and determine the depth to bedrock.

Overburden & Bedrock

Approximately 2 to 10 inches of topsoil was encountered across the brine pond site and found to be underlain by a deposit of silt 3 to 9 feet in thickness. The silt deposit contained little to near equal amounts of clay, trace amounts of fine sand, and occasional cobbles. The number of cobbles and the amount of sand present within the deposit was found to typically increase with depth.

A thin sequence of sand and silt was encountered directly beneath the silt deposit at six (6) of the explored locations. At these locations, the sequence was found to have a thickness of less than 5 feet.

Found beneath the sequence of sand and silt, or the silt deposit where the former was not present, was glacial till. Embedded within the till's fine sand/silt soil matrix was medium to coarse sand and fine to coarse gravel. Numerous cobbles and boulders were also found to be present as evidenced by the difficulty in advancing the test borings with depth as well as their presence in many of the test pit excavations.

Slug testing, performed to assess the permeability of the overburden/weathered bedrock, was conducted at eight (8) of the monitoring well locations. Permeability values were then typically computed using the rising head data and well established methods resulting in permeability values for the glacial till to be in the range from $1.3x10^{-6}$ to $7.0x10^{-6}$ centimeters per second (cm/s) while the permeability values of the weathered rock were in the range from $1.2x10^{-4}$ to $1.3x10^{-2}$ centimeters per second (cm/s). Example output from several of the computer analyses are contained in the Engineer's Report (Appendix F).

For those test borings that fully penetrated the glacial till, bedrock deposit, an interbedded shale and siltstone, was encountered directly beneath the till at depths ranging from 16.5 to 33 feet. The bedrock was found to be weathered and broken to depths of 1 to 7 feet below its surface. Thereafter it became medium hard and sound. It was found to be thinly bedded at or near a horizontal orientation and to contain numerous fractures with intermittent soil seams within the depths explored.

Profiles of the subsurface conditions encountered at the site and the lines along which they were developed are presented in the Engineer's Report. The Subsurface Exploration Logs, Test Pit Logs and Monitoring Well Construction Logs are presented in the Engineer's Report.

Groundwater

Groundwater levels in each of the monitoring wells were measured on several dates. The most recent observation was made on January 11, 2011; more than one month after slug testing was performed in several of the wells. On this date, the observed groundwater levels were considered to have stabilized and were found to be present 1.3 feet to 6.2 feet below the existing site grades. At one monitoring well, MW-16, a strong sulfurous odor was noted to be present during construction of the well. This odor was not noted during follow-up observations. It is not uncommon, however, for shale bedrock such as that encountered at the brine pond site to contain sulfides which have a characteristic sulfurous odor.

Water was observed weeping into the test pit excavations through granular seams or partings within the overburden at depths ranging from 4 feet to 10 feet beneath the ground surface. At the test boring locations, water could be heard entering the auger casing once the augers fully penetrated the glacial till and were extended into the underlying layer of weathered/broken bedrock. Above these depths, seepage of water into the drill holes was not audible. The water levels in wells screened across the glacial till/weathered rock interface were typically within 6 to 12 inches of the levels observed in wells of the same couplet which were screened only in the overlying glacial till. Collectively these observations indicate that groundwater is contained in the layer of broken/weathered rock and confined by the overlying till which has a permeability 2 to 4 orders of magnitude less than that of the layer of broken/weathered rock. Groundwater is also contained within granular seams of the overburden which, at some locations, is perched above the piezometric surface of the confined groundwater table.

The Engineer's Report (Volume 2) contains a Groundwater Contour Plan, Drawing SI-4 (Appendix A of Volume 2 of the Engineer's Report), which was developed using the most recent groundwater level observations.

4.1.2.2 Potential Impacts

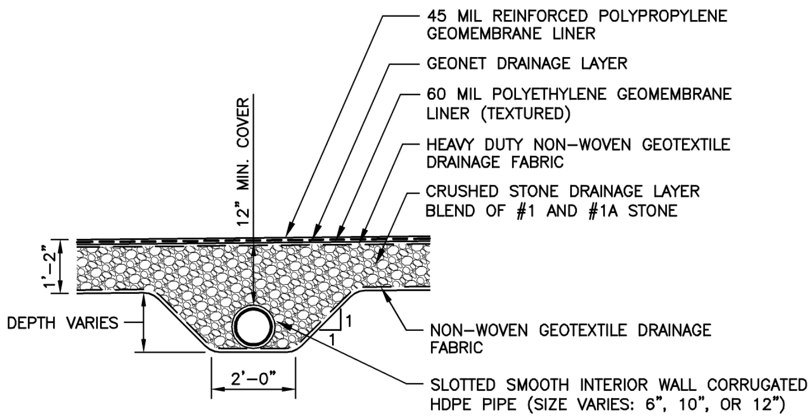
Potential impacts which have been identified in terms of the brine pond focus on its potential failure, impacts to vegetation if there is a release from the brine pond, impacts to groundwater (to be discussed in the water resources section below) and to Seneca Lake, visual impacts (to be addressed in the visual impacts section below) and with regard to the suitability (and available volume) of on-site soils for construction of the pond itself. These impacts are primarily mitigated, as discussed in the following sections, through the design of the brine pond and operations, maintenance and contingency planning (most of the latter of which are discussed in the public safety section below).

4.1.2.3 Proposed Mitigation Measures and Alternatives

Brine Pond Design

Geomembrane Liner System Design

The brine pond will be constructed using the double-liner and leak detection system shown on the following schematic below.



Typical Geomembrane Liner System Cross-Section at Underdrain Location

Permanent drainage of groundwater below the pond is necessary to guard against hydrostatic uplift of the liner system at times when the pond level is seasonally lowered to its lowest operating level (i.e. nearly fully drained). As shown in the detail above, the liner system across the base of the pond will be underlain by a drainage course of crushed stone, that being a 14-inch thick layer of an equal blend of No. 1 and No. 1A sized crushed stone. Groundwater collected by this drainage course and the interceptor drains installed at the toe of the embankment's interior slopes will be directed to five (5) header pipes, three of which will be aligned along or very close to the pre-existing drainage swales discussed in Section 3.5. At the header pipe locations, the drainage course will be locally increased an amount equal to the outside diameter of the header pipes. Estimates of the groundwater flow these pipes may carry have been made and, for their design pitch, the pipe diameters shown on the drawings are capable of transmitting many times the estimated rates of groundwater flow. Accordingly this underdrainage system will guard against hydrostatic uplift of the liner system.

In areas of cut along the western side of the pond, groundwater may also seep from the impoundment's side slope. To intercept and direct this groundwater seepage to the crushed stone drainage course placed across the base of the pond, the drainage course will be extended up the embankment's interior side slopes. Along the impoundment's west side, the drainage course will be extended up the interior side slope to elevation 825 feet. Progressing around the north and south ends of the pond, the depth of cut gradually diminishes as does the potential for groundwater seepage from water bearing seams in the indigenous glacial till. Extension of the drainage course up these interior side slopes will gradually diminish to the limit shown in the Engineer's Report (Detail 4 of Drawing D2). On these slopes the depth of the drainage course will be reduced to eight (8) inches except where local unstable subgrade conditions are encountered. Where such conditions are encountered, the unstable subgrade soils will be locally undercut and the drainage course increased in depth an amount equal to the depth of undercut.

Groundwater collected by the underdrainage system described above will be discharged to drainage manholes or open swales to allow for its periodic sampling and testing. Beyond these structures, the collected groundwater will flow into drainage swales present downhill from the impoundment. Using Darcy's Law and the results of the slug testing conducted at the groundwater monitoring well locations, the quantity of seepage into the excavation was estimated to be on the order of 50 to 100 gallons per minute as presented in the Engineer's Report (in Appendix E of that Report, Underdrain Calculations). As such, the diameter of the underdrains will vary in size from 6 to 12 inches to capture and discharge this expected seepage.

A 60-mil textured HDPE geomembrane will be installed above the drainage course but will be underlain by a heavy duty geotextile to separate the liner from the underlying drainage course of crushed stone and prevent it from being punctured by the same. A leak detection system consisting of geocomposite (geonet) will be installed above this geomembrane and itself be covered with the primary geomembrane, a 45-mil reinforced polypropylene (rPP) geomembrane. The upper (primary) geomembrane will contain the brine solution while the lower (secondary) liner will contain any potential leaks in the primary liner. The upper rPP geomembrane has been selected due to its flexibility in handling, excellent weathering characteristics and chemical/UV resistance and manufacturer's warranty period of 20 years. The lower textured HDPE geomembrane has been selected due to its enhanced sliding resistance over the heavy duty geotextile and its greater resistance to being punctured by the underlying crushed stone drainage course.

At four (4) locations across the base of the pond, the lower geomembrane will be locally depressed along where leakage collection pipes will be installed below the upper rPP geomembrane. The collection pipes along these lines will be 6-inch diameter perforated/slotted HDPE pipes with double-walled solid (non-perforated) outfalls booted through the secondary geomembrane liner. Each pipe will be pitched to discharge by gravity flow to their respective collection/sampling points, allowing for identification of which section of the impoundment any potential leak occurs in. The perforated/slotted sections of these pipes will be bedded within pea stone. Profiles of the leakage detection piping from the pond to the 5,000 gallon collection tank are shown on Drawing PR1.

At the collection tank, flows from each leak detection pipe will be manually measured on a daily basis using a calibrated bucket and stop watch. Daily flow readings will also be recorded with respect to the elevation of the brine in the pond as a means of proactively monitoring the upper liner system's containment performance. The end of each pipe will be capped with a plate, the bottom of which will have a ¾ inch diameter orifice. In the event the measured flows from the leak detection pipes equipped with this orifice plate exceed .55 gallons per minute (gpm) for each pipe, the brine pond operator will record the brine pond elevation and visually inspect the pond's upper liner at or near its wetted perimeter for any obvious defects that could have contributed to the increased flow rates exceeding the 0.55 gpm operational threshold. The 0.55 gpm operational threshold is conservatively set and establishes a proactive maximum flow rate for the upper liner's leak detection zone monitoring that would signal to the brine pond operator that a defect location and repair service would be necessary for the next cycle of the brine pond draw down if the inspection did show an obvious defect that could be repaired at this time.

The maximum hydraulic design flow rate of the upper liner system's leak detection zone's geocomposite drainage layer is such that the head of brine inducing a flow rate in the detection zone being greater than 25 gpm will begin to increase the head on lower liner such that it will be greater than the difference in the invert elevation of the leak detection pipes where they are booted through the secondary liner and the invert elevation of the pipes at the collection tank. This maximum design flow rate of 25 gpm has been set as the maximum allowable rate such that the geocomposite (geonet) drainage layer between the liners will not become fully saturated and begin to place any significant head of brine on the secondary liner if the 25 gpm threshold is not exceeded. Calculations supporting the selection of the maximum allowable design flow rate from geocomposite leak detection system's flow rate of 25 gpm for each pipe are included in Appendix K of the Engineer's Report. These calculations include verification that this rate of flow will not exceed the tranmissivity of the geocomposite and, as such, demonstrates that the action limit for the daily monitoring of the leak detection system of 0.55 gpm is generally 45 times less than the maximum design capacity of the leak detection system and will ensure against liner system leakage induced groundwater impacts.

A valve will be installed on each leak detection pipe that will remain open and free flowing at all times. Two (2) submersible pumps in the collection tank, will each have a discharge capacity of 200 to 250 gpm. The second pump will be installed as a backup to the first. A high level alarm will be installed to provide the operator notification that the first pump has either failed or its pumping capacity has been exceeded and the second pump has been activated; thereby providing sufficient time to evaluate the cause of the high level alarm. In the event that the first pump has failed, it will be repaired or replaced to re-establish the back up pumping system. Thus, via this proactive upper liner performance monitoring approach, in the event that one or more collection pipes are discharging excessive flows greater than the operational threshold of 0.55 gpm and, even in the unlikely event of maximum design threshold of 25 gpm being achieved, the valves on the leak detection pipes can remain open.

For operational exceedences of 0.55 gpm, Finger Lakes will plan for when removal of brine from the brine pond is next expected so that defects can be located and repairs can be made to eliminate the source of leakage from the primary liner. Finger Lakes will report all incidents where liner repairs will be necessary to Department 30 days prior to the repairs being made.

In the very unlikely event that the maximum design threshold of 25 gpm is exceeded, Finger Lakes will notify the Department within 7 days of the exceedance and submit a corrective action plan to the Department for approval.

Embankment Stability

To fully utilize cut soils as fill material and approximately balance the earthwork required to construct the brine pond, an embankment will be constructed on the downhill (east) side of the brine pond. The top of this embankment will be established at elevation 841.0 feet (three (3) feet above the operating level of the pond) and, where the site is lowest in elevation, its toe will meet the existing site grades at elevation 790 feet. The resulting maximum embankment height will be 51 feet.

On the embankment's interior, its side slopes will be inclined at and between 1:4 and 1:3 (Vertical: Horizontal). As groundwater may weep from the cut slope made along the pond's west side, this slope will be inclined 1:4 to enhance its stability under such potential seepage conditions. Opposite this slope, the embankment will be a fill section and, as such, the interior slope of the embankment will not be subject to such seepage. The embankment's interior slope on this side of the impoundment will be 1:3 (V:H). Along the north and south ends of the pond between its east and west, the embankment's interior side slopes will gradually transition between these inclinations of 1:4 and 1:3. The exterior slope of the embankment facing Seneca Lake will be graded at 1:4 to enhance its stability even though a steeper side slope would have a more than adequate factor of safety against a slope failure. Section 3.8 of the Engineer's Report presents the stability analyses of the embankment's side slopes.

Although the brine pond's embankment does not fall under the classification of a "dam", the stability of the embankment's side slopes was analyzed following procedures identified in the DEC publication "Guidelines for Design of Dams". These guidelines reference the use of methods of analyses outlined in the U.S. Army Corps of Engineers publication EM 1110-2-1902, *Slope Stability*. Four Loading conditions were analyzed: (1) end-of-construction, (2) long-term with steady seepage and maximum storage pool (including design rainfall event), (3) rapid drawdown, and (4) earthquake-case II with seismic loading. Based upon the analyses, the computed factors of safety for the embankments under each loading conditions were found to satisfy the minimum required factors of safety.

For a complete description of the analyses performed, including each of the loading conditions, the slopes analyzed and the minimum required factors of safety refer to the Engineer's Report (Section 3.8).

Leak Detection and Monitoring

A leak detection system will underlie the upper geomembrane and will consist of a geocomposite. Near the low point in the pond, a collector pipe is to be bedded within a sand-filled trench to collect any leakage through the rPP geomembrane and pipe it to a sampling location along the downstream embankment. The sand should have a permeability value equal to or greater than $1x10^{-2}$ centimeters per second (cm/s).

In the unlikely event of a leak, the geocomposite placed between the upper and lower geomembrane liners will allow any leaked brine solution to migrate to the low leak collection pipes installed along four (4) lines across the pond bottom. At these locations, perforated collection pipes will capture any leaked solution and convey it through the lower liner to a 5,000 gallon pre-cast concrete holding tank located between the brine pump building and the flare stack located along the gravel drive near the downhill toe of the impoundment's embankment.

Flow from the four (4) collection pipes will be monitored on a daily basis as set forth in Section 3.7 of this report. The pipes at their point of entry into the holding tank will be numbered to match the number designation of the area of the liner they service. The end of each pipe will be equipped with an orifice plate to facilitate monitoring their flow rate and, as previously described, establish the rate above which the geocomposite (geonet) will begin to become saturated and result in a head of brine to be imposed on the secondary liner.

The accumulated brine solution will be pumped out of the tanks' containment chamber/sump back into the brine pond using the submersible pumps installed within the tank. If the recorded leakage exceeds 25 gallons per minute at any pumps, steps will be taken to determine the vicinity of the leak(s) in the primary liner.

The pond will then be drained and investigations will begin to locate leaks by visual observation and testing existing seams. Drainage of the pond will be conducted at the end of the winter heating season. If the leak locations are not visible, a specialized leak detection contractor will be hired to perform electronic detection. Upon locating the leak(s), repair(s) will be made utilizing the appropriate method for the specific type of leak to be repaired.

Potential Wind Uplift on Liner

As the upper geomembrane is exposed and not covered by any soil, or brine solution at certain times of the year, uplift pressures due to wind were analyzed and considered in the design of the geomembrane and anchor trenches. Anticipated uplift pressures were determined according to the methodology outlined in "Uplift of Geomembranes by Wind" by J.P. Giroud, T. Pelte, and R.J. Bathurst, published in Geosynthetics Institute, Vol. 2, Number 6 in 1995. A copy of this article has been included in Appendix F of the Engineer's Report (Appendix F to the DSEIS).

The uplift pressure on the upper geomembrane was calculated for a peak gust wind speed obtained from climatic wind data available from the National Oceanic and Atmospheric Administration ("NOAA"). Monthly peak gust wind velocities were generally found to range from 40 to 55 miles per hour. Using this data, a design wind velocity of 50 miles per hour was selected for the uplift calculations. Material properties such as weight per unit area and allowable tensile capacity were estimated from the Product Data Sheets presented in the Engineer's Report.

From this analysis, it was determined that a 45-mil rPP geomembrane did not possess the required weight to resist wind pressures. Accordingly, the design includes the installation of weight tubes along the surface of the geomembrane across portions of the pond bottom where it is anticipated that pressures will be less than 3 pounds per square foot. These tubes are to be sand filled and bonded to the liner at intervals of 5 feet. Calculations supporting their need and use are presented in the Engineer's Report.

Geomembrane Monitoring

As it is difficult to accurately predict the service life of the primary geomembrane liner, several strips of geomembrane will be welded onto the primary liner to allow for their recovery and testing at 5-year intervals of the liner's service life. These pieces will be 18 inches by 36 inches in plan and will be welded to the primary liner across their short ends. They will be positioned at and below the seasonal high operating level of the pond (elevation 837 feet and below) and just below the injection point where the brine will be delivered at elevated temperatures. The locations of these test strips are shown on Drawing No. P3 of the Engineer's Report.

Parameters for which the samples will be tested will include thickness, density, tensile strength, and tear and puncture resistance. Sampling and testing standards to be followed will be those designated in the specifications for the primary geomembrane. Results will be compared to those during manufacture of the material. Acceptable values for tests run during manufacturing are listed in the specification for synthetic membranes. The allowable service life reduction in these values will be established based upon recommendations provided by the Geosynthetic Research Institute.

Groundwater Quality Monitoring

The lower geomembrane liner provides a secondary line of defense against the potential for leakage of brine into the groundwater. In order to document the quality of the groundwater during the life of the pond, a series of monitoring wells will be installed. The location of these monitoring wells is shown on Figure 3 of the Engineer's Report, "Groundwater Monitoring Well Locations". Monitoring groundwater quality will consist of collecting groundwater samples from two (2) up-gradient and three (3) down-gradient monitoring wells and, in addition, one (1) well to be located at the pond's south end near the base of the embankment's exterior slope. The up-gradient and down-gradient wells will be screened within the overburden whereas the monitoring well installed at the south end of the pond will be screened within bedrock. The samples from all the wells will initially be analyzed for "Baseline Parameters" per Title 6 NYCRR Part 360 regulations. Based on the test results the owner may petition DEC to reduce the list of analytical parameters to more closely match that of the brine solution, i.e. chlorides and certain other parameters. The groundwater quality will be monitored on a quarterly basis. More frequent groundwater monitoring will be conducted in the event a leak in the primary liner system is identified. If the concentration of targeted parameters increases in the down-gradient monitoring wells (but not in the up-gradient wells), steps will be undertaken to further investigate the cause of such an occurrence.

Groundwater monitoring wells previously installed within the footprint of the brine pond will be decommissioned in accordance with the provisions set forth by CP-43: Groundwater Monitoring Well Decommissioning Policy and its addendum, Groundwater Monitoring Well Decommissioning Procedures. Appendix M of the Engineer's Report contains copies of these documents. This work will be performed under the observation of the Engineer-of-Record prior to initiating site clearing.

When the facility is slated for closure, brine will be drained from the pond and the 5,000 gallon holding tank and any solid residues remaining in each removed from the same. The residues appropriately disposed of along with the holding tank, liners, geocomposite and leak detention piping. The impoundment area will be backfilled with the materials used to construct the impoundment's embankment, returning and shaping the site grades to those which previously existed. Provisions set forth in 6 NYCRR Part 360-6.6(c)(3) will be followed for the facility's closure.

Utilization of On-Site Soils

Numerous cobbles and boulders are expected to be present within the excavated site soils. Rather than be wasted or hauled off-site for disposal, these materials will be placed along the exterior slope of the embankment facing Seneca Lake to further enhance its stability. Placement and compaction criteria for the site soils placed to construct the brine pond's embankment are provided in the Engineer's Report.

Operational Access

A perimeter access road will be constructed around the top of the entire brine pond. The road will be surfaced with GRASSPAVE2, a product of Invisible Structures, Inc. This product consists of lightweight injection-molded plastic units that are bedded on a subbase of granular material and filled with sand. Topsoil and seed will be placed over the sand-filled units to develop a grass cover over a durable underlayment that will be capable of withstanding vehicular traffic and will inhibit erosion and the development of wheel ruts. It will be approximately 12 feet wide and be accessed via a same surfaced drive that connects to the existing gravel drive present directly east of the pond's embankment.

Diversion Channel Flow

The pond will interrupt flow of three existing drainage swales and runoff from land between the adjacent roads and the impoundment. A diversion channel will be constructed to intercept and divert the flow from these sources around the impoundment into detention basins. From these basins, the flow will discharge into 42 and 54 inch diameter HDPE culvert pipes and then into the existing swales and culvert pipes downstream of the pond.

The three existing swales convey stormwater runoff from culverts that pass under State Route 14 and the entrance/exit ramps of State Route 14A, and direct it towards Seneca Lake. The watershed for these culverts was determined using USGS quadrangle sheets and design plan information obtained from the NYSDOT. Using HydroCAD to model the watershed and estimate the flow from these culverts during a 100-year storm event, the diversion channel was sized to convey the calculated runoff. Flow velocities were computed and the drainage swales leading from the culverts (from the property line to the diversion swale) and the diversion channel itself were lined with rock and/or turf reinforced mats to protect them from erosion. Calculations supporting the design of the swales and diversion channel are presented in the Engineer's Report. Since the culverts under the state roadways were likely designed to carry the runoff from a lesser storm event and there is some additional watershed downhill from these highways, these culverts have less capacity than the proposed diversion swale and the piping which will receive flow from the same. Accordingly, the proposed diversion swales and piping are conservatively designed.

The design capacity of the diversion channel and the downstream piping was commensurate with the size of the tributary watershed. In addition, the existence of the brine pond will capture rainfall that falls on it effectively reducing the size/area of the watershed of the diversion channel. Consequently, the peak flows in the pre-existing drainage swales downhill of the brine pond will be slightly less than what they were under preconstruction conditions.

Interceptor Trenches

Interception and removal of groundwater is essential to not only facilitate construction of the impoundment's interior side slopes in areas of cut but also to inhibit uplift of the excavation as it progresses with depth (particularly in areas where bedrock is present at the most shallow depths below the final excavation grade).

An interceptor trench will be constructed along the eastern edge of the diversion channel to intercept seepage from water bearing seams of the overburden. With an underdrain installed at its base, the trench will be backfilled with crushed stone wrapped in geotextile. Adjacent to the high point of the diversion channel, the underdrain will have an invert elevation of 833.0 feet, i.e. it will be installed approximately 4 feet below the bottom of the diversion channel. The stone and underdrain will be pitched to the north and south from this high point of the channel and will daylight within the channel at the edge of the northern and southern ends of the impoundment's embankment at the approximate locations shown on Drawing P3 of the Engineer's Report.

Flow discharged from this interceptor drain will be insignificant in comparison to the flow the diversion channel will carry as the glacial till into which the interceptor drain is installed has a very low permeability. The flow it will carry will be essentially equal to that which seeps from granular seams found to be present in the test pit excavations.

Interceptor trenches/underdrains will also be installed along the toe of the impoundment's interior side slopes (east and west sides), their purpose being to help guard against excavation heave while also serving as collection pipes for the lower liner's underdrainage system. Invert elevations established for these underdrains are shown on Drawing P3 of the Engineer's Report. They have been carefully chosen considering the estimated depth to the weathered/broken layer of bedrock and the hydrostatic head which may be contained within the same. Underdrains along the west side of the pond near its base are to be installed at the locations shown before the excavation progresses to the base elevation of the pond. The purpose of this sequence of work is to effectively lower the hydrostatic head of water within the weathered/broken rock layer to guard against sloughing of the excavation face as it progresses further with depth. Additional underdrains intermediate to these will be installed if field conditions such as excavation base heave and/or subgrade instability dictate their need. Calculations supporting the size of the underdrains are contained in the Engineer's Report. These calculations are conservative (i.e. they err on the safe side) as the underdrains have been sized assuming that the permeability of the weathered/broken rock is as great as 100 times the highest permeability determined through slug testing. The actual flow they will transmit and add to that which drainage swales east of the impoundment must carry is not expected to exceed 1.5 cubic feet per second (8-inch diameter pipe at 1% flowing full) at any given discharge point. This additional hydraulic loading on the drainage ways leading to Seneca Lake represents an increase of less than 1 percent during the design storm event.

Brine Pond Level Control

The brine pond is open to the atmosphere such that there will be a combination of evaporative losses and rainfall/snowmelt accumulation. At the project site, the average historical annual rainfall exceeds the evaporative losses, so over time there should be a net accumulation in the pond once it is placed into operation. The level in the brine pond will be monitored on a daily basis and in particular during and following periods of intense rainfall. If the brine level ever exceeds elevation 837.0' and begins to encroach on the freeboard, then some of the brine solution should be pumped to the US Salt brine pond located south of the main brine pond. The pumped off brine solution will be used to generate salt product and taken permanently out of the cavern loop.

Potential Precipitation, Brine Pond Freeboard and Excess Brine

The pond's design freeboard is 36 inches, that is the distance between the top elevation of its embankment of 840.0 feet less the operating high brine level of 837.0 feet. Following DEC's Guidelines for the Design of Dams dated January 1989, the minimum required freeboard for a new Class "B" dam is 2.0 feet. Accordingly the impoundment has been designed with a freeboard one (1) foot greater than that required for a large dam with a hazard classification of "B".

The design flood for a new Class "B" dam is 40 percent of the Probable Maximum Flood (PMF). For the region of New York State where the project is located, the PMF results from a probable maximum precipitation (PMP) event of approximately 25 inches of rainfall as identified by NOAA. See Figure 18 of NOAA's "Probable Maximum Precipitation Estimates, United States East of the 105th Meridian." Forty (40) percent of 25 inches equates to 10 inches of rainfall. This amount of rainfall when added to the operating level of the brine pond will leave 26 inches of freeboard.

Under an extreme wind event, wave action may develop in the brine pond and result in elevated water/brine levels that also infringe upon the pond's design freeboard of 36 inches. Based on NOAA data, a wind gust velocity of 50 miles per hour was considered appropriate for the brine pond and, although wind gusts are not sustained in nature, an equivalent sustained wind velocity of 50 miles per hour was assumed to assess the potential maximum wave heights that could develop on the pond. Wind acting in the long direction of the pond was assumed as the worst case scenario for these calculations. A total rise in the water surface elevation (wind setup plus wave run-up) of 20 inches (1.66 feet) was calculated, indicating that maximum wave height that could potentially develop on the pond should be well within the design freeboard of 36 inches. Furthermore, under the unlikely combination of extreme rainfall and sustained wind of high velocity, the maximum level of water/brine should not result in overtopping of the pond's embankment.

Although the embankment does not fall under the classification of a "dam" according to the Dam Safety Section of DEC, the freeboard provided in the brine pond's design is compatible with the dam safety design criteria for a Large Class "B" hazard dam.

In the event there is a need to remove brine from Finger Lake's pond to maintain the minimum freeboard, Finger Lakes will make a connection to the brine line piping-flare system near well 58 to US Salt's brine pond. <u>See</u> Figure 4. As part of the underground component of the project, Finger Lakes will be installing 3 electrically driven brine pumps[7] below the pond embankment on the east side of the pond. The suction line for the 3 pumps will be installed along the outside of the pond bank and then down the inside of the bank to the bottom of the pond, which will withdraw the highest saturation of brine to displace product in the caverns. Finger Lake's brine line will be a 10 inch line and will run from the brine pond pumps and flare stack to proposed FL1, well 33 (or its substitute), and well 58.

At well 58, approximately 250 feet of 6 inch line piping will connect to the flare stack which is connected to US Salt's existing piping to their existing brine pond. The connection of Finger Lake's brine line to the flare stack would allow brine to be pumped to the US Salt pond while injecting or withdrawing product from any of the Finger Lake's wells. When Finger Lakes is not injecting or withdrawing product there is an existing flare stack bypass valve which can be opened to go directly to the US Salt pond. Unless brine needs to be pumped to US Salt to maintain minimum freeboard in Finger Lakes pond the valve will be remain closed and locked. If Finger Lakes is pumping into US Salt's pond, Finger Lakes will monitor US Salt's pond brine level.

The purpose of operating US Salt's pond is to receive brine from their south field wells.[8] The brine siphons from the pond through piping to the US Salt facility for processing. Therefore, if there is excess brine from the Finger Lake's brine pond that must be removed, it will be removed from the bottom of that pond where the saturation is greatest and it will be pumped, through a flare stack, to US Salt's brine pond and then to the US Salt facility for processing. Operationally, if US Salt's pond level is high, they can shut down solution mining of their north field to be able to receive brine from Finger Lakes pond.

Brine Pond Liner Repair and Replacement

To further mitigate against any releases from the brine pond, Finger Lakes has specific procedures to be followed in the event the brine pond liner is torn or requires replacement.

Repair Procedure

If any cuts, rips or tears in the Polypropylene membrane should occur above the brine water line, a patch of the same material would be cut with rounded corners and an overlap a minimum of 3 inches. The patch would be applied with a hand held heat gun and roller. The patch and damaged membrane area should be clean and dry. The heat gun should be inserted between the patch and the membrane liner, heating the surfaces of each to a molten state. Steel roller pressure over a hard surface should be applied during the heating process in such a way as to smooth out any wrinkles while mating both surfaces.

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[7] These electric pumps are manufactured by Gould's Pumps (model 3196 MTi 4x6-10H) and are rated at 800 GPM.
[8] US Salt also has solution mining wells in its north field, but the brine from these wells do not go through the brine pond, but directly to US Salt's manufacturing facility.

If any cuts, rips or tears occur below the brine water surface, operations during injection season will discontinue and brine will be pumped from the pond with the use of the three brine pumps located below the east embankment of the pond, through the existing brine pipeline system to the US Salt facility brine pond. When brine water level is below the damaged area the repair can be made.

If any cuts, rips or tears occur below the brine water surface, operations during withdrawal season will discontinue and the brine will be pumped from the pond with the use of the three brine pumps located below the east embankment of the pond, through the existing brine pipeline system to the US Salt facility brine pond and to the storage wells to displace product. This will decrease the time to lower the pond level.

If brine is detected between the two liners at the monitoring points, the brine level will have to be lowered until the breach is located. During this procedure the brine from the monitoring points can be pumped back into the pond so there is no ground water contamination. Once the breach is located the repairs can be made and an inspection of the monitoring points will be conducted to insure the leak is sealed. Also a walk around visual inspection will be conducted to check for any other issues.

Replacement of Upper Liner

The Polypropylene membrane has a 20 year warranty. During yearly inspections (prior to the start of injection season when the pond is empty or lowest point) if Finger Lakes feels there could be an issue with the membrane integrity an outside liner engineering consultant will be hired to conduct an inspection and give recommendations if the liner should be replaced. If it is recommended by the consultant to replace the membrane the pond will be completely emptied of brine, washed down and cleaned out. Any residue (silt) will be disposed of properly. Once cleaned, the liner will have a complete inspection. If any questionable areas are found a patch will be installed as listed above in the repair section. Once the pond is repaired a trench will be dug around the top of dike and a new membrane will be installed over top of the existing liner. This will be considered a replacement in kind operation. Once the new membrane is installed and all seams are tested the trench will be filled in and the pond put back in service.

Closure

At closure, all brine will be removed from the surface impoundment; all connecting lines, and any associated systems (including the brine pumps) will also be removed. The brine will be provided to US Salt or to local municipalities for road use during winter. All connecting lines will be disconnected and securely capped or plugged, once the brine is transferred to US Salt's operational brine pond.

The liner system will remain in place if drained, cleaned to remove all traces of brine, and both liners punctured so that drainage is allowed. The impoundment is to be backfilled and regraded to the surrounding topography.

Brine Pond Failure

The high sodium chloride levels present in the production brine (31,100 to 417,000 mg/l), if released to the environment in significant quantities, are the most serious threat to plant life. As noted above, with the design of the brine pond, this is unlikely to occur. In the unlikely event it does occur, the concentrations of sodium chloride from the brine pond will inhibit the ability of plants to absorb water (Miller, 1978). Therefore, spillage of brine high in sodium chloride almost always kills vegetation and sterilizes the soil. However, recent research indicates the soil's plant toxicity is short lived due to the northeast's high rainfall and rapid leaching of the sodium and chloride salts. In addition, the brine has high concentrations of calcium and magnesium which have the beneficial effect of increasing the soil pH. Increase in soil pH helps combat the effects of acid rain and increase plant species diversity in the Northeast (Auchmoody, 1986).

As part of its Operations, Maintenance and Contingency Plan and as otherwise described above, Finger Lakes will have systems in place to readily identify any potential leaks in the double liner system. These include a leak detection system, interceptor trenches to assure that there is no groundwater uplift on the liner system, groundwater monitoring (described below), a liner replacement procedure, a procedure to redirect brine to US Salt's system, a Spill Control Prevention Plan, and an Emergency Response Plan.

Therefore, while a complete structural failure of the brine pond, however unlikely, may potentially pose a threat to vegetation and soils in the immediate vicinity, Finger Lakes has taken all necessary precautions to prevent such a failure, including the chosen liner, monitoring requirements and repair and replacement procedures.

Brine Pond Alternatives

Given the size of brine storage needed, Finger Lakes considered several alternatives, in terms of location, configuration and size before concluding on the size and location of the proposed brine pond. The site selected has a grade change ranging from about 35-45' depending upon which portion of the structure you are looking at. For overview drawings showing the pond options considered, refer to Figures 5-9.

Option 1 – Two Ponds In Current Location

The first option considered to accommodate the 2.1 million barrels of brine that is to be displaced from the storage caverns was two ponds located on the land where the latest pond is proposed to be located. This option would have involved two individual ponds laid out as shown on the attached Option 1 layout drawing. See Figure 6. The rectangular shape of each pond would allow for lining the structures more easily. This layout would also allow for additional flexibility when managing the brine; however several drawbacks drove Finger Lakes to consider additional options. The two pond option forces the second pond to the east and into steeper terrain. This steeper terrain necessitated a narrower embankment with an outside slope of three to one on each side. This steeper embankment would have a greater potential for instability, while the single pond layout allows for outside slopes of four to one as well as a much wider embankment. With the lake located to the east of the site, Finger Lakes wanted to ensure they were able to utilize the option that provided the greatest factor of safety. A single pond in this location allowed for the greatest factor of safety against embankment failure.

In addition, consideration was given to using two or more ponds of greater depth. The presence of relatively shallow bedrock limited their depth and it was not possible to acquire additional land which would accommodate the embankments and side slopes of two or more ponds that would collectively provide the required storage volume. One, large pond was selected as it limited the depth of excavation and thereby minimized the volume of rock excavation and it had the added benefit of roughly balancing cut and fill volumes.

Option 1A – Two Ponds Aligned in North South Orientation

In an effort to utilize the area chosen for option 1 a second pond layout was investigated, the results of this exercise is shown as option 1A (See Figure 7). In order to allow for a more gradual berm on the lake side of the structure the storage cells were oriented North and South to attempt to take advantage of the flatter area on the US Salt property as well as the newly acquired portion of the Young Property. This orientation would allow for gentler slopes to the lake side of the structures, improving the factor of safety. When preliminary gradings were completed on this option, the toe of the slope on the north end extended past the property line at a 3:1 slope. With this steeper slope requirement and the property line constraints it was decided that this was not a viable option.

Option 2 – Single Pond Near Rail Siding

The second option that Finger Lakes considered was a single storage pond located on the property purchased for the rail siding. As shown on the attached Option 2 layout drawing (Figure 8), the dimensions of the top of the pond structure do not fit in the area owned by Finger Lakes. Without designing the grade of the structure, it is also evident that this single storage pond would impact the Class C tributary to the lake located south of the site. In addition, there is a small pond/wetland area that has been identified on the site; the single pond would also impact this resource. With the potential resource impacts and the lack of adequate space it was decided that this was not a feasible option.

Option 3 – Single Pond North of Cemetery

The third option that was considered was a single storage pond located on the property where the gas transmission line will be installed north of the cemetery. This property is owned by Finger Lakes' affiliate US Salt. As shown on the attached Option 3 layout drawing (Figure 9), a square storage structure would fit onto the property; however, the topography in the area makes this storage location impractical. The change in elevation from west to east is approximately 70 feet according to the USGS Topographic map. This would necessitate the installation of a very high, very narrow embankment on the east side of the structure. The factor of safety utilized to design the single storage embankment in this location would not be possible. In addition, the structure would impact the Class C tributaries to the North and South of the structure. As shown on the drawing, this structure would also be immediately upslope from the motel located on route 14. Finger Lakes was therefore concerned about any negative impacts the embankment might have on this property owner. Also shown on this drawing is the planned gas transmission line from the rail area to the storage area. This pond location would be directly over the planned pipeline. The pipeline would need to be rerouted, and with the property lines as shown there is no location where this pipeline can be installed and not interfere with the option three storage pond.

Option 4 – Single or Double Pond Layout on US Salt Property

In addition to the options discussed above, Finger Lakes looked at the entire US Salt property for another suitable location. With the presence of many salt caverns and well heads and the increase in topography as the site gets closer to the lake, no potential sites were found on the property.

4.1.3 Underground Storage Caverns

In its plans to construct an LPG storage system, Finger Lakes plans to convert Gallery 1 (well 33,[9] new wells FL1 and FL2) and Gallery 2 (well 58) to LPG storage service.

Out of the existing sonar determined storage capacity for Gallery 1 of approximately 5 million barrels, Finger Lakes has requested authorization to store 1.5 million barrels of LPG in this Gallery. It has requested authorization to store up to 600,000 barrels of LPG in Gallery 2 (well 58).

A Reservoir Suitability Report has been filed with the DEC, but because of its proprietary nature and for security reasons, it is deemed confidential. The Reservoir Suitability Report presents information based on known geology of the salt deposits, US Salt company files, public records and publications, competency of overlying formations, hydraulic pressurization of wells and caverns and a finite element analysis (FEA) to demonstrate integrity of these caverns and the ability to safely retain LPG.

[9] The bonding for well 33 is good to an approximate depth from bottom to 140 feet from the surface and Inergy is evaluating methods to ensure isolation of fresh water zones where the bond may not be adequate and to determine if there are any gas bearing zones or more saline waters that may be present such that further bonding is necessary. If for some reason an adequate bond cannot be demonstrated, a new well will be drilled adjacent to well 33 for use as an injection/withdrawal well and this work, along with a nitrogen/brine interface test for such well, shall be done to the Department's satisfaction prior to the commencement of storage operations.

4.1.3.1 Existing Environmental Setting

Location and Regional Geology

The US Salt brine field, located in Schuyler County, is in the south central part of New York State, along the west shore of Seneca Lake. See the general location map in Figure 1. It is approximately 2-3 miles north of the village of Watkins Glen.

Salt can be found within the upper Silurian Salina Group in either the Syracuse or Vernon formations, or both, depending upon the location in the state. The bedded salt of New York varies in thickness and number of beds, and is usually associated with other sedimentary rocks, such as shales, limestones, dolostone, gypsum and anhydrite. The salt strata dip to the south, ranging in depth from 500 feet at the northern edge of the occurrence to 4,000 feet at the New York/Pennsylvania border. Net aggregate thickness reaches over 500 feet in Chemung, Tioga, southern Tompkins and Schuyler and eastern Steuben counties. (Briggs, 1996 citing Sanford, 1996)

Physiographically, the region is part of the Finger Lakes district of the Allegheny plateau that has been peneplaned, uplifted and glaciated. Due to glaciation, the area is marked by deep valleys that are now occupied by the Finger Lakes and hanging tributary valleys. Rocks that outcrop in the area are Devonian Age sedimentary formations that dip gently to the southwest. The terrain rises steeply across the site toward the west from the lake shore at about 270 feet/quarter mile. The site is covered with native vegetation.

Sediments encountered by wells drilled in the brine field range in age from Upper Devonian, Genesee shales, to the Upper Silurian, Salina group, Syracuse salt and underlying Vernon shale.

Sediments are composed of shales, sandstones, limestone and dolomites with the shales of the Middle Devonian, Hamilton group, being 800 feet in thickness and separated from the upper Devonian shales by about 30 feet of middle Devonian Tully limestone. The Hamilton group is underlain by the middle-lower Devonian, Onondaga limestone that overlies the lower Devonian Oriskany sandstone. The Oriskany is rather sporadic in occurrence and has not been identified in all wells. See generally Rickard, 1969; Jacoby and Dellwig, 1974; Jacoby, 1963.

Below the Oriskany, sediments of the Upper Silurian, Bertie and Salina groups are encountered and consist of limestone, dolomite, shale, anhydrite and evaporate salt beds. The salt previously dissolved to create the proposed LPG storage caverns is part of the Syracuse salt formation that is a member of the Salina group of the Cayugan series of the Upper Silurian system. At the Project site, it consists of six distinct beds with the possibility of a thin salt stringer some 40 feet below the sixth salt. The salt beds are intensely folded into a series of local east-west anticlines and synclines with only a few tens of feet from crest to crest. It is likely that the salt and incompetent shales of this section flowed plastically and absorbed the shock of the regional tectonic force during the Mesozoic era, and gave rise not only to the intense folding, but also faulting of the salt section. This is apparent when the structure of the salt is compared to the overlying sediments. The overlying sediments are characterized by broad, gentle east-west synclines and anticlines with axes generally paralleling the sharp folds of the underlying evaporites. On the basis of the cores from the Watkins Glen brine fields, some beds appear to pinch out completely while others double in thickness over a distance of 300-400 feet. See generally Rickard, 1969; Jacoby and Dellwig, 1974; Jacoby, 1963.

Historical Development of Salt Caverns and Previous Usage for Hydrocarbon Storage

The US Salt facility has been in business for over 100 years with US Salt acquiring the facility in 1998. Its wells extend into the earth's crust for more than a half mile, tapping an underground salt deposit that extends from Madison County in the east to Erie County in the west. The deposit, which also extends into Pennsylvania, West Virginia, Ohio, Michigan and Ontario, was created by the evaporation of sea water more than 300 million years ago.

The salt was first discovered in Watkins Glen in 1882. In September 1882, the Watkins Oil Well Company, drilling west of Watkins Glen, reported it had reached a sufficient flow of brine to make salt at 1,512 feet below the surface. According to US Salt, this discovery was the basis for today's US Salt plant. Due to impurities in the brine making it difficult to dry the salt, successful commercial production of salt was slow to develop. Eight years after the Watkins Oil Well Company drilled its first well, the first brine-producing well was put in use. The Glen Salt Company was the first real producer of salt in Schuyler County. Its wells were drilled on property now owned by US Salt, with the first well drilled in 1893.

While the US Salt facility has been in business for over 100 years, individual caverns and wells have had a limited productive life (for brining and salt production purposes) because they have relied on "reverse injection." (Jacoby, 1963). That is, water was injected near the top of the salt to form "morning glory" cavern shapes. That method of brining leaves large volumes of undissolved salt in the ground. In addition, broken brine return tubing from accelerated brining and encountered ledges in some caverns have led to early abandonment.

Core Test Results – Integrity of Salt

Core testing has been done on the salt underlying the site of the Finger Lakes underground storage caverns. Subsequently, a geomechanical analysis was conducted. The coring that was performed was to determine what the Poissons Ratio, Young's Modulus, and compressive strengths are of the salt deposit. That is, what were the mechanical properties of the local salt body that had been solution mined for over 100 years. Core analysis and rock mechanics testing from one or two wells in a salt body are transferrable to other wells/caverns in the same salt body.

A model was then prepared for Finger Lakes to simulate the worst case in utilizing the caverns in relation to adjacent caverns based on the wall-to-wall distance between caverns.

The core results verify the fact that the insoluble fragments and "faults" are all enclosed with recrystallized salt and do not create a situation where an insoluble fall into the cavern means that the developing space must be abandoned.

The caprock across the area and over the caverns are dense, hard and relatively contiguous shales and dolostone/dolomites with compressive strengths over 10,000 psi. Those high compressive strengths and solid correlation of beds across the brine field attest to the competent roof span shown in the sonar surveys.

Historic Earthquake and Seismic Activity

Based on data compiled by the National Geophysical Data Center and updated using USGS data, there are no risks involved at the site with earthquakes within ½ mile of any of the subject Galleries. See Appendix G. In addition, an Earthquake Database Search was conducted as well as a base map compiled by the National Geophysical Data Center using USGS data. See Appendix G. Updated data for the time period between 2001 (the date of the last report) and 2010 was obtained from the USGS National Earthquake Information Center's Earthquake Data base. The results indicated that the area continues to be a low seismicity area. Since the original report dated 2001, only five minor seismic events have been recorded within the survey radius. These events range from a low of 2.4 MDPAL to a high of 2.9 MDPAL and the closest event recorded was 101 km from the project area.

Existing and Proposed Nearby Facilities

As noted above, both TEPPCO and NYSEG operate underground LPG and natural gas storage facilities, respectively, in close proximity to the proposed Finger Lakes facility. TEPPCO's LPG storage facility has the capacity to store 1.2 million barrels of LPG and this facility has stored LPG underground for over 25 years. The approved storage capacity of NYSEG's Seneca Storage facility is 2.34 billion cubic feet (Bcf) with a working gas capacity of 1.45 Bcf and this facility has stored natural gas underground for over 15 years.

In addition, NYSEG is studying the feasibility study of a compressed air energy storage (CAES) facility for a site on US Salt's property. A CAES facility pumps compressed air into a depleted underground salt cavern when low-cost, off-peak electricity is available to power the compressors. However, the feasibility study is still underway, so there is no definitive proposal at this time. If the study confirms that CAES is feasible and economical, NYSEG would seek approval from state and federal agencies to proceed with construction of the plant with a target in-service date of late 2014. However, if a proposal is made, it would have to take in to account the caverns that are already in use in the area, including the Finger Lakes caverns.

4.1.3.2 Potential Impacts[10]

Suitability of Caverns to Store LPG

The focus of any potential impact associated with the underground storage of LPG is the integrity and the suitability of the underground caverns. As noted below in the public safety section, salt solution mined caverns are ideal for underground storage of LPG. Nevertheless, the process of obtaining an underground storage permit from the DEC requires detailed studies, models, and reports with regard to the local and regional geology, evaluations that have been conducted to determine well and cavern integrity, rock mechanics, cavern sonar survey studies and mechanical integrity tests, subsidence monitoring, and safety procedures to be implemented during operations. To the extent that this DSEIS can disclose information not otherwise already deemed confidential by the DEC, it shall. Otherwise, a description of the kind of studies and information provided to DEC will be included.

State-of-the art cavern sonar surveys and hydrotesting have been performed on the galleries or underground caverns in which Finger Lakes seeks to store LPG. That testing shows the shape of

[10] Much of the information contained in this section is based on the information provided in Finger Lakes' Reservoir Suitability Report most recently revised and submitted to DEC on May 14, 2010, the responses of Finger Lakes to DEC Notices of Incomplete Application and the revised FEA that was submitted on September 28, 2010. Finger Lakes submitted such documents under a claim of confidentiality which, for the most part, the Department has accepted. Only

the caverns and reflects the success of the hydrotest in each of the caverns and wells in Gallery 1 and 2. Careful evaluation was performed to study the well cores and logs, including casing inspection, cement bond, gamma ray and neutron logging, and detailed studies of the related geology and geomechanical analysis. A finite element analysis (FEA)[11] model was performed to further evaluate the suitability of the caverns, particularly in light of proximity of other wells developed over the years at the US Salt site for solution mining. Based on all of the above, Finger Lakes' reservoir suitability report demonstrates and concludes that the aforementioned proposed LPG storage galleries will be safe to operate LPG injections and withdrawals under constant hydraulic pressures, and LPG will be safely contained at all times over the life of the facility.

Minimum and Maximum Storage Pressures

Salt caverns in LPG storage remain full of liquid at all times (i.e., brine or LPG). The fluid pressure in the well and cavern depends on the height of the column of fluid(s) in the well and the weight of the fluid in the column. There are two columns of fluid in the LPG storage well. The well casing called the production casing is cemented into the rock formations and goes from the surface to a point just above the salt layer, ending at the "casing shoe." A tubing string called the "brine string" is hung from the wellhead and passes down through the inside of the cemented production casing, past the casing shoe to near the bottom of the cavern or other predetermined depth inside the cavern. The tubing is always full of brine during normal storage operations.

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those parts of Finger Lakes' underground storage application that have not been deemed confidential have been included in Appendix O to this DSEIS. See Footnote 4 above.

[11] An FEA is performed to accurately model processes to determine structural integrity, performance and reliability, as well as predict the threshold for structural failures in the salt cavern areas. The FEA is a numerical predictive model that uses a complex system of points called nodes which make a grid called a mesh. This mesh is programmed to contain the material and structural properties, in the case of the Finger Lakes facility, salt, that defines how the structure (cavern) will react to certain loading conditions over the life of the facility.

The space around the tubing inside the casing is called the annulus. The annulus is filled with brine when the cavern is empty and with LPG when the well is in storage service. Storage is accomplished by pumping LPG down the annulus and displacing brine out from the cavern into the tubing to the surface. Recovery of product is accomplished by pumping brine into the tubing and displacing LPG back out of the cavern up the annulus to the surface facilities. The well/cavern system is a closed system.

The pressures at the casing shoe and in the cavern are always controlled by the weight of the column of fluid in the tubing. The pumping pressures are the pressures required to overcome the weight of brine or LPG in their respective columns plus the friction acting against the flow.

Finger Lakes' proposed maximum and minimum operating storage pressure is based on constant LPG or brine pressures in the wells and caverns making up each of the galleries. The wells will be operated in parallel and will all be at the same pressure, either under hydraulic pressure of brine or LPG pressure.

The rock mechanics and FEA evaluations submitted by Finger Lakes assumed a 0.8 psi/foot pressure to the casing seat in their analysis. Finger Lakes hydrostatic pressure testing in proposed Gallery 1 was at 0.8 psi/foot. The Gallery 2 hydrostatic pressure testing was also 0.8 psi/foot. To further ensure the pressure integrity of the wells and their casing seats, Finger Lakes will test with nitrogen/brine mechanical integrity test (MIT) at 0.75 psi/foot at the casing seats in both new and existing wells in Galleries 1 and 2 before product is injected into those wells. In addition, as a safety factor, the maximum and minimum storage gradients at the wellhead and casing shoes during LPG storage operations will be well below those assumed in the FEA.

Geological Faults Analysis

In addition, Finger Lakes engaged in an analysis to determine whether there were any faults in the salt layers that would have a negative consequence for hydrocarbon storage. While past studies (Jacoby, 1973; Jacoby and Dellwig, 1974) have indicated that faulting is present in the brine field, resulting in alternating thinning and thickening of both salt and insoluble layers, that faulting is limited to the Salina salt interval, and there is no indication the faults extend into overlying confining beds or the underlying Vernon shale.

As more wells have been drilled into salt and underground mines developed, geologists and engineers have come to a better understanding of the mechanical characteristics of salt and its response to the tectonic forces that create folding and faulting. "Faulting is a major component of most hydrocarbon traps. Many faults form the boundary plane of a pool of oil and gas, and this may be due to the fact that the fault is tightly sealed and holds the petroleum from further migration" (Levorsen, 1954). The existence of faulting does not indicate necessarily that there is a pathway for fluids to migrate.

Indeed, the plasticity of salt as the gross salt thickness was thrust to the present state along the decollement has resulted in the closure of any porosity around the "faults", enclosing them with salt. Experience at other bedded salt locations has shown that whenever a layer of insolubles is undercut and falls into the bottom of a developing cavern, the space can be recovered by working the well over and adding new tubing to the injection string. In the case of the proposed Finger Lakes Gallery 1, considerable space has been retained that is suitable for hydrocarbon storage, indicating that the roof and walls have structural integrity. Since the roof span has been stable with hydraulic support from brine, then stability with liquid butane and/or propane is assured.

Moreover, the Camillus shale directly overlies the Syracuse salt sequence. This shale sequence is approximately 80 feet thick across the Finger Lakes LPG Storage area. The thickness of the Camillus Shale varies from 78 to 82 feet thick across the brine field. The fact that the thickness of the shale is so uniform confirms the interpretation that the Camillus shale cap rock has not been compromised by faulting. If faulting had occurred, significant shortening by normal faults or lengthening in response to reverse faulting would be reflected in the thickness of the Camillus shale.

In addition, there is an approximately 30 feet of geologic dip to the west across the brine field. The consistent dip represented reinforces the interpretation that no faulting extends into the Camillus shale cap rock.

In Finger Lakes' underground storage permit application, cross-sections were included to show the gallery relationships between the wells in each gallery along with the overlying formations of Camillus shale, Bertie anhydrite, Helderberg limestone, Oriskany sandstone, Onondaga limestone and Marcellus shale. The original total depths of the wells are shown and the lowest sonar depths of each well are recorded. The cross-sections (one North-to-South and the other West-to-East) also illustrate the absence of faulting and the uniformity of the Camillus shale across the Finger Lakes LPG Storage area. The cross-sections illustrate the distinct salt and "rock" units using the Rickard standardized salt unit naming convention. The cross-sections show all sonar survey outlines (appropriately labeled) and any interconnections with other wells/caverns (e.g., in Gallery 1).

Having reviewed all the evidence of the past operating data, geological and engineering studies and the results of sonars, hydrotests, vertilogs, and the successful pressure tests, Finger Lakes' underground storage permit application demonstrates the suitability of these caverns to safely contain and store LPG for the life of the facility.

Earthquake or Seismic Impacts

Based on the historic earthquake and seismic data, there are no risks involved at the site with earthquakes within ½ mile of any of the subject Galleries.

Subsidence Monitoring

US Salt has been monitoring the elevations of wellheads and other subsidence monuments for decades. To the extent there have been changes in elevation, much of this can be attributed to the change in the weather from warm to cold. This phenomenon is universal and documented surveys show that there has been no significant subsidence across the field mainly due to the stiffness of the overlying formations.

At the DEC's request, Finger Lakes will conduct subsidence monitoring at least every two (2) years at all injection, withdrawal, monitoring and plugged wells in each storage gallery.

Mechanical Integrity Test (MIT) Procedures

MITs are performed at a pressure greater than normal operating pressures. The purpose of an MIT is to show that the production casing has integrity and structural part of the cavern (i.e., production casing seat) that protects the Underground Source of Drinking Water (USDW) will not allow gas to migrate to those formations. MIT pressures are above operating pressures but still significantly below the safe working pressures of the pipe and cement, and even further below the lithostatic pressures above the cavern and the compression that the cavern roof and salt walls can withstand. MITs are short duration tests and the existing wells and caverns have always passed these tests.

Even more compelling, however, are the long term in-situ tests that have been performed on the caverns showing that those caverns do not leak even when subjected to much higher than normal operating pressures for weeks or months. Finger Lakes will monitor pressures on its caverns on a daily basis so that any leak would be detected quickly.

Finger Lakes understands that DEC requires nitrogen/brine interface MIT tests at all wells prior to first injection of product and at five-year intervals thereafter as nitrogen testing is the industry standard for testing gas tightness in storage caverns constructed in salt. Finger Lakes has proposed to conduct MITs on the wells that are the subject of its underground storage application at five-year intervals in the future.'

Vertilogs - Integrity of Wells

Vertilogs were run by Finger Lakes to determine remaining wall thickness of the existing wells in order to determine if those wells are suitable for underground storage of liquid hydrocarbons. The purpose of performing a vertilog is that if a well indicates poor integrity from the vertilog information or from the hydrotest, that well will either be a candidate for a new liner or will be abandoned and a replacement well drilled to move product in and out. Based on vertilogging, well 33 will be further evaluated to determine cement bonding integrity to ensure proper isolation from any gas bearing, fresh water or saline water zones. See Section 4.1.3, fn. 9. If the cement bonding for well 33 is shown to demonstrate adequate isolation, it will be used for injection/withdrawal and wells 34, 43 and 44 will be plugged and abandoned. Otherwise, a replacement injection/withdrawal well for well 33 will be drilled adjacent to its current location. Additionally, well FL1 will be installed as an injection/withdrawal well and well FL2 will be installed as a monitoring well.

A vertilog was also run in well 58 to determine casing wall thickness, a sonar for cavern shape and suitability for LPG storage. The results of the vertilog information demonstrate that well 58 can be used as part of Finger Lakes' LPG storage operations and that there is casing integrity. After more recent solutioning of well 58, another sonar, vertilog and cement bond log was run (in late March 2011) and a copy provided to the Department as part of Finger Lakes' April 20, 2011 response to DEC's Third NOIA on the Underground Storage Application. See Fn 2 above.

4.1.3.3 Proposed Mitigation Measures

Regulations Implementing the Oil, Gas and Solution Mining Law

The regulations implementing the Oil, Gas and Solution Mining Law, 6 NYCRR Parts 550 - 559 address each aspect of the drilling, completion, production and plugging and abandonment of oil and gas wells, including LPG storage wells.

Cavern Development Plan

Finger Lakes Gallery 1

No additional solution mining is planned for Finger Lakes Gallery 1. That existing space is suitable for storage of hydrocarbons based on the work that has been performed. The recent reworking of each of these wells included sonars and hydrotesting, and as a result demonstrated the lack of pressure interference with adjacent wells and caverns when the hydrotest test was run on the wells. The increase in cavern dimensions will be about 1-2% annually by the displacement of hydrocarbon products with slightly undersaturated brine, and then because the gallery is so large, the increase might not be noticeable by sonar survey since additional insolubles will accumulate on the cavern bottom, reducing the usable cavern volume.

As noted above (Section 4.1.3, fn. 9), with regard to well 33, Inergy is evaluating the cement bond to determine if there is proper isolation from any fresh water or gas bearing zones or more saline waters. If for some reason an adequate bond cannot be demonstrated, a new well will be drilled adjacent to well 33 for use as an injection/withdrawal well and this work, along with a nitrogen/brine interface test for such well, shall be done to the Department's satisfaction prior to the commencement of storage operations.

In order to convert to LPG storage, well 34 will be plugged and abandoned since the production casing is too small for the planned storage injections and withdrawals. A new well (FL #1) will be drilled and cemented into the salt between wells 34 and 44 at the high point determined by the combined sonar surveys of those two wells. This new well and well 33 (or a replacement for well 33 if adequate cement bonding isolation cannot be demonstrated) will be the primary injection/withdrawal wells. Wells 43 and 44 will also be plugged and abandoned and a new monitoring well (FL2) will be installed near well 44. Further, prior to injection of any LPG into Finger Lakes Gallery 1, plugged and abandoned wells, and wells re-entered which are located immediately adjacent to the proposed storage gallery, including wells in International Gallery 10 (well Nos. 18, 52, 57), will be evaluated for proper plugging or construction if any well is proposed for monitoring purposes. All well entry, plugging and/or conversion work deemed necessary will be conducted under appropriate Department well permits.

Finger Lakes Gallery 2

Well 58 will be subjected to a nitrogen/brine interface MIT before being placed into LPG storage. As noted above, a final sonar, microvertilog and cement bond log was performed in late March 2011 and provided to the Department on April 20, 2011. After the nitrogen/brine interface MIT is completed, the results will be submitted for DEC prior to commencing LPG storage service.

Sonar Reports and Surveys

There will not be any additional solution mining in preparation for the conversion of Gallery 1 to hydrocarbon storage. Gallery 1 was sonared in 2009 and an additional sonar is tentatively scheduled for 2019.

Based on the existing sonar determined storage capacity for Gallery 1, Finger Lakes seeks authorization to store 1.5 million barrels of LPG.

With regard to Gallery 2 (well 58), the 2009 sonar indicated a capacity of approximately 600,000 barrels (including rubble). A sonar survey was again completed in March 2011 to confirm the shape and diameter of the cavern and to determine capacity. Based on this 2011 sonar survey, Finger Lakes estimates that well 58/Gallery 2 has a storage capacity of approximately 827,000 barrels. However, Finger Lakes' underground storage permit application only seeks authority to store a maximum of 600,000 barrels of product in this gallery.

Gamma Ray and Neutron Logging

Gamma ray and neutron logs have been run in the past to compare the open hole logs with the status of the lithology as solution mining took place. That comparison shows where the lithology is the same as before brining commenced and after salt has been removed. These tools are important to the operation of the storage reservoir since repetitive and comparative logs will alert Finger Lakes to any changes that might affect the well and cavern operation. Such tools will be utilized on the same schedule as sonar surveys.

Rock Mechanics and Finite Element Analysis ("FEA")

Rock mechanics studies and reports for the site where underground storage is proposed have concluded that the proposed LPG storage galleries will not affect the integrity of adjacent wells, caverns and galleries, including the natural gas stored to the south in Seneca Lake Storage Gallery 1 and proposed (by Arlington Storage Company, LLC) natural gas storage in Seneca Lake Storage Gallery 2. The salt and insoluble layers correlate within the south to north cross-section through the salt section.

The roof of Gallery 1 is very stable and with the hydrostatic pressure testing performed (see discussion above under minimum and maximum storage pressures) demonstrating in-situ pressure integrity. Due to the fact that all of the caverns in the area are being supported by hydraulic pressure of brine, and later by liquid petroleum gases, there will be no integrity problems in storing liquid hydrocarbon products.

The FEA model was prepared to assess the stability conditions of storage Gallery 1, storage Gallery 2, and adjacent International gallery 10 at the proposed Finger Lakes facility. Laboratory test data were used to determine the mechanical and rheological properties of the Syracuse salt and the overburden rocks.

Two finite element models were then developed to represent a vertical and a horizontal cross-section of the studied galleries and caverns in relation to the site geology. Conservative cavern geometry and boundary conditions were then imposed. The analyses were made to simulate the mechanical behavior of the surrounding salt under three extreme internal pressures through the next 50 years. These cases include (1) constant hydrostatic pressure of brine, (2) the MIT hydrostatic pressure (about 80% of the in-situ stress at casing shoe), and (3) the minimum LPG pressure with zero wellhead pressure. The study results (as updated by recent discussions with Department staff) are summarized as follows:

- The inter-cavern pillars between caverns 33 and 43, 34/44 LPG gallery and gallery 10 will be mechanically stable under the minimum LPG storage pressure of 1,197 psi at the casing shoe. To monitor the same, a new well (FL2) will be installed near well 44 as a monitoring well.

- The inter-cavern pillars will be mechanically stable under the MIT hydrostatic pressure of 1,680 psi at the casing shoe. The MIT pressure is lower than the predicted pillar stresses.

- Leakage or communication between galleries and caverns under the MIT and minimum pressures is very unlikely.

- The impact of the pressure cycle is very small due to the small difference between the proposed magnitudes of the maximum and minimum storage pressures of the LPG.

- The salt pillars have been subjected to large shear strains during brine storage/production. However, these strains are significantly reduced by the increase of the confining pressures in the salt pillars when the caverns/galleries are under MIT pressure and LPG storage.

- Certain conservative assumptions were made relating to the pressure, location and size of cavern associated with adjacent Gallery 10. Although the results reflect integrity and lack of failure in all cases using these conservative assumptions, for further assurance and maintenance of integrity in Finger Lakes Gallery 1, originally well 44 was to be utilized only as a monitoring well and no solution mining was going to occur in the direction of well 44. Now, well 44 will be plugged and abandoned and a new well (FL2) will be installed as the monitoring well.

- Well 33 will not increase in diameter when it is put into LPG storage service since any 30% increase in solution mining by undersaturated brine product displacement will take place above the existing maximum diameter.

- Wells 43 and 44 will be plugged and abandoned and will not be solution mined (i.e., those wells had no effect on the finite element modeling).

- Both well 58 and NYSEG Galleries 1 (natural gas storage service and potential gallery 2) are also too far away to have any affect on the Finger Lakes LPG storage caverns. Even after the recent solutioning at well 58 by US Salt, the FEA conclusions are still valid, even with the anticipated conversion of NYSEG Gallery 2 to natural gas service. As noted in the FEA, the existing NYSEG natural gas storage caverns known as Gallery 1, future NYSEG/Arlington natural gas storage Gallery 2 (wells 30, 45 and 31) and well 58, are too far away to affect storage operations of Finger Lakes' storage caverns. Based on rock mechanics and FEA calculations, much of the solution mined space that will be used for natural gas storage in NYSEG/Arlington Galleries 1 and 2 is in rubble that will provide support to the walls of the caverns at both the maximum and minimum planned storage pressure regime after passing the required mechanical integrity testing.

Safety Procedures and Emergency Shutdown

Finally, as a mitigating factor, evidence of well and cavern problems can be quantified simply by careful recording of wellhead pressures, and product injection and comparison with product withdrawal. In most cases, the amount of product injected, much like the ups and downs of subsidence monuments, can deviate slightly from what is withdrawn, or vice versa. It becomes obvious however when product or brine pressures and volumes deviate from the norm. Finger Lakes will quickly shut-in operations when pressures do not respond to the norm. Finger Lakes is cognizant of the overall pressures required for safe operations of LPG storage caverns based on years of experience and will use its operating experience to prevent leakage that would jeopardize the public or USDW. Finger Lakes will monitor wellhead pressures of its storage wells on a daily basis and the procedure for this will be addressed in the facility's Operations Manual.

Finger Lakes intends to have in place, prior to the commencement of operations, a number of different manuals or programs, all designed to prevent and react to accidents should one occur. This will be accomplished through an Operations, Maintenance and Contingency Plan, which shall include a Spill Prevention and Control Manual, a Hazard Communication and Assessment Program, a Safety Plan, and a Facility Security Plan.

Each of these Plans will contain the necessary information for safe operation of the Facility. Safe operations are accomplished via training. Employees will be required to take computer based training every two (2) years at a minimum. In addition to the computer-based training, each employee will experience at least six months on the job during which specific training and monthly safety meetings are given to reinforce the computer based training. Also, task specific safety meetings will be held. A further discussion regarding training is contained in the public safety section (4.6) below.

4.2 IMPACTS ON WATER RESOURCES

4.2.1 Groundwater

4.2.1.1 Existing Environmental Setting

The Finger Lakes Storage project is located in the Western Oswego River basin which includes the drainage basins of the four largest Finger Lakes: Cayuga, Seneca, Keuka and Canandaigua. Groundwater is generally available throughout the basin in quantities sufficient for domestic and farm supplies and, in many places, in quantities sufficient for municipal and industrial supplies. Nine to 12 million gallons per day (mgd) of groundwater is used in the basin, and several times this amount is available for future development, particularly from areas south of the four lakes and from certain areas along the Barge Canal.

The principal aquifers defined are unconsolidated glacial sand and gravel deposits in the large valleys of the southern half of the basin, where well yields of 1,000 gpm (gallons per minute) or more are possible. The most productive deposits are at the north ends of the valleys. Parts of the valleys of Fall and Sugar Creeks, where streams are in hydraulic contact with the aquifers, have potential yields of several million gallons per day. Delta deposits in similar hydraulic contact with the lakes could yield tens of millions of gallons per day.

In the northern part of the basin, the most important sources of ground water are deposits adjacent to and in hydraulic contact with the Barge Canal. Well yields of more than 1,000 gpm are obtained from these deposits, and perennial yields of 2 to 4 mgd per square mile of aquifer are possible. A Silurian shale bedrock unit containing soluble salt and gypsum yields as much as 1,000 gpm, and Devonian carbonate units yield as much as 400 gpm.

Precipitation in the area ranges from about 30 inches in the northwest to about 40 inches at higher altitudes in the southeast. Direct groundwater recharge from precipitation was computed to range from about 20 million gallons per year per square mile for areas underlain by glacial till to 262 million gallons per year per square mile for areas underlain by sand and gravel in the south. (Ground Water Resources, p 1)

Chemical Quality

The Western Oswego River basin is split between two physiographic provinces, the Central Lowland (in the northern part of the basin) and the Appalachian Plateau (in the southern part of the basin).

The geology of the basin generally consists of glacial deposits overlying bedrock of Silurian and Devonian age. The bedrock consists of shale, siltstone, and sandstone, in the southern half of the basin, and limestone, dolomite, and gypsiferous shale in the northern half.

The dissolved-solids concentration of precipitation in the Western Oswego River basin is about 10 mg/l (milligrams per liter), whereas that of overland flow and high streamflow generally ranges from 50 to 300 mg/l. Water from the shale, siltstone, and sandstone unit, the Onondaga Limestone, and the Lockport Dolomite has a median dissolved-solids concentration of less than 500 mg/l. All these formations except Lockport Dolomite have calcium bicarbonate type water; this dolomite has calcium and magnesium bicarbonate type water. Water in the Camillus Shale, Vernon Shale, and Silurian carbonate rocks is of the calcium sulfate type and has a median dissolved-solids concentration greater than 1,600 mg/l.

The dissolved-solids concentration of the water commonly tapped by wells in the southern half of the basin generally ranges from 150 to 500 mg/l; in the area north of the outcrop of the Onondaga Limestone, it generally ranges from 500 to more than 1,000 mg/l. Highest concentrations were found in deeper wells and in the low-lying areas that are points of groundwater discharge.

Major constituents in the ground water in the northern half of the basin are calcium and sulfate. High chloride concentrations (more than 250 milligrams per liter) are found in deeper wells throughout the basin and in the shallow ground water near the Seneca River and the New York State Barge Canal.

The chemical quality of ground water in the Western Oswego River basin has a great effect on the quantity of water that actually is available for development. Water having a high dissolved-solids concentration may be unsuitable for human consumption, irrigation, or certain industrial uses. High concentrations of certain constituents such as chloride, sulfate, nitrate, iron, or fluoride may cause color, taste, or even health problems. Therefore, even though certain areas of the Western Oswego River basin are underlain by large ground-water reservoirs, much of this water may be unusable, or suited, to few uses, because of its poor chemical quality. (Chemical Quality, p 2)

Taste, odor, dissolved-solids concentration, and hardness of water were some of the ground-water problems for approximately 25 percent of the water wells inventoried in the Western Oswego River basin. Severity of these problems ranged from mere annoyance to unfitness of water for use.

Most of the northern one-half of the basin is underlain at depths less than 100 feet by water whose dissolved-solids concentration exceeds 1,000 mg/l (milligrams per liter) and whose sulfate and (or) chloride concentrations exceed 500 and 250 mg/l, respectively. The principal dissolved chemical constituents are calcium sodium, bicarbonte, chloride, and sulfate. Because of the widespread occurrence of poor-quality water in the north, owners, communities, and industries are either using water that would not be considered acceptable in other areas or importing water from long distances. In certain parts of the area, lack of good-quality water has hindered the economic growth because people and industry tend to locate where large amounts of high-quality water are readily available. (Chemical Quality, p 2)

Groundwater Quality Monitoring Data Developed During Brine Pond Design

As part of the Engineer's Report activities, groundwater samples were collected from monitoring wells MW-1, MW-3, MW-4, MW-13 and MW-16 on January 12, 2011. The monitoring well locations are shown on the Subsurface Investigation Plan contained in Appendix A to Volume 2 of the Engineer's Report. Prior to sampling, the water levels, as measured from the top of the PVC casing, were determined in each well utilizing a water level meter.

The following is a summary of the laboratory results:

- Volatile organic compounds (VOCs) were not detected in the groundwater samples. A table summarizing the laboratory results can be found in Appendix C to Volume 2 of the Engineer's Report.
- Several metals on a "totals" basis were detected in the monitoring wells. Total metal concentrations represent the total concentration of the metals in the groundwater samples without being filtered to remove suspended sediment in the samples prior to the samples being preserved with a fixative. The analytes detected included aluminum, barium, calcium, chromium, iron, magnesium, manganese, potassium, sodium, zinc and lead. Of the metals detected, aluminum, iron, magnesium, and sodium exceeded DEC standards in some or all of the monitoring wells.
- Dissolved metal concentrations represent the concentration of metals in the groundwater samples after being filtered to remove suspected sediments in the samples prior to being preserved with a fixative. The analytes detected in some or all the wells included barium, calcium, magnesium, manganese, sodium and zinc. Only magnesium and sodium exceeded their respective groundwater standards. As anticipated, their concentration was only slightly lower than the total concentration as these analytes are soluble in water.

The values presented provide a baseline of the groundwater quality at the site. The analytes detected above DEC standards are considered to be naturally occurring and not related to sources of contaminates within or nearby the project site. Elevated levels of metals in the "total" metals analysis are considered to be related to suspended sediments in the water samples collected and analyzed. This was confirmed through the analysis of "dissolved" metal whereby the samples were first filtered to remove the suspended sediments prior to being analyzed. A few metals (magnesium, sodium, etc.) above standards in the total and then again in the dissolved samples are typically not affected by filtering because they are very soluble in water.

A copy of the laboratory analytical results report is included in Appendix C to Volume 1 of the Engineer's Report.

Additional Groundwater Related Information

Information regarding drainage patterns, overburden and bedrock (i.e., relevant stratigraphic units), groundwater levels, and regional geology in the area of the brine pond site are presented in Sections 4.1.2.1 and 4.1.3.

4.2.1.2 Potential Impacts

The underground storage caverns and brine pond have either been or will be tested and/or designed to, among other things, minimize any impacts to groundwater. Potential impacts that integrity testing and proper well construction of the underground storage wells and caverns are designed to address include ensuring no contact with groundwater zones, maintaining product within the cavern, and avoiding any introduction of surface water into the cavern through the wells accessing the underground storage caverns. Potential impacts that the conservative design of the brine pond is intended to address include impacts from groundwater levels to the operation of the brine pond, potential leaks of the liner system to groundwater, and a release of brine from the pond.

The high sodium chloride levels present in the production brine wastes (31,100 to 417,000 mg/l) could certainly pose a potential threat to plant life and groundwater. Such excessive concentrations of sodium chloride osmotically inhibit the ability of plants to absorb water (Miller, 1978). Therefore, spillage of brine or other waste fluids high in sodium chloride almost always kills vegetation and sterilizes the soil. However, recent research indicates the soil's plant toxicity is short lived due to the northeast's high rainfall and rapid leaching of the sodium and chloride salts. In addition, the brine has high concentrations of calcium and magnesium which have the beneficial effect of increasing the soil pH. Increase in soil pH helps combat the effects of acid rain and increase plant species diversity in the Northeast (Auchmoody, 1986).

4.2.1.3 Proposed Mitigation Measures and Alternatives

Brine Pond

The lower geomembrane liner of the brine pond provides a secondary line of defense against the leakage of brine into the groundwater. In order to document the quality of the groundwater during the life of the pond a series of monitoring wells will be installed. The location of these monitoring wells is shown on Figure 3, "Groundwater Monitoring Well Locations", of the Engineer's Report. The monitoring will consist of collecting groundwater samples from two (2) up-gradient and three (3) down-gradient monitoring wells and, in addition, one (1) well to be located at the pond's south end near the base of the embankment's exterior slope. The up-gradient and down-gradient wells will be screened within the overburden whereas the monitoring well installed at the south end of the pond will be screened within bedrock.The samples from all the wells will initially be analyzed for "Baseline Parameters" per Title 6 NYCRR Part 360 regulations. Based on the test results the owner may petition DEC to reduce the list of analytical parameters to more closely match that of the brine solution, i.e. chlorides and certain other parameters. The groundwater quality will be monitored on a quarterly basis. More frequent groundwater monitoring is recommended in the event a leak in the primary linter system is identified. If the concentration of targeted parameters increases in the down-gradient monitoring wells (but not in the up-gradient wells), steps will be undertaken to further investigate the cause of such an occurrence.

Groundwater monitoring wells previously installed within the footprint of the brine pond will be decommissioned in accordance with the provisions set forth by CP-43: Groundwater Monitoring Well Decommissioning Policy and its addendum, Groundwater Monitoring Well Decommissioning Procedures. Appendix M of the Engineer's Report contains copies of these documents. This work will be performed under the observation of the Engineer-of-Record prior to initiating site clearing.

In addition, the design of the brine pond includes leak detection and monitoring, geomembrane monitoring, brine pond level monitoring and regularly scheduled visual inspections. See Section 4.1.2.3.

Brine Pond Maintenance

In order to mitigate any impact of the brine pond on groundwater quality, the following steps will be taken in regards to brine pond maintenance:

- All embankments shall be mowed twice annually and inspected at this time for rodent holes and wet areas in the embankment, with special attention given to the toe of all embankments. If issues are found during this inspection, an Engineer will be contacted immediately.

- During inspections the interior of the basis shall be observed as well. The inspector shall look for areas of cracking or sloughing, along with any other signs of structural integrity problems.

- All grassed swales shall be inspected every six months to ensure waterway capacity, vegetative cover, and outlet stability is maintained. Vegetation damaged by vehicle or machinery traffic, herbicides, erosion or sedimentation must be repaired promptly.

- The grassed swales shall be inspected following significant rainfall events (greater than one inch). Damaged areas will be filled, compacted and seeded immediately. All sediment deposits shall be removed to maintain the capacity of the grassed waterway.

- The vegetation within the swales will be periodically mowed to maintain capacity and reduce sediment deposition.

- All seeding in the area shall be protected from concentrated flow until vegetation is established.

- All culverts/underground outlets shall be inspected following large rainfall events to ensure the inlet and outlet have not been clogged with debris. Any debris found will be immediately removed.

- The driveways will be inspected annually for adequate gravel cover and grade. Additional gravel will be placed as needed to ensure runoff from the driveways is directed to the swales or drip trenches.

- Sediment shall be removed from the forebay and/or Water Quality Pool when 50% of the design volume remains. If these issues become apparent during an inspection, a contractor will be contacted to remove the sediment. There will be no harmful chemicals in use on site; no testing of the sediment will be required. The sediment may be disposed of on site if adequately spread and immediately seeded.

- An inspection checklist will be utilized on a periodic basis with regard to the brine pond. The frequency of inspection will be once per month between April 1 and December 1, and after any rainfall that exceeds 2 inches in an hour. In addition, there will be routine maintenance of the embankment crest and downstream slope to include mowing of grass cover and removal of tree growth. All trees and shrubs will not be allowed to grow on the embankment.

- In addition to periodic inspections, there will be routine maintenance of the embankment crest and downstream slope to include mowing of grass cover and removal of tree growth.

Underground Storage Cavern Testing

As noted above in Sections 4.1.3.2 and 4.1.3.3, the following mitigation measures are designed to ensure that the Finger Lakes underground storage caverns maintain integrity so that there is no potential impacts to groundwater:

- Periodic Mechanic Integrity Tests
- Periodic Sonar Surveys
- Gamma Ray and Neutron Logging when Sonar Surveys are conducted
- Daily Pressure Monitoring
- Periodic Subsidence Monitoring

4.2.2 Surface Water

4.2.2.1 Existing Environmental Setting

Seneca Lake and US Salt Property

The Finger Lakes project is located adjacent to Seneca Lake. Seneca Lake is a multi-purpose lake located within the Seneca-Oswego River Basin. The lake serves as a source of public water supply for the City of Geneva and the Villages of Ovid, Waterloo, and Watkins Glen. According to a DEC Water Quality Study (2001), trophic conditions within Seneca Lake have declined substantially over the past several decades, as evidenced by marked declines in total phosphorus and chlorophyll a levels, and a substantial increase in water clarity. Furthermore, the lake continues to be well oxygenated throughout the growing season. Major ion trends within Seneca Lake indicate significant declines in chloride and sodium levels, and a smaller decline in calcium levels, as well as increases in sulfate and alkalinity levels. Organic chemical findings from the Seneca Lake sediment core indicate a substantial decline in total DDT levels over the past several decades, but levels remain above the threshold effect level ("TEL"). Sediment core findings indicate a total PCB concentration of 466 ppb (from 4-6 cm sediment depth representative of the late 1970s), which is in the upper range of total PCB levels observed within the Finger Lakes, and is above the TEL and probable effect level ("PEL") for PCBs. Inorganic chemical findings from the Seneca Lake sediment core indicate that arsenic levels are near or slightly above the PEL, although arsenic levels do not show the marked surficial enrichment seen in several of the other Finger Lakes. Subsequent water column sampling within Seneca Lake, albeit limited, has shown no detectable arsenic concentrations above 10 ug/l (analytical detection limit). Cadmium levels within the sediments were stable, and were above the TEL but below the PEL. As with many of the Finger Lakes, calcium concentrations within the sediments of Seneca Lake have increased substantially over the past several decades. Lead levels within Seneca Lake sediments have declined precipitously over the past several decades, and are below the PEL – however, they remain above the TEL. Mercury levels within Seneca Lake sediments have declined by approximately 50 percent over the past 40 years, and surficial concentrations are below the TEL and the PEL for total mercury. Nickel levels within the sediments of Seneca Lake are basically stable over the past half century, and concentrations are above the TEL but below the PEL. (DEC Water Quality Study, p 12)

Seneca Lake is the largest of the Finger Lakes. The lake is approximately 60 km long, 2-5 km wide, 190 m deep and has a surface area of 175 km^2. It contains an estimated 4.2 trillion gallons of water. In 2007, Seneca Lake was the eighth most frequently fished body of water in the state of New York. (Connelly and Brown, 2009)

Seneca Lake is strongly stratified during the summer months — with the upper-most 20 meters (epilimnion) being significantly warmer (20-25°C) and less dense than the bottom layer (hypolimnion, 4°C). The epilimnion and the hypolimnion are separated by a thermocline — or area of rapid temperature change with depth (1°C per meter). As solar radiation decreases in the fall, the epilimnion gradually cools to 4°C. At 4°C, the entire water column is at the same temperature and the lake may overturn (mix). This annual cycle of stratification and mixing cycle has important implications for the brine pond. For example, a brine spill that occurs in the summer may be restricted to the epilimnion. W. F. Ahrnsbrak investigated the trajectory of a salt plume released into Seneca Lake during the summer months and found that this plume sunk to the thermocline (20 m below the surface) but no deeper. See further discussion in Section 4.2.2 below.

The ambient chloride and sodium concentrations in Seneca Lake and several drainage swales are 2 to 10 times higher than the other Finger Lakes. Seneca Lake is reported to have a chloride concentration of 140 mg/L and a sodium concentration of 80 mg/l. One explanation for the high salt concentrations in Seneca Lake relates to the fact that at its northern end, the lake intersects the Silurian salt beds 450 to 600 meters below the ground surface and groundwater discharge brings saline water into the lake. (Wing et al., 1995, Halfman et al., 2006). See Appendix M.

Nearby Water Bodies

Two different Class C tributaries to Seneca Lake and several drainage swales flow through the US Salt property, while the largest parcel is directly adjacent to Seneca Lake. All runoff from this site will enter Seneca Lake. See Appendix M.

Current Drainage Areas and Points

Currently, flows over the affected acreage generally flow to (2) different Class C tributaries to Seneca Lake and several drainage swales which also discharge to the lake.

Municipal Water Supply/Watershed Areas

No municipal potable water supply is located within the project area. The project area is adjacent to Seneca Lake which serves as the potable water intake source for the municipal water supply for the Village of Watkins Glen and the Town of Hector among others. The potable water intake for the Village of Watkins Glen is located at the northern village boundary with Seneca Lake, approximately 2.75 miles south (upstream) of the closest stream outflow point that might contain surface water run-off from the project. The waters of Seneca Lake flow northward and, as a result, this potable water source is upstream from the project. The Town of Hector water system supplies water to parts of the Town of Hector and the Village of Burdett. The Town of Hector potable water intake is located at Smith Memorial Park on the eastern shore of Seneca Lake, approximately five miles north and downstream from the closest stream outflow point that might contain surface water run-off from the project. There are non-public community potable wells for private use located at the US Salt processing facilities just south of the Big Hollow Run outflow (outside the project area) and at three motels located along New York State Route 14 (outside the project area).

The closest potable water intake source utilizing ground water is in the Village of Montour Falls, which has shallow wells in the glacial gravel of the Catherine Creek Valley, approximately four miles south of the project area.

Designated Surface Water Protection Areas

No designated surface water protection areas or sensitive waterbodies are crossed by the proposed project facilities. Seneca Lake, as noted above, is used for municipal potable water supply purposes and has a DEC classification of (AA)(TS) per 6 NYCRR Part 898. The best usage of Class AA waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; fishing. The waters shall be suitable for fish propagation and survival. The symbol (TS) means that the designated waters are suitable for trout spawning. Seneca Lake's water quality classification establishes it as a specially designated surface water protection area.

Aquifers

The proposed facilities do not cross or affect any U. S. Environmental Protection Agency ("EPA") or state designated aquifers. The project will not require excavation within an aquifer.

Wetlands

A federal wetland is located in the northwestern portion of the US Salt property (to the east of the brine pond near the NYS Route 14/14A ramp) but will not be disturbed.

Surface Facility Site (former Former Casella Property)

A wetland delineation was recently conducted on the former Casella property pursuant to the 1987 Corps Wetlands Delineation Manual and 2009 Interim Regional Supplement to the Manual. <u>See</u> Appendix N. As part of the delineation, one perennial stream (that will not be impacted) and one ephemeral swale (which will be culverted as part of the site plan) were identified. In addition, three (3) wetlands were identified, one (1) of which is isolated and therefore not subject to federal jurisdiction, and the other two (2) will be avoided. See Appendix N.

4.2.2.2 Potential Impacts

Surface Facility Site (former Former Casella Property)

The railroad siding will result in an impervious area of approximately 5.2 acres. The area will have drainage swales installed to the east which will direct all runoff to a pond with forebay and extended detention micropool. This pond will outlet to the south and enter one of the swales which currently receives runoff from the site.

The office will have impermeable area of approximately 1.5 acres. Dry swales will be installed below this area to treat the water quality volume with a dry pond that will retain larger storms, ensuring that the runoff rate will not be increased. The drypond will discharge to the ditch located north of the identified wetland.

The railroad runaround track will widen out the existing track and include a set of new drainage swales. The increase in runoff is fairly minimal and will be taken care of utilizing infiltration trenches

Plant Area

The plant area will create a total impermeable area of 4.4 acres. This area will drain to a pond with extended detention treating the water quality volume and ensuring runoff rates are not increased. This pond will discharge to one of the drainage swales currently receiving runoff from the site. Dry swales will treat the runoff from these areas.

Brine Pond

The brine pond area will have steeper slopes; however the pond surface areas will retain all runoff that falls on the surfaces. Overall runoff from the site will actually decrease. During construction a sediment control basin will be installed to ensure sediment is not carried off site. This basin will discharge runoff directly to the Class C tributary running north of the site. In addition, the Stormwater plan calls for installing basins to allow for pumps to dewater the site.

Potential for Brine Pond Release

While the brine pond has been very conservatively designed, the most serious potential threat to the health of Seneca Lake from the proposed project that has been identified to study under the final scope for this dSEIS relates to the highly unlikely accidental release of the contents of the brine pond.[12] This section presents several lines of evidence that demonstrate that a release from the brine pond is unlikely and, should it occur, the impacts to Seneca Lake will be short-term and localized to the area around the release.

- Pond Design – Section 4.1.2.3 of this DSEIS outlines the design, operations, maintenance and contingency measures that Finger Lakes has taken to eliminate potential impacts from the potential failure of the brine pond. Given these measures, the breach of the impoundment is very unlikely.

[12] If the embankment did fail and if the brine pond was completely full, there would not be a release of all of the brine. In the unlikely event of a failure, assuming the worst case scenario, brine would spill down to elevation 811. This would be about 78,430,000 gallons or 1,867,000 barrels.

- Seneca Lake is Well Mixed – Should the proposed brine impound fail, the fact that Seneca Lake is well mixed annually indicates that the negative effects of the released brine will be short-term. As discussed in Section 4.2.2.1, Seneca Lake is strongly stratified during the summer months (Halfman 1999). As solar radiation decreases in the fall, the epilimnion gradually cools to 4°C. At 4°C, the entire water column is at the same temperature and the lake will mix (fall turnover). This cycle (stratification followed by turnover) can also occur during the winter/early spring as surface water cools to below 4°C in the winter and returns to 4°C in the spring (spring turnover). Additional mixing occurs within the epilimnion over shorter time periods (hours/days) in response to wind and current-induced internal waves (referred to as seiche activity). Seiche activity can cause the depth-to-thermocline to change from 20 m to 50 m over the course of two or three days (Halfman 1999). This rate of change indicates considerable mixing within the epilimnion.

- Mass Balance Model (Entire Lake) - Finger Lakes used a mass balance model to predict the concentrations of sodium and chloride that would result from an instantaneous release of over 80 million gallons of brine into Seneca Lake. The assumptions of this model were as follows:
    - Instantaneous release of over 80 million gallons of brine;
    - All brine reaches the lake;
    - Seneca Lake contains 4.2 trillion gallons of water;
    - Brine is 25% sodium chloride (by weight);
    - The temperature of the release brine is 15 °C;
    - Uniform mixing between liquids; and
    - No density or temperature-related stratification of brine within the lake.

  The results of this mass balance model predict that a breach of the brine impoundment would increase the lake-wide sodium and chloride concentrations by 2-3% or 2.4 mg/l for sodium and 3.6 mg/l for chloride. Added together with the background concentrations described in Section 4.2.2.1, total concentrations of chloride and sodium are predicted to be 144 mg/l and 82 mg/l respectively.

  USEPA indicates that freshwater aquatic organisms should not be negatively affected if the four-day average concentration of dissolved chloride, when associated with sodium, does not exceed 230 mg/l more than once every three years on average and if the one-hour average concentration does not exceed 860 mg/l more than once every three years on average (USEPA 1988). The lake-wide chloride concentration predicted from this simple modeling effort (144 mg/l) is considerably less than both of these USEPA standards.

- Mass Balance Model (Epilimnion Only) – While the above-described model adequately predicts the lake-wide concentrations of chloride and sodium once the contents of the brine impoundment are well mixed with the entire lake, this model makes an assumption that may not be true if the breach occurs during the time of year when the lake is stratified. Finger Lakes conducted another mass balance model to address this condition.

This model used the above-listed mass balance assumptions with one exception - the release brine was restricted to the epilimnion due to lake stratification. In the scenario, the epilimnion was defined as the top 20 m of the lake (a conservative [concentration increasing] assumption as the depth-to-thermocline can vary from 20 m to 50 m over the course of days).

The results of this "epilimnion only" mass balance model indicate that the release of over 80 million gallons of brine would contribute 9 mg/l of sodium and 14 mg/l of chloride to the epilimnion. Added together with the background concentrations described in Section 4.2.2.1, total concentrations of chloride and sodium are predicted to be 154 mg/l and 89 mg/l when the released brine is well mixed within only the top 20 m of the lake. This predicted chloride concentration is still well below the USEPA (1988) values of 230 mg/l for long-term exposure and 860 mg/l for short-term exposure.

- <u>Concentration Gradient from Point of Release</u> – Both of the above-described mass balance models assume that the released brine will be instantaneously mixed throughout the entire area under evaluation (whole lake or epilimnion). In reality, until mixing occurs, there is likely to be a gradient of brine concentrations with higher concentrations located in the sensitive shoreline areas that are proximal to the point of release. Brine concentrations in these areas could be in the range of 35,000 to 50,000 mg/l. The size of this area of elevated brine concentrations is unknown but is likely to exceed 1 km. This conclusion is drawn from the evidence presented in Ahrnsbrak (1974) who investigated the trajectory of a salt plume released into Seneca Lake and found that the plume retained its identity to a distance of 1 km from the point of origin.

  Most freshwater fish have not evolved the physiological mechanisms to cope with salinities this high. Freshwater fish have been shown to exhibit avoidance behavior when confronted with increased salinity; however, in the short-term it is possible that some fish will suffer mortality despite this avoidance behavior. Sessile and slow moving organisms within areas of high brine concentrations are more likely to suffer mortality.

- <u>The Fate of Brine in the Environment</u> **–** While it is true that sodium and chloride are very conservative ions (i.e., resistant to degradation), these ions have two characteristics that make their presence less damaging than many chemicals that are accidentally released into the environment. Sodium and chloride are not likely to adhere to the sediment or aquatic biota and these ions do not bioaccumulate in aquatic organisms or biomagnify through the food chain. Thus, in the event of a release, these characteristics indicate that simply gently flushing the affected area with fresh water will facilitate the mixing of the released brine and bring about a reduction in brine concentration.

The evidence provided in Section 4.1.2.3 (pertaining to impound design) indicates that a breach of the brine impoundment is an unlikely event. In addition, the evidence provided in this section indicates that injury to Seneca Lake is likely to be localized and short-term should this unlikely event occur. Seneca Lake is well mixed over daily and annual time frames and the chloride and sodium ions have aquatic fate characteristics that will not impede this mixing. Once totally mixed with the entire lake, the sodium and chloride concentration from a hypothetical release of brine would increase the overall concentration of these ions by 2-3%. When added to the existing ion concentrations, the predicted total is well below the USEPA chloride standard.

Pipeline

The pipeline areas will be maintained as rights of way. Runoff after construction will not increase. Waterbars shall be left in place until the right of way seeding is established. The waterbars may then be regraded and reseeded.

4.2.2.3 Proposed Mitigation Measures and Alternatives

To protect surface waters, Finger Lakes will implement the mitigation measures described in its Spill Prevention, Containment and Countermeasure Plan, Stormwater Pollution Prevention Plan (see Appendix H), and as set forth below.

Storm Water Pollution Prevention Plan

Construction activities will disturb greater than 1.0 acre and therefore under the DEC State Pollutant Discharge Eliminations System ("SPDES") regulations, Finger Lakes must comply with the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-08-001 ("General Permit"). In accordance with the General permit, a Stormwater Pollution Prevention Plan ("SWPPP") has been prepared for the project to comply with the General Permit and in conformance with DEC technical standards for erosion and sediment controls and also water quality and quantity controls.

Since the sites are currently undeveloped, there is no storm water conveyance system in place. In general, the runoff from all of the sites proceeds to the east. Runoff from the surface facility currently enters several small drainage ditches. Approximately 2/3 of the area drains towards the existing wetland while the remaining area flows to the east and eventually enters the stream to the south of the site (tributary to Seneca Lake – Class C). Runoff from the surface facility office area flows to the east and enters the federal Wetland. The wetland eventually discharges to a Class C tributary to Seneca Lake located north of the site.

The plant area also flows to the east and eventually splits to the north and the south. The area to the north enters the same tributary as the runoff from the rail siding area while the area to the south enters a drainage way that discharges into the lake. All pipelines on the properties also enter class C tributaries to the lake.

The brine pond area drains to the east through several small drainage swales, some of these swales discharge to the same class C tributary that receives the runoff from the rail siding office, while the remaining swales discharge directly to the lake.

The objective of the stormwater management system is to have a runoff quantity (rate) equal to or less than pre-existing conditions by use of stormwater ponds, dry swales, and extended detention. In addition, the quality of the runoff will be maintained by directing small runoff volumes through dry swales and dry ponds and directing larger volumes through ponds with extended detention. Runoff from above the affected areas will be diverted around the planned projects, ensuring that the quality of this water is maintained. Outlet protection will also be located at the outlets of all culverts and basins.

During the summer of 2009 a SWPPP was developed for the Finger Lakes project as envisioned at that time. This original stormwater plan covered a railroad siding and associated offices, a plant area, a pipeline, and a two celled brine storage facility. This plan was completed and the Notice of Intent was signed and mailed on August 20, 2009. An Acknowledgement of Receipt was received from DEC with permit NYR10R595 coverage effective 5 business days after August 24, 2009. See Appendix E. In conjunction with this original authorization a request to disturb more than 5 acres was submitted to DEC on August 21, 2009. After review of the plan by DEC's stormwater management specialist, and minor plan modifications, approval for disturbance was received on September 15, 2009 from DEC.

Following original plan approval, Norfolk Southern required that a runaround track be installed north of the site to allow for delivery of rail cars into the siding. In addition, the brine pond design was refined and, in the interest of safety, modified to a single cell. To accommodate these changes, Revision 1 to the stormwater plan was completed in June of 2010. This revision was reviewed with DEC's stormwater management specialist and received approval; a revision document was generated and supplied to the DEC stormwater management specialist.

Between June of 2010 and February of 2011 additional changes were made to the site plan by Finger Lakes. These changes included the removal of the electrical switch yard and substation (since electric has been provided by NYSEG from existing transmission and distribution lines) as well as the addition of a truck staging area. The stormwater practices associated with the electrical infrastructure were removed from plans. Modifications to the office area stormwater plan and addition of stormwater practices to serve the staging area were made. These modifications were reviewed with DEC's stormwater management specialist and revision 2 to the stormwater plan was submitted on March 4, 2011. All SWPPPs are contained in Appendix H.

Spill Prevention Containment and Countermeasures (SPCC) Plan

A Spill Prevention Containment and Countermeasures (SPCC) Plan has been developed to comply with State and Federal environmental regulations to prevent unplanned discharge of hazardous liquids to the environment. Its implementation shall be coordinated with the Best Management Practices set forth by the facility. The SPCC Plan will be kept on site and implemented immediately if necessary.

The following list of products may be stored within the plant or work areas. Other products and wastes may be stored in smaller containers within the plant or work areas. All tanks must be labeled per United States Department of Transportation (DOT) or National Fire Protection Agency (NFPA) requirements.

Product	Container Type	Comments
Diesel Fuel	300 gallon, steel, above ground storage tank	In secondary container
Gasoline	300 gallon, steel above ground storage tank	In secondary container labeled “Gasoline”
Ethyl Mercaptan	300 gallon, steel above ground tank	In secondary container

All containers of hazardous liquids in excess of ten (10) gallons in size must have secondary containment or be stored in a manner that controls escape from the storage shelf. The secondary container must provide 115% of volume of indoor/sheltered containers and 125% of volume for outdoor/non-sheltered containers. Under normal operating conditions, inspect each container for leaks, dents, cracks, etc. weekly. Ensure that each container is properly stored. Complete a SPCC Inspection Report. Under wet conditions, the secondary container will be checked for fillage.

Upon inspection, if leakage is possible or has occurred from a tank, drum, piping, valves, fittings, etc., the container or equipment must be immediately repaired replaced or usage discontinued until repaired or replaced.

Fire extinguishers must be placed in a conspicuous manner. Spill response material will also located in the plant area.

Hazardous wastes are not expected to be generated during operations of the Finger Lakes facility. If hazardous wastes are generated (e.g., cleansers for equipment), the Plant

Superintendent will be notified immediately to ensure that the appropriate state and federal agencies are notified and all necessary permits are secured. In any case, hazardous wastes will be handled in accordance with federal and state regulations. Hazardous waste will not be stored in excess of 90 days. Hazardous waste containers must be compatible with the waste and structurally sound. Containers must be closed during storage and handled in a manner to prevent rupture or leakage. Ignitable or reactive wastes must be stored away from materials that could cause ignition or reaction and 50 feet from the facility's property line. Spills must be contained, cleaned-up and materials properly disposed. A storage container holding a hazardous waste that is incompatible with other materials in the area must be separated from them by a dike, berm, wall or other device.

In addition, incompatible products or wastes will not be mixed together in tanks, piping and containers. Tanks, piping and containers must be thoroughly cleaned between usage of incompatible products and wastes.

As a further precaution, hazardous materials, chemicals, fuels and lubricating oils will not be stored within 100 feet of stream banks, wetland boundaries, or within a 200-foot radius of all private wells and a 400-foot radius of all municipal or community water supply wells. Refueling of construction equipment and performance of concrete coating activities shall not take place within 100 feet of stream banks or wetland boundaries, or within a 200-foot radius of all private wells and a 400-foot radius of all municipal or community water supply wells. However, refueling of water pumps used for trench dewatering or hydrostatic test pipe filling can be performed within 100 feet of stream banks and wetland boundaries as long as the pumps are set inside a temporary dike constructed of hay bales and tarp which will collect spillages of fuel if that may occur.

In the unlikely event a spill does occur, certain procedures will be followed. These include the following:

1. Identify the character, source, amount and area affected by the situation.
2. Assess the danger to the employees and environment.
3. Shut off/Stop the source of the spill if possible.
4. Notify Superintendent and request assistance.
5. Using spill response material, prevent the spill from spreading.
6. NOTIFY GOVERNMENT AGENCIES AND EMERGENCY SERVICES, IF NECESSARY OR LEGALLY REQUIRED.
7. Clean up spill.
8. Place material in a container for disposal in an approved landfill.
9. Reorder replacement items used from spill kit.
10. Complete an Environmental Incident Report within one day of the incident.
11. Incidents involving hazardous wastes require submittal of a written report within 15 days to the EPA and DEC.

Certain areas of the facility (e.g., any tanks, unloading areas, pump locations, hose connections) will be periodically inspected or monitored for leaks to prevent emergency situations (i.e., leaks, spills, fire, explosions). Any problem areas will be identified and correction dates must be documented on the SPCC Inspection Report, signed by the Emergency Coordinator, and retained on site for a period of three years.

These inspections are part of the overall good housekeeping practices that will be employed to reduce the possibility of spills and safety hazards. Product and waste containers must be stored in an orderly manner with adequate aisle space, floors must be kept clean and dry. Spills must be promptly cleaned up. Garbage must be picked up and disposed of regularly.

The plant area will be secured when not manned. Traffic patterns will be controlled and tanks, piping, drums, etc. will be adequately located away from roads. Artificial lighting is installed within the plant area.

In order to properly implement all of the above, Finger Lakes' Emergency Coordinator or his designee will make available Material Safety Data Sheets for chemicals used and assist personnel in proper handling of hazardous materials and wastes. The Emergency Coordinator assists in spill response and disposal procedures. Employee training is accomplished by on-the-job training and special training sessions. All personnel will be instructed spill prevention and countermeasure plans and procedures.

Brine Pond

In addition to the brine pond line repair and replacement procedure described in Section 4.1.2.3 above, in the highly unlikely event of a serious breach of the brine pond such that brine needs to be removed expeditiously from the pond, the following operational procedure will be implemented to effectuate a large-volume emergency drawdown if the breach occurs at a time the caverns are full of LPG:

1. The leaked brine will be collected in the 5,000 gallon holding tank and pumped back into the pond. There will be

4 separate lines connected to the holding tank from the pond leak detection piping.

2. After review, and if it is determined the pond has to be emptied to repair, brine will be pumped to the US Salt brine pond and used for the salt manufacturing process. Brine will also be injected into the storage cavern to withdraw product to rail, truck or pipeline.
3. The drawdown of the pond will be monitored at the holding tank to ensure pumping returns to pit are sufficient and monitor if brine level is lowered below leaking area.
4. When the leak level is determined, the operation to lower the pond level can be stopped and repair procedure can completed.

In such a scenario, there would be no need to flare or otherwise dispose of the LPG. If product needed to be withdrawn from the caverns because of customer demand after the brine pond was drained (for repairs) or a release occurred, the product would be withdrawn and sent to the pipeline or to rail cars. As the owner of US Salt, Inergy Midstream would ensure that its wholly-owned subsidiary, Finger Lakes, had sufficient brine to inject into the caverns to displace the product as necessary.

4.3 NOISE IMPACTS

4.3.1 Existing Environmental Setting

Introduction

Hunt Engineers performed a sound study in connection with Finger Lakes' proposed LPG storage facility located on New York State Routes 14 and 14A in Watkins Glen, Schuyler County, New York. The sound analysis consisted of evaluating the impact sound from equipment would have on various receptors near the proposed site. The evaluation followed the recommended procedure as stated in the DEC's Program Policy DEP-00-1, Assessing and

Mitigating Noise Impacts (DEC Noise Policy), First Level Noise Impact analysis. The Sound Study, revised as of May 2011, is attached as Appendix I.

Evaluation Procedure

In order to adequately evaluate any potential impacts, the noise generation from the proposed equipment had to be determined. The DEC recommends that the level of noise generation be obtained from the equipment manufacturer specifications, or by measuring existing similar equipment (DEC Noise Policy p. 17). At the future site there are three potential sources for noise impacts. They are the activities associated with the truck and railroad unloading site, off of NYS Route 14A, the electric brine pumps near the NYS Routes 14 and 14A interchange and the electric injection pumps located next to NYS Route 14 (See Figures 1 and 2 of Appendix I). For evaluating the noise impact associated with the pumps, manufacturer's specified data was used.

For the gas loading and unloading process, measurements were taken from a similar facility located in Savona, New York (Savona Site), owned by Inergy Midstream, parent company of Finger Lakes LPG Storage. In considering the various activities on site, the noise produced by the train engine moving around tank cars has the greatest possibility for an impact to daytime ambient levels. This activity will typically occur daily for approximately 2 hours in the afternoon. The rest of the site activities include truck movements and pumps that will sometimes operate during the night. In order to correctly measure these sounds, levels were obtained from the existing facility during all processes. The measured levels were then compared to ambient sound levels measured in and around various receptor locations in and around the proposed site.

To form a basis of comparison the ambient levels were obtained at the proposed site. The levels were obtained by measuring the equivalent sound over a one hour long period. These measurements were taken during the daytime at seven different receptors and at 2 receptors during the nighttime to estimate the nighttime ambient levels. Daytime levels were taken during lighted hours, constant with higher traffic and activity. Nighttime levels were taken after dark, consistent with lower traffic and activity. The proposed levels were then compared to measured and estimated levels, to evaluate any undesirable impacts.

Existing Site Sound Measurement

On January 5, 2011, sound level measurements were taken of the entire railroad car exchange at the Savona Site. Sounds levels were taken from 10:00am to 12:30pm. During this time, activities occurring at the Savona Site including unloaded train engine movements, maneuvering of tank cars and coupling of tank cars. These train movements are similar to what is expected to occur at the proposed Finger Lakes rail terminal. On May 12th, 2011, additional measurements were taken at the Savona Site of the truck and compressor noise production. The levels were measured using a handheld noise meter (EXTECH INSTRUMENTS Digital Sound Level Meter model 407736), the meter was set for slow response on the "A" Weighted Setting. The meter was placed at 4.5 feet off of the ground pointed towards the noise source, at a distance of 50 feet and 800 feet. The meter was covered by the provided wind screen. The weather was overcast with minor flurries, approximately 25 degrees, with an estimated wind speed of 5 mph. On May 12, 2011, the temperature was approximately 67 degrees, with an estimated wind speed of less than 5 mph. These measurements can be seen in Table 1 in Appendix B of the Sound Study, which is contained in Appendix I of the DSEIS.

On January 5, 2011, the ambient sound level at the Savona site was measured at 10:00 am prior to any train movement activities. The train activities were performed from 10:15 am to 12:15 pm. The maximum recorded level was 88.9 dB(A) and was caused by the train engine. For the duration of the train activities, the equivalent sound level was 76.1 dB(A). On May 12th, the ambient sound level at the Savona Site was measured at 8:00am prior to any train or truck movement activities. The truck activities were performed from 8:30 am to 9:00am. The truck noise consisted of primarily idling, braking, and back up alarms (since the Savona Site is not configured to allow for flow through traffic movements). The truck noise had an average sound level of 71.3 dB(A) and a maximum of 79.2 dB(A). The compressor (used to unload LPG into the bullet tanks) sound was measured from 9:10am to 9:40am and had an average sound level of 73.6 dB(A) and a maximum of 77.8 dB(A).

These levels are an accurate representation of the noise generated from the equipment because the difference between the maximum and the ambient is greater than 10 dB. As described in the DEC Noise Policy, differences greater that 10 dB between sounds will result in there being no additive effect to the larger of the sounds. In assessing the noise impact at the future site, the average sound levels created and the maximum sound level were used.

Future Site Sound Measurement

On May 12, 2011, ambient sound levels for daytime and nighttime were taken in and around the proposed site for the Finger Lakes LPG storage facility. Sound levels were measured at 7 receptor locations, 5 at the truck and rail loading facility, and 2 near the pumping locations. These receptor locations are shown on Figures 1 and 2 in Appendix A. The levels were measured using a handheld noise meter (EXTECH INSTRUMENTS Digital Sound Level Meter model 407736), the meter was set for slow response on the "A" weighted setting. The meter was placed at 4.5 feet off of the ground. The meter was covered with the provided wind screen. The weather was clear, approximately 75 degrees, with an estimated wind speed of 5 mph. These measurements can be seen in table 2 in Appendix B.

For the daytime, the ambient sound levels were recorded at all of the receptor locations to gain perspective of the ambient sound levels throughout the proposed area. These locations included residences, property borders, a hotel and a cemetery, which are shown on the attached mapping. It was found that the average (Leq) sound levels ranged from 54.0-63.1 dB(A), and the maximum sound levels were 73.9-85.0 dB(A). The higher measurements were found near the highways as a result of moderate traffic flow including some larger semi-trucks.

For the night time, ambient sound levels were taken at Receptors #1 and #6. The measured levels were then used to estimate the levels at the remaining receptors. At receptor #1 the ambient night time levels was found to be a decrease of 1.2 dB(A) over the day time level. Although the traffic levels decreased, natural sounds such as crickets and tree frogs limited the decrease in sound levels. This decrease was applied to receptors #2 to #5 as an estimate, due to similar environmental characteristics. At Receptor #6 the nighttime levels had a decrease of 6.0 dB(A). This was the result of a significant decrease in traffic. This decrease was applied to Receptor #7, due to similar environmental characteristics.

4.3.2 Potential Impacts

Sound Impact Evaluation

In order to evaluate the effect the sound from operations will have on the receptor locations, the DEC Noise Policy recommends using the inverse square method. Using this method the sound level is decreased by 6 dB for every time the distance from the sound source is doubled, greater than 50 feet, this is demonstrated in Graph 1 of the Sound Study. At each receptor location the effective sound was calculated and compared to the ambient sound levels. This data for the resulting sound levels can be seen in Table 3 in Appendix B of the Sound Study.

During the day time hours the greatest overall contribution to sound levels will be train noise. As shown in Table 3 of the Sound Study, the equivalent noise levels produced by the train would have no adverse impacts towards the ambient noise levels at receptors #1, #3 and #4. The levels that would be seen at Receptor #2 and #5 exceed the ambient level by less than 5 dB(A). According to the DEC Noise Policy, sound level increases of 0-5 dB(A) can be unnoticeable to tolerable. Maximum levels will be noticeable at the receptors however they do not exceed the existing maximum levels. It can be expected that maximum levels of sound produced by the train will not have any effect on receptors located more than 800 feet away from the source. This conclusion takes into account the decibel reduction only using the inverse square method and is validated by the measurements taken at the Savona site, seen in Table 1 in Appendix B of the Sound Study.

If the additive effect of the sound from the train and other sources is taken into account, this would result in an additional 2 dB(A) increase in the perceived sound. This would result in the sound at receptor #2 reaching the range of being intrusive. If the equipment were to operate simultaneously this would not cause any adverse impacts on the receptor as it is located on the border with a truck repair shop and a shop environment can see sound exceeding these levels.

For the night time hours, the facilities would have noise produced by trucks and compressors. This noise would cause an increase in the existing ambient levels at Receptors #2 and #5 by less than 2 dB(A). This increase would be unnoticeable to tolerable as stated by the DEC. The maximum levels would once again exceed the ambient levels, but would not exceed the existing maximum levels.

For the brine pumps, the manufacturer specifications give an operational sound level of 81.5 dB(A). The closest sensitive receptor to the pumps is a hotel located 900 feet away. The sound level perceived at the hotel border would be 56.5 dB(A) using only the reduction allowed under the inverse square method. This is lower than the ambient levels at the hotel during the day time and is 0.8 dB(A) higher than the estimated night time levels. This would not cause any adverse impacts.

The injection pumps could have an impact on both Receptors #6 and #7. As shown in Table 3, the injection pumps would result in a sound level of 67 dB(A) at Receptor #6 and 61 dB(A) at Receptor #7. For the cemetery, Receptor #6, this exceeds the daytime levels by approximately 2 dB(A) and 10 dB(A) for the nighttime levels. At receptor #6, the Injection pumps would result in an increase of 5.3 dB(A) for the nighttime ambient levels. The night time levels at the cemetery are to the point of being intrusive, however the cemetery is not a sensitive receptor at night. The increase over the estimated night time levels at the hotel could be intrusive as this is a sensitive receptor at night. To decrease the noise levels from these pumps at the receptors, mitigation methods being employed included an enclosure and earthen berms. These would result in an approximate 10 decibel reduction.

In addition to the above, it should be noted that Jake brakes and backup alarms (back up alarms may be used by construction equipment, but this will only be temporary) will not be used on the Project site locations (truck/rail facility or US Salt property). The truck/rail facility site plan has been revised so that no turn around movements from the truck staging area are necessary before trucks waiting in the staging area can move into position to be loaded.

In terms of engine noise, trucks that are in the process of being filled do not have their engine on and otherwise trucks that are waiting in the truck staging area cannot, under applicable DEC regulations (6 NYCRR Part 217-3), have their engines idling for more than 5 minutes. To enforce this regulation, Finger Lakes will post signs reminding truck drivers who are on site for LPG loading to stop their engines after a maximum of 5 minutes.

4.3.3 Proposed Mitigation Measures and Alternatives

At the proposed site, the majority of activities would not cause objectionable increases to the existing ambient sound levels. The injection pumps without consideration for distance attenuation and proposed mitigation could result in an adverse impact on one receptor without mitigation. With the proposed building enclosure and berms around the injection pumps, the sound levels would be decreased to an unnoticeable level, as an enclosure can result in a decrease of 10 dB(A). The proposed development also has proposed earthen berms at the brine pumps. This combined with the natural vegetation of the area (which has not been taken into consideration in terms of additional attenuation or noise reduction) can be expected to decrease the sound levels further.

It should be noted that the proposed site is located next to a state highway and an operational railroad. The DEC allowable noise limits for heavy motor vehicles permits sound levels up to 90 dB. Also, railroad traffic could be expected to produce sound levels equal to or exceeding the measured train noise. Therefore the site in its current state will experience sound levels, which exceed the proposed levels, due to highway traffic and railroad activity.

Given that the conservatively modeled noise levels generated by the facility do not exceed the maximum ambient noise levels to a degree considered intrusive, combined with mitigation efforts, it can be concluded that there will not be adverse impacts on the surrounding area ambient sound levels.

To verify that this is a valid conclusion, sound monitoring will be performed at the developed site after operations commence. Finger Lakes' parent, Inergy, and its affiliates, has on a number of FERC projects performed post-operational noise monitoring to determine whether the predicted noise levels are as expected. For the LPG storage facility in the Town of Reading, Finger Lakes will perform confirmatory sound surveys which it will then submit to DEC as follows:

- Within sixty (60) days after the commencement of the first injection season, Finger Lakes shall perform a confirmatory sound study, consistent with the methodology and locations utilized in the revised sound study described in this DSEIS. Finger Lakes will ensure that sound samples of the same duration in the revised sound study (i.e., 1 hour) are taken at same receptor locations and during a time when (1) rail operations are occurring; (2) injection is occurring into the caverns and the electronically driven injection pumps are being used.

- In addition, within sixty (60) days after withdrawal from the caverns starts occurring, Finger Lakes shall perform a confirmatory sound study, consistent with the methodology and locations utilized in the revised sound study. Finger Lakes will ensure that sound samples of the same duration in the revised sound study (i.e., 1 hour) are taken at the same receptor locations and during a time that (1) truck loading operations are occurring; and (2) rail car loading operations are occurring.

- If the noise attributable to these operations exceeds 65 dBa or the measured ambient noise levels by more than six (6) dBa Leq[13] if the ambient is greater than 65 dBa, then the confirmatory sound study shall include recommendations for further mitigation which may include additional barrier attenuation, additional plantings, muffling, etc. In such a case, a second confirmatory sound study shall be conducted focusing on the specific receptor where there was an exceedance of the predicted sound levels to ensure the effectiveness of the additional mitigation measures.

Finally, it should be noted that, in connection with the Department's recent environmental review of the Savona Site, the Department concluded that noise related to railroad car switching/movement on-site will take place periodically as LPG shipments are received or loaded. However, it continued, similar railroad activities already occur at the present time. Therefore, DEC concluded in that situation, long-term operational noise at the facility should be minimal and not present a significant adverse impact to the immediate surroundings or the local community. The same can be said with regard to the Finger Lakes rail operations (similar rail operations are conducted at the nearby Cargill's Salt Manufacturing in the Village of Watkins Glen).

[13] The six (6) decibel increase is conservative given that, according to the DEC noise guidance, "[a]n increase of 10 dB(A) deserves consideration of avoidance and mitigation measures in most cases." DEC Noise Policy, p.13.

4.4 TRAFFIC AND TRANSPORTATION IMPACTS

4.4.1 Existing Environmental Setting

4.4.1.1 Vehicular Access to Finger Lakes Facilities

The Facility is accessed by NYS Routes 14 and 14A. The proposed facility includes an underground liquid petroleum gas storage facility which will be loaded to rail, trucks or directly to a major pipeline in the area for distribution. The underground storage caverns are located on US Salt property that is accessed via NYS Route 14 using an existing driveway. No driveway improvements are necessary at this location. The brine pond and Plant Area will also be accessed via this driveway.

GTS Consulting conducted a review of the potential traffic impacts associated with the proposed Finger Lakes LPG Storage facility in the Town of Reading, NY. See Appendix J. GTS focused on the new access to the surface facility on NYS Route 14A, since this is the location where truck traffic will be exiting. No additional traffic, other than operator cars, are expected to access the part of the facility off of NYS Route 14 (the Plant Area and brine pond) except during construction.

Existing traffic volumes on Route 14A passing the site were obtained from NYSDOT. The traffic counts indicate an average daily traffic volume of approximately 2,340 vehicles passing the site on Route 14A, evenly split between the northbound and southbound directions. The hourly count breakdown indicates that the traffic volumes are typically less than 100 vehicles per hour in each direction over the course of the day. This would indicate an average volume of traffic passing the site of 1-2 vehicles per minute in each direction. (See Appendix J)

A site visit was conducted on December 21, 2010 to evaluate existing sight distances for the proposed driveway to ensure safe operations entering and exiting the site. Table 2 in the Traffic Report (Appendix J) and set forth below provides a summary of the recommended sight distances along Route 14A from the AASHTO "*A Policy on Design of Highways and Streets*" as well as the available sight distances based on field measurements.

Table 2

Sight Distance Summary				
Location	**Speed Limit**	**Direction**	**AASHTO Recommended Site Distance**	**Available Sight Distance**
Northbound @ Route 14A	55 mph	Looking Left Looking Right	530 feet 610 feet	670 feet 1.270 feet

The site distance looking west on Route 14A is limited by the sag vertical curve under the railroad bridge. The measured sight distance is what is available for a small car to see a small oncoming car on Route 14A. The sag vertical curve causes an oncoming car to "disappear" for approximately 1 second at the 670 foot distance noted in the table. The vehicle would actually be visible for an additional 300- 400 feet before the bottom of the sag curve. The sight distance for trucks exiting the site, with drivers sitting higher in their vehicles, will be approximately 1,100 feet with no loss of sight at the bottom the sag curve. The site distance looking east on Route 14A is limited by the horizontal curvature in the roadway dropping away to the south.

4.4.1.2 Rail

The Finger Lakes facility will be receiving propane and butane by rail cars to be used for offloading into onsite above ground storage tanks which will be used to load tractor trailer transports and also for injection into the underground storage caverns. A description of the rail car unloading process is contained in Sections 2.1 and 4.4.2. The Norfolk Southern (NS) railroad will be servicing the facility. NS will deliver loaded and empty tank cars to the facility depending on the season. Finger Lakes will receive loaded tank cars in the summer months, April to September and empty tank cars from September to March. These months are considered the injection and withdrawal months. Railcars will pass over the Watkins Glen Gorge Bridge, a trestle bridge that is located in Watkins Glen State Park. Currently, freight traffic on this same line going over this bridge contains all aspects of freight, including coal, sand and other liquids.

NS is one of the nation's premier transportation companies, operating the most extensive intermodal network in the East. Its Norfolk Southern Railway subsidiary operates approximately 21,000 route miles in 22 states and the District of Columbia, serves every major container port in the eastern United States, and provides efficient connections to other rail carriers. It is regulated by the Surface Transportation Board and the Federal Railroad Administration ("FRA"). Classified as a Common Carrier, NS is required by federal law to provide transportation service upon reasonable request for any of the more than 1,200 commodities listed in the Standard Transportation Commodity Codes ("STCC") between shippers, receivers and connecting rail lines across the Finger Lakes Storage rail system. Cargos, volumes and routings are ever changing. Its product mix is made up of coal, ores, agricultural products, metals, construction products, chemicals, paper and forest products. As an experienced and well known rail common carrier, NS will do all the switching in and out of the facility with their locomotives and their own crews. For 21 years in a row, NS employees have won the E.H. Harriman Memorial gold medal award for achieving the rail industry's lowest employee personal injury ratio. The award takes into account the volume of work performed, as well as the number of fatalities, injuries and occupational illnesses reported to the Federal Railroad Administration.

As noted above, historically the track to be utilized by the Finger Lakes Storage facility (Corning Secondary) has seen all manner of freight. It is a FRA Class 2 track with a maximum allowable operating speed for freight trains of 25 miles per hour. Per FRA requirements, track inspections are made weekly. New York State safety data obtained from the FRA shows that between 2000 and October 2010, Norfolk Southern trains have not been involved in any accidents that resulted in a release of hazardous materials. Currently, an average of 3 trains runs north and south on a daily basis in the vicinity of Watkins Glen.

4.4.2 Potential Impacts

Vehicular Traffic

Two truck loading bays will be built on the surface facility site off of NYS Route 14A with the capacity to load up to 30 trucks per day over the 4am-8pm daily operation. See Figure 2 Site Plan. Approximately 8-10 employees are expected to be working on the site when open for truck loading. The site is expected to operate between the hours of 4:00am and 8:00pm. Access to the site is planned via one full access driveway to Route 14A, approximately 700 feet northwest of the crossover connection to Route 14.

For this type of facility, there is no direct schedule for tanker truck arrivals. Any trucks that arrive when the facility is closed will be provided ample space on the site to park and queue. Any trucks arriving when the site is open will be directed to the loading bays and processed.

Given the operational window of 12 hours, approximately 4, but no more than 5 trucks are expected to arrive or depart in any given single hour. An additional 8-10 vehicles will be expected to arrive in the morning before the site opens and exit in the evening when the site closes.

Traffic generated by the site will be minimal with less than 15 vehicles expected to enter or exit the site in any given hour. This equates to approximately 1 vehicle every four minutes entering or exiting the site.

Given the low existing traffic volumes on Route 14A, along with the minimal traffic volumes expected to be generated by the site, there are no concerns with availability of gaps in traffic to turn in or out of the site. There are also no concerns with traffic volume capacity for the proposed stop controlled site driveway. See Appendix J.

The traffic study prepared for this DSEIS concluded that the additional traffic generated by the proposed Finger Lakes LPG Storage facility is negligible and will generally not be noticeable to existing motorists or residents in the area. Any hourly increase in truck traffic will also be negligible with no more than five trucks per hour expected. Trucks will likely use the crossover to the east to access Route 14, which is an established existing truck route in the area. Existing traffic volumes on Route 14A are low with less than 100 vehicles per hour in either direction which provides excess capacity to accommodate the minor increase in traffic expected. There are ample available sight distance lines in both directions from the site driveway along Route

14A which will provide for safe ingress and egress from the site. There are no adverse impacts to traffic operations expected in the area.

The minimal level of traffic set forth above is not expected to cause any congestion or impair vehicular safety. There will also be construction traffic, but this will only last approximately 6 months while the Facility is being constructed. The Plant Area and Rail/Truck Area will have parking and this is shown in the drawings submitted with this application. The site plan has also been developed to allow for a truck staging area on the site to avoid even the potential that trucks could stage on NYS Route 14.

Train Operations

NS will bring tank cars up from their switching yard in the Corning, NY area to the Finger Lakes facility by coming up their rail line north to Watkins Glen on the way to Geneva. The maximum speed limit on that line is 25 MPH. When the train arrives at the facility the engine will slow to a few MPH. A switch list will be given to the train conductor which will notify him and his crew of which rail cars need to be switched in and out of the facility. Typically, the loaded rail cars arrive at the site during the injection season.

The normal process for switching will be as follows. A northbound train (Geneva Turnaround) from Corning will typically have 24 cars in addition to the 32 Finger Lakes cars it will be transporting. The maximum number of cars that will be on the same train would be 72 cars. All cars will pull north of Abrams Road[14], clear the Abrams Road crossing and stop just south of the switch at the Finger Lakes Terminal. The engine will disconnect from all of its cars except for one car (called a buffer car) as required under FRA regulations. The engine and the buffer car will then travel past the switch at the Finger Lakes Terminal, move the switch and then back into and connect to Finger Lakes' outbound rail cars that are located on the four sidings (up to 32 cars).[15] The engine, buffer car and the outbound cars will move north on the main line to the north end of the run around track (this track will have switches to allow bidirectional temporary storage of cars). Once past the run around track, the switch there will be moved to allow the engine to move the outbound cars it had just picked up from the siding of the Finger Lakes Terminal and place them onto the run around track. Once that is done, the engine and buffer car will move off of the run around track, put the switch back into position to allow the engine and buffer car to move back south to the Finger Lakes Terminal to move what was on the 2 storage tracks (up to 16 cars) at the Finger Lakes Terminal to two of the Finger Lakes' siding tracks.[16] Once that is done, the engine and buffer car will go back on the main line and reattach to the cars it came north with (including the 32 Finger Lakes rail cars). It will then move north so that non-Finger Lakes cars are detached and left temporarily to the south of the Finger Lakes Terminal switch. The engine and buffer will then take the 32 Finger Lakes cars and move those into the 2 open siding and 2 open storage tracks at the Finger Lakes Terminal. Once that is done, the engine and buffer will move back onto the main line, reattach to the non-Finger Lakes cars and move to the north of the run-around track switch, where it will attach to the Finger Lakes outbound cars (maximum of 32) and continue on north, if the outbound cars are going north. If

[14] Abrams Road is 1890 meters from the proposed Finger Lakes rail siding terminal (Finger Lakes Terminal). A drawing showing the Abrams and Nye Road crossings and the distance from those crossings to the Finger Lakes Terminal is attached as Figure 10 to the dSEIS.
[15] Each siding has its own switch so this would be four (4) separate movements.

they are not going north they will be left on the runaround track to be picked up on the return trip south to Corning.

On the return trip, the train would clear Nye Road[17], stop at the south end of run around track, pick up any outbound cars that are destined for points south and then depart for its destination terminal in Corning.

With a maximum anticipated volume of 32 cars inbound and outbound cars on any given day and a draft of 24 non-Finger Lakes cars, buffer car and engine equal to roughly 620 meters, there is no reason for the train to pass over or come closer than 500 meters to Nye Road while switching. There are no crossing devices to be activated and no bells or horn sounded during this switch operation at the Finger Lakes Terminal. Even with a very large train consisting of 72 freight cars a train would clear Abrams Road by over 450 meters and Nye Road by over 320 meters.

The current local run which would handle the cars under the scenario above, starts in the mid afternoon and returns in the late evening. The outbound switching above would then likely occur around 4 or 5 p.m. lasting approximately 2 hours. If necessary, Norfolk Southern's operating department could add another local run (Corning to Geneva) to handle the Finger Lakes traffic on its own and allow the Geneva turn around to handle the increased volume to other destinations in a timely fashion. If that became necessary, such a train would likely leave Corning around 9 a.m. and arrive at the Finger Lakes Terminal at 10 a.m. and return on the

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[16] Only the siding tracks have apparatus to allow unloading.
[17] Nye Road is 1448 meters from the Finger Lakes Terminal.

southbound run in the afternoon. All of these rail switching movements will have the engine moving slowly at approximately 1 to 2 MPH.

Since the engine is moving very slowly, there is no need for high throttle so that excessive noise will not be produced from the engine to move the rail cars. When the cars are uncoupled the only noise is when the air line releases which is very minimal.

During the switch operation the engineer will <u>not</u> have to sound the engine horn for any movement associated with the switch, since there is no road crossing in the area where the switching occurs. Otherwise, under federal regulations, the engineer has to sound the horn when crossing a road.

4.4.3 Proposed Mitigation Measures and Alternatives

Vehicular Traffic

As noted above, there will be no impacts as a result of the traffic that will be utilizing the surface facility and sight distances are adequate. Therefore, no mitigation is necessary. Nevertheless, the site plan has been revised to provide for additional truck staging area on the site. See Figure 2.

Rail Operations

The New York State Rail Safety Inspection Program has been in existence since 1910. The program provides safety oversight for railroad freight carriers as well as intercity passenger rail operations in New York State. Since the Federal Railroad Safety Act of 1970, the Rail Safety

Inspection Program has partnered with the FRA to provide railroad safety monitoring and reporting of railroad compliance with Transportation Law and Railroad Law; and ensures compliance to the Federal Railroad Safety Program.

Freight, intercity, and tourist railroads operating in New York State are required by the Rail Safety Bureau to provide immediate notification to the Rail Safety Inspection Section (RSIS) if one of the following events occur:

- All train and train service accidents involving a passenger train;
- All train and train service accidents which cause delays to passenger train movements of more than 30 minutes;
- All collisions, except those minor collisions which can be repaired without the need to move to a repair facility;
- All freight train derailments that occur on tracks where maximum authorized track speed exceeds 25 mph, involve placarded hazardous materials cars, or derails at least five freight cars;
- Any release or spill of a hazardous material identified in 49 CFR Part 172;
- All bridge or other track opening failures;
- Any accident involving a steam powered locomotive
- All accidents at street or highway/rail grade crossings; or
- All train and train service accidents which result in death or an injury that requires immediate hospitalization.

Federal Track Safety

The FRA's Office of Railroad Safety promotes and regulates safety throughout the Nation's railroad industry. Under FRA regulations, each railroad has primary responsibility to ensure its own track meets or exceeds the federal safety standards. This includes railroad inspectors performing track inspections at specified minimum frequencies based on the Class of Track, the type of track, the annual gross tonnage operated over the track, and whether it carries passenger trains. Railroads are required to maintain accurate records of regular and ad hoc track inspections subject to review and audit by FRA federal inspectors at any time.

The FRA's federal track safety standards generally focus on four main areas:

- Track Structure: Rails, crossties, track switches, tie plates, and rail fastening systems
- Track Geometry: Track gage, alignment, elevation, curvature, and track surface
- Road Bed: Drainage and vegetation (vegetation cannot obstruct signs and signals)
- Track Inspection: Frequency and quality of inspection, special inspections, and recordkeeping

The Corning Secondary Track is a FRA Class 2 track with a maximum allowable operating speed for freight trains of 25 miles per hour. Per federal (FRA) requirements, track inspections are made weekly. As noted above, FRA safety data shows that between 2000 and October 2010, NS trains have not been involved in any accidents that resulted in a release of hazardous materials.

Federal Railroad Bridge Safety

Responsibility for railroad bridge safety rests with the owner of the track carried by the structure. The owner ensures the bridge is capable of safely accommodating all rail traffic operated over the track and specifies the maximum weight the structure can support.

In 2010, the FRA established federal safety requirements for railroad bridges, requiring track owners to implement bridge management programs, which include annual inspections of railroad bridges and to audit the programs (49 C.F.R. Part 237). The final rule also requires track owners to know the safe load capacity of bridges and to conduct special inspections if the weather or other conditions warrant such inspections.

As a matter of routine, NS's Bridge Department conducts regular annual inspections of all structures on the Norfolk Southern system with the Watkins Glen Gorge structure receiving special attention. Regular inspections of the Watkins Glen Gorge Bridge confirm that the bridge does not have any structural concerns, nor does it have any freight traffic restrictions. Moreover, the bridge's load carrying capacity is sufficient to handle current and expected future rail traffic. The allowable weight of a loaded LPG rail car is 286,000 pounds gross weight, which is well within the load carrying capacity of the bridge. NS has operated over the bridge since June 1, 1999. Since that time, there have been no environmental releases or incidents associated with the bridge. See correspondence from NS in Appendix E.

4.5 IMPACTS ON AESTHETIC RESOURCES

A Visual Impact Analysis was conducted for the proposed Finger Lakes LPG Storage Facility. The Visual Impact Analysis was conducted in accordance with DEC Program Policy DEP-00-2 entitled "Assessing and Mitigating Visual Impacts." A copy of the Visual Impact Analysis is attached to the DSEIS as Appendix K.

Based upon the visual assessment prepared for the project, the brine pond site and truck transfer facility site will not be visible from Seneca Lake and NYS Route 414, running along the eastern portion of Seneca Lake. The brine pond embankment and portions of site clearing will be visible or partially visible from NYS Route 414 and Seneca Lake. Once the brine pond is constructed and the side slopes of the embankment are vegetated, the view from Seneca Lake and NYS Route 414 is anticipated to be similar to the current view. The proposed brine pond site will be visible from NYS Route 14 and NYS Route 14A. The truck transfer facility will also be visible from NYS Route 14A. Potential visual impacts along NYS Route 14 and NYS Route 14A will be mitigated during site development activities through strategic native plantings and seeding at both the brine pond site and the truck transfer facility site. It is not anticipated that the proposed project will result in any significant adverse visual impacts.

4.5.1 Environmental Setting

Proposed Brine Pond Site

The proposed brine pond site is located approximately two-thousand (2,000) feet east of New York State Route 14. The site is presently an undeveloped, forested parcel, predominantly vegetated with deciduous and coniferous species, although the northwestern portion of the site is comprised of a cleared, successional field. The brine pond site is situated at an elevation of approximately 840 feet above mean sea level (MSL). The brine pond site is situated approximately 400 feet in elevation above the western shore of Seneca Lake. The brine pond site is bordered by New York State Route 14/14A to the west, forested areas to the north, south and east.

LPG Rail & Truck Transfer Facility

The proposed LPG Transfer Facility site is located approximately two-hundred (200) feet south of New York State Route 14A, and approximately four-thousand (4,000) feet west of the proposed Brine Pond site. The transfer facility site is presently an undeveloped, scrub-shrub field. The transfer facility site is situated at an elevation of approximately 1,020 feet above MSL. The transfer facility site is bordered by New York State Route 14A and agricultural fields to the north, a railroad to the west, a truck facility to the east and forested areas to the south.

4.5.2 Potential Impacts

In accordance with DEC Program Policy DEP-00-2, important aesthetic resources in the vicinity of both the Brine Pond site and the Truck Transfer Facility were inventoried to determine whether or not the proposed project may have a significant adverse visual impact to these sensitive resources.

Inventory and Assessment Conclusions

National or State Register of Historic Places

There are no known properties on or eligible for inclusion in the National or State Register of Historic Places in the immediate vicinity of the project sites. See Appendix E. Within a five (5) mile radius of the project sites, there are five (5) National Register properties mapped by the NYS Historic Preservation Office (SHPO) through SHPO's Online Geographic Information System (GIS) database; the Watkins Glen Grand Prix Course, the A.F. Chapman House, the first Baptist Church of Watkins Glen, the Watkins Glen U.S. Post Office and the Schuyler County Courthouse Complex. All five (5) properties are located in the Village of Watkins Glen, approximately three (3) linear miles from the project site. No State Register properties are mapped by SHPO within a five (5) mile radius from the project sites. Due to the distance, vegetation, topography and number of buildings between the project sites and the National Register listed properties, it is not anticipated that the proposed project will have any visual impact upon properties on or eligible for inclusion on the National or State Register of Historic Places.

State Parks

According to the SHPO Online GIS database, there are no State Parks mapped within the immediate vicinity of the project sites. Within a five (5) mile radius of the project sites, there is one (1) mapped State Park; Watkins Glen State Park. Due to the distance, vegetation, topography and number of buildings between the project sites and the Watkins Glen State Park, it is not anticipated that the proposed project will have any visual impact upon State Parks.

Urban Cultural Parks (now named Heritage Area System)

According to New York State Heritage Area Online Database there are no Heritage Areas within five (5) miles of the project sites. The nearest Heritage Area is the Seneca Falls Heritage Area, located approximately thirty-four (34) miles northeast of the project site. As such, it is not anticipated that the proposed project will have any visual impact on Heritage Areas.

State Forest Preserve Land

The project sites are not located within or near the Adirondack or Catskill Parks, and as such, are not located in proximity to any State Forest Preserve Land.

National Wildlife Refuges, State Game Refuges and State Wildlife Management Areas

According to mapping from the U.S. Fish & Wildlife Service and the DEC Database for State Recreational Lands, there are no mapped National Wildlife Refuges or State Game Refuges within five (5) miles of the project sites. There is one (1) mapped State Wildlife Management Area, the Catherine Creek Wildlife Management Area, located approximately 3.6 miles southeast of the project sites, near the Village of Watkins Glen. Due to the distance, vegetation, topography and number of buildings between the project sites and the Catherine Creek State Wildlife Management Area, it is not anticipated that the proposed project will have any visual impact upon State Wildlife Management Areas, National Wildlife Refuges or State Game Refuges.

National Natural Landmarks

According to the United States National Park Service National Natural Landmark Database for New York State, no National Natural Landmarks are mapped within five (5) miles of the project sites. As such, it is not anticipated that the proposed project will have any visual impact on National Natural Landmarks.

National Parks, Recreation Areas, Seashores & Forests

According to the United States National Park Service Database for New York State, there are no National Parks, Recreation Areas or Seashores within five (5) miles of the project sites. One (1) national forest, the Finger Lakes National Forest, is mapped approximately 2.5 miles northwest of the project sites. Due to the distance, vegetation and topography between the project sites and the Finger Lakes National Forest, it is not anticipated that the proposed project will have any visual impact upon the National Parks, Recreation Areas, Seashores & Forests.

National/State Designated Wild, Scenic or Recreational Rivers

According to National Wild, Scenic and Recreational River System mapping for New York State, no National Wild, Scenic and Recreational Rivers are mapped within five (5) miles of the project sites. According to the DEC list of State Wild, Scenic and Recreational Rivers, no State Wild, Scenic or Recreational Rivers are mapped within five (5) miles of the project sites.

State Designated Scenic Site, Area, Lake, Reservoir or Highway

According to the U.S. Department of Transportation Scenic Site List for New York State, no designated scenic sites, areas, reservoirs, highways or byways are mapped within five (5) miles of the project sites. Seneca Lake is considered to be a scenic lake, and portions of the proposed brine pond site may be visible from Seneca Lake.

Scenic Areas of Statewide Significance

According to the New York State Department of State Scenic Areas of Statewide Significance Program (2004), no Scenic Areas of Statewide Significance are located within five (5) miles of the project sites.

Adirondack Park Scenic Vistas

The project site is not located within or near the Adirondack Park.

State Nature and Historic Preserve Areas

According to Article 45-0117 of the New York State Environmental Conservation Law, no State or Natural Preserve Areas are designated in the vicinity of the project sites.

Palisades Park

The Palisades Park is located approximately 185 miles southwest of the project sites.

Bond Act Properties

According to the DEC Environmental Facilities Mapper, no Bond Act Properties are mapped within five (5) miles of the proposed project site.

Additional Assessment of Potential Visual Impacts

Through the inventory and analysis of potentially sensitive resources, three (3) receptor features were chosen for additional assessment of potential visual impacts; New York State Route 14/14A, Seneca Lake and New York State 414. Four (4) line of sight profiles were prepared showing the brine pond site and truck transfer site in relation to each of the three (3) receptor features (refer to Attachment B of the Visual Impact Analysis, Visual Assessment Profile View). The brine pond site is situated between Route 14/14A and Seneca Lake, and as such has the potential to be visible from both features. Tree heights in the vicinity of both the project site and each receptor site were determined to be approximately fifty (50) feet tall. Trees of this height were added to each line of sight profile to illustrate trees present within each alignment. Photographs were taken from each receptor location looking toward the Brine Pond site and truck transfer facility and were added to the Visual Assessment Plan View (refer to Attachment C of the Visual Impact Analysis). An assessment of each line of sight profile is included below.

Alignment A

Alignment A provides a line of sight profile from Station 0+00 on the northern portion of NYS Route 414 (at an elevation of approximately 700 feet above MSL) west to Station 113+00 on NYS Route 14A (at an elevation of approximately 850 feet above MSL). The proposed brine pond site is shown at Station 109+00. Receptor station 0+00 is approximately two (2) miles east of the proposed brine pond site. Receptor station 113+00 is approximately 300 feet west of the proposed brine pond site. Based upon this line of sight profile for Alignment A, assuming a clear line of sight from NYS Route 414, the proposed brine pond cleared site and embankment may be visible from NYS Route 414, and the brine pond site will be visible from NYS Route 14A. The brine pond itself will not be visible from NYS Route 414.

Alignment B

Alignment B provides a line of sight profile from Station 0+00 in the middle of Seneca Lake (at an elevation of approximately 450 feet above MSL) west to Station 58+00 on NYS Route 14A (at an elevation of approximately 850 feet above MSL). The proposed brine pond site is shown at Station 54+00. Receptor station 0+00 is approximately one (1) mile east of the proposed brine pond site and receptor station 58+00 is approximately 300 feet west of the proposed brine pond site. Based upon this line of sight profile for Alignment B, the proposed brine pond cleared site and potentially the very top of the embankment may be visible from Seneca Lake. The brine pond site will also be visible from NYS Route 14A.

Alignment C

Alignment C provides a line of sight profile from Station 0+00 on the southern portion of NYS Route 414 (at an elevation of approximately 800 feet above MSL) west over Seneca Lake through Station 104+00 on NYS Route 14A (at an elevation of approximately 850 feet above MSL) to the proposed truck transfer facility NYS Route 14 at Station 134+00 (at elevation of approximately 1,000 feet above MSL). The proposed brine pond site is shown at Station 100+00. Receptor station 0+00 is approximately 2.5 miles east of the proposed truck transfer facility and approximately 1.7 miles from the brine pond site. Based upon this line of sight profile for Alignment C, the proposed truck transfer facility will not be visible from NYS Route 414 or Seneca Lake. The brine pond site and truck transfer facility will be visible from different portions of NYS Routes 14 and 14A. The proposed brine pond cleared site and potentially the top of the embankment may be visible from Seneca Lake.

Alignment D

Alignment D provides a line of sight profile from Station 0+00 on the central portion of NYS Route 414 (at an elevation of approximately 600 feet above MSL) west over Seneca Lake through Station 103+00 on NYS Route 14A (at an elevation of approximately 850 feet above MSL) to the proposed truck transfer facility NYS Route 14 at Station 127+00 (at elevation of approximately 1,000 feet above MSL). The proposed brine pond site is shown at Station 96+00. Receptor station 0+00 is approximately 2.4 miles east of the proposed truck transfer facility and approximately 1.6 miles from the brine pond site. Based upon this line of sight profile for Alignment D, the proposed truck transfer facility will not be visible from NYS Route 414. The proposed brine pond cleared site and potentially the top of the embankment may be visible from

Seneca Lake and NYS Route 414. The brine pond site and truck transfer facility will be visible from different portions of NYS Routes 14 and 14A.

4.5.3 Proposed Mitigation Measures or Alternatives

Based upon the four (4) line of sight profiles detailed above, the receptor locations with the greatest potential for visual impacts are NYS Routes 14 and 14A located in close proximity to the proposed brine pond and truck transfer facility, and there are potential visual impacts from the brine pond site from Seneca Lake and NYS Route 414. Currently, the brine pond site is comprised of a mixed successional covertype with both mature coniferous and deciduous species dominant (refer to Attachment D of the Visual Impact Analysis, Brine Pond Site Existing Conditions Photo and Proposed Conditions Visual Simulation). Portions of the brine pond site are currently used for an active industrial salt mining operation, which is currently visible along Seneca Lake and NYS Route 414. The site is proposed to be cleared and graded, followed by the construction of the brine pond. An approximately 8-foot tall corrugated metal pump enclosure structure, approximately 150 square feet in area, will be constructed at the base of the brine pond embankment (refer to Attachment A, Site Operations Plan to the Visual Assessment). The pump enclosure structure will be screened from NYS Routes 14 and 14A by the embankment, and will be screened from Seneca Lake and NYS Route 414 (which runs along the eastern side of Seneca Lake) by the existing treed slope between the brine pond site and Seneca Lake.

As previously stated, the proposed brine pond itself will not be visible from Seneca Lake or NYS Route 414, which runs along the eastern side of Seneca Lake. The eastern portion of the brine pond will be supported by an embankment. This embankment will efficiently conceal the brine pond from Seneca Lake and NYS Route 414. The embankment will be seeded with a native seed mix and allowed to germinate with herbaceous species that will further act to "blend" the brine pond embankment into the characteristic natural landscape on the western side of Seneca Lake. Portions of the brine pond site may be visible from NYS Route 414 during fall and winter months when deciduous trees along the eastern portion of Seneca Lake have no leaves. During spring and summer months when the leaves on deciduous species have grown in, the brine pond site will likely not be visible from southern portions of NYS Route 414 (Alignment C).

Without mitigation, the proposed brine pond would be visible from NYS Routes 14 and 14A (refer to Attachment D of the Visual Impact Analysis, Brine Pond Site Existing Conditions Photo and Proposed Conditions Visual Simulation). As the crest of NYS Route 14A sits at an elevation of approximately 870 feet above MSL, traffic along NYS Route 14A will have the ability to look downhill into the brine pond site, where the water surface will be at an elevation of approximately 840 feet above MSL. The truck transfer facility would also be visible from NYS Route 14A (refer to Attachment E of the Visual Impact Analysis, Truck Transfer Facility Site Existing Conditions Photo and Proposed Conditions Visual Simulation). However, it is important to note that the NYS Route 14A ramp is primarily used for vehicular traffic, and any vehicles traveling along the ramp would only be afforded a limited, transient view of the brine pond site.

The truck transfer facility would also be visible from NYS Route 14A (refer to Attachment E, Truck Transfer Facility Site Existing Conditions Photo and Proposed Conditions Visual Simulation). Lighting fixtures are proposed to be installed at the truck transfer facility (refer to

Attachment H, Truck Transfer Facility Lighting Plan). Luminaire type HL1-2 proposed for installation along the rail transfer kiosks in the rear of the facility is International Dark Sky compliant shielded downlighting, with illumination concentrated on the ground directly beneath the fixtures. Luminaire type MS 1-1 is proposed to be installed under the truck transfer facility canopy, with illumination concentrated on the ground directly beneath the fixtures. Potential lateral light spillage from these ceiling mounted fixtures will be minimized by the recessed location of the fixtures up inside the truck transfer facility canopy. Two (2) lighting fixtures are currently proposed for the front of the truck transfer facility; luminaire type HL1-1 and luminaire type HL1-3. Luminaire type HL1-1 are pole mounted fixtures that will be installed to provide lighting for the control building entrance and parking area as well as the compressor pad and storage tanks. Luminaire type HL1-3 are wall mounted fixtures that will be affixed to the control building. The majority of the proposed site lighting will be installed behind the truck transfer facility control building. While screened from NYS Route 14A by the control building, truck transfer canopy and proposed site plantings, the proposed site lighting to be installed behind the control building has been designed to further mitigate potential off-site impacts related to lighting. Fixtures located in the front of the truck transfer facility will be screened from potential viewers along NYS Route 14A by the proposed plantings at the truck transfer facility site (refer to Attachment G).

In accordance with DEC Program Policy DEP-00-2, additional mitigation measures (beyond those related to lighting) for visual impacts were evaluated during site design. Landscaping plans were prepared to illustrate the proposed locations of native mitigation plantings, which will act to visually screen the brine pond from NYS Routes 14 and 14A and the truck transfer facility from NYS Route 14A (Refer to Attachment F of the Visual Impact Analysis, Brine Pond Landscaping Plan and Attachment G of the Visual Impact Analysis, Truck Transfer Facility Landscaping Plan, respectively). A total of 216 plantings are proposed to be installed along NYS Routes 14 and 14A at the brine pond site and 182 plantings will be installed between the truck transfer facility and NYS Route 14A, and between the truck transfer facility and the commercial railroad tracks that run along the western edge of the transfer facility project site.

The proposed plantings will include the following species, as illustrated on the Landscaping Plan included with the Visual Impact Analysis:

- Densa Inkberry (*Ilex glabra 'densa'*) - Broad-leaved evergreen
- White spruce (*Picea glauca*) – Coniferous tree
- American arborvitae (*Thuja occidentalis*) – Coniferous tree
- Allegheny Serviceberry (*Amelanchier Laevis*) – a native non-invasive species
- Common lilac (*Syringa vulgaris*) – Deciduous tree with a dense branch structure

Species were selected based on the following criteria:

- Species provides a large, dense canopy as it grows;
- Species is fast growing;
- Species is either an evergreen/coniferous planting or, if deciduous, has a dense branch structure that blocks views of the brine pond during "leaf-out" conditions (October to April); and
- Species is similar or identical to the native vegetation currently growing at the site and/or on adjacent properties.

Planting locations were chosen so as to mitigate potential visual impacts along NYS Routes 14 at the brine pond site and NYS Route 14A at both sites to the maximum extent practicable. Visual simulations of proposed conditions at the brine pond site and the truck transfer facility site are provided in Attachments D and E of the Visual Impact Analysis, respectively. In the event that the brine pond is not visually screened in some locations, the site will resemble a natural pond water feature that will mimic other ponds in the vicinity of the project site. The proposed vegetated embankment will also resemble existing successional fields to the north and south of the brine pond site. Once plantings have become established as adults, plant heights will range from approximately seven (7) feet in height for species like inkberry to approximately fifty (50) feet in height for species like white spruce. At these heights, the brine pond and truck transfer facility sites will be nearly completely screened from drivers along NYS Routes 14 and 14A.

4.6 IMPACTS ON PUBLIC SAFETY

4.6.1 Environmental Setting

The Finger Lakes Storage project will be located in the Town of Reading, Schuyler County. The Town of Reading encompasses an area of approximately 27 square miles with a population of approximately 1,786 (2000 *U.S. Census*). It is a small rural town with a balance of agriculture and industry. Agriculture includes: dairy and grain farms as well as grape vineyards. Industry includes: natural gas storage and transmission, a salt evaporation plant, and a metal fabrication/machining company. Attractions in the town include two golf courses, numerous bed and breakfast inns, various motels, restaurants and wineries. The village of Watkins Glen is approximately 3 miles to the south of the locations of the Finger Lakes Storage Facility. It had a population of 2,149 based on the 2000 census.[18]

Two railroad lines operate through Reading for freight usage. Four natural gas, and LP gas pipelines transverse the town, including the Empire Connector, part of the Millennium Pipeline project. US Salt, which draws from a vast underground salt supply, is the major employer within the town. TEPPCO and NYSEG have underground LPG and natural gas storage facilities. BMS Manufacturing, a metal fabrication and machining company is another major employer within the town. Farming is still being conducted with wineries becoming a major factor in the area's economy. In the area of the surface facility, there is a truck repair facility, an inactive solid waste transfer station, and a highway garage.

NYSEG has launched a comprehensive feasibility study for a compressed air energy storage (CAES) facility for a site on US Salt's property. A CAES facility pumps compressed air into a depleted underground salt cavern when low-cost, off-peak electricity is available to power the compressors. The compressed air is then released to spin a turbine to generate electricity as needed, particularly during times of high customer demand. If the study confirms that CAES is feasible and economical, NYSEG would seek approval from state and federal agencies to proceed with construction of the plant with a target in-service date of late 2014. However, no proposals have been made at this time. Once a proposal is made, the NYSEG proposal would have to take in to account the caverns that are already in use in the area, including the Finger Lakes caverns.

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[18] 2010 Census results are not yet available.

State Highways in the Town of Reading include 14, 14A, and 226. County Routes include 23, 27, 28, 29 and 30.

Emergency services in the vicinity of the proposed Storage Facility include:

Fire

Watkins Glen Fire Department
201 North Perry Street
Watkins Glen, New York 14891
(607) 535-7700

Dundee Fire Department
12 Union Street
Dundee, New York 14837
(607) 243-8441

Montour Falls Fire Department
111 Lee Street
Montour Falls, New York 14865
(607) 535-7265

Law Enforcement

Schuyler County Sheriff's Office
106 Tenth Street Unit 2
Watkins Glen, New York 14891
(607) 535-8222

New York State Police
600 College Avenue
Montour Falls, New York 14865
(607) 535-7731

Hospital

Schuyler Hospital
220 Steuben Street
Montour Falls, New York 14865
(607) 535-7121

Emergency Medical Services

Schuyler County Volunteer Ambulance Association
909 South Decator Street
Watkins Glen, New York 14891
607-535-7273

Dundee Ambulance Corp
12 Union Street
Dundee, New York 14837

Emergency Management

Schuyler County Emergency Management
Michael J. Maloney Public Safety Building
106 Tenth Street Unit 36
Watkins Glen, New York 14891
607-535-8200

Finger Lakes has communicated with Schuyler County Emergency Management and before operations commence will work with the local fire departments to ensure they are familiar with Finger Lakes' operations.

4.6.2 Potential Impacts

Cavern Safety

Solution cavity storage was first conceived of in Canada during World War II as applied both to gases and liquid hydrocarbons. By 1949 field experimentation had been done in the U.S. and during the 1950's the use of salt solution cavities[19] became increasingly widespread. (Bays, 1962) Salt cavern facilities have grown in number since their first use in the late 1940s and early 1950s. (Evans, 2008)

Hydrocarbon storage in caverns has the following advantages from an environmental and safety perspective.

a. Environmental:

- Minimizes land requirements for storage and allows for other surface uses.
- Minimize nuisance hydrocarbon emissions (from valves, compressors, etc.).

[19] The salt mining industry has prospered in New York State since 1878 when commercial quantities of subsurface rock salt were inadvertently discovered at a well drilled for oil and gas. (Briggs, 1996)

- Saves energy (above ground would require extra compression, insulation, etc.)
- Reuses natural resources (once the salt has been extracted from the cavern, continued reuse for storage).

b. Safety:

- Possibility of leak from cavern cavity (storage container) very low.
- Salt very low permeability and porosity. Salt has ability to seal in the event of unplanned fracture.
- Significantly safer than similarly sized above ground storage. See also Evans, 2008.
- Also safer from tampering/vandalism perspectives.

(Manocha, 1993)

In fact, it has been found that bedded salt structures like those proposed by Finger Lakes provide ideal conditions for subsurface storage of many products. (Querio, 1980; Manocha, 2001) They are particularly good for LPG storage. Through proper design of the well, wellhead and careful monitoring of cavern development, large volumes of LPG can be stored safely in subsurface storage caverns, particularly after utilizing caverns for brine production. (Querio, 1980) Some commentators have noted that "salt caverns provide one of the safest answers to the problem of storing large amounts of hydrocarbons." (Evans, 2008 citing "Bérest et al. 2001" and "Bérest & Brouard 2003") Indeed, exposure to natural hazards are reduced in the utilization of subsurface storage. (Querio, 1980) Underground gas storage is viewed as having an excellent environmental, health and safety record. (Evans, 2008 citing "Lippmann & Benson 2003; Imbus & Christopher 2005") Even in urban areas "...underground gas storage, oil and gas production can be conducted safely if proper procedures are followed." (Evans, 2008 citing "Chillingar & Endres 2005"). Indeed, a good portion of the United States Strategic Petroleum Reserve is stored in salt caverns that underlie most of the Texas and Louisiana coastline, since such caverns offer the best security and the most affordable means of storage (U.S. DOE, 2011).

One of the reasons that underground storage facilities in salt caverns are much safer in terms of safety and environmental protection is that salt formations are almost perfectly impermeable; underground, hydrocarbons are separated from the oxygen in the air (necessary for combustion) by several hundred meters of rock; high storage pressures present no problem insofar as high pressure is the natural state of the fluids underground; and, underground storage is extremely economical in terms of land area. (Berest & Brouard, 2003) Put another way, a storage cavern is a pressure vessel: high pressure fluids are contained in a stiff impervious (e.g., salt) envelope, and a system of valves allows the cavity to be sealed off. (Berest & Brouard, 2003) In recent years research has shown that salt rock exhibits pronounced time-dependent deformation or creep under relatively low stress level and has low permeability and porosity. Salt rock creeps to a large strain without fracturing and tends to be self-healing. So salt rock is often considered as an ideal material for storage of natural gas, petroleum and wastes, or nuclear waste. (Liu et al., 2011; Berest et al., 2001)

In general, the essential requirements to provide suitable and safe underground storage are:

1. A salt section of sufficient thickness and purity to permit cavity development without significant constrictions, subsurface movements due to substantial impure interbeds, and which will be rendered impermeable to the material to be stored when a solution cavity is made therein.
2. Roof or caprock that will stand supported by the fluid buoyancy available from the brine, water or product to be stored and free of materials which are soluble in the hydrocarbon material to be stored.

3. Sufficient depth and appropriate section between the cavity and the surface to permit effective cementing and effective well construction together with the geostatic load to confine the stored material with complete certainty.

4. Suitable surface provisions and resources for water supply, disposal, and storage of water or brine to permit development and operation of the storage system.

(Bays, 1962). As is the case with New York's permit application process, prior to LPG storage, the cavern stability and tightness must be verified involving pressure testing the cavern to the design test pressure and monitoring pressure deviations and fluid quantities required to maintain the test pressure. In addition, the design of a cavern field must consider geomechanic evaluations in the determination of acceptable salt roof and salt pillar distances relative to cavern diameters and ultimate cavern utilization. (Querio, 1980) See Section 4.1.3 of this DSEIS.

Storage facilities for liquefied hydrocarbons are operated by the "brine compensation" method. As brine is injected through a tubing at the bottom of the cavern, an equivalent volume of products is withdrawn through the annular space between the steel cemented casing and the central tube. When the cavern is idle, the brine is at atmospheric pressure at ground level. (Berest & Brouard, 2003; Querio, 1980)

The major risk and uncertainties inherent in LPG storage in solution mined caverns can be minimized by following good engineering design and construction practices and implementing appropriate control methods during operation. (Querio, 1980) For example, the wells used for the solution mining of a cavern are designed to provide protection against the possible pollution of fresh water aquifers and to insure well integrity throughout the life of the facilities. (Querio, 1980) Monitoring the cavern development involves measuring flow rates, pressures, and salt concentrations. Sonar surveys and interface logging are used with production data and computer simulation to predict stages of cavern development. (Querio, 1980)

More specifically, safe underground storage of hydrocarbons such as LPG can be accomplished by focusing on the following safety and operational issues. (Ward, 1999)

- Design review – Safe design and accident analysis can be achieved using various industrial methods. HAZOPS (Hazard and Operability Study) is one method that systematically investigates the processes to identify and eliminate the hazards and their causes before they occur. This method is cost effective and can be conducted on-site. As described below, as part of its compliance with EPA's Risk Management Plan ("RMP") and OSHA's Process Safety Management ("PSM") regulations, Finger Lakes must conduct a survey to ensure potential hazards associated with processes are identified and controlled. Finger Lakes will use a HAZOP study as the methodology at the design level and pre-startup to identify the hazards associated with the process and the safeguards against them, and will use the findings from these and other studies to assist in implementing these requirements.

- Gas Detection – Gas detection is essential for early warning, activation of warning systems, closing emergency block vales, securing rotating and process equipment and communications to initiate site and possibly community emergency plans. Finger Lakes will utilize numerous gas detectors at its Facility. <u>See</u> the specifications for the gas detector in Appendix L.

- Physical Protection – Simple physical barriers at the site can easily prevent some very serious accidental releases. The Finger Lakes truck/rail unloading facility will be fenced as will the brine pond. The existing gate to the US Salt property/NYSEG Seneca Lake Gas Storage Facility will remain in place.

- Emergency Horns – The site should be equipped with emergency horns. Quick warning of the site and contractor personnel is a must. They must be capable of activation by the control room and in remote locations.

- Process Flare – The site should be equipped with an elevated flare. Proper flare, separator, and pipeline design is essential. As part of the Finger Lakes project, there will be appropriate flaring.

- Asphyxiation – Great care must be taken to avoid accidental piping of hydrocarbons into occupied areas. For the Finger Lakes project, hydrocarbons will not be piped into or through occupied enclosed areas.

- Electrical Equipment and Instrumentation – Strict adherence to applicable electrical codes must be made when classifying site zones and in purchasing and installing process and control equipment.

- Wellhead Safeties and Related Equipment – The largest quantities of hydrocarbons are obviously stored in the well. Well head integrity and control is imperative. This will be assured through issuance of well permits by DEC.

- Brine Separator, Flare and Brine Pond Igniters – Brine withdrawn from hydrocarbon storage caverns will contain entrained brine. The site should be equipped with brine separator and flare to incinerate the separated gases. For the Finger Lakes project, there will be a flare at the brine pond location.

- Training and Qualification of Personnel – Trained and qualified personnel are very important for safe operation of storage facilities. Finger Lakes will have a comprehensive training program in place.

- Emergency Plans – Management should consider all the potential emergencies that the site might experience. Prior to the commencement of operations, Finger Lakes will submit to the DEC and local emergency officials, an Operations, Maintenance and Contingency Plan. This Plan will, among other things, contain an Emergency Response Plan, described below.

- Communications – All aspects of communications are important to the safety of the site and community.

- Safe Work Procedures – The development of these procedures is by analysis and compiling in detail the tasks to be performed, writing of the training modules and then the work procedures.

- Operating Manual – The development of the control computer's programming will lead automatically to the development of the written operating discipline and from that the Operating Manual can be written. The Plan identified above will contain detailed operating procedures for every facet of the operation.

- Maintenance Plan – Maintenance's role in safety of the site is often overlooked. The impact of maintenance on the site safety in performance of the routine and the emergency jobs can be significant.

- Control of Change – The control of change is a very important issue for the site. A formal program with management sign-off must be in place to insure that engineering, maintenance and operational changes to the system or operating disciplines are not made without prior approvals. Finger Lakes' PSM Program will include written procedures to manage changes in process chemicals, technology and equipment.

- Community Relations – Emergency response plans must incorporate the community, officials, and the law enforcement agencies. An ongoing positive relationship with law enforcement officials will benefit the site in both routine and emergency situations.

- Ingress and Egress Control – Control of whom enters and leaves the site is important for many reasons. Perimeter fencing, cameras, sign-in, manned gates and badge requirements are a few tools. As noted above under physical protection, both sites that are part of the Facility will be fenced.

- Product Inventory Management – The management of inventory and the accountability of inventory is an important management issue. Accurate well maintained measuring devices, computer generated volumes, comparison with downhole interface detectors or interface logs and static pressure well calculations can help avoid overfill and accountability problems.

- Contractor Safety Control Policy – Proper control of and safety policies for contractors working on the site is a must.

(Ward, 1999)

Tightness of the underground storage caverns can be tested through a Mechanical Integrity Test. This often takes the form of a Nitrogen Leak Test, which consists of lowering a nitrogen column in the annular space below the last cemented casing. The central string is filled with brine, and a logging tool is used to measure the brine/nitrogen interface location in the annular space. Two or three measurements, generally separated by 24 hours, are performed; an upward movement of the interface is deemed to possibly indicate a nitrogen leak. In several states such a test must be performed every 5 years in LPG caverns. (Berest & Brouard, 2003) See Section 4.1.3.3.

Salt caverns are deep cavities (from 300 m to 2000 m) that are connected to the ground level through a cased and cemented well. One to several strings are set in the well to allow injection or withdrawal of fluids into or from the cavern. (Berest et al., 2001) The maximum pressure, below which a cement-filled annular space will not leak significantly, is a purely empirical and site-specific notion: this pressure must not be exceeded at the casing shoe, where the cement is in direct contact with the stored product. (Berest et al., 2001) The architecture of the wells and the number and length of steel casings are generally selected with reference to the actual objectives of the drilling operations. Quite clearly, the objectives must also include leakage protection. In particular, the last two cemented casings must be anchored in the salt formation or in an overlaying impermeable formation. (Berest et al., 2001)

Brine Pond

The potential impacts associated with the brine pond have been discussed above in the sections on Impacts to Land and Impacts to Water Resources. In these sections, the design of the brine pond is described, as well as other systems that will be in place to ensure that there is not a catastrophic failure of the pond and its embankments and that there is not a leak and any resulting impact to groundwater. In addition, to ensure public safety, Finger Lakes has specific procedures to be followed in the event the brine pond liner is torn or requires replacement. See Section 4.1.2.3.1.

At closure, all brine will be removed from the brine pond; all connecting lines, and any associated systems (including the brine pumps) will also be removed. The brine will be provided to US Salt or to local municipalities for road use during winter. All connecting lines will be disconnected and securely capped or plugged, once the brine is transferred to US Salt's operational brine pond.

The liner system will remain in place if drained, cleaned to remove all traces of brine, and both liners punctured so that drainage is allowed. The brine pond is to be backfilled and regraded to the surrounding topography.

In terms of closure of the facility and the underground caverns, Finger Lakes' wells, when necessary, will be closed and plugged in accordance with Mineral Resources regulations 6NYCRR Part 555 and standards described in the 1992 GEIS, which are designed to prevent surface and subsurface environmental impacts. In accordance with maximum financial security requirements specified in ECL § 23-0305.8, the Department holds $40,000 to ensure proper plugging of the wells and restoration of the well sites. Finger Lakes will also be required to properly abandon the storage facility in accordance with ECL § 23- 1305.

Transportation Impacts

In Section 4.4.2 above, potential impacts from rail operations are described. While there is no history over the last 10 years of rail accidents on the line to be utilized for the transport by NS of LPG to the Finger Lakes facility, mitigation for potential accidents, and bridge or track issues are addressed.

4.6.3 Proposed Mitigation Measures

Regulatory Oversight

The construction and operation of the facility will be under the watchful eye of several regulatory agencies or programs. First, DEC is in the process of reviewing Finger Lakes' underground storage permit application. In order for a permit to be issued, it must be demonstrated that the reservoir is adaptable for storage purposes. ECL 23-1301(1)(b). In addition, DEC's regulations contain standards for well drilling practices and operations. 6 NYCRR Parts 550-557. Second, Finger Lakes must comply with EPA's Risk Management Program. Third, Finger Lakes must comply with applicable laws and regulations promulgated under the Occupational Safety and Health Act (OSHA). Fourth, the pipeline that brings product to the underground storage caverns must be designed and operated consistent with U.S. DOT standards and regulations. Finally, the rail line must be operated in accordance with federal and state law, as overseen by the Federal Railroad Administration.

Safety and Training

Notwithstanding the inherent safety of underground storage, Finger Lakes is nevertheless required to undertake or will otherwise have in place certain safety and training related programs. As noted above, Finger Lakes is required to develop an RMP, and submit the RMP to EPA. These mitigation measures will apply to all aspects of the Finger Lakes facility, as appropriate. See 40 CFR Part 68. The goal of these regulations is to prevent accidental releases that could affect the public or the environment.

An important aspect of addressing public safety is worker safety. Finger Lakes' Operations, Maintenance and Contingency Plan will include a Safety Plan which will describe measures to be taken, consistent with OSHA, to ensure worker safety. Many of the sections below are inherent parts of the Safety Plan. However, the Safety Plan will also address first aid, the use of personal protective equipment, housekeeping, fire prevention, and testing and inspection of safety systems.

Accidental Release Prevention and Emergency Response Policies

Finger Lakes will have in place a comprehensive accidental release prevention program that covers areas such as design, installation, operating procedures, maintenance, and employee training associated with the process at the facility. This facility will comply with NFPA-58 requirements for LP-Gas storage, and will adhere to all applicable federal, state, and local laws. If an emergency were to occur, local fire companies (listed above) would be notified and requested to assist in the response.

To comply with the EPA's RMP, prior to operation, the facility will conduct a HAZOPS study to ensure that hazards associated with the process are identified and controlled efficiently. The study must be undertaken by qualified personnel with expertise in engineering and process operations as well as employees familiar with the process, and is revalidated at a regular interval of 5 years. Any findings related to the hazard analysis are addressed in a timely manner.

Process Safety Information

Finger Lakes will maintain records of safety information that describes the chemical hazards, operating parameters and equipment designs associated with the process.

Operating Procedures

For the purposes of safely conducting activities within our covered processes, Finger Lakes will maintain written operating procedures. These procedures address various modes of operation such as initial startup, normal operations, temporary operations, emergency shutdown, emergency operations, normal shutdown and startup after a turnaround. The information is regularly reviewed and is readily accessible to operators involved in the processes.

Training

Finger Lakes will have a comprehensive training program in place to ensure that employees who are operating processes are competent in the operating procedures associated with these processes. Refresher training is provided at least every 3 years and more frequently as needed.

At the very least, operator training will be conducted and documented in accordance with the following regulations where applicable:

- 49 CFR §172 Subpart H (PHMSA)
- 29 CFR §1910.119 (g-h) (OSHA PSM)
- 40 CFR §68.71 (EPA RMP)

New employee operator training will be accomplished mainly by “hands-on” instruction by supervisors and senior operators. All operators and employees working near or on process equipment will also complete a computer and classroom based training program. In addition, all employees will complete and must achieve a passing score on written or computer based examinations on the training materials provided to them.

All new hires will be considered on a “probationary” period for approximately one year from their date of hire. During this period they will work closely with experienced operators until such a time that their skills and knowledge are deemed satisfactory by the supervisor(s) and senior operators.

Initial training will be undertaken by all new employees and refresher training will be completed at least every three years.

The following is a summary of the types of training to be undertaken by operators:

1. General Awareness and Familiarization

- Safe Handling of LPG
- Familiarization and Awareness of Hazardous Materials Regulations
- Drugs in the workplace/company policies

2. Function Specific Training

- Operating Procedures
- Mechanical Integrity Program
- Pipeline Maintenance Standards and Procedures
- Confined Space Entry Procedures
- Lockout/Tagout
- Powered Industrial Truck (Forklift)
- Trenching and Excavation
- Tank car loading and unloading
- Tank truck loading and unloading

- Marking, labeling and Placarding Bulk Shipments
- Finger Lakes LPG SCADA control systems and user interface

3. Safety Training

- Safety Equipment and its uses and limitations
- Hazard Communication Program
- Employee Participation in the development and implementation of Process Safety Management and Risk Management Plan programs
- Spill Prevention and Control procedures
- Emergency Response Procedures
- Security Awareness Training
- Hazard Recognition and Evaluation

Mechanical Integrity

Finger Lakes will carry out documented maintenance checks on process equipment to ensure proper operations. Process equipment examined by these checks includes, but is not limited to: pressure vessels, storage tanks, piping systems, relief and vent systems, emergency shutdown systems, controls and pumps. Maintenance operations are carried out by qualified personnel with previous training in maintenance practices. Furthermore, these personnel are offered specialized training as needed. Any equipment deficiencies identified by the maintenance checks are corrected in a safe and timely manner.

Management of Change

Written procedures will be in place at Finger Lakes to manage changes in process chemicals, technology, equipment and procedures. Process operators, maintenance personnel or any other employee whose job tasks are affected by a modification in process conditions are promptly made aware of and offered training to deal with the modification.

Pre-startup Reviews

Pre-start up safety reviews related to new process equipment and to modifications in existing process equipment will be conducted as a regular practice at Finger Lakes. These reviews are conducted to confirm that construction, equipment, operating and maintenance procedures are suitable for safe start-up prior to placing equipment into operation.

Compliance Audits

Finger Lakes will conduct audits on a regular basis to determine whether the provisions set out under the RMP rule are being implemented. These audits are carried out at least every 3 years and any corrective actions required as a result of the audits are undertaken in a safe and prompt manner.

Incident Investigation

In the unlikely event of an incident, Finger Lakes would promptly investigate any such incident that has resulted in, or could reasonably result in a catastrophic release of a regulated substance. These investigations are undertaken to identify the situation leading to the incident as well as any corrective actions to prevent the release from reoccurring. All reports are retained for a minimum of 5 years.

Employee Participation

All Finger Lakes' employees will be strongly encouraged to express their views concerning accident prevention issues and to recommend improvements. In addition, employees will have access to all information created as part of the facility's implementation of the RMP rule including, but not limited to, process safety information and information resulting from process hazard analyses.

Contractors

On occasion, Finger Lakes will hire contractors to conduct specialized maintenance and construction activities. Prior to selecting a contractor, an evaluation of the safety performance of the contractor will be carried out. Contractors will be informed of all the procedures for emergency response should an accidental release of a regulated substance occur. The safety performance of contractors is evaluated upon completion of any contract work.

Emergency Response Program

Finger Lakes will have a written Emergency Response Plan (ERP) to deal with accidental releases of hazardous materials. The plan includes all aspects of emergency response including adequate first aid and medical treatment, evacuations, notification of local emergency response agencies and the public, as well as post-incident decontamination of affected areas.

The ERP will address incidents at the Finger Lakes facility involving propane and/or butane. In particular, the plan and the procedures contained herein will deal with the problems that occur when LPG product is accidentally released either through human error, transportation accident, well and/or cavern failures, fire, or explosion.

It is the purpose of this ERP to set and provide general guidelines and practices which the response team should follow to mitigate the incident as soon as possible after the incident has begun. The ERP is designed to provide a quick and effective response to a LPG incident.

The objectives of the plan are to provide:

1. Initial information on the properties, characteristics, and emergency procedures to be followed at the scene and during mitigation of the incident.

2. Technical advice and expertise to the local authorities once they are at the scene.

3. A means of contacting outside industry personnel trained in the safe handling of a hazardous material incident as well as type of equipment involved in the incident.

The ERP will establish an Emergency Response Organization or Chain of Command to minimize confusion so that all employees will have no doubt about who ultimately has the authority to make decisions in the time of crisis. The duties of the Facility manager and Emergency Response Coordinator (ERC) shall include but not be limited to the following:

1. Assess the situation and determine whether an emergency exists that requires activating emergency procedures. A Decision and Action Plan will be based on the nature of the identified hazard.

2. Directing operations in the area which will include evacuation of personnel and minimizing property loss.

3. Ensuring that outside emergency services such as medical aid, local fire department, local law enforcement, etc. are notified of the situation as soon as it is has been determined that an actual emergency situation exists.

4. Call in all off duty personnel to assist in the termination of the emergency condition.

Planned Changes to Improve Safety

Finger Lakes will periodically evaluate the effectiveness of all programs and policies to identify areas where improvements to safety can be made.

Security Plan

In additional to the physical protection and fencing at each of the sites, the facility will have a security plan as part of its Operations, Maintenance and Contingency Plan. The security plan will include sections on personnel reference checks, access to the facility by visitors, use of gates and locks, truck driver identification verification, rail car number verification, and security training.

4.6.4 Potential Accidents at Underground Hydrocarbon Storage Facilities and Mitigating Factors

Wherever possible, Industry Best Practices, including those identified in previous subsections herein, will be implemented to minimize any potential risks associated with the storage and handling of LPG. Finger Lakes will have multiple safeguards in place including an extensive gas and fire detection system, an emergency shutdown system which, along with all other aspects of the process, are controlled by a state of the art electronic control system. In addition, operating, maintenance, and emergency procedures will be in place to ensure that the effects of accidents are minimal.

Based on industry reports, some examples of potential accidents at salt cavern LPG storage facilities are as follows:

1. Surface and Subsurface blowouts: The following scenario could result in a "blowout" of LPG.

   Overfilling can occur if the LPG reaches the bottom of the tubing. The LPG would enter the brine tubing and flow upward. As the hydrostatic head is lowered the LPG will flow faster towards the surface and if not shut in would flow into the main brine line to the flare stack where it would be flared in a controlled fashion.

   Finger Lakes safety equipment to prevent this:

   - In-line flow meters monitor the flow of brine to and from the cavern. These meters are controlled by a Programmable Logic Controller (PLC) which has maximum flow shut off points to close in the fail close electric/ pneumatic actuated valves. This will keep the LPG from reaching the surface in the brine string.

   - The brine string has a ¼ inch hole drilled, 4 inches up from the bottom of the tubing. If the gas reaches this hole a small amount of LPG will flow up the tubing and go to the flare tower as an indication that maximum storage capacity of cavern is almost reached.

2. Wellhead Failure. Wellhead failure is unlikely, as there are no external seals that could fail and release product. All seals are contained inside the metal well head. If these seals were to fail the brine and LPG would be contained inside the wellhead with no release. Between the well head and valve flanges there are metal ring joint gaskets rated for 3000 psi.

   Wellhead valve failure, even if this occurred, would not release LPG. It would still be contained inside the pipe. There are actuated valves and manual isolation valves inline that can be used to isolate the well. When the well is emptied and evacuated of all LPG the valve can be replaced safely.

3. Accidents Involving Truck Transport. Hose blowouts caused by cracks or tears in transfer hoses could cause the hose to rupture, releasing a limited quantity of LPG.

Truck loading racks will be equipped with emergency shutoff valves that can be actuated remotely or at the loading area.

En route safety is the responsibility of the transport companies. CHEMTREC provides 24 hour support to emergency services personnel.

4. Accidents Involving Rail Transport. Hose blowouts to transfer hose on the rail rack could rupture or develop a leak; however, any ensuing accidental release would likely be limited (by pneumatic or manual Emergency Shut Downs [ESD]) to the quantity of LPG in the hose itself.

   En route safety is the responsibility of the rail companies. CHEMTREC provides 24 hour support to emergency services personnel.

5. Potential general hazards associated with the handling of LPG. Piping ruptures-surface piping will be protected by means of physical barriers to prevent damage caused by vehicles or heavy equipment.

   Tank Overfilling- tanks will be protected from overfilling by following NFPA 58 guidelines and by relief valves.

   Cryogenic/asphyxiation- employees will be supplied with the proper personal protective equipment to protect against these hazards

4.6.5 Capabilities of Local First Responders to Manage the Effects of Accidents

In the case of a fire or accidental release, local emergency responders will be called in to assist plant personnel in controlling the effects and if necessary initiating community emergency action plans. Finger Lakes will have at least 1000gpm of water available (from US Salt's existing freshwater supply and a future hydrant system) in both sections of the facility for firefighting, cooling or LPG cloud dispersal.

Finger Lakes will have a written emergency response plan to deal with accidental releases of LPG. The plan includes all aspects of emergency response including adequate first aid and medical treatment, evacuations, notification of local emergency response agencies and the public, as well as post-incident decontamination of affected areas. Finger Lakes management will evaluate the safety of all aspects of operations on an on-going basis and changes will be made to improve facility safety and security when measures to minimize risks and or hazards are identified.

A brief summary of local emergency responders and their capabilities is as follows:

Finger Lakes will coordinate with the Watkins Glen Fire Department to develop a site specific plan prior to the commencement of operations. The Watkins Glen Fire Department is an entirely volunteer department that answers Fire, EMS, Auto Extrication, High Angle Rescue, and many other types of alarms each year. They cover a 58 square mile response district out of one station. The department answers on average over 700 alarms a year throughout the county. The department currently has a 1999 75' Ladder Truck, a 2007 Heavy Rescue Engine, a 1990 Engine, a 1986 Tanker, a 1986 Bruch truck, a 1998 Tahoe for EMS response, a 2007 Polaris 6x6, a Tech Rescue Trailer, and a 2002 Subaru Forester for EMS response.

Watkins Glen Fire Department has a predetermined response plan for a progressive response.

The first alarm would be the Watkins Glen Fire Department and as a situation escalates they would use a 2nd and 3rd alarm. The response details for a 2nd and 3rd alarm response are summarized in the following table provided by Schuyler County Emergency Management.

03/29/10	Department	Engine or Pumper Rescue	Tanker or Pumper tanker
REVISED	Confirmed Structure Fire Per 911 or Department Officer - Dundee (Yates Co.		
Second Alarm	Burdett	BE-4 to scene	BT- 5 to scene
District 3	Tyrone		JE-53 to scene
Reading East	Montour Falls	GE-17 to fill Site	GT-20
	SCVAA		
	Coordinators		

Fill Sites: Ellison Road Hydrent Stamp's Hydrents, Spencer Rd Dry Hydrant, Water Tank on Steuben
Comand to determine fill site

	Department	Engine or Pumper Rescue	Tanker or Pumper tanker
Third Alarm	Odessa	HE-23 & Manpower	HT-28 to scene
District 3	Dundee (Yates Co.)		2 Tanker to scene
Reading East	Beaver Dams	AE-6 stand By @ WGFD	

Fill Sites: Ellison Road Hydrent Stamp's Hydrents, Spencer Rd Dry Hydrant, Water Tank on Steuben
Comand to determine fill site

As noted in Section 4.6.1, emergency services in the vicinity of the proposed Facility include:

Fire

Watkins Glen Fire Department
201 North Perry Street
Watkins Glen, New York 14891
(607) 535-7700

Dundee Fire Department
12 Union Street
Dundee, New York 14837
(607) 243-8441

Montour Falls Fire Department
111 Lee Street
Montour Falls, New York 14865
(607) 535-7265

Law Enforcement

Schuyler County Sheriff's Office
106 Tenth Street Unit 2
Watkins Glen, New York 14891
(607) 535-8222
New York State Police
600 College Avenue
Montour Falls, New York 14865
(607) 535-7731

Hospital and Emergency Medical Services

Schuyler Hospital
220 Steuben Street
Montour Falls, New York 14865
(607) 535-7121

Schuyler County Volunteer Ambulance
Association
909 South Decator Street
Watkins Glen, New York 14891
(607)-535-7273

Dundee Ambulance Corp
12 Union Street
Dundee, New York 14837

Emergency Management

Schuyler County Emergency Management
Michael J. Maloney Public Safety Building
106 Tenth Street Unit 36
Watkins Glen, New York 14891
(607)-535-8200

5.0 ALTERNATIVES TO THE PROPOSED ACTION

Given the size of brine storage needed, Finger Lakes considered several alternatives, in terms of location, configuration and size before concluding on the size and location of the proposed brine pond. The site selected has a grade change ranging from about 35-45' depending upon which portion of the structure you are looking at. For overview drawings showing the pond options considered see Figures 5-9. Given that the solution mining wells already exist, Finger Lakes did not consider other greenfields in the vicinity of the site for an underground storage LPG facility. In addition, given the use of the US Salt property for solution salt mining, underground natural gas storage, and with this application, LPG storage, it was not feasible to locate the surface facility on the US Salt property. Therefore, Finger Lakes acquired property on NYS Route 14A because it is contiguous to property US Salt owns on the west side of NYS Route 14 making the pipeline connection possible without having to acquire any easements from other property owners.

In terms of options for where the brine pond is proposed to be located, the following was considered:

Option 1 – Two Ponds In Current Location

The first option considered to accommodate the 2.1 million barrels of brine that is to be displaced from the storage caverns was two ponds located on the land where the latest pond is proposed to be located. This option would have involved two individual ponds laid out as shown on the attached Option 1 layout drawing. See Figure 6. The rectangular shape of each pond would allow for lining the structures more easily. This layout would also allow for additional flexibility when managing the brine; however several drawbacks drove Finger Lakes to consider additional options. The two pond option forces the second pond to the east and into steeper terrain. This steeper terrain necessitated a narrower embankment with an outside slope of three to one on each side. This steeper embankment would have a greater potential for instability, while the single pond layout allows for outside slopes of four to one as well as a much wider embankment. With the lake located to the east of the site, Finger Lakes wanted to ensure they were able to utilize the option that provided the greatest factor of safety. A single pond in this location allowed for the greatest factor of safety against embankment failure.

Consideration was given to using two or more ponds of greater depth. The presence of relatively shallow bedrock limited their depth and it was not possible to acquire additional land which would accommodate the embankments and side slopes of two or more ponds that would collectively provide the required storage volume. One, large pond was selected as it limited the depth of excavation and thereby minimized the volume of rock excavation and it had the added benefit of roughly balancing cut and fill volumes.

Option 1A – Two Ponds Aligned in North South Orientation

In an effort to utilize the area chosen for option 1 a second pond layout was investigated, the results of this exercise is shown as option 1A (see Figure 7). In order to allow for a more gradual berm on the lake side of the structure the storage cells were oriented North and South to attempt to take advantage of the flatter area on the US Salt property as well as the newly acquired portion of the Young Property. This orientation would allow for gentler slopes to the lake side of the structures, improving the factor of safety. When preliminary gradings were completed on this option, the toe of the slope on the north end extended past the property line at a 3:1 slope. With this steeper slope requirement and the property line constraints it was decided that this was not a viable option.

Option 2 – Single Pond Near Rail Siding

The second option that Finger Lakes considered was a single storage pond located on the property purchased for the rail siding. As shown on the attached Option 2 layout drawing (Figure 8), the dimensions of the top of the pond structure do not fit in the area owned by Finger Lakes. Without designing the grade of the structure, it is also evident that this single storage pond would impact the Class C tributary to the lake located south of the site. In addition, there is a small pond/wetland area that has been identified on the site; the single pond would also impact this resource. With the potential resource impacts and the lack of adequate space it was decided that this was not a feasible option.

Option 3 – Single Pond North of Cemetery

The third option that was considered was a single storage pond located on the property where the gas transmission line will be installed north of the cemetery. This property is owned by Finger Lakes' affiliate US Salt. As shown on the attached Option 3 layout drawing (Exhibit 9), a square storage structure would fit onto the property; however, the topography in the area makes this storage location impractical. The change in elevation from west to east is approximately 70 feet according to the USGS Topographic map. This would necessitate the installation of a very high, very narrow embankment on the east side of the structure. The factor of safety utilized to design the single storage embankment in this location would not be possible. In addition, the structure would impact the Class C tributaries to the North and South of the structure. As shown on the drawing, this structure would also be immediately upslope from the motel located on Route 14. Finger Lakes was therefore concerned about any negative impacts the embankment might have on this property owner. Also shown on this drawing is the planned gas transmission line from the rail area to the storage area. This pond location would be directly over the planned pipeline. The pipeline would need to be rerouted, and with the property lines as shown there is no location where this pipeline can be installed and not interfere with the option three storage pond.

Option 4 – Single or Double Pond Layout on US Salt Property

In addition to the options discussed above, Finger Lakes looked at the entire US Salt property for another suitable location. With the presence of many salt caverns and well heads and the increase in topography as the site gets closer to the lake, no potential sites were found on the property.

6.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The project will result in the irretrievable loss of 14.2 acres of developed area at the surface facility and approximately 13 acres at the brine pond site and a small Plant Area adjacent to the existing driveway to the US Salt brine field and NYSEG Seneca Storage facility. In addition, as part of the operation of Galleries 1 and 2, when nearly saturated brine is injected and withdrawn from the caverns, this will result in the incidental removal of approximately 3 million tons of salt from the storage caverns over the life of the facility. However, as noted above in the public safety section of this DSEIS, reuse of underground salt caverns for hydrocarbon storage is safe as well as economical and environmentally renewable.

7.0 GROWTH INDUCING ASPECTS

Finger Lakes storage will ultimately make available 2.1 million additional barrels or 88.2 million gallons of local supply that will be immediately available with large scale truck, rail, and pipeline access.

The ability to make product available to the market is a function of how much is in storage and immediately available along with a robust loading facility. Additionally, this storage will make more supplemental storage available to TEPPCO pipeline through Finger Lakes' connection.

Pipeline allocations and the need for large volumes of spot product at high pricing spreads will be dramatically reduced relieving millions of dollars of potential burden from consumers and helping to ensure the use of clean burning fuels.

In terms of economic benefits, the total estimated project cost is $40 million. It is expected that approximately 50 construction jobs and 8-10 permanent full time jobs will be created. The permanent jobs will pay approximately $40-50,000/job. In addition, there will be indirect job creation, including jobs for railroad employees and trucking industry. Finger Lakes has had discussions with the Schuyler County IDA (SCIDA) and the Schuyler County Partnership for Economic Development (SCOPED) regarding a Payment in Lieu of Taxes (PILOT) agreement.

All of the above results in positive growth inducing aspects, without an increase in population or reliance on outside services. Additional jobs, even during construction, will result in a demand for local hotel rooms, services to support ongoing operations and increased use of other local vendors.

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