Skyridge Water District
Drinking Water Source Protection Program (DWSP2) Plan

System Name: Skyridge Water District
PWS Number: NY3304337

Location:
Town of Manlius
Onondaga County
New York

LaBella Project No. 2223129.13
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LIST OF ACRONYMS

AEM	Agricultural Environmental Management
BMP	Best Management Practice
BTS	Bureau of Transportation Statistics
CAG	Community Advisory Group
CFA	Consolidated Funding Application
DPW	Department of Public Works
DWSP2	Drinking Water Source Protection Program
EPA	Environmental Protection Agency
GIS	Geographic Information System
GPD	Gallons Per Day
GPM	Gallons Per Minute
MCL	Maximum Contaminant Level
MGD	Million Gallons Per Day
MG/L	Milligrams Per Liter
NHD	National Hydrology Dataset
NLCD	National Land Cover Data
NRCS	Natural Resources Conservation Service
NYS	New York State
NYSDEC	Department of Environmental Conservation
NYSDOH	Department of Health
NYSDOT	Department of Transportation
PMT	Plan Management Team
PWS	Public Water Supply
SEQR	State Environmental Quality Review
SPDES	State Pollution Discharge Elimination System
SWAP	Source Water Assessment Program
SWCD	Soil and Water Conservation District
TOGS	Technical and Operational Guidance Series
TOT	Time of Travel
TRI	Toxic Release Inventory
OCWA	Onondaga County Water Authority
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WD	Water District
WIA	Water Improvement Area

INTRODUCTION

In 2022, the Town of Manlius in Onondaga County, New York, applied for technical assistance to prepare a Drinking Water Source Protection Program (DWSP2) plan to protect its local source water for the Skyridge Water District (WD). A New York State (NYS) technical services team ("consultant team") led by LaBella Associates, D.P.C. ("LaBella") was assigned to the town. Other members of the team included Behan Planning and Design which provided planning assistance, and Amala Consulting which completed the mapping work. The consultant team worked closely with a Skyridge WD Community Advisory Group (CAG) to develop the DWSP2 plan. The plan was developed using the New York State Departments of Environmental Conservation (NYSDEC) and Health (NYSDOH) DWSP2 framework to assist municipalities with assessing and supporting public drinking water source protection.

The town owns and operates the public water supply known as the Skyridge WD (ID# NY 3304337). The primary water source type is groundwater. Skyridge WD currently provides potable water to 29 service connections (approximately 100 persons), drawing water from two individual wells, located respectively on Gulf Road and Horseshoe Lane, in the Town of Manlius, Onondaga County. A limited portion of the upgradient recharge area is within the adjoining Town of Sullivan in Madison County.

The DWSP2 plan was developed by a working committee including residents, the Deputy Supervisor and Town Board member, the water authority, and others. Maintenance over time of this DWSP2 plan can contribute significantly to the conservation of natural resources and preservation of public health. In addition, protection of the water sources can create future benefits, including generating drinking water treatment savings costs, general liability insurance savings, maintenance of real estate values, and preservation of the Skyridge Water District's source water through an era of increased climate change.

Previous studies, reports, and plans were used in the development and completion of the DWSP2 plan. These include the Town of Manlius Comprehensive Plan, water quality reports and local laws provided by the town.

1.0 STAKEHOLDER GROUP

1.1 Community Advisory Group

In 2022, the consultant team facilitated the formation of the Community Advisory Group (CAG), which consisted of individuals from a variety of backgrounds, many of whom have years of experience with or in the realm of source water protection. These individuals represented Town leadership, the Onondaga County Water Authority (OCWA), regional planning, local land and business owners, as well as the Onondaga County Department of Health. Sara Bollinger, the main contact for the CAG, can be emailed at sbollinger@townofmanlius.org. A complete listing of the CAG members and their relevant affiliations is summarized in Table 1.1a below and in Appendix 1.

Table 1.1a. Community Advisory Group

Name	Relevant Affiliation
Sara Bollinger	Deputy Supervisor, Town of Manlius
Anson Bettinger	Onondaga County Water Authority (OCWA)
Tom Kinsella	President, Kinsella Quarries
Rob Furley	Onondaga Department of Health
Lauren Darcy/ Aaron McKeon	Regional Environmental Planners
Alexander Behm	Clear Path for Veterans
Erin Reynolds	Resident/Landscape Architect/ Town Planning Board member

The CAG scheduled a series of working meetings between 2022 and 2023 (roughly every month) that included a formal kickoff meeting to facilitate coordination between the participating parties, introduce the consultant team, review the objectives of the DWSP2, identify other interested parties to engage, and initiate a discussion to establish specific goals and a vision to guide the DWSP2. Each meeting led to substantial contributions to the development of the full plan. All the meetings of the CAG and the topics covered are shown in Table 1.1b in Appendix 1.

1.2 Vision and Goals

The CAG met to formulate a vision guiding their DWSP2 work, and supportive goals. The following vision was created by the CAG for the Skyridge WD:

Protect the recharge area to maintain and enhance water quality and quantity to Skyridge Water District wells with potential benefits to surrounding properties.

The CAG then established specific goals for the source water protection plan, supportive of the vision statement.

Table 1.2 - Skyridge WD DWSP2 Goals

Source Water Protection Program Plan Goals	
1.	Utilize an array of strategies to protect the quality and quantity of the Skyridge WD recharge area.
2.	Continue to include Clear Path (and other future partners) in implementation of the Skyridge WD DWSP2 plan.
3.	Increase awareness of source water protection measures.

A data summary table regarding the establishment of goals and formulation of a vision is contained in Appendix 1.

2.0 DRINKING WATER SOURCE ASSESSMENT

2.1 Overview of the Water System

A general water system overview has been prepared to assist with the development of the DWSP2 plan. Table 2.1 in Appendix 1 contains a summary of the basic information used for this.

2.1.1 Primary Sources

The Skyridge WD's two public water supply source areas come from a local groundwater aquifer, drawing water from two individual wells located within the town, on Gulf Road and Horseshoe Lane. Horseshoe Lane and adjoining homes lie near the rim of the Onondaga Escarpment, consisting of bluffs supported by the fracture-resistant Onondaga limestone. The two bedrock wells supporting the Skyridge WD are drilled through this formation into the next and more-fracture prone geologic formation, the Manlius formation. The Manlius formation is in some instances known to be prone to solution channel formation (e.g., karst).

The "lower" well located off Gulf Road was drilled to approximately 115 feet deep to reach the water-bearing bedrock horizon. The "upper" well is situated at higher elevation off Horseshoe Lane and was advanced to approximately 230 feet deep to encounter the water-bearing horizon.

2.1.2 Water System History

The current water withdrawal permit that covers the Skyridge WD was issued in December 1994 with no expiration date. Subsequently, the NYSDEC now only regulates withdrawals of 100,000 gallons per day or more.

2.1.3 Water System Existing Conditions

The average daily water system demand is around 3,000 gallons per day (gpd). The two individual wells are used in alternation rather than at the same time. The lower well pump turns on/off automatically, but the system operator, OCWA, remotely turns the upper well on/off manually. When the upper well is placed in service it usually runs long enough to provide 2,200 gallons before being turned off. When the lower well is placed in service, it usually runs through the night and so provides 3,600 gpd which satisfies daily demand and adds additional volume which tops up the water storage tank. The distribution pumps at the upper well chlorine station run continuously between the hours of 4 am – midnight, to serve adequate pressure throughout the system. Once a week (Wednesdays, midmorning), the OCWA system operators will manually operate the lower well for 30 minutes to test the chlorine feed system. The well operators report that well productivity is stable, with little seasonal variability and that depths to the water level in the wells are also relatively stable. These characteristics are not typical of karst formations, suggesting that the water-bearing formation is not karstic in the location of either well.

2.1.4 Water Quality

Water quality samples from the upper and lower well routinely meet all drinking water standards, necessitating only routine disinfection before entering the distribution system. Sodium levels are marginally above the 20 mg/l advisory limit in both wells for those on severely restricted diets, with a higher sodium presence in the upper well. The upper well has sodium concentrations as high as 75 mg/l. Water softener use is known to be widespread but is not believed to have a significant effect

on sodium levels. If septic systems were the source of sodium in the water supply wells, it would be accompanied by higher nitrate levels (which does not occur). In addition, while a 2003 NYSDOH Source Water Assessment Program (SWAP) test rated the wells as being susceptible to microbials, the water is disinfected to ensure that the finished water delivered into homes meets New York State's drinking water standards.

No fluctuating pH, turbidity, nitrate, biologicals (or flows), characteristic of karstic groundwater have been recorded, further supporting an interpretation that the water bearing Manlius formation is not karstic in the location of either well.

The only treatment this water system receives is disinfection by the addition of liquid chlorine.

2.2 Drinking Water Source Protection Map

2.2.1 Ownership and Control Areas

The Skyridge WD wells are situated on small municipally owned parcels. The upper well parcel is 0.19 acres and is not large enough to satisfy either current 100-foot radius ownership or 200-foot radius control NYSDOH PWS requirements. The lower well parcel is 0.83 acres and may satisfy 100-foot ownership requirements (the well location and property site boundary would have to be surveyed in order to know conclusively). This parcel clearly does not satisfy the 200-foot control radius. The approximate well locations are shown on maps in Appendix 2.

2.2.2 Critical and Extended Source Areas

Under the DWSP2, recharge areas for public water system wells are subdivided into Critical Source Areas, typically describing areas where a contaminant release might reach a well within 5 years, and Extended Source Areas where groundwater will eventually reach a well. Details on the delineation of the protection areas for the Skyridge WD wells are summarized in Table 2.2a in Appendix 1 and described below.

To delineate the Critical Source Areas for the Skyridge WD two wells, the DWSP2 team sought well test records but no pumping test data are available for either the upper or lower well. Instead, a fixed radius estimate of 500 feet was assigned around the immediate wellfield recharge area. This was judged a reasonable radius of influence which includes the conservative allowance admitting the potential for reasonable extensions of wellfield influence extending in some discrete directions more than other directions responsive to linear fractures. These 500-foot radial boundaries were then also each extended an addition 1,000 feet in the upgradient direction from each well to accommodate an estimated 5-year time of travel, resulting in the mapped representations of the Critical Source Area.

The full Extended Source Areas were then estimated based on topography. Land rises south of both Skyridge wells to a ridgeline approximately 6,000 feet distant, away from which groundwater is expected to migrate radially to the west, north and east. A conservative Extended Source Area is therefore mapped extending from the wells toward this ridge line. Based on the lower elevation position of Skyridge's lower well, its Extended Source Area pinches out rather than extending fully to the ridgeline.

2.2.3 Map Access

Appendix 2 provides full-size pdf maps showing the Critical and Extended Source Areas. The maps were created using ArcGIS Pro software.

2.3 Potential Contaminant Source Inventory

Publicly available data source layers for land use categories and discrete potential point sources of contamination were downloaded and posted to project maps to allow the CAG to summarize and prioritize potential contaminant sources. The approximate locations for the potential point sources are shown on Figure 1 in Appendix 2. Land use is shown on Figure 2 in Appendix 2.

OCWA publishes an Annual Water Quality Report for the customers of the Skyridge WD, which is available on their website. As the 2022 OCWA Annual Water Quality Report states, the water meets all requirements set forth by the New York Sanitary Code. Specific contaminants of concern are referenced in the above section 2.1.4 Water Quality.

The CAG reviewed the maps and created a narrative summary of the specific categories of potential contaminant sources within the Critical and Extended Source Areas, found in Table 2.3 in Appendix 1. The CAG also discussed specific sites familiar to them to ensure that their summary captured all manner of water quality contaminants warranting protective planning. The CAG concluded that, generally speaking, the potential threats to the Skyridge WD wells include road salt, nitrate and microbials from septic systems, fertilizers and pesticides from residential and agricultural activities, and the potential for petroleum spills.

The CAG recognized that most of these geolocated elements are not confirmed sources of contamination per se, but rather represent categories of potential groundwater risk based on the histories of land use and their traditional contaminant risk correlations. The potential contaminant sources within the Critical and Extended Source Areas helped guide the consultant team as to which categories of land uses and activities warranted attention during development of this DWSP2 plan.

3.0 PROTECTION AND IMPLEMENTATION STRATEGIES

3.1 Identify Protection and Management Methods

The CAG discussed in detail the potential threats represented by the potential contaminant sources discussed in Section 2.3 above and listed in Table 2.3 of Appendix 1. To protect the public drinking water sources from these potential contaminant sources, the CAG developed specific protection and management recommendations for each potential contaminant source, as is shown in Table 3.1/3.2 in Appendix 1 and described in more detail below. These protection plan elements were developed to not only respond to the potential contaminant sources identified through this plan, but also to support the project goals and vision created by the CAG and listed in section 1.2 of the report.

The CAG recognized that certain planning protection measures, such as an aquifer protection ordinance, manage only future potential land use contaminants while others, such as local education and enhanced spill response can be deployed to address existing or otherwise ongoing potential threats.

Table 3.1/3.2 in Appendix 1 also includes budget estimates for each protection initiative, potential funding sources, and likely collaboration partners. More analysis describing the budget estimates is shown in Table 3.3 in Appendix 1.

Given the potential contaminant sources found, this DWSP2 plan effort focuses on expanding partner communication, reducing salt application, educating the public and local officials about the location of the local drinking water sources and best management practices (BMPs), addressing agricultural uses, and the preservation of large parcels in the Critical and Extended Source Areas. The proposed protection and management methods are summarized below, with additional information provided in Table 3.1/3.2 in Appendix 1.

3.1.1 Partner Communication and Spill Response

Several of the protection methods listed in Table 3.1/3.2 in Appendix 1 have to do with greater communication between the Town of Manlius and partner municipalities, agencies, or groups. The need to keep apprised and be on the same page with other groups is especially evident in areas of overlapping responsibility and concern.

Protection Method 1 focuses on increasing awareness from and communication with regional NYSDEC, police, and highway department spill responders. An annual reminder of where the Critical Source Areas of the wells are located is necessary.

3.1.2 Road De-icing

The CAG discussed at length the concern of road salt within the Critical Source Area. Recognizing that safe winter roads are a priority, protection methods 2a and 2b in Table 3.1 are aimed at reducing the amount of salt application in the Critical and Extended Source Areas. The CAG recommends an education campaign (protection method 2a) for the Town and County to refine best management practices (BMPs) so that road salt application is not excessive within the Critical and Extended Source Areas. Personnel at the Town Highway Department who manage and apply the road salt in Manlius should collaborate with partners, including the New York State Department of Transportation (NYSDOT), Onondaga County Department of Public Works (DPW), Town of Sullivan, and other partners who salt the rest of the Critical and Extended Source Areas. The installation of low salt educational signage along the side of the road is also recommended to let highway staff and the public know that they are in an area of source water protection and that salt application will be lighter in this section of the roadway. An annual reminder to the Town and County highway departments regarding the need for lower salt loads for the section of Salt Springs Road between Sleepy Hollow Road and Palmer Road where more than one agency salts is imperative.

Continuous training on BMPs is necessary and may include post-storm assessments and efforts to minimize rock salt remaining on road margins beyond the duration of the snow season, since such salt simply dissolves into the environment. The use of brine rather than the spreading of rock salt is understood to de-ice roads more precisely, using less salt and leaving far less of a post-winter salt residue.

Depending on salt levels, an additional long-term road salt planning initiative would be to create a rolled curb on Salt Springs Road, which falls in the Critical Source Area (protection method 2b) and construction of a wider paved shoulder/apron where plows turn around at the intersection of Salt Springs and Gulf Road. Also included in protection method 2b could be a similar wider paved shoulder/apron on both sides of Salt Springs between Palmer Road and Clear Path (about half mile total) may be appropriate.

3.1.3 Potential Groundwater Threats and Landowner Education

Several of the protection methods listed in Table 3.1/3.2 have to do with education and BMPs to limit contaminants from different land uses. Educating property owners within the Critical and

Extended Source Areas will lead to public awareness on source water protection. This is the aim of protection methods 3 and 4.

The CAG identified education as a method to increase awareness about groundwater quality potential threats from possible quarried lands (protection method 3). Education on the BMPs for storage and use of petroleum, other volatile organic compounds (VOCs), and chemicals such as deicing salts. and a periodic (likely annual) reminder about their location near the Skyridge wells will help limit impacts to the source water. Any permitted quarry will have an approved and pre-bonded mined land reclamation plan for the site that will be implemented to prevent pollution associated with mining activity.

Protection method 4 is an education campaign for homeowners on BMPs for activities such as water softening systems, septic systems, fertilizer, pesticides, etc. For example, calibrated water softeners can reduce salt use. The Town should partner with the Onondaga Resource Recovery to disseminate information on the proper disposal of chemicals, fertilizers, pesticides, petroleum, and other contaminants.

3.1.4 *Agricultural Uses*

Addressing agricultural uses within the Critical and Extended Source Areas is the focus of protection methods 5a and 5b. The creation of an education campaign for BMPs on agricultural uses is the purpose of protection method 5a. The Onondaga County Soil & Water Conservation District (SWCD) is a partner for education campaigns to share with farm owners. The outreach would include a periodic reminder about proximity to the Skyridge WD drinking water wells, the availability of technical assistance through the SWCD, and information regarding the wide array of agricultural BMPs affecting groundwater quality that are available in New York State. The issue of nutrient runoff from agricultural lands has protection methods that rely on collaboration. Protection method 5b looks to the future when agricultural uses may intensify and identifies the need to work with Onondaga County SWCD to implement Agricultural Environmental Management (AEM) programs on farms in the Critical and Extended Source Areas to limit nutrient and sediment runoff.

3.1.5 Protect Larger Parcels

Large parcels that are lightly developed are a benefit to groundwater in the Critical and Extended Source Areas. The CAG discussed the need to protect recharge in the larger parcels that are present in the southern portion of the Critical and Extended Source Areas. Protection methods 6a and 6b are designed to address this issue.

The Town should seek opportunities to establish conservation easements and/or acquire land in the Critical and Extended Source Areas (protection method 6a). This could involve applying for grants such as NYSDEC's Water Quality Improvement Project (WQIP) to help the Town with the substantial cost.

The current R-A zoning does not allow new homes on lots smaller than 100,000 square feet for parcels with septic systems. The town should ensure that large parcel zoning is maintained in the Critical and Extended Source Areas (protection method 6b).

3.2 Implementation Timeline

Recognizing that it would be difficult to implement all plan elements simultaneously, the CAG reviewed the urgency of need and the ease of implementation for each protection activity. On this basis, the group assigned a target implementation year to each element.

Table 3.1/3.2 includes target years to advance each planning element. The table assigns actions as "Year 1" if they are more urgent or may require less up-front investment of time or funding. Actions assigned to "Year 2" and beyond are either less urgently needed or were recognized by the CAG to require more budget or thought to implement.

Many standing recommendations have been assigned annual repetition, periodically, or ongoing, particularly those including coordination efforts with local officials/project partners and education initiatives.

The implementation timeline portion of Table 3.1/3.2 will be revised in the future to account for potential new funding sources that could aid with methods identified in this plan.

Suggested implementation steps for all listed protection methods are given in Table 3.2a in Appendix 1.

4.0 PROGRESSION AND MAINTENANCE

4.1 Plan Management Team

The CAG chose a Plan Management Team (PMT) to carry on plan implementation. They were chosen for their expertise in municipal cooperation, water treatment, and public education. Table 4.1a below shows the full PMT list. Further details on the PMT are contained in data summary tables in Appendix 1. The PMT is to establish a process to replace those who leave the team as time passes.

The Plan Management Team will meet on a regular meeting schedule to be set up by the team to discuss the DWSP2 plan, priorities, and next steps, which will be documented for review by the Town Board. A quarterly meeting schedule is proposed for Year 1, then the team will decide upon future meeting needs. The DWSP2 plan will have a yearly revision schedule. The plan tracker listed as Table 4.1c in Appendix 1 will be utilized to document updates and revisions to the DWSP2 plan. Progress by the Plan Management Team is to be reported to the Town Board twice a year. Progress will be monitored relative to this plan and documented in the reports provided to the Town Board. Until determined otherwise, the chair of the Plan Management Team will be Erin Reynolds, who can be contacted by email at ereynolds@townofmanlius.org.

Part of the Plan Management Team's ongoing work will be sharing progress in drinking water protection with the public. Any accomplishments and strides in watershed protection resulting from the protection methods described in this report (and other related work) should be marketed and communicated widely to all affected parties.

Table 4.1a – Plan Management Team

Name	Relevant Affiliation
Erin Reynolds, Chair	Skyridge water district resident/Town Planning Board member
Sara Bollinger	Deputy Supervisor, Town of Manlius
Alex Behm	Clear Path for Veterans
Tom Kinsella	Kinsella Quarries
Anson Bettinger	Onondaga County Water Authority

Appendix 1 - Drinking Water Source Protection Program (DWSP2) Plan Data Summary

DWSP2 Plan Checklist 1.1
Public Water Supply Information 1.2
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DWSP2 Plan Checklist	
Component	**Status**
Phase 1. Stakeholder Group	
1.1 Form a Stakeholder Group	Complete
1.2 Establish Goals and Formulate a Vision	Complete
Phase 2. Drinking Water Source Assessment	**Complete**
2.1 Develop an Overview of the Water System	Complete
2.2 Prepare a Drinking Water Source Protection Map	Complete
2.3 Create a Potential Contaminant Source Inventory	Complete
Phase 3. Protection and Implementation Strategies	**Complete**
3.1 Identify Protection and Management Methods	Complete
3.2 Develop an Implementation Timeline	Complete
Phase 4. Progression and Maintenance	**Complete**
4.1 Designate a Plan Management Team	Complete

Public Water Supply (PWS) Information	
PWS Name:	Skyridge Water District
PWS ID:	NYS PWSID #3304337
Type of Sources identified in plan:	Groundwater

1.1a - Community Advisory Group Members

Name	Contact Information Email	Relevant Affiliation(s)
Erin Reynolds	ereynolds@townofmanlius.org	Skyridge water district resident/ Town Planning Board member
Anson Bettinger	Private	Onondaga City Water Authority
Sara Bollinger	sbollinger@townofmanlius.org	Deputy Supervisor, Town of Manlius
Robert Furey	Private	Onondaga County Health Department
Aaron McKeon	Private	Manager, Environmental Management Central New York Regional Planning and Development Board
Tom Kinsella	Private	Kinsella Quarries
Alex Behm	Private	Executive Director, Clear Path for Veterans - adjacent property
Matthew Vanderwerken	Private	Director of Operations, Clear Path for Veterans

1.1b - Community Advisory Group Meetings	
Date	**Topic(s) Covered**
9/28/2022	Introduction were made for the newly formed CAG. An overview of the program was presented. The group formulated a vision and goals. Next steps were discussed and meeting date/time set.
10/27/2022	The consultant team presented the overview/summary of the Manlius map of potential contaminants and recharge areas to Skyridge wells (the map is preliminary at this stage) and general geography. LaBella's senior hydrogeologist suggested a 500' radius on both wells. There is a quarry nearby but it was noted that quarries are not typically a threat to groundwater contamination. The consultant team will continue working on potential contaminants (PCS) list for next meeting.
12/8/2022	The consultant team reviewed the overview of the watershed (table 2.1) and the group collaboratively filled in some blanks in the water quality summary section. The team went over the updated maps, explaining that the secondary areas (in blue) were kept conservatively large for protection around wells with critical areas are marked by a black dotted line. The consultant team shared the PCS inventory, which consists of spills, septic systems, underground oil and gas tanks, remediation sites, and mined lands. For next meeting, consultant team will refine this list and begin to identify protection and management methods.
1/12/2023	The consultant team shared the data summary for review of the cleaned up potential contaminants list and moved on to discussion of the protection methods of each potential contaminant, filling out table 3.1 together.
2/23/2023	The consultant team shared suggested goal revisions and CAG accepted changes. Continued work on the protection methods and strategies, particularly on road salt and adjacent land uses of agriculture and mined lands.
3/23/2023	Group pared down protection strategies, considering changes already made and current zoning restraints. Filled out implementation strategy side of the table.
4/13/2023	Group made edits to table 3.1/3.2 together. Discussed local land uses as well as educating public on health of watershed. Group started table 3.3 cost analysis.
5/11/2023	Went over draft DWSP2 plan and edited as a group.

1.2 Goals and Vision

Vision Statement
Protect the recharge area to maintain and enhance water quality and quantity to Skyridge wells with potential benefits to surrounding properties.

1	**Goal**	Utilize an array of strategies to protect the quality and quantity of the Skyridge WD recharge area.
2	**Goal**	Continue to include Clear Path (and other future partners) in implementation of the Skyridge WD DWSP2 plan.
3	**Goal**	Increase awareness of source water protection measures.

2.1 Overview of the Water System			
Water system name:	Skyridge Water District		
NYS PWS ID:	NYS PWSID #3304337		
Type of water system (e.g. community, non-community, transient, non-transient):	Community		
Name of the community, or communities, served by the system:	Portion of the Town of Manlius		
Population served by the system:	Approximately 100 persons		
# of service connections:	29		
Summary of wells, intakes, infiltration galleries, and/or springs including name, depth, screen length and pumping rates where applicable:	Two individual wells, located respectively on Gulf Road and Horseshoe Lane, in the Town of Manlius, Onondaga County. The "upper" well is approximately 230 feet deep and located off Horseshoe Lane. The "lower" well is approximately 115 feet deep and located off Gulf Road. The two individual wells are used in alternation rather than at the same time. The lower well pump turns on/off automatically, but the system operator remotely turns the upper well on/off manually. When the upper well is placed in service it usually runs long enough to provide 2,200 gallons before being turned off. When the lower well is placed in service, it usually runs through the night and so provides 3,600 gpd which satisfies daily demand and adds additional volume which tops up the water storage tank.		
General treatment information:	The only treatment this water system receives is disinfection by the addition of liquid chlorine.		
Summary of hydrogeographic setting of drinking water sources including watershed information and/or type of aquifer and aquifer materials (this information may be gathered after delineating protection areas in section 2.2):	The site lies near the rim of the Onondaga Escarpment, consisting of bluffs supported by the fracture-resistant Onondaga limestone. Bedrock wells supporting the Skyridge water district are drilled through this formation into the next and more-fracture prone geologic formation, the Manlius formation.		
Water quality summary including any known ambient water quality information, finished water detections, and/or history of maximum contaminant level (MCL) violations*:	Water quality samples from the upper and lower well routinely meet all drinking water standards, necessitating only routine disinfection before being entering the distribution system. Sodium levels are marginally above the 20 mg/l advisory limit in both wells for those on severely restricted diets, with a higher sodium presence in the upper well. Upper well has sodium concentrations as high as 75 mg/l. No fluctuating pH, turbidity, nitrate, biologicals, (or flows), characteristic of karstic groundwater have been recorded.		
Water quantity summary:	Current Water Withdrawal Permit Expiration Date(s) - December 1994 permit issued with no expiration date. NYSDEC now only regulates withdrawals of ≥ 100,000 gpd		
	Total Permitted Water Withdrawal Capacity		GPD
	Average Daily Water Demand (= Yearly Usage / 365)	around 3,000 gallons per day	GPD
	Maximum Daily Water Demand (Unofficial 3-day average in peak month - e.g. July)	5,800 - 6,000	GPD
	Daily Water Losses (can be obtained from Water Conservation Program form)	minimal, or none known	GPD

*Refer to "Sources of Water Quality Information" in Drinking Water Source Assessment Resource Kit

2.2a Drinking Water Source Protection Map		
Protection Areas	**Description**	**Delineation Method**
Ownership and Control Area (for groundwater)	The water district wells are situated on small parcels. The upper well parcel is not large enough to satisfy either current 100-foot radius ownership or 200-foot radius control NYSDOH PWS requirements. The lower well may satisfy 100 foot ownership requirements but does not satisfy the 200 foot control radius.The lower well parcel is 0.83 acres and the well location and property site boundary would have to be surveyed in order to know conclusively if it satsfies the 100-foot requirement.	Hydrogeologic mapping
Critical Source Area	No pumping test data are available for either the upper or lower well. Withdrawal rates are modest so we have assigned a conservative fixed radius of 500 feet to cover all reasonable contingencies for extended linear fractures. To this we added 1,000 feet in the upgradient direction to accommodate an estimated 5-year time of travel.	Hydrogeologic mapping
Extended Source Area	The full Extended Source Area was estimated on the basis of topography. Land rises south of both Skyridge wells to a ridgeline approximately 6,000 feet distant, away from which groundwater is expected to migrate radially to the west, north and east. A conservative secondary source area is therefore mapped extending from the wells toward this ridge line. Based on the lower elevation position of Skyridge's lower well its Extended Source Area pinches out rather than extending fully to the ridgeline.	Hydrogeologic mapping

2.2b Drinking Water Source Protection Map Layers

Layer	Date Created or Acquired	Description
Bulk Storage Facilities - New York State (NYSDEC)	8/16/2022	Bulk Storage Facilities - New York State (NYSDEC) Obtained from NYS GIS Clearinghouse - NYS Dept. of Environmental Conservation (DEC) - Bulk Storage Sites in New York State. Source: NYS Department of Environmental Conservation, 2010. Files updated daily.
Major Oil Storage Facilities	8/16/2022	Major Oil Storage Facilities Obtained from NYS GIS Clearinghouse - NYS Dept. of Environmental Conservation (DEC) - Bulk Storage Sites in New York State. Source: NYS Department of Environmental Conservation, 2010. Files updated daily.
Petroleum Bulk Storage Facilities (i.e. gas stations)	8/16/2022	Petroleum Bulk Storage Facilities (i.e. gas stations) Obtained from NYS GIS Clearinghouse - NYS Dept. of Environmental Conservation (DEC) - Bulk Storage Sites in New York State. Source: NYS Department of Environmental Conservation, 2010. Files updated daily.
Active Landfills	8/16/2022	Active Landfills Obtained from https://data.ny.gov/Energy-Environment/Solid-Waste-Management-Facilities/2fni-raj8 Source: NYS Department of Environmental Conservation, April 7, 2022.
Inactive Landfills (Title 12)	8/26/2022	Inactive Landfills (Title 12). Obtained from NYSDEC Email 8/26/202. Source: NYS Department of Environmental Conservation, June 24, 2022
Land Application Sites	8/19/2022	Land Application Sites Obtained from https://data.ny.gov/Energy-Environment/Solid-Waste-Management-Facilities/2fni-raj8 Source: NYS Department of Environmental Conservation, April 7, 2022
Vehicle Dismantling Facilities (i.e. junk yards)	8/19/2022	Vehicle Dismantling Facilities (i.e. junk yards) Obtained from https://data.ny.gov/Energy-Environment/Solid-Waste-Management-Facilities/2fni-raj8 Source: NYS Department of Environmental Conservation, April 7, 2022
Environmental Remediation Site Boundaries	8/16/2022	Environmental Remediation Site Boundaries Obtained from http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1097 Source: New York State Department of Environmental Conservation, updated nightly. Downloaded 8/16/2022
Environmental Remediation Sites (Superfund Sites, Brownfield Sites, etc.)	8/16/2022	Environmental Remediation Sites (Superfund Sites, Brownfield Sites, etc.) Obtained from http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1097 Source: New York State Department of Environmental Conservation, 2010. Files updated daily
Spill Incidents	8/22/2022	Spill Incidents Obtained from https://data.ny.gov/Energy-Environment/Spill-Incidents/u44d-k5fk Source: New York State Department of Environmental Conservation, Division of Environmental Remediation, 2015. Files updated daily.
Oil, Gas, and Other Regulated Wells	8/22/2022	Oil, Gas, and Other Regulated Wells Obtained from https://www.dec.ny.gov/energy/1603.html Source: NYS Department of Environmental Conservation. Files updated nightly.
Orphan Oil and Gas Wells	8/19/2022	Orphan Oil and Gas Wells Obtained from https://data.ny.gov/Energy-Environment/Orphaned-Wells/vgue-bamz Source: NYS Department of Environmental Conervation,Decemeber 16, 2021.
Mines	8/19/2022	Mines Obtained from https://www.dec.ny.gov/lands/5374.html Source: NYS Department of Environmental Conservation, 2022. Files updated nightly.
State Pollutant Discharge Elimination System Permitted (SPDES) Facilities	8/17/2022	State Pollutant Discharge Elimination System Permitted (SPDES) Facilities Obtained from http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1010 Source: New York State Department of Environmental Conservation, revised August 2022.
Combined Sewer Overflows (CSO's)	8/19/2022	Combined Sewer Overflows (CSO's) Obtained from https://www.dec.ny.gov/chemical/48595.html Source: New York State Department of Environmental Conservation, Division of Mineral Resources, November 10, 2020
Airports of the United States, Puerto Rico, and Virgin Islands.	8/19/2022	Airports of the United States, Puerto Rico, and Virgin Islands. Obtained from https://ais-faa.opendata.arcgis.com/datasets/e747ab91a11045e8b3f8a3efd093d3b5_0/explore?location=5.669367%2C-1.633886%2C2.71&showTable=true Source: Federal Aviation Administration, Aeronautical Information Services, July 14, 2022.
NYS Railroads	8/17/2022	NYS Railroads Obtained from https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=904 Source: New York State Department of Transportation, 2013
North American Rail Lines	8/19/2022	North American Rail Lines Obtained from https://data-usdot.opendata.arcgis.com/datasets/usdot::north-american-rail-lines-1/about Source: USDOT BTS, July 22, 2022.
Hazmat Routes	8/19/2022	Hazmat Routes Obtained from https://koordinates.com/layer/22794-us-hazmat-routes/ Source: US Bureau of Transportation Statistics (BTS), August 28, 2018
Road Maintenance Facilities (NYSDOT Facilities)	11/1/2021	Road Maintenance Facilities (NYSDOT Facilities) Obtained from https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=391 Source: NYSDOT October 2020
Salt and Deicers Storage (NYSDOT Facilities)	11/1/2021	Salt and Deicers Storage (NYSDOT Facilities) Obtained from https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=391 Source: NYSDOT October 2020
Petroleum Product Pipelines	8/19/2022	Petroleum Product Pipelines Obtained from https://www.eia.gov/maps/layer_info-m.php Source: Created by EIA using publicly available data. 4/28/2020

Layer	Date Created or Acquired	Description
Natural Gas Interstate and Intrastate Pipelines	8/19/2022	Natural Gas Interstate and Intrastate Pipelines Obtained from https://www.eia.gov/maps/layer_info-m.php Source: Collected by EIA from Federal Energy Regulatory Commission (FERC) and other external sources. 4/28/2020
HGL Pipelines	8/19/2022	HGL Pipelines Obtained from https://www.eia.gov/maps/layer_info-m.php Source: Collected by EIA from Federal Energy Regulatory Commission (FERC) and other external sources. 4/28/2020
Crude Oil Pipelines	8/19/2022	Crude Oil Pipelines Obtained from https://www.eia.gov/maps/layer_info-m.php. Source: Collected by EIA from Federal Energy Regulatory Commission (FERC) and other external sources. 4/28/2020
NYS Water Withdrawals	8/19/2022	NYS Water Withdrawals Obtained from https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1265 Source: DOW - Bureau of Water Resource Management, January 2022
New York State Boat Launches	9/6/2022	New York State Boat Launches Obtained from http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1268 Source: New York State Department of Environmental Conservation, 2009. Revised May 2021
Boat Launch Sites by State Parks or Marine Facility	9/6/2022	Boat Launch Sites by State Parks or Marine Facility Obtained from https://data.ny.gov/Recreation/Boat-Launch-Sites-by-State-Parks-or-Marine-Facilit/2gcg-hikh Source: New York State Office of Parks, Recreation and Historic Preservation, December 7, 2020
USGS National Land Cover Data (NLCD) (2019)	7/23/2021	USGS National Land Cover Data (NLCD) (2019) Obtained from https://www.mrlc.gov/data?f%5B0%5D=category%3ALand%20Cover&f%5B1%5D=category%3Aland%20cover&f%5B2%5D=year%3A2019. Source: National Land Cover Database 2019 (NLCD2019)
NLCD Percent Developed Imperviousness (2019)	7/23/2021	NLCD Percent Developed Imperviousness (2019) Obtained from https://www.mrlc.gov/data?f%5B0%5D=category%3ALand%20Cover&f%5B1%5D=category%3Aland%20cover&f%5B2%5D=year%3A2019. Source: National Land Cover Database 2019 (NLCD2019)
Toxic Release Inventory (TRI) Facilities	8/19/2022	Toxic Release Inventory (TRI) Facilities Obtained from https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-data-files-calendar-years-1987-present Source: EPA, July 20, 2020
Nutrient Loading (Lakes Only) (The Waterbody Inventory /Priority Waterbodies List)	9/8/2022	Nutrient Loading (Lakes Only) (The Waterbody Inventory /Priority Waterbodies List) Obtained from http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1117. Source: NYS Department of Enviromental Conservation, Division of Water, Bureau of Water Assessment and Management, 2007. Revised March 2020
National Hydrology Dataset (NHD)	9/8/2022	National Hydrology Dataset (NHD) Obtained from https://www.usgs.gov/core-science-systems/ngp/national-hydrography/access-national-hydrography-products Source: USGS NHD Data August 12, 2022.
Septic Systems	9/8/2022	Data on Private Sewer Systems in NYS Tax Parcels (Centroids) for Onondaga and Essex Counties data. Obtained from: http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1300 Source: NYS GIS Program Office (GPO)
Waterfront Property Management	9/8/2022	Data on Waterfront Property Management in NYS Tax Parcels (Centroids) for Cayuga, Cortland, Onondaga and Tompkins Counties data under PROPCLASS category. Obtained from: http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1300 Source: NYS GIS Program Office (GPO)
SSURGO	10/4/2022	Data on Soil Survey Geographic Database. Obtained from https://www.arcgis.com/home/item.html?id=cdc49bd63ea54dd2977f3f2853e07fff. National Resources Conservation Service (NRCS) 2017. Updated February 14, 2022

2.3 Potential Contaminant Source Inventory				
Potential Source	**Contaminant Category**	**Specific Contaminant(s) of Concern**	**Protection Area(s) Impacted**	**Relevant Information**
NYS DEC Spill Incident	Unknown	Unknown gaseous substance (as per NYSDEC spill report)	Critical Source Area	One off Salt Springs Road in the Critical Source Area of the south (or upper) well. Accidental releases of petroleum or hazardous chemicals are reported to NYS DEC. The Spill Response Program oversees the investigation and cleanup of these spills. The DEC Spill Incident database lists that the spill date was 03/23/2003 at 8612 Salt Springs Road. An unknown amount of an unknown material was spilled, affecting the air. The date the spill case was closed by the case manager in the DEC was 6/12/2003.
Private septic systems	Chemical and microbiological	Nitrates, bacteria, viruses	Critical Source Area	Around 10 in the Critical Source Area of the north (or lower) well and around 12 in the Critical Source Area of the south (or upper) well. All residents in the Skyridge Water District have septic systems. If improperly maintained, these contaminants have the potential to contaminate the water supply causing treatment complications and potential health impacts.
Roads	Chemical	Salt, heavy metals	Critical and Extended Source Area	Streets throughout the source areas are a source of runoff.
Agricultural Activities	Chemical	Nutrients, specifically nitrogen, phosphorus and pesticides	Extended Source Area	Mostly pasture lands. Agricultural activities may contribute to nutrient loading in the wellfield.
Mined lands	Chemical	Potential deicing salts and VOCs	Critical and Extended Source Area	Kinsella mine is still in planning stages and awaiting approval. The informal uses often established in former mines may be a potential contaminant source to the wellfield, however a new quarry undergoes considerable permitting and the zoning would go back to underlying (agricultural) once not used as allowed in natural resource removal overlay zone.
Allowed residential uses	Chemical and microbiological	Nitrates and microbials, fertilizers, pesticides, petroleum, salt	Critical and Extended Source Area	Septic system density can be of concern for lots at less than 2 acres. Everyday lawn and garden uses and automobile/vehicle care.

3.1 Identify Protection and Management Methods & 3.2 Develop an Implementation Strategy Timeline

Rank	Priority Issue	Targeted Potential Contaminant Source(s)	Goal	Protection Method and/or Management Method	Ease to Implement	Potential Cost	Potential Funding Sources	Project Leader and Partnerships Needed	Timing	Representative Implementation Start Date
Moderate risk	Ensure prompt spill response to any NYS DEC Spill Incidents in Critical or Extended Source areas.	Petroleum or hazardous chemicals	Utilize an array of strategies to protect the quality and quantity of the Skyridge WD recharge area. Increase awareness of source water protection measures.	**Foster communication between Town and partner municipalities, agencies, or groups to ensure prompt spill response.** 1. Annual reminders of Critical Source Area locations and response with regional NYSDEC, Police & highway department spill responders.	Easier	$595.00	Town	Town, Partners - DEC, Police, Highway Depts	Year 1 & annually	11/2023
	Limit road salt impacts to groundwater in Critical and Extended Source Areas (Rt 132, Rt 93, Rt 169)	Salt, heavy metals	Utilize an array of strategies to protect the quality and quantity of the Skyridge WD recharge area. Increase awareness of source water protection measures.	**Education for the Town and County to refine BMPs regarding road salt application within the Critical and Extended Source Areas.** 2a. Education campaign for town & county highway departments, BMPs for deicing. Annual reminder to the Town and County highway departments regarding the need for lower salt loads (for section between Sleepy Hollow & Palmer Road). Low salt area signs along roadway.	Easier	$4,000.00	Town	Town, Onondaga County DOT, Town of Sullivan, Madison County Highway Dept.	Year 1 & annually	11/2023
				Contingent upon salt levels, road improvements to reduce deicing impacts. 2b. Possible creation of rolled curb along Salt Springs Rd in Critical Source Area and intersection of Salt Springs and Gulf Road where plows turn around. A similar wider paved shoulder/apron on both sides of Salt Springs between Palmer Road and Clear Path (about half mile total) may be appropriate.	Complex	$434,950.00	Town NYS DEC Water Quality Improvement Project (WQIP) Program	Town	Year 3, if needed	11/2026

3.1 Identify Protection and Management Methods & 3.2 Develop an Implementation Strategy Timeline

Rank	Priority Issue	Targeted Potential Contaminant Source(s)	Goal	Protection Method and/or Management Method	Ease to Implement	Potential Cost	Potential Funding Sources	Project Leader and Partnerships Needed	Timing	Representative Implementation Start Date
Moderate risk	Prevent groundwater quality threats from quarried lands	Potential deicing salts and VOCs	Utilize an array of strategies to protect the quality and quantity of the Skyridge WD recharge area. Continue to include Clear Path (and other future partners) in implementation of the Skyridge WD DWSP2 plan. Increase awareness of source water protection measures.	**Education to increase awareness about groundwater quality potential threats from possible quarried lands.** 3. Education on BMPs for storage and use of petroleum, other VOCs, and chemicals such as deicing salts.	Easier	$1,840.00	Town	Town, Partner - Landowner/operator	Year 1 & periodically (as needed due to owner/staff turnover)	3/2024
Moderate risk	Limit groundwater contamination from residential land uses	Nitrates and microbials, fertilizers, pesticides, petroleum, salt	Utilize an array of strategies to protect the quality and quantity of the Skyridge WD recharge area. Continue to include Clear Path (and other future partners) in implementation of the Skyridge WD DWSP2 plan. Increase awareness of source water protection measures.	**Education for homeowners on various BMPs.** 4. Education campaign for homeowners on best management practices for activities such as septic systems, fertilizer, pesticides, etc.	Easier	$1,840.00	Town	Town, Partner - Onondaga Resource Recovery	Year 1 & annually	3/2024
Lower risk	Manage nutrient loading to aquifer from agricultural activities	Nitrogen and phosphorus	Utilize an array of strategies to protect the quality and quantity of the Skyridge WD recharge area. Continue to include Clear Path (and other future partners) in implementation of the Skyridge WD DWSP2 plan. Increase awareness of source water protection measures.	**Education campaign for BMPs on agricultural uses.** 5a. Periodic reminder about location near wells and BMPs that protect groundwater quality.	Easier	$1,840.00	Town	Town, Partner - Soil & Water Conservation District	Year 1 & annually	4/1/2024
				Limit nutrient and sediment runoff within the Critical and Extended Source Areas. 5b. Develop nutrient management plan(s) if agricultural uses intensify.	Moderate	$150,990.00	NYS Soil and Water Conservation Committee Agricultural Nonpoint Source Abatement & Control Grant Program	Town, Partner - Soil & Water Conservation District, landowners	Year 5 and beyond	11/2028
Lower risk	Protect recharge on larger parcels	Nitrate and microbials, fertilizers, pesticides, petroleum, salt	Utilize an array of strategies to protect the quality and quantity of the Skyridge WD recharge area. Continue to include Clear Path (and other future partners) in implementation of the Skyridge WD DWSP2 plan. Increase awareness of source water protection measures.	**Protect larger parcels within the Critical and Extended Source Areas.** 6a. Set up conservation easements or acquire land in the Critical and Extended Source Areas as opportunities arise.	Complex	$201,980.00	NYS DEC Water Quality Improvement Project (WQIP) Program Land Acquisition Project for Source Water Protection	Town, Partner - land trust, landowners	Year 5 and beyond	11/2028
				Maintain current zoning minimum lot size requirements. 6b. Pay attention to zoning and nutrient management issues as they arise and seek to keep large lots.	Easier	$495.00	Town	Town	On-going	10/2023

TABLE 3.2A - Implementation Steps

Protection Method 1: Foster communication between Town and partner municipalities, agencies, or groups to ensure prompt spill response. Annual reminders of Critical Source Area locations and response with regional NYSDEC, Police & highway department spill responders.

1. Share Critical and Extended Source Areas for drinking water in the Skyridge water district with partners so any spills in these areas can be highest priority.
2. Set up procedure for an annual reminder to spill responders for location of the Critical and Extended Source Areas.
3. Set up procedure for interacting/collaborating with partners and sharing information and materials. Set up an annual schedule for all parties to collaborate.

Protection Method 2a: Education for the Town and County to refine BMPs regarding road salt application within the Critical and Extended Source Areas. Education campaign for town & county highway departments, BMPs for deicing. Annual reminder to the Town and County highway departments regarding the need for lower salt loads (for section between Sleepy Hollow & Palmer Road where more than one agency salts). Low salt area signs along roadway.

1. Update all partners on BMPs of a reduced salting program, including post-storm assessments and cost-effective alternatives, e.g., anti-icing salt brine applications prior to storms.
2. Plan training sessions for all partners on procedures and BMPs.
3. Set up procedure for interacting/collaborating with partners and sharing information and materials. Set up an annual schedule for all parties to collaborate.
4. Install educational road signage where low salt areas are implemented within the Critical and Extended Source Areas in collaboration with partners.

Protection Method 2b: Contingent upon salt levels, road improvements to reduce deicing impacts. Possible creation of rolled curb along Salt Springs Rd in Critical Source Area and intersection of Salt Springs and Gulf Road where plows turn around. A similar wider paved shoulder/apron on both sides of Salt Springs between Palmer Road and Clear Path (about half mile total) may be appropriate.

1. Closely monitor sodium and chloride levels in the Skyridge WD wells for a 2-3 year period to see if Method 2a steps are working to reduce salt loading in the WD wells.
2. If levels are increasing, arrange a meeting with County highway department and other partners to discuss improvements in paving to reduce salt runoff infiltration.
3. Design the infrastructure solution and implementation strategy for the identified site with input from landowners and other partners.
4. Apply for funding
5. Implement solution when funding is available.

Protection Method 3: Education to increase awareness about groundwater quality potential threats from possible quarried lands. Education on BMPs for storage and use of petroleum, other VOCs, and chemicals such as deicing salts.

1. Maintain regular communication with Kinsella Quarry to determine when quarry activities begin to approach the Critical Source Area of the lower well.

2. For quarrying activities within the Critical Source Area, work with owners of Kinsella Quarry to develop and implement any appropriate BMPs for storage and use of chemicals, as well as spill response.
3. Establish an annual reminder to review the above topics and determine when they are relevant.

Protection Method 4: Education for homeowners on various BMPs. Education campaign for homeowners on best management practices for activities such as septic systems, fertilizer, pesticides, etc.

1. Develop education and outreach mailings and public information sessions for owners of developed property, with urgent outreach to those owning land in Critical Source Areas.
2. Establish an annual schedule for partners to collaborate on continual education and awareness campaign.
3. Track new and emerging contaminants which may require development of new educational materials.

Protection Method 5a: Education campaign for BMPs on agricultural uses. Periodic reminder about location near wells and BMPs that protect groundwater quality.

1. Develop education and outreach mailings and public information sessions for agriculture owners with partners, with urgent outreach to those owning land in Critical Source Areas.
2. Establish an annual schedule for partners to collaborate on continued education and awareness campaign.
3. Seek opportunities to move any nutrient storage areas outside of Extended Source Area.

Protection Method 5b: Limit nutrient and sediment runoff within the Critical and Extended Source Areas. Develop nutrient management plan(s) if agricultural uses intensify.

1. Collaborate with SWCD in the watershed to identify farms who can be added to the AEM programs.
2. Share all relevant materials regarding Critical and Extended Source Areas with contacts at SWCD.
3. Set up procedure for interacting/collaborating with partners and sharing information and materials.
4. Set up an annual schedule for all parties to collaborate.
5. Assist landowners and SWCD to gather materials and apply for the NYS Soil and Water Conservation Committee Agricultural Nonpoint Source Abatement & Control Grant Program.

Protection Method 6a: Protect larger parcels within the Critical and Extended Source Areas. Set up conservation easements or acquire land in the Critical and Extended Source Areas as opportunities arise.

1. Work with partners to identify parcels of land for easements or acquisition within the Critical Source Areas.
2. Gather materials to apply for the NYSDEC Water Quality Improvement Project (WQIP) Program.
3. Apply to the WQIP through the Consolidated Funding Application (CFA) process.
4. Acquire land when grant is awarded.

Protection Method 6b: Maintain current zoning minimum lot size requirements. Pay attention to zoning and nutrient management issues as they arise and seek to keep large lots..

1. Work with the Town Board to ensure that the current large lot zoning is maintained within the Critical and Extended Source Areas for development that is reliant upon individual well and septic systems.
2. Develop communication with the Zoning Board of Appeals to encourage them not to grant exemptions for minimum lot size within the Critical and Extended Source Areas.
3. Share the results of the DWSP2 Plan with town planning and zoning boards, and other relevant groups including the Town of Sullivan.

3.3 Cost Analysis									
Applicable Protection Method and/or Management Method	**Task Requirements, for either entire assignment or per year (indicate which)**		**Weekly Requirements from Municipal Personnel**	**Total Hours Required from Municipal personnel over period**	**Labor Cost per Hour (NYSDOL Wages)**	**Cost of Total hours required from Municipal Personnel, including 50% benefits cost**	**Non-Personnel Costs (e.g. equipment/materials, land, hardware, consultants)**		**Total Potential Cost**
1. Foster communication between Town and partner municipalities, agencies, or groups to ensure prompt spill response.	Share Critical and Extended Source Areas for drinking water in the Skyridge water district with partners so any spills in these areas can be highest priority. Set up procedure for an annual reminder to spill responders for location of the Critical and Extended Source Areas. Set up procedure for interacting/collaborating with partners and sharing information and materials. Set up an annual schedule for all parties to collaborate.	Annual	0.25	6	$55.00	$495.00	Mailings, copies	$100.00	$595.00
2a. Education for the Town and County to refine BMPs.	Update all partners on BMPs of a reduced salting program. Plan training sessions for all partners on procedures and BMPs. Set up procedure for interacting with partners and sharing information and materials. Set up an annual schedule for all parties to collaborate. Install educational road signage.	Entire assignment	0.25	32	$55.00	$2,640.00	Material budget: signs, brochures, mailings	$1,360.00	$4,000.00
2b. Contingent upon salt levels, road improvements to reduce deicing impacts.	Closely monitor sodium and chloride levels in the Skyridge WD wells for a 2-3 year period to see if Method 2a steps are working to reduce salt loading in the WD wells. If levels are increasing, arrange a meeting with County highway department and other partners to discuss improvements in paving to reduce salt runoff infiltration. Design the infrastructure solution and implementation strategy for the identified site with input from landowners and other partners. Apply for funding. Implement solution when funding is available.	Entire assignment	1	60	$55.00	$4,950.00	Engineering design, pavement contractors	$430,000.00	$434,950.00

3.3 Cost Analysis									
Applicable Protection Method and/or Management Method	**Task Requirements, for either entire assignment or per year (indicate which)**		**Weekly Requirements from Municipal Personnel**	**Total Hours Required from Municipal personnel over period**	Labor Cost per Hour (NYSDOL Wages)	**Cost of Total hours required from Municipal Personnel, including 50% benefits cost**	**Non-Personnel Costs (e.g. equipment/materials, land, hardware, consultants)**		**Total Potential Cost**
3. Education to increase awareness about groundwater quality potential threats from possible quarried lands.	Maintain regular communication with Kinsella Quarry to determine when quarry activities begin to approach the Critical Source Area of the lower well. For quarrying activities within the Critical Source Area, work with owners of Kinsella Quarry to develop and implement any appropriate BMPs for storage and use of chemicals, as well as spill response.Establish an annual reminder to review the above topics and determine when they are relevant.	Annual	0.25	12	$55.00	$990.00	Brochures, mailings, handouts	$850.00	$1,840.00
4. Education for homeowners on various BMPs.	Develop education and outreach mailings and public information sessions for owners of developed property, with urgent outreach to those owning land in Critical Source Areas. Establish an annual schedule for partners to collaborate on continual education and awareness campaign.Track new and emerging contaminants which may require development of new educational materials.	Annual	0.25	12	$55.00	$990.00	Brochures, mailings, handouts	$850.00	$1,840.00
5a. Education campaign for BMPs on agricultural uses.	Develop education and outreach mailings and public information sessions for agriculture owners with partners, with urgent outreach to those owning land in Critical Source Areas. Establish an annual schedule for partners to collaborate on continued education and awareness campaign. Seek opportunities to move any nutrient storage areas outside of Extended Source Area.	Annual	0.25	12	$55.00	$990.00	Brochures, mailings, handouts	$850.00	$1,840.00

3.3 Cost Analysis									
Applicable Protection Method and/or Management Method	**Task Requirements, for either entire assignment or per year (indicate which)**		**Weekly Requirements from Municipal Personnel**	**Total Hours Required from Municipal personnel over period**	Labor Cost per Hour (NYSDOL Wages)	**Cost of Total hours required from Municipal Personnel, including 50% benefits cost**	**Non-Personnel Costs (e.g. equipment/materials, land, hardware, consultants)**		**Total Potential Cost**
5b. Limit nutrient and sediment runoff within the Critical and Extended Source Areas.	Collaborate with SWCD in the watershed to identify farms who can be added to the AEM programs. Share all relevant materials regarding Critical and Extended Source Areas with contacts at SWCD. Set up procedure for interacting/collaborating with partners and sharing information and materials. Set up an annual schedule for all parties to collaborate. Assist landowners and SWCD to gather materials and apply for the NYS Soil and Water Conservation Committee Agricultural Nonpoint Source Abatement & Control Grant Program	Entire Assignment, estimated duration 2 years	0.25	12	$55.00	$990.00	Brochures, mailings, handouts, and the costs for implementing the farm BMPs as recommended by the SWCD.	$150,000.00 Implementation of agricultural water quality BMPs.	$150,990.00
6a. Protect larger parcels within the Critical and Extended Source Areas.	Work with partners to identify parcels of land for easements or acquisition within the Critical Source Areas. Gather materials to apply for the NYSDEC Water Quality Improvement Project (WQIP) Program. Apply to the WQIP through the Consolidated Funding Application (CFA) process. Acquire land when grant is awarded.	Entire Assignment, estimated duration 2 years	0.25	24	$55.00	$1,980.00	Cost TBD/acre, assume $1000/acre and interest in acreage of at least 20 acres per action.	$200,000.00	$201,980.00
6b. Maintain current zoning minimum lot size requirements.	Work with the Town Board to ensure that the current large lot zoning is maintained within the Critical and Extended Source Areas for development that is reliant upon individual well and septic systems. Develop communication with the ZBA to encourage them not to grant exemptions for minimum lot size within the Critical and Extended Source Areas. Share the results of the DWSP2 plan with town planning and zoning boards, and other relevant groups including the Town of Sullivan.	Annual	0.5	6	$55.00	$495.00	-	-	$495.00

4.1a Plan Management Team	
Name	**Contact Information**
	E-mail
Erin Reynolds, Chair	ereynolds@townofmanlius.org
Sara Bollinger	sbollinger@townofmanlius.org
Alex Behm	Private
Tom Kinsella	Private
Anson Bettinger	Private

Table 4.1b - Plan Management Summary	
Plan Management Summary	
Item	**Status**
Designate a Plan Management Team	Complete
Determine progress report frequency Months Quarterly in Year 1	Complete
Share progress reports	Complete
Review and share the plan	Complete
Verification from NYS DOH and DEC for completeness	Complete
Create a revision schedule	Complete

Table 4.1c - Plan Tracker		
Use the table below to track updates and revisions to the DWSP2 Plan. Use the notes section to detail changes made in each update and/or revision:		
Update/Revision Tracker		
Report	**Date**	**Notes**
First report:		
Update/Revision 1		
Update/Revision 2		
Update/Revision 3		
Update/Revision 4		
Update/Revision 5		
Update/Revision 6		
Update/Revision 7		
Update/Revision 8		

Appendix 2 - Maps

Figure 1: Drinking Water Source Protection Areas & Potential Contaminant Sources Map
Figure 2: Potential Contaminant Source Inventory and Land Use Map

Ownership and Control Area

Critical Source Area

Ownership and Control Area

Critical Source Area

Extended Source Water Area

Town of Manlius

Town of Sullivan

Onondaga Co.

Madison Co.

Gulf Rd

Horseshoe Ln

Salt Springs Rd

Tuscarora Rd

Brentwood Rd

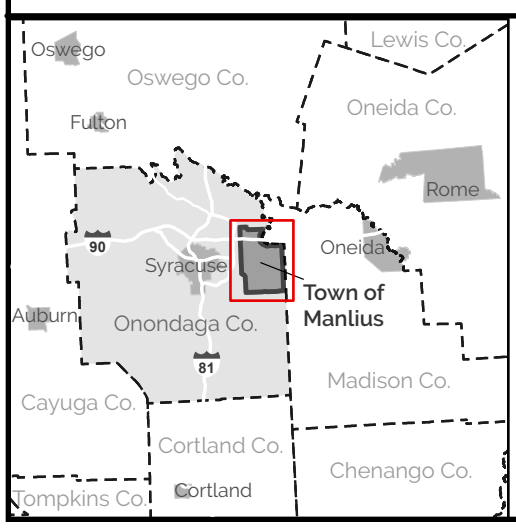
Ramsgate Rd

Lonsdale Rd

Heathfield Rd

Heathfield Ln

Palmer Rd



Legend:

- Wells
- Critical Source Area
- Extended Source Water Area
- Ownership and Control Area
- Skyridge Water District
- East Fayetteville Quarry
- Clear Path for Veterans (Project Partners)
- Contour (20 ft)
- Stream
- NYSDEC Spill Incidents
- Private Septic Systems
- Underground Oil/Gas Tanks

NYSDEC Remediation Sites

- No Further Action

Skyridge Water District Source Water Protection

Figure 1. Drinking Water Source Protection Areas & Potential Contaminant Sources Map

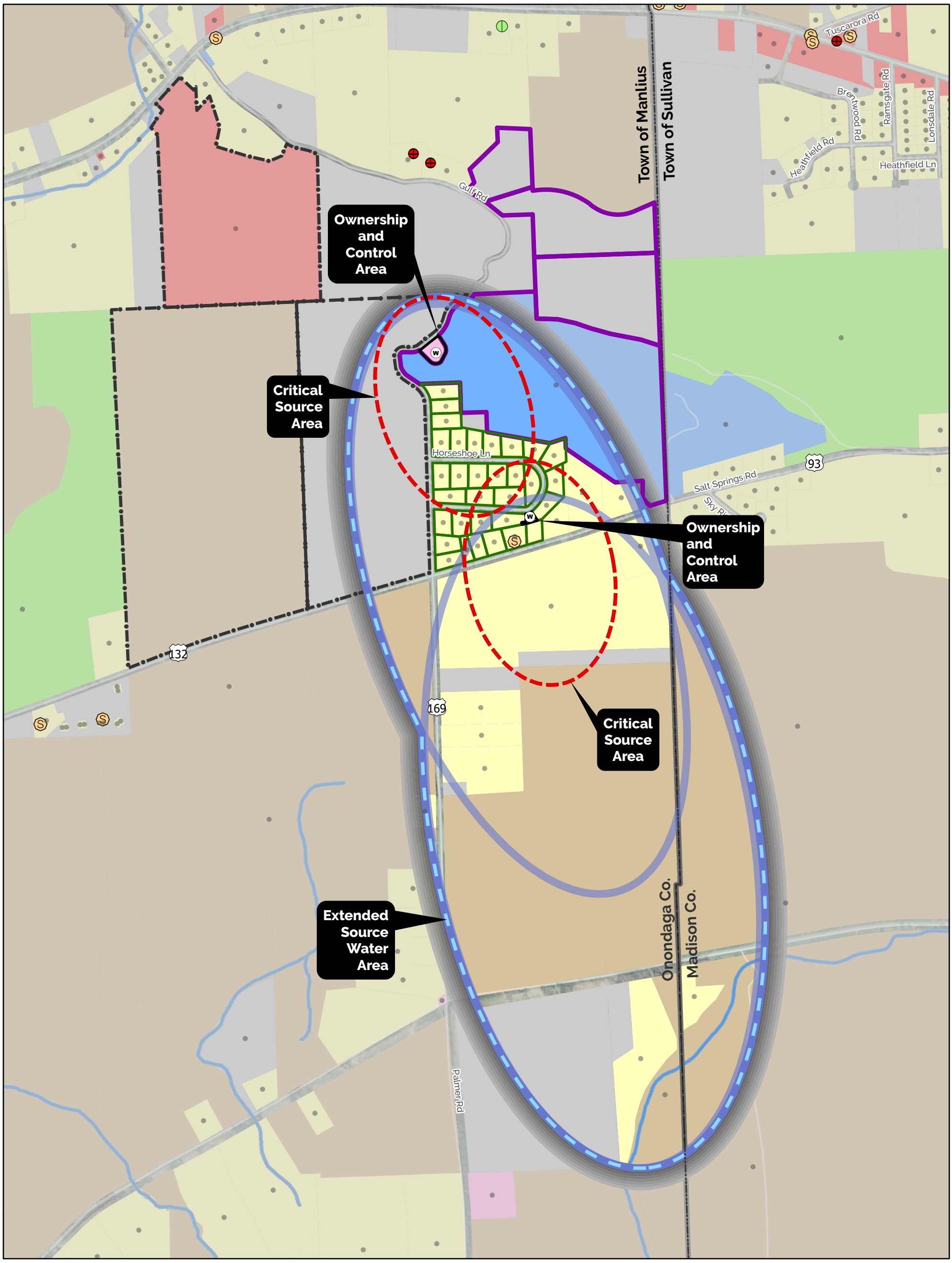
Town of Manlius, Onondaga County, NY

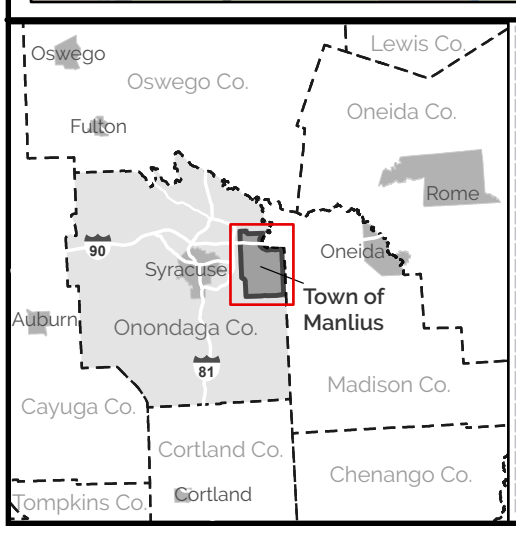
Drawn:	STP
Date:	08/29/2023
Scale:	1:10,000
Project:	CZ42020.13
Figure:	1

Sources: Onondaga County; Madison County; NYS DEC; NYS GPO; NYS ORPTS; US DOT; FEMA; USGS; ESRI.

Map Size: 11 x 17

N Scale: 0 0.13 0.25 Miles





Legend:

- Wells
- Critical Source Area
- Extended Source Water Area
- Ownership and Control Area
- East Fayetteville Quarry
- Skyridge Water District
- Clear Path for Veterans (Project Partners)
- Stream
- NYSDEC Spills Incidents
- Private Septic Systems
- Underground Oil/Gas Tanks

NYSDEC Remediation Sites

- No Further Action

Land Use

- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Public Services

Skyridge Water District Source Water Protection

Figure 2. Potential Contaminant Source Inventory and Land Use

Town of Manlius, Onondaga County, NY

Drawn:	STP
Date:	08/29/2023
Scale:	1:10,000
Project:	CZ42020.13
Figure:	2

Sources: Onondaga County; Madison County; NYS DEC; NYS GPO; NYS ORPTS; US DOT; USGS; ESRI.

Map Size: 11 x 17

N Scale: 0 0.13 0.25 Miles