CHAPTER 7: SOURCES OF POLLUTION
D. LANDFILLS, DUMPS, AND INACTIVE HAZARDOUS WASTE SITES

SUMMARY
The location of landfills, dumps and inactive hazardous waste sites were identified throughout the Seneca Lake watershed. Information about landfills and dumps was taken from personal conversation with local residents and through records available from the New York State Department of Environmental Conservation (NYSDEC) and municipal archives. Twenty landfills and/or dumps were located in the watershed. At present, there are two landfills considered active, both located in Yates County (*Table 7D.5*). Inactive hazardous waste site information was taken from NYSDEC records. Twelve inactive hazardous waste sites are all considered closed with complete remediation or closed with some level of monitoring and remediation taking place. Since concentrated waste areas can pose a potential human health risk and threaten water quality, landfills and inactive hazardous waste sites in the watershed were ranked for risk to surface and groundwater. This ranking identified five landfills with a high potential, six landfills with a medium potential and eight landfills with a low potential to threaten water quality (Table 7D.15). Nine inactive hazardous waste sites were identified as having a high potential and three sites were ranked with a medium potential (*Table 7D.16*).

INTRODUCTION
Landfills and Dumps
For centuries, communities have disposed of their wastes in land depressions (e.g., gravel pits), wetlands, streams and shallow portions of the lake. There are many testimonials that verify these statements. Fortunately, these practices do not continue at the same pace they once did.

Open dumping is defined as the dumping of residential or construction waste on flat or slightly sloped land. Natural land depressions are also used as open dumping sites. Historically, after a pit or gully was filled, a new "open" dump would open elsewhere. These inactive dumps are, along with landfills, the remaining known deposits of the watershed's waste stream.

There are no complete records for the opening and closure of local municipal dumps. Dates given for openings and closures, while not precise, are however the best figures available. The importance of dating the period of operation is that it provides an indication of the methods of operation and closure. The New York State Department of Health (NYSDOH) regulated dumps until 1977. Regulations placed emphasis on controlling disease vectors such as flies and rats, rather than what kind of material was disposed. The NYSDOH later instituted pesticide spraying to kill flies and rats with more frequent earth coverings of the waste to discourage odor and disease carriers. "Permanent" closure of these dumps involved spreading an earth cover, which often was not adequately deep or properly done.

In 1977, the New York State Department of Environmental Conservation (NYSDEC) was given the responsibility for environmental regulation of dumps. They increased the operating and closing standards markedly. By 1981, many town landfills closed because of the burdensome cost of operating them in accordance with the new regulations. Today most of the solid waste generated in the watershed is eventually disposed of through established county recycling programs or collected and contained in locally operated waste centers and disposed of in NYSDEC regulated landfills outside of the watershed. There is one NYSDEC regulated landfill active in the watershed that receives by-products and reject materials from the New York State Electric and Gas (NYSEG) plant in Dresden.

Inactive Hazardous Waste Sites

The Abandoned Sites Act of 1979 created New York State's inactive hazardous waste site registry to specifically address the need to identify and clean up old hazardous waste sites. This Act marked the beginning of a hazardous disposal site program. In 1982, New York State developed an assessment of hazardous waste sites to create a funding source for cleaning up sites that were "abandoned". The five classifications for hazardous waste sites are specified in the Environmental Conservation Law. All inactive hazardous waste sites are assigned a classification according to the following code:

1. Causing or presenting an imminent danger of causing irreversible or irreparable damage to the public health or environment – Immediate action required.

2. Significant threat to the public health or environment – action required.

   2A. Temporary classification assigned to sites that have inadequate and/or insufficient data for inclusion in any other classification.

3. Does not represent a significant threat to the public health or the environment – action may be deferred.

4. Site is properly closed – requires continued management.

5. Site is properly closed, no evidence of present or potential adverse impact – no further action is required.

The New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation maintains a record of all reported inactive hazardous waste disposal sites and conducts investigations on the cause and extent of contamination sites. The Seneca Lake watershed is under the jurisdiction of Region 8, headquartered in Avon, New York. The NYS Department of Health is responsible for protecting the public against any negative health effects a hazardous site may pose.

In 1988, the NYSDEC Division of Solid Waste introduced strict guidelines under Part 360 Solid Waste Management Facilities for properly engineering and siting sanitary landfills to receive hazardous waste, sludge and solid waste with minimal impact to both ground and surface waters.

RESULTS OF KNOWN LANDFILLS, DUMPS AND HAZARDOUS WASTE SITES

There are twenty landfills in the Seneca Lake watershed, two remain active, one continues to receive dumping despite the fact that is it considered closed. The active sites are the NYSEG Ash landfill and the Hopeton Road landfill both located in the Town of Torrey. There are a number of older, inactive non-engineered landfills and dumps in the watershed, which have the potential to contaminate water quality. There is one municipality that spreads municipal sludge on a regular basis in the watershed. This process is closely regulated by the NYSDEC. Tables 7D.1. through 7D.5. summarize the status of landfills and dumps by county in the Seneca Lake watershed.

Every attempt was made to identify all landfills in the watershed. The landfills and dumps listed are those where most of the municipal waste was dumped up to about the mid-1980's. They include town and private dumps. During operation, evidence suggests the demand to make a profit caused the private commercial dump owner to accept all types of waste, regardless of the potential hazard. Since regulation was minimal at that time, the DEC and DOH now have a greater concern for the inactive private commercial dumps in the watershed.

There are twelve inactive hazardous waste disposal sites within the Seneca Lake Watershed. All of these sites are classified as 2 or 2A (defined above). . Eight inactive hazardous waste sites remain in the NYSDEC registry; four have been de-listed. Tables 7D.1. through 7D.5. summarize the status of inactive hazardous waste sites (HWS and shaded) by county in the Seneca Lake watershed. HWS–*delisted* signifies that the site has been cleaned and no longer requires monitoring by the NYSDEC.

The hazardous waste site information is available through the NYSDEC Department of Remediation in their yearly publication entitled *Inactive Hazardous Waste Disposal Sites in New York State.* This publication is created jointly through the NYS Departments of Environmental Conservation and Health.

Table 7D.1. Seneca County Landfills and Dumps Sites and Hazardous Waste Sites in the Seneca Lake Watershed.

Town	Location	Operated From	Materials Disposed of	Regulatory Agency(s)	Associated Problems	Closure	Sub-watershed	Soil Description
Romulus HWS*	#4 - Dump, Sampson State Park Route 96A	Before 1960's to ?	Ash, Municipal Garbage, Chemical Warfare Refuse	NYSDEC and US Army Corp	Suspected VOC's and metals	Closed, soils cover and vegetated; Site investigations planned by DEC	Sampson State Park	Groundwater 7.5 feet; Variety of soil types throughout the park; silt loams
Romulus HWS*	#5 - Dump, Seneca Army Depot, Route 96 A	1940 – 1980	Ammunition Wastes, Chlorinated Solvents	USEPA, USDOD and NYSDEC	Chemicals detected in ground and surface water, soil surface; oil contamination	Closed, Remedial Investigation, Feasibility Study	Sampson State Park	Groundwater 1-23 feet; Varies throughout the site; silt loams
Lodi	#13 - Landfill, Keady Road, S of Covert Rd	1963 –1977 1982 –1986	Municipal Wastes	NYSDEC	Leachate problems in 1980's	Closed, soil cover and vegetated	Mill Creek	Bedrock 6-8 feet Clay, shale
Lodi	#14-Unofficial Dump, Dean Road	1965 –1967	Municipal waste	Seneca County Health Department	Unknown	Closed, soil cover and vegetated	Mill Creek	Groundwater 1-2 feet; Bedrock Outcrops
Lodi	#15 - Landfill, Shaw Road	? – 1967	Municipal waste	Seneca County Health Department	Leachate problems in 1970's	Closed, soil cover and vegetated	Lamoreaux Landing	Groundwater 1-2 feet; Bedrock 2-3 feet; silt loam
Lodi	#16-Unofficial Dump, behind Town Barns	1968 – 1969	Trash, Municipal waste	Unknown	Unknown	Closed, soil cover	Lodi Point	< 200 feet from a stream, Alluvial/ gravelly silt loam
Varick	#17 - Landfill, Route 96A, S of Hahnel Road	1969 - 1980	Municipal waste	Seneca County Health Department	Leachate problems in 1980's	Closed, soil cover and vegetated; Initially groundwater monitoring program – no concerns	Wilcox Creek	Groundwater .5 – 1.5 feet; Bedrock 3-3.5 feet; silt loam
Ovid	#18 - Landfill, County Road 131, S of Gilbert Road	1970's – 1984	Municipal waste; septic tank contents	Seneca County Health Department NYSDEC	Leachate problems in 1980's	Closed, soil cover and vegetated	Sixteen Falls Creek	Bedrock 8 feet; Groundwater est. at 30 feet; Honeoye- Lima soil: Good drainage
Ovid	#19 –Landfill, Willard Treatment Center	1965 - 1974	Municipal waste	Seneca County Health Department	Unknown	Closed, refuse pushed down the bank, soil cover and vegetated	Sixteen Falls Creek	Exact location unknown

Table 7D.2. Schuyler County Landfills and Dumps and Hazardous Waste Sites in the Seneca Lake Watershed.

Town	Location	Operated From	Materials Disposed of	Regulating Agency(s)	Associated Problems	Closure	Sub-watershed	Soil Description
Dix HWS – (delisted)*	#10 - Landfill, Dug Road, E of Johnson Road	1964 - 1981	Municipal and Industrial Wastes	Schuyler County Landfill Commission; NYSDEC monitoring	Heavy metal, phenol and cyanide detection in soil, surface water; leachate runoff	Closed; Clay capped	Catharine Creek, Catharine Creek Marsh	Mardin channery silt loam/Aurora channery silt loam; Depth to bedrock-23 inches
Dix HWS*	#3 - Dump, North Franklin Street Site	? - 1990	PCE, Chlorinated solvents	NYSDEC	Groundwater and soil contamination	Remediation in progress, soil vapor extraction, and groundwater treatment	Catharine Creek	2-6 feet fill over clayey silt & fluvial silty sand
Dix	#20 -Landfill, Grand Prix	1960's - 1981?	Construction and Demolition Debris	None	Unknown	Closed; soil cover	Catharine Creek	Bedrock > 60 inches; channery silt loam
Reading	$21 - Landfill, Irelandville Road	1981 - 1986	Municipal solid waste, construction and demolition debris	Schuyler County Landfill Commission; NYSDEC	Unknown	Closed, Capped, collecting leachate and stormwater runoff	Reading	Seasonally high water table; Wetlands present; Volusia channery silt loam; Depth to bedrock >60 inches
Montour	#22 - Landfill, Johns Creek Reservoir	1960 - 1969	Municipal solid waste, Construction and Demolition Debris	None	Used for town and village storage of construction and demolition debris; brush	Closed; soil cover and vegetated	Catharine Creek	Howard; gravelly loam, steep terrain
Hector	#23 - Landfill, Satterly Hill Road	1950's? 1968 - 1979?	Municipal solid wastes	Village of Burdett, currently private owner	Unknown	Closed; soil cover and vegetated	Hector Falls Creek	Bedrock > 60 inches; Lansing gravelly silt loam
Hector	#24 - Landfill, Tuttle Road	1970 - 1976	Municipal solid wastes	Village of Hector, currently private owner	Unknown	Closed; soil cover and vegetated	Hector Falls Creek	Seasonal high water table at 3-6 feet; Lansing gravelly silt loam; Depth to bedrock > 60 inches

Table 7D.2. (Continued) Schuyler County Landfills and Dumps and Hazardous Waste Sites in the Seneca Lake Watershed.

Town	Location	Operated From	Materials Disposed of	Regulating Agency(s)	Associated Problems	Closure	Sub-watershed	Soil Description
Hector/ Village of Watkins Glen	#25 - Landfill, Lakeside Park North; end of Rock Cabin Road	1945 - 1955	Municipal solid waste, construction and demolition debris; ash	None	Unknown; currently used as a ballfield	Closed; soil cover and vegetated	Catharine Creek	Udorthent, Aquepts; poorly drained
Catharine	#26 - Landfill, Grant Road Landfill	1950's - 1960's	Municipal solid wastes	Town of Catharine	Unknown	Closed; soil cover and vegetated	Catharine Creek	Seasonal high water table; Howard gravelly loam; depth to bedrock > 60 inches

*HWS – Hazardous Waste Site

Table 7D.3. Chemung County Landfills and Dumps and Hazardous Waste Sites the Seneca Lake Watershed

Town	Location	Operated From	Materials Disposed of	Regulating Agency(s)	Associated Problems	Closure	Sub-watershed	Soil Description
Veteran HWS - (delisted)*	#1 - Dump, Oughterson Site Church Hill Road	1980 - ?	Household , construction and demolition waste, scraps. Drums with toluene, mineral spirits, triethylamine, lead and cobalt naphthanate	NYSDEC	Contaminated soil	Closed; State Superfund drum removal program removed 120 drums and 80 Tons of contaminated soil ; Complete site remediation	Catharine Creek	Groundwater 4-5 feet; Lordstown channery silt
Horseheads HWS – (delisted)*	#2 - Dump, 104 Wygant Road, corner of Route 14; Wetland area, Aikman Property	1974 - 1990	Waste oil, foundry sand and ash, flammable solvents	NYSDEC	Soil and surface water contaminated	Closed; Kennedy Valve Company removed 100 drums; Complete site remediation	Catharine Creek	Ground water <2 feet; Phelps gravelly loam and muck

Table 7D.4. Ontario County Landfills and Dumps and Hazardous Waste Sites in the Seneca Lake Watershed.

Town	Location	Operated From	Materials Disposed of	Regulating Agency(s)	Associated Problems	Closure	Sub-watershed	Soil Description
City of Geneva	#27 - Dump, Along Marsh Creek and Preemption St	<1924 – 1950's	Household/ Industry waste	None	Unknown	Closed, currently Route 5&20 lies on top of the dump sites	Geneva	Poorly drained silt loam
Geneva HWS – (delisted)*	#11 - Dump, Preemption Road, Routes 5 & 20	1960 – 1980	Suspected Disposal of Hazardous Waste	NYSDEC	Suspected ground and surface water contamination	Closed; Phase I and II investigation showed no evidence of hazardous waste	Geneva	Ground water 3-13 feet; Surface layer of clay overlying sand to at least 30 feet
Geneva	#28 - Landfill, Mason Street	Unknown	Municipal waste	None	Unknown	Closed; Hospital built over	Geneva	Poorly drained silt loam
Waterloo HWS*	#6 - Landfill, NYSEG/ Geneva Coal Gas, North Street	1903 – 1934	Coal Tar, Solid and Liquid Waste, Coke Quenching Process Water	NYSDEC	Contaminated ground and surface water, stream sediments and soil	Closed; Site investigation by NYSDEC	Geneva	Groundwater 5 feet; Fill overlying silty clay

*HWS – Hazardous Waste Site

Table 7D.5. Yates County Landfills and Dumps and Hazardous Waste Sites in the Seneca Lake Watershed

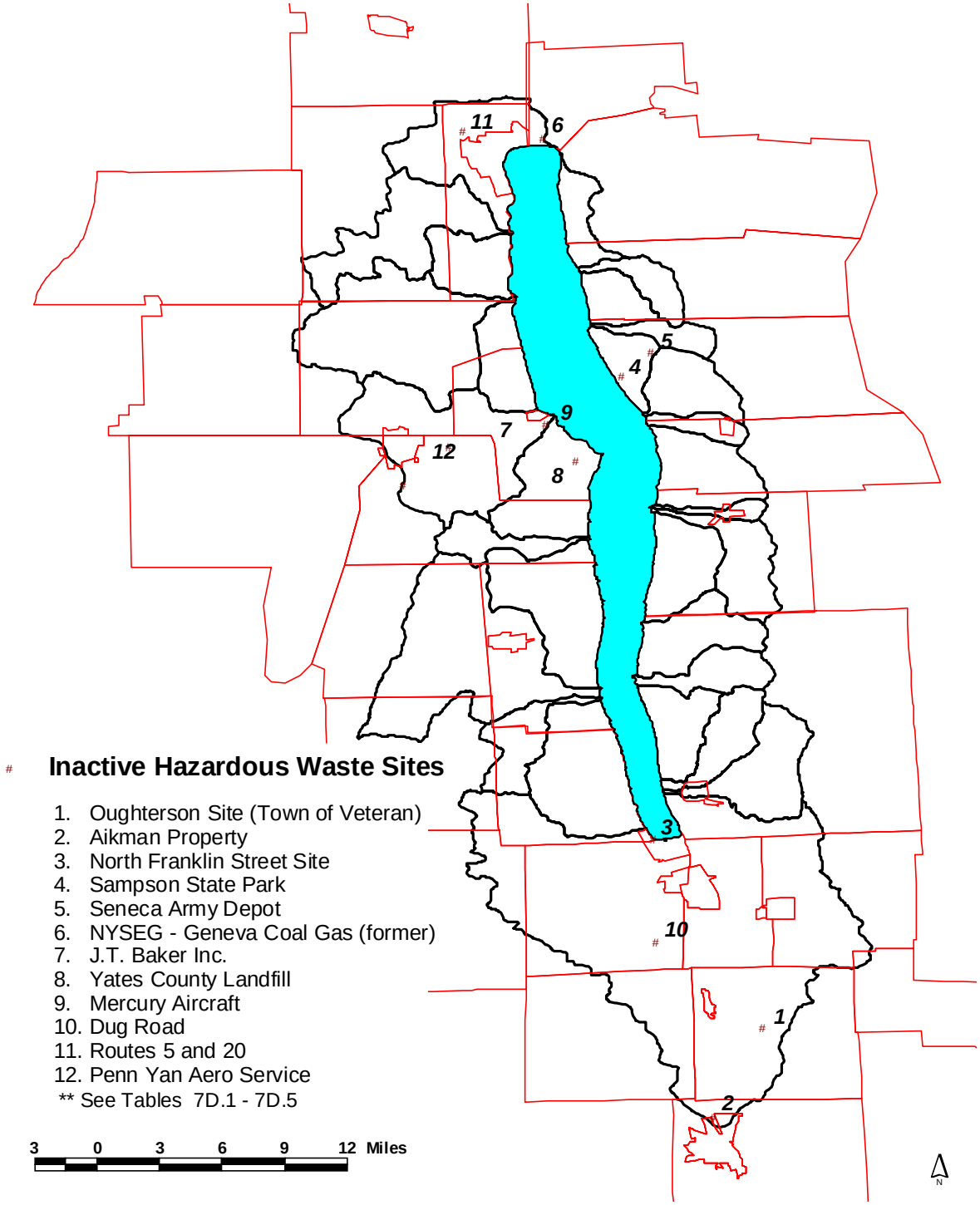
Town	Location	Operated From	Materials Disposed of	Regulating Agency(s)	Associated Problems	Closure	Sub-watershed	Soil Description
Torrey HWS*	#8 - Landfill, Yates County Long Point Road	1972 - 1985	Phenols, Barium, Iron, Ethylbenzene, Methylene chloride, 1,2-dichloroethane, Carbon tetrachloride	NYSDEC	Groundwater contamination and private wells	Closed; capped, leachate collected and treated off-site	Long Point	Groundwater approx. 40 feet; Silty clay
Torrey HWS*	#9 - Structure, Mercury Aircraft, Perry Point Road	? - 1993	300-500 gallons TCE, trichloroethane	NYSDEC	Groundwater contaminated to 160 feet; Soil contamination	Closed: Remedial plan is to treat groundwater/monitor coupled with a deed restriction/notification	Long Point	Groundwater 5-10 feet; Glacial till
Torrey	#29 - NYSEG Ash Landfill, Oliver Road	1979 – PRESENT	Coal ash, waste treatment sludges, mill rejects	NYSDEC EPA AES	Groundwater monitor wells established; no impact to date	ACTIVE	Keuka Lake Outlet	Sandy loams
Torrey	#30 - Eaves Dump, Hopeton Road	1960's – PRESENT	Municipal waste, cannery waste	None	Unknown, but is located close to the outlet proper	Considered closed, casual dumping still occurs; no cover	Keuka Lake Outlet	Steep broken land; 35 – 60% slope
Milo HWS*	#7 - Dump, J. T. Baker, Inc Private road off Outlet Road	1900 - 1966	100 + tons, Sulfur wastes, chromium, PCB's, and VOC's	NYSDEC	Soil and Groundwater contamination at two locations	Closed; remediation completed 1999; soil consolidated covered and vegetated; 5 year monitoring	Keuka Lake Outlet	Groundwater approx. 2 feet; Alluvial soil; bedrock 0-10 feet down
Milo HWS*	#12 - Structure, Penn Yan Aero Service, Inc. 2499 Bath Road	1968 -1996	PCE, acetone, Methylene chloride, volatile organic compounds	NYSDEC	Soil /water contamination; 14,000 gallons of wastewater seep from underground tanks	Tanks removed; site monitoring planned	Keuka Lake Outlet	Glacial till, shale bedrock, approx. 7 feet down
Milo	#31 - Dump, Rice Hill Road	? – 1960's	Municipal waste	None	Unknown	Closed, dirt cover and vegetated	Plum Point	Shallow, Shale bedrock silty/or clay loam
Starkey	#32 - Village Landfill, Preemption Rd	1950 - 1965?	Municipal waste	None	Unknown	Closed, dirt capped and vegetated	Starkey	Unknown

Table 7D.5. Yates County Landfills and Dumps and Hazardous Waste Sites in the Seneca Lake Watershed

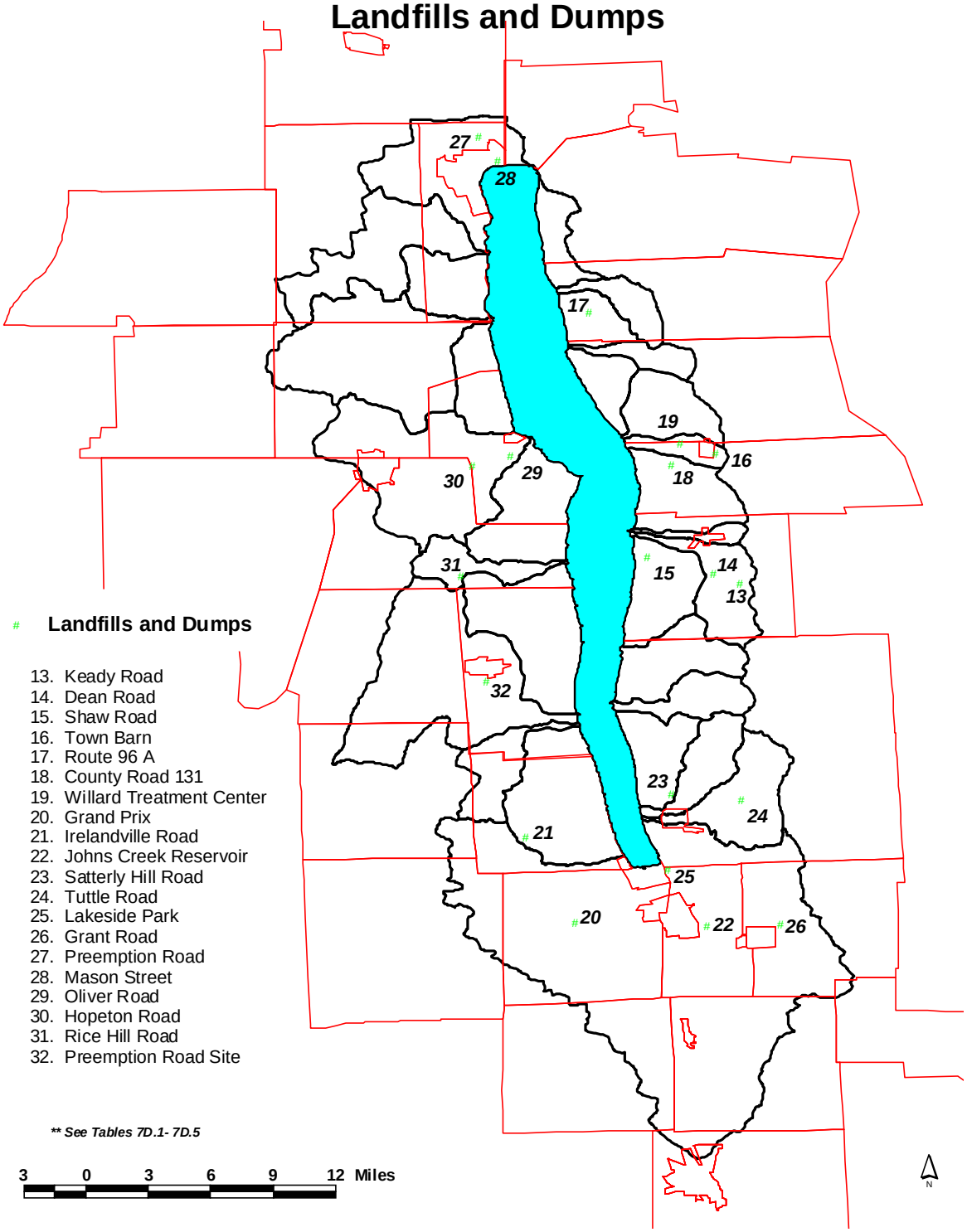
Town	Location	Operated From	Materials Disposed of	Regulating Agency(s)	Associated Problems	Closure	Sub-watershed	Soil Description
Starkey	Landspread, Village of Dundee Dundee/ Glenora Road or Rt. 14A. (not located on map)	? – PRESENT	Municipal Sludge/waste-water	NYSDEC; Village of Dundee	Quarterly testing of sludge; restricted land use	ACTIVE	Starkey	Unknown

*HWS – Hazardous Waste Site

Potential Pollution Problems By Sub-Watershed
Inactive Hazardous Waste Sites



Potential Pollution Problems By Sub-Watershed
Landfills and Dumps



LANDFILLS, DUMPS, AND HAZARDOUS WASTE SITES RANKING

Type of Threat

Old (fifteen or more years), inactive landfills pose a potential human health risk from exposure to toxic and pathogenic contaminants. These contaminants include heavy metals, pathogens, nutrients and a wide variety of organic chemicals. Heavy metals and organic chemicals can remain toxic for years, while pathogens and nutrients are generally not considered a major threat from landfills.

The Need for Rating and Ranking Toxic Risks

In recent years, there has been a growing recognition by public officials that inactive landfills and hazardous waste sites are a potential threat to human health and water quality. Remediation is an expensive process and the money available from the federal and state governments is in high demand. Therefore, an attempt has been made to rank landfills and hazardous waste site in the Seneca Lake watershed to determine how best to allocate available funding for their proper clean up and closure.

Problems in Developing the Ranking/Rating Method

Some of the calculation development problems are:

In general, it is known which specific toxins are contained in each kind of waste. It is not known, however, which wastes are present in the landfills. Information from witnesses, or from water quality measurements are necessary to begin an engineering assessment. This baseline information is needed to create enough evidence to verify a potential problem and justify the need for a more expansive study.

It is important to know the quantity and time period in which waste disposal occurred. This information is needed to determine waste degradation. The information can provide, in some instances, this necessary information from good records or sampling.

The list of potential toxins at a site can be long unless the waste is identified. Broad spectrum testing is expensive, but necessary for the sake of properly containing a known dump. Testing will not likely be done unless compelling evidence of a problem exists (e.g. dump is leaching into adjacent land, groundwater or wells).

A terraced landfill may provide several pathways of pollution through point source leachates and nonpoint surface runoff, with each having the potential to reach groundwater. Soil type, and the type of closure, if any, is significant in restricting toxic contaminant movement through landfills and hazardous waste sites. The top, bottom, and sides of a landfill and hazardous waste site boundary can vary the rate and quantity of leakage. The bottom and buried sides of a landfill may not show signs of seepage without core tests.

A difficult problem to quantify is the impact a landfill or hazardous waste site has on groundwater and wells because so little data has been collected on subsurface water.

Groundwater monitoring is expensive and is not conducted until engineering studies are underway to assess the extent of remedial action required. An attempt is made here to consider groundwater in the ranking; however, the information used here should be considered preliminary.

Over long travel distances, toxic contaminants may move from surface waters (a stream) to groundwater (in a recharge zone) and back to surface water (a lake). It may also be intercepted by a private drinking water well.

The transport of pollutants to a receiving water body (tributary or lake) is extremely complex, and the process can differ from one toxin to the next. This complexity is shown in Table 7D.6.

Table 7D.6. Transport of a contaminant in water.

Factors Affecting Movement of Water	**Factors Affecting Movement of Contaminants in Water**	**Changes in Contaminant in Moving Water**
Rate of Moving Water Distance to Nearest Waterbody Depth to Bedrock Soil Permeability Degree and Length of Slope Ground Cover in Pathway	Chemical Nature Initial Concentration Temperature Degradation Rate	Dilution Binding to Soil Particles Change to Other Chemicals

This table indicates the complexity of water movement, contaminant movement within moving water, and the changes in the contaminant itself as it moves. To allow comparison and ranking of landfills and hazardous waste sites, it is assumed that contaminant levels are equal and the movement of contaminants can be evaluated. Factors noted with an asterisk are used in the ranking process. Although there are much more sophisticated models available, these require more expense to develop the necessary input data and were beyond the scope of this study. The rating method was simplified to match those parameters for which data was available.

Simplification of the Ranking Method

The simplified rating factors are given in three major categories: contaminant generation, contaminant transport, and the receiving waterbody. The assumption is also made that the three categories are equal. The contaminant is generated and leaves the landfill to be transported by water to the receiving waterbody. The three category ratings are totaled for each landfill, added and a ranking is determined.

1. <u>Contaminant Generation</u>
   ✓ Only toxins (heavy metals and organic compounds) are considered.

2. Contaminant Transport

✓ Surface and groundwater movement is considered. Dilution is not considered.

✓ Factors affecting the movement of water are considered, e.g. no chemical change.

✓ The types of discharge are not distinguished between nonpoint or point, steady or sporadic, and surface or ground. The assumption is made that the nearer the landfill or hazardous waste site is to a waterbody, the more likely toxins will reach the waterbody either through surface or groundwater movement.

3. Receiving Waterbody

✓ Of all receiving waterbodies, only creeks/tributaries, significant wetlands (i.e. Catharine Creek Marsh) and the lake are considered. Creeks enter tributaries and tributaries enter Seneca Lake. Catharine Creek Marsh is approximately 900 acres and empties directly into Seneca Lake.

DEVELOPMENT OF THE RANKING TABLES

The first category, contaminant generation is summarized in Table 7D.7. The following questions were considered in developing this category:

1) What is the level of health significance for the toxins generated by the type of waste known or thought to be in the landfill?

2) What level of confidence exists for the particular type of toxins thought to be in the landfill?

3) The third criteria parameter is called the Degree of Closure that questioned: What is the degree to which it is expected that the toxin will leave the landfill?

Table 7D.7. Contaminant Generation Ratings

Level of Confidence that a Toxin is Present	**Category**	**Surface Value**	**Ground Water**
From government water quality testing	High	5	5
Significant toxins suspected from witness, polluters or strongly related inference i.e. town dumps	Medium	3	3
General knowledge of limited amounts for a Residential/farm dump	Low	1	1
Known to be completely non-hazardous		0	0
Significance	**Category**	**Surface Value**	**Ground water**
Carcinogenic organic compounds	High	5	5
Heavy metals and non-carcinogenic compounds	Medium	3	3
After testing, no elevated measurements of Significant contaminants	Low	1	1

Table 7D.7. (Continued)

Degree of Closure	Category	Surface Value	Ground water
Open and uncovered	High	5	5
Partially covered with vegetation and dirt	Medium	3	3
Completely covered with vegetation and dirt	Low	1	1
Properly capped according to DEC		0	0

The second category, Contaminant Transport in Water is comprised of five parameters: distance to waterbody, soil permeability, slope, depth to bedrock and type of vegetative cover in the path to the waterbody (*Table 7D.8*). This category answers the question: How likely is it that leachate will reach the receiving waterbody?

Table 7D.8. Contaminant Transport in Water.

Distance to a Waterbody	Category	Surface Value	Ground Water
Lake shoreline, next to stream or wetland	High	3	3
Less than 101’	Medium	2	2
101’ to 300’	Low	1	1
Greater than 300’		0	0
Soil Permeability	**Category**	**Surface Value**	**Ground water**
Impermeable	High	3	0
Slow	Medium	2	1
Moderate	Low	1	2
Moderate rapid, rapid, very rapid		0	3
Slope	**Category**	**Surface Value**	**Ground water**
Greater than 15%	High	3	3
8-15%	Medium	2	2
Less than 8%	Low	1	1
Depth to Bedrock	**Category**	**Surface Value**	**Ground water**
Less than 3 meter	High	3	3
3 to 10 meters	Medium	2	2
Greater than 10 meters	Low	1	1

Table 7D. 8 (continued)

Vegetative Cover*	Category	Surface Value	Ground water
Hamlet/village, bare earth or wetland	High	3	3
Agriculture	Medium	2	2
Transition	Low	1	1
Forest		0	0
*vegetative cover is that between the dump and the nearest waterbody			

The third rating category is the receiving waterbody. It answers the question: Will the toxin have an immediate impact on a waterbody with a high use classification? Seneca Lake has the highest New York State waterbody classification "AA" which means its best use is for drinking water; a fishing stream or major tributary is next with a "C" rating, and a feeder creek to the tributary has the least value as these are usually not rated. In this study, a major tributary has the same ranking as a fishing stream because of the high probability of transporting a toxic to the lake (See Table 7D.9.).

Table 7D.9. Receiving Waterbody.

Waterbody	Category	Value
Lake	High	15
Fishing Stream or Major Tributary	Medium	10
Feeder Creek to a Tributary	Low	5

Application of the Ranking Charts

Tables 7D.10. through 7D.14. summarize the rating of all landfills, dumps and hazardous waste sites in the Seneca Lake watershed. This information is drawn from Tables 7D.7. through 7D.9. above. The judgement of such factors as level of confidence, significance, and degree of closure is drawn from information provided by volunteered information from local citizens and officials, local documentation and the NYSDEC registry. Judgement factors for the contaminant transport in water category is taken from county soil surveys.

The next step is to take the differences between the highest and lowest values for the surface water and ground water from Tables 7D.10. through 7D.14. and divide by three to obtain the high, medium, and low ranking categories for surface and groundwater

pollution potential. The results are as follows:

Surface Water Risk	Groundwater Risk
34 through 27 is HIGH	34 through 26 is High
26.9 through 21 is MEDIUM	25.9 through 19 is MEDIUM
20.9 through 14 is LOW	18.9 through 11 is LOW

Using these ratings, the Seneca Lake watershed landfill rankings are summarized in Table 7D.15. and hazardous waste sites are summarized in Table 7D.16.

SUMMARY OF FINDINGS

1. Overall, the ranking of pollution potential between surface and groundwater changes little, based on the input information available.

2. Five of the twenty landfills ranked HIGH. Contaminant transport appears to be the dominating category that differentiates among the high, medium and low rankings for landfills.

3. Despite the fact that the Oliver Road landfill is active, it ranked LOW. This could be due to the intensity of testing and proper closure techniques mandated by the NYSDEC.

4. Nine of the twelve hazardous waste sites ranked HIGH. The HWSs typically had a higher value under the contaminant generation category because testing has revealed harmful chemicals that pose a potential threat to both water quality and public health.

5. The types and amounts of chemicals that may be in closed landfills is unknown since little or no water testing has been done at their sites.

6. HWSs with a MEDIUM ranking have had some degree of remediation to reduce the threat to water quality and health.

7. There was insufficient data to rank the landspreading of municipal sludge. Land receiving sludge does have restrictions in it subsequent use. For example, there is an 18 month restriction for growing food crops and 12 months for grazing and public access on lands that have received sludge. The NYSDEC regulates this process of eliminating sludge with permits.

The information found in this research should be considered qualitative and only used as mechanism for providing information to prioritize additional studies. The ranking analysis suggests that further study is needed to redefine the pollution potential of the landfills not currently under remediation. A low-cost, logical step is to physically observe the sites by a volunteer geologist who is familiar with the hydrogeology of the

area. More detailed information on land cover, depth to bedrock, private well locations, historical waste disposal practices, and water quality monitoring and physical investigation is needed to accurately assess the status of landfills throughout the watershed.

Table 7D.10. Comparison of Seneca County Landfill Risks to Surface and Groundwater in the Seneca Lake Watershed.

Seneca County Towns	**Romulus**				**Lodi**								**Varick**		**Ovid**			
Location of Landfill	#4 - State Park		#5 - Army Depot		#13 - Keady Road		#14 - Dean Road		#15 - Shaw Road		#16 - Town Barn		#17 - Route 96A		#18 - County Road 131		#19 - Willard Treatment	
Water Source*	S	G	S	G	S	G	S	G	S	G	S	G	S	G	S	G	S	G
Contaminant Generation																		
Level of Confidence	3	3	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Significance	3	3	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Degree of Closure	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SUBTOTAL	7	7	11	11	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Contaminant Transport																		
Distance to water	3	3	3	3	0	0	3	3	3	3	3	3	3	3	0	0	3	3
Soil permeability	U*	U	2	1	1	2	0	3	1	2	0	3	2	1	1	2	U	U
Slope	2	2	2	2	1	1	3	3	3	3	1	1	1	1	1	1	3	3
Depth to bedrock	3	3	3	3	3	3	3	3	3	3	2	2	3	3	2	2	U	U
Vegetative cover	3	3	1	1	2	2	3	3	0	0	3	3	3	3	1	1	3	3
SUBTOTAL	11	11	11	11	7	8	12	15	10	11	9	12	12	11	5	6	9	9
Receiving Waterbody																		
Body Significance	15	15	5	5	5	5	15	15	15	15	10	10	10	10	10	10	10	10
GRAND TOTAL	34	34	27	27	15	16	30	33	28	29	22	25	25	24	18	19	22	22

*S-Surface water; G-Groundwater, U-unknown

Table 7D.11. Comparison of Schuyler County Landfill Risks to Surface and Groundwater in the Seneca Lake Watershed.

Schuyler County Towns	**Reading**		**Montour**		**Dix**						**Catharine**		**Hector**					
Location of Landfill	#21 - Irelandville Road		#22 - Johns Creek Reservoir		#10 - Dug Road		#3 - North Franklin Street		#20 - Grand Prix		#26 - Grant Road		#23 - Satterly Hill Road		#24 - Tuttle Road		#25 - Lakeside Park	
Water Source*	S	G	S	G	S	G	S	G	S	G	S	G	S	G	S	G	S	G
Contaminant Generation																		
Level of Confidence	3	3	0	0	5	1	5	5	U*	U	U	U	3	3	U	U	U	U
Significance	1	1	1	1	3	1	5	5	U	U	1	1	U	U	U	U	1	1
Degree of Closure	0	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1
SUBTOTAL	4	4	2	2	8	2	10	10	1	1	2	2	4	4	1	1	2	2
Contaminant Transport																		
Distance to water	0	0	3	3	3	3	0	0	0	0	1	1	0	0	0	0	3	3
Soil permeability	3	0	3	0	2	1	2	1	3	0	3	0	2	1	2	1	1	2
Slope	1	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Depth to bedrock	2	2	3	3	2	2	3	3	2	2	3	3	3	3	3	3	3	3
Vegetative cover	2	2	3	3	1	1	3	3	0	0	2	2	2	2	2	2	3	3
SUBTOTAL	8	5	15	12	9	8	9	8	6	3	10	7	9	7	8	7	11	12
Receiving Waterbody																		
Body Significance	10	10	15	15	10	10	15	15	15	15	5	5	5	5	5	5	15	15
GRAND TOTAL	22	19	32	29	27	20	34	33	22	19	17	14	18	16	14	13	28	29

*S-Surface water; G-Groundwater, U-unknown

Table 7D.12. Comparison of Chemung County Landfill Risks to Surface and Groundwater in the Seneca Lake Watershed.

Chemung County Towns	**Veteran**		**Horseheads**	
Location of Landfill	# 1 -Church Hill Road		#2 - Wygant Road	
Water Source*	S	G	S	G
Contaminant Generation				
Level of Confidence	5	5	5	5
Significance	5	5	1	1
Degree of Closure	0	0	0	0
SUBTOTAL	10	10	6	6
Contaminant Transport				
Distance to water	1	1	3	3
Soil permeability	3	0	3	3
Slope	2	2	1	1
Depth to bedrock	3	3	3	3
Vegetative cover	1	1	3	3
SUBTOTAL	10	7	13	13
Receiving Waterbody				
Body Significance	5	5	15	15
GRAND TOTAL	25	22	33	33

*S-Surface water; G-Groundwater, U-unknown

Table 7D.13. Comparison of Ontario County Landfill Risks to Surface and Groundwater in the Seneca Lake Watershed.

Ontario County Towns	**Waterloo**		**Geneva**					
Location of Landfill	#6 -North Street		#27 - PreEmption Street		#11 - Routes 5 & 20		#28 - Mason Street	
Water Source*	S	G	S	G	S	G	S	G
Contaminant Generation								
Level of Confidence	5	5	5	5	3	3	3	3
Significance	5	5	3	3	U	U	U	U
Degree of Closure	0	0	0	0	1	1	1	1
SUBTOTAL	10	10	8	8	4	4	4	4
Contaminant Transport								
Distance to water	3	3	1	1	3	3	0	0
Soil permeability	1	2	3	0	3	0	3	0
Slope	1	1	1	1	1	1	1	1
Depth to bedrock	3	3	U*	U	U	U	U	U
Vegetative cover	1	1	1	1	1	1	1	1
SUBTOTAL	9	10	6	3	8	5	5	2
Receiving Waterbody								
Body Significance	10	10	5	5	15	15	5	5
GRAND TOTAL	29	30	19	16	27	24	14	11

*S-Surface water; G-Groundwater, U-unknown

Table 7D.14. Comparison of Yates County Landfill Risks to Surface and Groundwater in the Seneca Lake Watershed.

Yates County Towns	**Torrey**								**Milo**						**Starkey**			
Location of Landfill	#8 - Long Point Road		#9 - Perry Point Road		#30 - Hopeton Road		#29 - Oliver Road		# 7 - Outlet Road		#12 - Bath Road		#31 -Rice Hill Road		#32 - PreEmption Road		#20 -Dundee/ Glenora Road	
Water Source*	S	G	S	G	S	G	S	G	S	G	S	G	S	G	S	G	S	G
Contaminant Generation																		
Level of Confidence	5	5	5	5	1	1	1	1	5	5	5	5	1	1	1	1	5	5
Significance	5	5	5	5	U	U	1	1	5	5	5	5	U	U	U	U	3	3
Degree of Closure	0	0	5	5	5	5	5	5	0	0	0	0	1	1	1	1	5	5
SUBTOTAL	10	10	15	15	6	6	7	7	10	10	10	10	2	2	2	2	13	13
Contaminant Transport																		
Distance to water	0	0	1	1	3	3	0	0	3	3	0	0	0	0	U	U	U	U
Soil permeability	1	2	2	1	3	0	2	1	1	2	1	2	2	1	U	U	U	U
Slope	1	1	2	2	3	3	1	1	1	1	2	2	1	1	U	U	U	U
Depth to bedrock	U	U	3	3	3	3	3	3	3	3	3	3	3	3	U	U	U	U
Vegetative cover	0	0	1	1	3	3	1	1	1	1	1	1	1	1	U	U	U	U
SUBTOTAL	2	3	9	8	15	12	7	6	9	10	7	8	7	6	**	**	**	**
Receiving Waterbody																		
Body Significance	10	10	10	10	10	10	5	5	10	10	5	5	10	10	5	5	5	5
GRAND TOTAL	22	23	34	33	31	28	19	18	29	30	22	23	19	18	**	**	**	**

*S-Surface water; G-Groundwater, U-unknown

** Insufficient data to rank

Table 7D.15. Seneca Lake Watershed Pollution Potential Ranking for Landfills and Dumps.

Item	Town	Landfill Name	Rating		Overall Rank
			Surface Water	Ground-water	
Seneca County	Lodi	Keady Road	L	L	L
	Lodi	Dean Road	H	H	**H**
	Lodi	Shaw Road	H	H	**H**
	Lodi	Town Barn	M	M	M
	Varick	Route 96A	M	M	M
	Ovid	County Road 131	L	M	M
	Ovid	Willard Treatment Center	M	M	M
Schuyler County	Dix	Grand Prix	M	M	M
	Reading	Irelandville Road	M	M	M
	Montour	Johns Creek Reservoir	H	H	**H**
	Hector	Satterly Hill Road	L	L	L
	Hector	Tuttle Road	L	L	L
	Hector	Lakeside Park	H	H	**H**
	Catharine	Grant Road	L	L	L
Ontario County	Geneva	Preemption Road	L	L	L
	Geneva	Mason Street	L	L	L
Yates County	Torrey	Oliver Road	L	L	L
	Torrey	Hopeton Road	H	H	**H**
	Milo	Rice Hill Road	L	L	L
	Starkey	Preemption Road Site	**	**	**

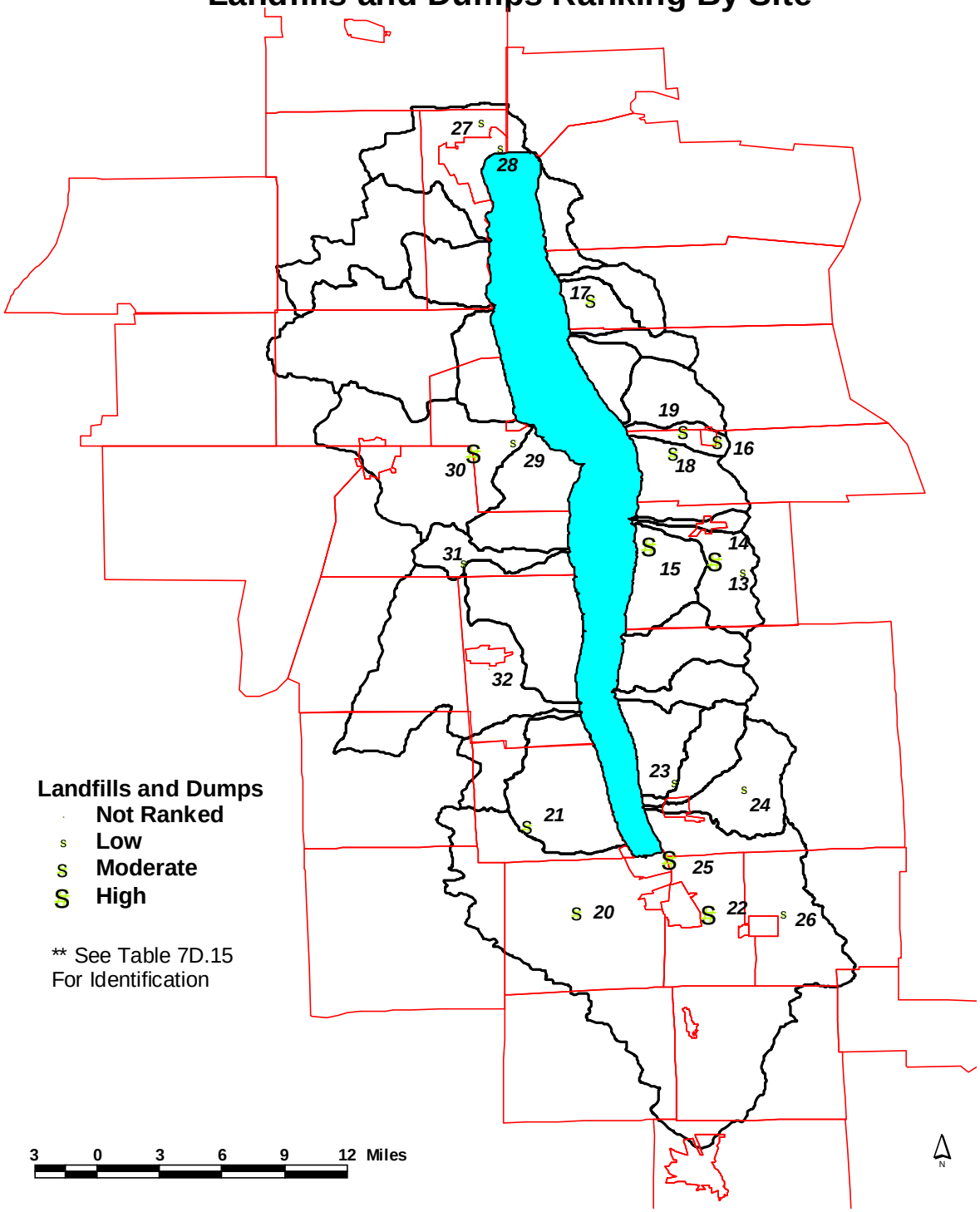
** Insufficient data to rank

Table 7D.16. Seneca Lake Watershed Pollution Potential Ranking for Hazardous Waste Sites.

Item	Town	Landfill Name	Rating		Overall Rank
Water Source*			S	G	
Seneca County	Romulus	Sampson State Park	H	H	**H**
	Romulus	Seneca Army Depot	H	H	**H**
Schuyler County	Dix	Dug Road	H	M	**H**
	Dix	North Franklin Street	H	H	**H**
Chemung County	Veteran	Church Hill Road	M	M	M
	Horseheads	Wygant Road	H	H	**H**
Ontario County	Geneva	Routes 5 & 20	H	M	**H**
	Waterloo	North Street	M	H	**H**
Yates County	Torrey	Long Point Road	M	M	M
	Torrey	Perry Point Road	H	H	**H**
	Milo	Outlet Road	H	H	**H**
	Milo	Bath Road	M	M	M

*S – Surface G – Groundwater

Potential Pollution Problems By Sub-Watershed
Landfills and Dumps Ranking By Site



Potential Pollution Problems By Sub-Watershed
Inactive Hazardous Waste Sites
Ranking By Site