

PART 3—CONDITION AFFECTING PUBLIC HEALTH AND SAFETY

3.1 Public Water Supplies and Source Water Protection

3.1.1 Public Water Supplies

Most of the drinking water provided to the residents of the Walnut Creek watershed is from the City of Erie Water Authority (Water Authority). Water is withdrawn from Lake Erie, and after treatment, is conveyed to parts of Fairview, Millcreek, Summit, and McKean Townships. The Water Authority holds a Water Allocation permit for the surface water withdrawal, and Water Supply Management permits for the treatment and distribution of public drinking water. According to eFACTS, the Water Authority is compliant with its permit requirements.

The remainder of the drinking water within the watershed is obtained from either un-regulated residential wells or conveyed from small Public Water Supplies that use groundwater sources. Due to the generally poor quality and quantity of groundwater found in local bedrock aquifers, unconsolidated glacial remnants, particularly outwash channel and ancestral Lake Erie beach deposits constitute the primary aquifers for water supplies within Erie County and the watershed.

There are 16 permitted public water supplies located within the watershed, as identified by eFACTS.

Public Water Supplies in Walnut Creek Watershed (C = Community, N = Non-Community, P = Non-Transient Non-Community)

PWSID #	Type	Name	Municipality
6250042	C	Vlasion Mobile Home Park	Fairview Twp
6250074	C	Sunnydale Subdivision	Fairview Twp
6250075	C	Millfair Heights	Millcreek Twp
6250085	C	Holly Acres Estates	Summit Twp
6250834	N	Holiday Mart	Mckean Twp
6250845	N	Hill Family Campground	Mckean Twp
6250875	N	City Of Erie Munci Golf Course	Millcreek Twp
6250878	N	Urraro Oil Company	Mckean Twp
6250919	N	Colonial Inn	Fairview Twp
6250944	N	Burger King	Mckean Twp
6250954	N	French Quarter	Summit Twp
6250973	N	Franks Farm Market	Millcreek Twp
6250985	N	Valley View Golf Club	Summit Twp
6250990	P	Accuspec Electronics Services	Mckean Twp
6250982	N	Beechwood Bar and Grill	Mckean Twp
6250968	P	Howard Industries	Mckean Twp

In general, permitted sources are relatively shallow ground water wells, transecting glacial deposit aquifers. These supplies all serve Community or Non-Community Water Systems, as defined in 25 Pa Code Ch.109. It is important to understand that though much of the public water supplied to consumers in the watershed is from outside sources, activities within the watershed have the potential to adversely affect the limited water supply aquifers available in the region. In short, groundwater is not confined by municipal, topographic, or land use boundaries. Likewise, once groundwater sources are contaminated or diminished, many difficult challenges and decisions will be faced.

3.1.2 Source Water Assessment

DEP has completed Source Water Assessments for all Public Water Supplies within the Commonwealth. The assessments were conducted through a combined effort of DEP staff and contractors. The assessments involved a susceptibility analysis of drinking water sources to contamination to identify threats and risk factors to be considered for source water protection. The following excerpt from DEP's Source Water Protection Program Plan explains source susceptibility:

The susceptibility of a drinking water source serving a PWS is the potential for that source to draw water, contaminated by inventoried sources of contamination, at concentrations that would pose a concern. This susceptibility is determined at the point in the water body immediately preceding collection for the PWS. A drinking water source, as a whole, is considered highly sensitive to contamination if at this point a U.S. Environmental Protection Agency establish Maximum Contaminant Limit (MCL) has been exceeded for a regulated contaminant, 50 percent of an MCL has been reached for nutrients or heavy metals, or detections have been made of Volatile Organic Compounds (VOCs) or Synthetic Organic Compounds (SOCs) above the detection limit. This does not complete the analysis of the individual potential sources of contamination for drinking water source susceptibility. The intent of a susceptibility analysis is to "narrow down" the potential contaminant sources of concern to assist the effectiveness of local voluntary Source Water Protection (SWP) programs.

The susceptibility analysis is a qualitative measure of relative priority for concern of the different potential and existing sources of contamination based on the following:

- Drinking water source sensitivity
- Potential impacts posed by sources of contamination to the PWS source (this is a qualitative assessment of the impact on a PWS source if an uncontrolled contaminant release were to occur from a specific activity).
- Potential for release of contaminants of concern

The susceptibility analysis uses a series of matrices to determine high, medium and low values for the various factors in the process. The process is described the *Susceptibility Analysis of Drinking Water Sources to Contamination* listed in the Appendix.

Some errors were found in the contractors susceptibility analysis completed for small public water supplies. These sources are being reevaluated. The susceptibility of the 16 small Public Water Supplies within the Walnut Creek watershed are not currently available.

3.1.3 Source Water Protection Programs

The most important objective for conducting a Source Water Assessment is to support the development of local, voluntary source water protection (SWP) programs. DEP supports and promotes the development and implementation of these plans with public education, program promotions, local grants for protection program development and implementation, federal and state agency coordination, and technical assistance.

DEP, through the Bureau of Water Supply Management, has primary responsibility for regulating public water supplies. In addition, DEP has primary authority to regulate most point and non-point source discharges of potential contaminants. The role of DEP in SWP is to provide technical support and guidance to the local governments and the water supply purveyor for the development and implementation of local SWP programs, and to coordinate environmental protection programs with these programs.

DEP regional staff that conducted initial Source Water Assessments are tasked to assist in promotion and development of local SWP programs. After the assessments were completed, DEP staff presented the relationship of the source water assessment to the local water suppliers along with approaches for managing existing and potential sources of contamination. They also coordinate with existing programs to promote funding for development and implementation of local SWP programs.

There have been no documented Source Water Protection programs implemented for the 16 small public water supplies in the Walnut Creek watershed.

3.2 Pollution Sources within the Walnut Creek Watershed

Pollution is created from activities that change the natural state of the quality of the air, soils, surface water, and groundwater. Because certain facilities and operations are known to generate wastes that can cause pollution, regulatory requirements are imposed to minimize those threats. Environmental regulations mandate, among other things, waste treatment requirements, source reduction strategies, waste disposal methods and spill response planning to minimize pollution of the environment. Pollution reduction strategies and controls, when properly managed, can reduce, and in some cases, eliminate the sources and impacts of pollution.

The types of pollution sources reviewed for this assessment included existing facilities operating under DEP permits, closed or abandoned facilities where known soil or water contamination has, or continues, and non-point pollution sources. Each category has regulations to prevent impacts to public health, safety and the environment. Pollution sources reviewed during the assessment include: **DEP permitted and regulated activities; “Superfund”, Hazardous Cleanup, National Priorities List and Toxic Release Inventory sites; and non-point pollution sources.**

3.2.1 Department Permitted and Regulated Activities

The assessment included a compliance evaluation of DEP permitted activities within the watershed. The evaluation involved identifying and determining compliance of each activity based on information from the Department's Environmental Facility Application Compliance Tracking System (eFACTS) and the Pennsylvania Safe Drinking Water Information System (PADWIS) databases. In some cases the compliance evaluation also included interviews, case file reviews and follow-up/follow-on inspections. It is important to note that the review did not include every Department permit or regulated activity. Permits and compliance information can change on a daily basis. The types of activities reviewed and the compliance evaluation results are listed by activity, below.

Injection wells

No injection wells were found as part of the query.

Mining operations

The Department has issued one mining permit in the watershed. A permit for surface mining operations has been issued to Waste Management Disposal Services of PA, Inc. for its operations at the Lakeview Landfill. According to eFACTS, the permittee is compliant.

Air pollution control

There are three facilities within the Walnut Creek Watershed that have DEP Air Quality permits for air emissions. According to eFACTS, the facilities are compliant with permit requirements.

NPDES discharges

Point source discharges are regulated by the National Pollutant Discharge Elimination System program, a federal initiative founded by the Federal Water Pollution Control Act of 1972, later amended in 1977 as the Clean Water Act (CWA). The Act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions.

Pennsylvania has primacy of the NPDES program and operates under funding through federal grant agreements. DEP administers the NPDES program for the Commonwealth, which includes permitting, monitoring, enforcement, and reporting. In Erie County portions of the NPDES program have been delegated from DEP to the Erie County Department of Health through a Memorandum of Understanding and to the Erie County Conservation District through a Delegation Agreement.

Permitted NPDES point source discharges are classified as either: Sewage, Industrial Waste, Industrial Stormwater, Municipal Separate Storm Sewer System (MS4) or Groundwater Cleanup. The compliance status of each category is described below.

Sewage: The majority of the sewage waste generated from the citizens within the watershed is conveyed to the Erie Wastewater Treatment Facility for treatment and is discharged to Lake Erie approximately two miles off shore. There are; however, approximately 28 privately owned sewage treatment plants that discharge to the Walnut Creek drainage. DEP's eFACTS database indicates that the facilities are compliant with permit requirements.

Industrial Waste: There are no discharges of treated industrial waste in the watershed.

Industrial Stormwater: Certain industrial categories are required to obtain a permit to discharge stormwater to surface waters. There are three permitted industrial stormwater discharges in the watershed.

Municipal Separate Storm Sewer Systems (MS4): Summit, Millcreek and Fairview Townships have been issued MS4 permits to control stormwater discharges. MS4 permits require each municipality to control the quality and quantity of stormwater discharges by implementing minimum control measures (MCMs), including:

- Public education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site runoff control
- Post-construction stormwater management
- Pollution prevention and good housekeeping for municipal operations

The Department inspected Summit, Millcreek and Fairview Township's MS4 programs in 2006. Summit and Fairview Townships MS4 programs were found to be compliant. Millcreek Township's MS4 program was incomplete for "illicit discharge detection and elimination" and in violation of the MS4 permit. The Department is currently working with Millcreek Township to resolve the violation.

Groundwater Cleanup: Remediation of contaminated groundwater from leaking underground storage tanks often involves a pump and treatment system. An NPDES permit is needed to discharge treated groundwater to any surface water. There are two groundwater cleanup discharges within the watershed, including Erie Petro, Inc. and Kwik Fill (M149).

102 Permits: In 2002, DEP integrated the federal Phase II NPDES requirements into the existing Phase I NPDES permit for stormwater discharges associated with construction activities (NPDES Construction Permit). Phase II requires permit coverage for small construction activities that disturb one to less than five acres, which result in a point source discharge to waters of the Commonwealth. An NPDES general permit can be used for most construction activities that require authorization under either Phase I or Phase II. Some activities; however, are not eligible for coverage under the general permit, including:

1. Activities in special protection watersheds;
2. Activities prohibited from coverage under 25 Pa. Code Chapter 92; and
3. Activities otherwise listed in the PAG-2 General Permit as ineligible.

In Erie County, DEP administers the NPDES Construction Permit Program through a delegation agreement with the Erie County Conservation District. The Conservation District processes and authorizes the permit coverage, conducts site inspections, and responds to complaints for all general permits. DEP issues all individual permits and is responsible for all compliance activities. The number of 102 permits issued within the Walnut Creek watershed is has not been determined. Several enforcement actions have been taken for Chapter 102 erosion and sedimentation violations in the watershed.

Waste operations and landfills

There are two municipal waste landfills permitted within the Walnut Creek watershed. The Lakeview Landfill, owned and operated by Waste Management of Pennsylvania, Inc. is located near the headwaters of Walnut Creek on Donation Road. Its operation involves a landfill permit, air quality emissions permits and a mining permit. Industrial wastewater from the landfill is collected and conveyed to the City of Erie Waste Water Treatment Plant for treatment. Stormwater from the site is controlled using BMPs required by the landfill permit, and discharged to Walnut Creek under authorization of an Industrial Stormwater NPDES permit. DEP's eFACTS database indicates that the facility is compliant with all permits.

The second landfill is an inactive operation named the Weiss Demolition Landfill. eFACTS indicates that the facility is compliant.

Oil & Gas operations

There are over 200 permitted Oil & Gas wells in the watershed. Most of the Oil & Gas development has occurred within the headwaters area. eFACTS indicates compliance with permit requirements.

3.2.2 "Superfund", Hazardous Cleanup, National Priorities List and TRI Sites

No state or federal "Superfund" or hazardous cleanup sites were found as part of the query.

The Toxics Release Inventory (TRI) is an EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain industrial groups. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and the Pollution Prevention Act of 1990. The TRI lists reported chemical data for all materials released in-site, off-site or transferred off-site. The 2005 TRI reported releases form the following watershed industries:

Erie Bronze & Aluminum— 677,880 pounds of total production related waste managed, including: 4,165 pounds on-site disposal or other releases, 1,000 pounds off-site disposal or other releases of Aluminum (Fume Or Dust), Chromium Compounds, Copper, Lead, Nickel and Zinc compounds.

Eriez Manufacturing--16,915 pounds total production related waste managed, including 16,915 pounds combined pounds of 1,1,1-Trichloroethane, Chromium, and Nickel transferred off-site for further waste management.

EPA's TRI can be viewed at <http://www.epa.gov/triexplorer/>.

3.2.3 *Non-point Source Pollution*

Non-point source pollution can generally be described as contamination from activities that are dispersed, or of a low intensity, but the potential for cumulative impacts to soils and waters may be significant. These activities can range broadly from airborne depositions, residential chemical use, urban stormwater runoff, on-lot sewage disposal and agricultural operations. Certain activities that can contribute to non-point source pollution are regulated, such as stormwater management, sewage management and agricultural nutrient management. Other activities, however, are not specifically addressed through regulation, but can cause pollution.

Act 167 Stormwater Management Planning

The Stormwater Management Act (Act of October 4, 1978, P.L. 864 No. 167) requires counties to develop stormwater plans for each of the watersheds within its boundary. The Act also requires each municipality within the watershed to adopt the county plan, enact and enforce ordinances to ensure that development and changes in land-use are done with the appropriate stormwater quantity and quality controls to prevent flooding and environmental problems.

The Erie County Planning Department prepared the *Lake Erie Area Watershed Act 167 Stormwater Management Plan* for Erie County in June 1996. The Plan is focused on the Lake Erie Watershed portion of Erie County. The *Plan* takes into account physical features and characteristics of the watershed to establish criteria and standards for stormwater runoff control. Implementation is governed through municipal ordinance using a systematic approach to prioritizing and correcting drainage problems. Act 167 Plans are to be update at least every five years to reflect changes in land use, drainage and stormwater control regulations.

The original *Plan* for the Lake Erie watershed was developed in 1996 to meet the requirements of Act 167 by addressing stormwater management from a standpoint of quantity control. The *Plan* does not; however, specifically address stormwater quality. The quality of stormwater and the transport of contaminants to surface waters and groundwater are now better understood. Act 167 Plans developed today put much more emphasis on stormwater quality control.

The emphasis on stormwater quality control has been further stressed with the implementation of the federal Phase II Stormwater requirements. Several municipalities within Erie County boundaries have been identified as Municipal Separate Storm Sewer Systems (MS4), and as such, have been issued MS4 NPDES permits. These permits require affected municipalities to ensure both stormwater quantity and quality controls are in place for new land development and redevelopment.

Erie County has started the process of updating the *Lake Erie Area Watershed Act 167 Stormwater Management Plan*. The updates will consider changes in local land-use and hydraulic characteristics with an emphasis placed on stormwater quality as well as quantity.

On-lot sewage

Under the Pennsylvania Act 537-Sewage Facilities Act (Act of January 24, 1966, P.L. 1535, *as amended*, 35 P.S. §§750.1-750.20a) each municipality has the responsibility to provide for sewage treatment and disposal. As such, each municipality is required to submit a plan (537 Plan) to the Department describing how sewage services will be handled within its jurisdiction. The municipality is also responsible to address complaints and abate malfunctioning systems and illicit discharges. During the sewage planning process, the municipality identifies sewage disposal problems and needs areas for improved sewage services. The township chooses among alternatives to address the problems within a reasonable time period.

Alternatives for sewage disposal can include, among other things, publicly owned treatment works, private sewage treatment plants, sewer system conveyance of sewage to a public or private sewage treatment plant, or on-lot sewage disposal. Townships within the Walnut Creek Watershed, including Millcreek Township, Fairview Township, Summit Township, and portions of McKean and Greene Townships, use various alternatives of each of these service types.

Millcreek Township has an approved 537 Plan that identifies the City of Erie Wastewater Treatment Facility to serve most of the Millcreek community. Either on-lot sewage disposal systems or privately owned small flow sewage treatment plants serve other portions of the township. In its 537 Plan, Millcreek Township has identified sewage problems. First, the township's Kearsarge sewage pumping station is hydraulically overloaded. To address this problem the township entered into a legal agreement with the Department and constructed an overflow retention facility to eliminate the discharge. The project was completed in Spring 2007. Second, Millcreek Township has recently identified areas where on-lot systems have had problems. These areas have been newly sewered, or are in the process of planning and installing new sewers.

Fairview Township is currently revising its 537 Plan. Similar to Millcreek Township, The City of Erie Wastewater Treatment Facility serves most of the Fairview community, while other portions are served by either on-lot sewage disposal systems or privately owned small flow sewage treatment plants. Fairview Township has identified suspect needs areas and surface water contamination from malfunctioning on-lot sewage disposal systems. The 537 plan will confirm and address these problems. An on-lot sanitary survey was started in Spring 2007.

As it's neighbors do, Summit Township also uses the services of the City of Erie Wastewater Treatment Facility to serve the populated portions of the township. Rural portions of Summit Township are served by either on-lot sewage disposal systems or privately owned small flow sewage treatment plants. Summit Township has recently completed a sewer extension in the Weber Hills area to address on-lot system malfunctions at the request of the Department. Summit Township is not proposing any additional on-lot sanitary survey's or Act 537 plan revisions at this time.

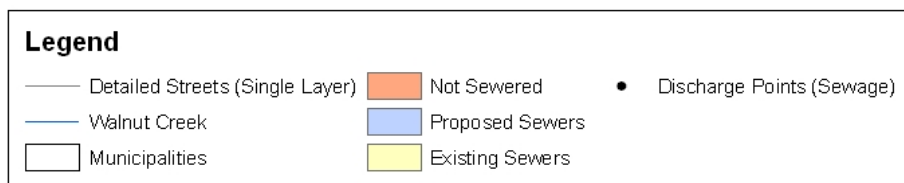
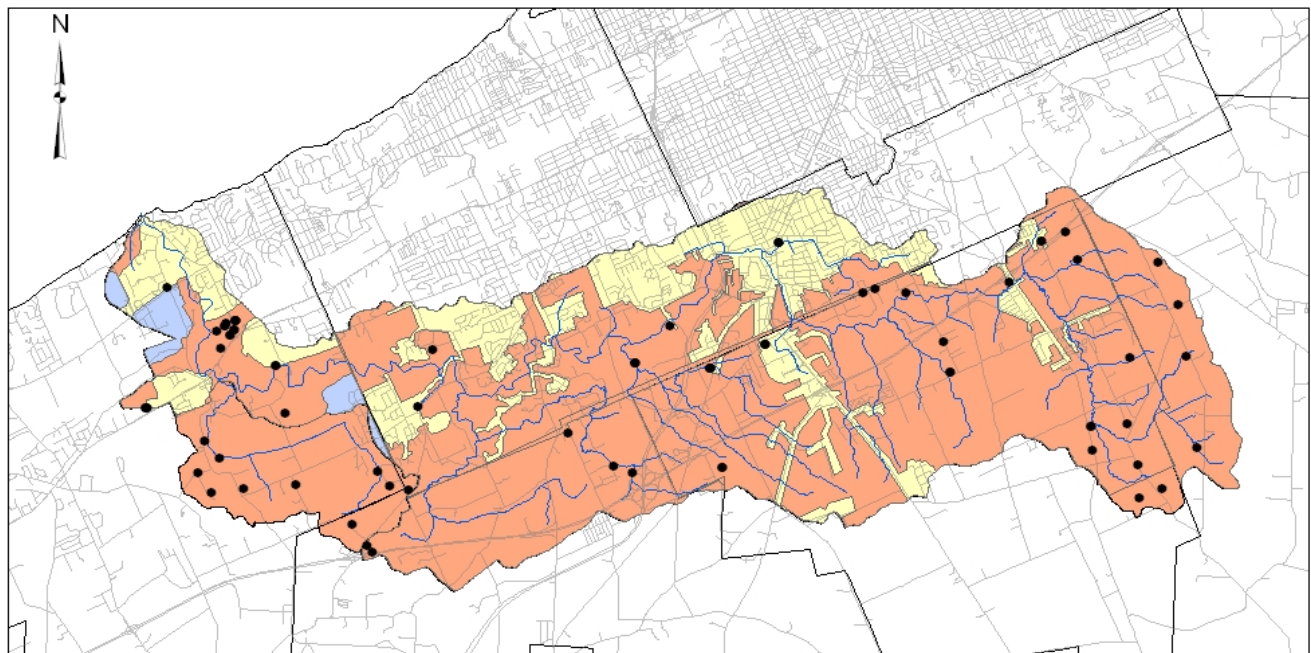
The areas of McKean and Greene Townships within the Walnut Creek watershed are served by on-lot sewage disposal systems. McKean Township has identified several areas with significant on-lot system malfunctions. McKean Township, by obligation of a legal agreement with the

Department, has submitted an Act 537 plan Update Revision in March 2007 to address these areas. The majority of the study area lies in the Elk Creek Watershed, and a small area of the Walnut Creek watershed near Township Road 514. The 537 Plan is currently under review by the Department.

Greene Township's Act 537 Plan has recently been updated to address problems with malfunctioning on-lot systems. They are currently in the design/permitting stages for the construction of a new wastewater treatment and collection system. The majority of the proposed service area lies within the Four-mile and French Creek watersheds.

The following figure shows the areas of the watershed that are served by public sewers and public and private sewage treatment plants. The map was created through a review of review township sewer maps, reports and sewage permits. The representation is a coarse illustration of sewer services areas, but is useful in identifying potential non-point sources of pollution from on-lot sewage disposal systems.

Walnut Creek Sewers and Discharge Points



Farming and Nutrient Management

Agricultural activities can cause non-point source pollution of soils and water if proper management techniques for preventing erosion, applying herbicides, pesticides and fertilizers are not considered. Stormwater run-off from barnyards and fields can have very high levels of sediment, nutrients, herbicides, pesticides, and bacteria. These pollutants can infiltrate the ground and contaminate groundwater and threaten water supplies. Stormwater runoff can become contaminated and pollute surface waters. This is of particular concern in the spring when fields have been recently tilled, fertilizer applied, and crops have yet to mature, leaving soils unstable. As will be presented further in this report, this is the time of year when snowmelt and precipitation are most significant, exacerbating the concern.

Farms are required by Chapter 102 of DEP's regulations to have a written Erosion and Sedimentation Plan for plowing or tilling activities involving areas of 5,000 square feet. These site-specific plans define the best management practices that will be implemented to minimize accelerated erosion and sedimentation. In many cases the Erosion and Sedimentation Plan is a portion of the overall conservation plan for the farm.

Farms using fertilizers and manure need to ensure that it is applied at the proper rate to prevent stormwater and groundwater contamination. Farmers can voluntarily develop a Nutrient Management plan (with partial grant funding) that describes how to best apply manure and fertilizers to minimize environmental problems. In some cases, as with Concentrated Animal Feeding Operations, Nutrient Management Plans are required. There are currently no Nutrient Management Plans approved for the watershed. Although no specific pollution sources from farming operations were identified in this assessment, the potential does exist.

Airborne Deposition

Although contamination of heavy metals and nitrogen, among other things, is a known non-point source of pollution from airborne deposition, it was not assessed in this project.

3.3 Potential Sources of Contamination

Potential Sources of Contamination (PSOC) are activities or facilities that exhibit an increased risk of contamination of soils, surface water, or groundwater. PSOCs are typically referred to in terms of threats to water supplies, but can also be applied to watersheds as a whole. PSOCs include a very broad category of activities.

The most obvious PSOCs are industrial and commercial activities that deal with hazardous substances on a daily basis, like the facilities mentioned above in Section 3.2.1. A leaking underground gasoline storage tank at a gas station has the potential to contaminate a drinking water well. An anhydrous ammonia release from a manufacturing site that leaks into a stormwater drain can cause a fish kill in Walnut Creek. Although highly visible and assumed to be the most threatening, these facilities are regulated and probably the least likely to cause contamination. These activities do need compliance monitoring and should be included in

Source Water Protection planning and watershed protection strategies, but the bigger concern may be the unpermitted and unknown PSOCs.

Unregulated activities with no controls are likely to have a bigger impact, particularly with regards to stormwater contamination. This, coupled with the fact that the total extent of unregulated sources is unknown, makes it challenging to conduct a comprehensive assessment of PSOCs. Evaluating PSOCs involves making assumptions based on area land uses. The types of PSOCs reviewed during this assessment include:

- Transportation corridors
- Urban activities

Transportation Corridors

Hazardous materials and waste products are transported commercially in unregulated quantities in Erie County every day. Several significant transportation routes transect the Walnut Creek watershed, including Interstate Highways 79 and 90, numerous State Routes, and several rail lines. The Pennsylvania Department of Transportation District 1-0, headquartered in Oil City, Venango County, manages interstate and state highway routes within the watershed. Local municipal and county governments manage other roads within the watershed.

The proximity of the watershed to the City of Erie, central to the cities of Pittsburgh, Buffalo, and Cleveland, and the presence of these North/South and East/West corridors, accounts for a relatively high concentration of road and rail traffic. The Pennsylvania Department of Transportation's *Traffic Volume Map* for Erie County shows the traffic patterns and volume values, which is included as an appendix to this report. Also located near the watershed are the Erie International Airport and the Port of the City of Erie. These facilities too contribute to increased traffic in and around the watershed.

These numerous and significant transportation routes in and around the watershed increases the presence of real and potential impacts, in particular, to surface and ground water quality. Road construction can result in a loss of habitat and riparian buffer zones. Stormwater runoff from roadways can carry contaminants to waterways. Large spills from highway or rail accidents are also examples of actual and potential impacts to the watershed from transportation corridors.

Activities associated with transportation must also be taken into account when evaluating PSOCs. The high density of roadways in the watershed relates to an increased number of re-fueling stations and parking areas. Surface spills from fuel delivery or re-fueling activities and contaminants left on large parking areas, such as: volatile organic compounds, oil and grease, coolants, and de-icing compounds can cause pollution to surface water and groundwater

A unique consideration for roadways in the Walnut Creek watershed is the need for snow removal and de-icing. Due to the northerly latitude and proximity to Lake Erie, roads in the watershed receive significant amounts of snowfall through a longer portion of the year than other areas of the Commonwealth. Winter roadway maintenance involves applying de-icing (sodium chloride), anti-caking (sodium ferro cyanide), and anti-skid (sand & grit) compounds. These

products, if over applied, can cause substantial impacts to surface waters, groundwater, roadside vegetation, and sensitive aquatic species. The U.S. Environmental Protection Agency, Office of Water's - Source Water Protection Practices Bulletin *Managing Highway Deicing to Prevent Contamination of Drinking Water* (EPA 816-F-02-019, August 2002) is included as an appendix to this report.

Urban Activities

The co-produced EPA and The Weather Channel television special titled, "After the Storm" ("*After the Storm*," Jan. 2003, EPA 833-B-03-002), describes the effects that residential activities can have on stormwater. Mishandled household hazardous wastes like insecticides, pesticides, paint and solvents can pollute waters and impact aquatic life. Excess fertilizers and pesticides used on lawns and gardens can be carried to streams and groundwater. Yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams. Car washing, degreasing auto parts at home, dumping used motor oil and other auto fluids can send contaminants into storm sewers, having the same effect as dumping them directly into the stream. Pet waste left behind can be a major source of bacteria and excess nutrients in local waters. "After the Storm" can be viewed at weatherchannel@epa.gov.

3.4 Pollution Source Distribution

PSOCs, particularly from non-point sources, are not easy to evaluate and quantify. One approach to better understand the distribution of regulated and non-regulated PSOCs is to review complaints filed with DEP. DEP's Complaint Tracking System was used to review complaints filed over the past three years. The number and types of complaints filed within the watershed are listed to provide an indication of the potential pollution sources and areas that may be targeted for further action.

A total of 33 public complaints were filed with the Department for activities within the Walnut Creek watershed between 2004 and 2006. Complaints were categorized as: illegal disposal or dumping; odors, burning or fugitive emissions; wetland or stream encroachments; above ground or underground storage tanks; and oil and gas wells and operations. It is important to note that in some cases complaints received by Department are referred to the responsible agency or municipality and would not be included in the system. The Pennsylvania Farm Bureau and the Erie County Conservation District handle agriculture related complaints. The Erie County Conservation District handles erosion and sedimentation complaints. Spills, illegal discharges and responses to emergencies are handled by the Erie County Department of Health. Sewage complaints are referred to the respective municipality. Below is a listing of the type of complaint and the occurrence.

Year	Disposal/Dumping	Odors/Burning	Wetland/Stream Encroachment	AST/UST Storage Tanks	Oil & Gas Wells
2004	7	1	3	1	2
2005	3	3	4	1	1
2006	3	2	1	1	0
Totals	13	6	8	3	3

Complaints do not indicate compliance, but they do give an indication of the types of activities occurring, citizens concerns, and level of involvement.

Creating a complete accounting of PSOCs in the watershed is not the point of the assessment. Rather, PSOCs are described to offer a setting of the large number and extent of activities that pose a risk of contamination. Evaluating and mapping the specific location and distribution of PSOCs is the next step in building local Source Water Protection plans and watershed management plans. Local planners and decision makers can use this information to take action and reduce the risk of PSOCs to public health, safety and the environment.

In summary, the most significant PSOCs identified through the assessment that should be considered are:

1. Stormwater runoff from construction activities and developed land is likely the largest PSOC to the watershed. Until Phase II Stormwater regulations went into effect in 2002, little effort was made toward stormwater *quality* control. Pre 2002 control structures were designed to handle large flood events with no treatment for stormwater quality. In some cases there is no stormwater management controls with direct discharges to Walnut Creek.
2. Municipal Separate Storm Sewer Systems (MS4) can carry large volumes of stormwater and pollutants. This PSOC requires control measures for minimizing stormwater contamination and accelerated erosion.
3. Transportation corridors are high risk, low potential sources of pollution. Accidental spills and releases cannot be directly managed, but response and control can be. Effective spill response is the best line of defense.
4. Sewage pollution from failing septic systems is also a significant PSOC. Samples results show that *E. coli* is commonly found throughout the watercourse. PCR DNA testing indicates that some of the bacteria are from human origin.
5. Privately owned sewage treatment plants, if not properly operated, pose a threat to water quality, particularly *E. coli* contamination.
6. Agricultural activities have significant potential for non-point source contamination of soils and waters if proper management techniques for mitigating erosion of soils, applying herbicides and pesticides, and using fertilizers are not considered.

3.3 West Nile Virus Protection Program

Since 2000, the Department has implemented standardized mosquito surveillance in all counties to determine the presence and distribution of West Nile Virus (WNV). Information generated from this sampling is used to determine the potential for virus transmission, the need for control measures, and provides baseline knowledge regarding possible mosquito vectors across the Commonwealth. Annually, each county within the Commonwealth receives a grant from the Department to administer the mosquito surveillance and control program. In Cooperation with DEP, the Erie County Health Department administers the program in Erie County.



Culex restuans



Culex pipiens

The Health Department's first level of surveillance for mosquitoes consists of sampling aquatic habitats (such as wetlands, flood land, sewage treatment plants, and tire piles) for larvae. When high populations of larvae are found, those areas are treated with larvicides to prevent adult mosquitoes from hatching. If sampling (light traps deployed overnight) for adult mosquitoes still indicates high populations of flying mosquitoes, spraying (fogging) of ultra low volume pesticides is conducted. Sprayers are typically mounted on the back of a pick-up truck, but may also be mounted on an ATV or a backpack. Erie County Health Department does most of the surveillance and control- DEP assists when needed.

Over the past six seasons, a total of 57 mosquito sampling sites have been established in the area surrounding the Walnut Creek watershed. Among those sites, an average of 151 samples have been collected per sampling year, with a high of 311 samples collected in 2006. The results of the 2006 surveillance dictated that 13 larval control events and 14 adult control events be conducted in the watershed.



Within the watershed, since the inception of the WNV Control Program, there have been a total of eleven mosquito samples that have tested positive for WNV--one positive sample in 2000, three in 2002 and seven in 2006.

County staff spraying pesticide

3.3 Pathogenic Bacteria Assessment

While the Walnut Creek Watershed assessment was being conducted, a separate, but related assessment was also being done. The *E. coli* Task Force was commissioned to study the cause(s) for the unprecedented number of beach closings at Presque Isle State Park during the 2006 summer swimming season. The *E. coli* Task Force was formed of representatives from DEP, DCNR, PAFBC the Erie County Department of Health, the Regional Science Consortium at the Tom Ridge Environmental Center at Presque Isle, Pennsylvania Sea Grant, Erie County Conservation District and the Erie Area Convention and Visitors Bureau. The focus of the task force was to assess factors and potential pollution sources influencing water quality along the Lake Erie shoreline in western Erie County and how it relates to the beach closings at Presque Isle State Park.

The *E. coli* Task Force completed a three-phased assessment to identify potential contamination sources that may be impacting Presque Isle beaches, reference Operation Creek Sweep—Surface Water *E. coli* Assessment, December 19, 2006. The first phase of the assessment involved *Creek Sweep*, a comprehensive sampling event and investigation designed to determine the sources and levels of fecal indicating bacteria (FIB) in the surface waters tributary to Lake Erie. FIB are a bacteria group present in the gastrointestinal tract of warm blooded animals that include, among other groups of bacteria, *Escherichia coli* (*E. coli*), *Bacteroides fragilis* (*Bacteroides*) and *Enterococci sp.* The presence of FIB in surface waters is used as an indicator of the presence of other pathogenic bacteria groups from sewage pollution, which creates potential risk to human health (Francy, 2003).

Phase II of the assessment involved comparing *Creek Sweep* results to historic water quality data from other Pennsylvania streams. Three reference Water Quality Network (WQN) stations within mostly undeveloped watersheds were used as ambient references for comparison to the Lake Erie watershed. The objective of this review was to provide context for evaluating the bacteria levels found during *Creek Sweep*.

Certain sites on Elk Creek and Walnut Creek were sampled a third time for FIB during wet weather, high stream flow conditions as part of Phase III of the assessment. The samples were used for DNA Polymerase Chain Reaction testing (PCR testing) to determine whether the FIB were from animal or human sources.

The assessment provided valuable information on the levels of FIB in Walnut Creek. *Creek Sweep* revealed that FIB appear to be commonly found in surface waters and are released into the environment through point sources and non-point sources. *E. coli* sampling conducted during dry weather, low stream flow conditions established baseline levels for the microorganism. In most cases *E. coli* bacteria levels were relatively low compared to WQN reference stations and public bathing standards. On the contrary, *E. coli* levels are significantly higher during wet weather, high stream flow conditions.

PCR DNA testing results indicate that FIB may be from both animal and human sources. The presence of human specific *Bacteroides* DNA shows that human waste is a contributing source to the bacteria loading in the watershed, possibly from both point sources and non-point sources.

With the interest of public health and safety held first and foremost, a strategy of “the best defense is a good offense” was recommended in the Creek Sweep Report. Specifically, the *E. coli* Task Force was encouraged to:

- Continue its research on FIB sources, monitoring and control programs.
- Partner with local and regional agencies to share resources, gain new knowledge and direct initiatives.
- Continue monitoring and compliance efforts at regulated sewage discharges and Municipal Separate Storm Sewer Systems, as point source discharges remain to be a contributing factor of FIB.
- Continue surveillance within the watershed to identify and eliminate other illegal discharges.
- Employ beach-grooming activities that minimize the proliferation of FIB within beach sands.
- Start collecting data on the beach conditions concurrent with *E. coli* sampling to develop indicators for a predictive model for FIB.

Meanwhile, further study is necessary to identify the predominant sources of FIB within the watershed. Additional FIB sampling coupled with PCR testing is ongoing at specific points within the watershed to identify the source areas and contributing species. These results will then be compared to area land use to identify the actual source of the bacteria loading and drive appropriate corrective action. For example, surface waters identified to be contaminated from human wastes should be directed towards sewage needs surveys and appropriate sewage facilities. Likewise, surface waters found to be contaminated from farm animals can be directed toward agricultural BMPs.

It may be possible to correlate trends of precipitation, wind, stream flow and sediment loading to make a predictive model of FIB levels. Continued monitoring of these parameters, among others, in a portion of the watershed with corresponding FIB sampling could be used as a basis of the model.

From the results of the assessment it is known that tributary streams are one possible source of FIB to Lake Erie, but their fate and transport is unknown. The impacts of FIB on Presque Isle beaches from streams tributary to Lake Erie should be further assessed.

3.4 Giant Hogweed

Giant Hogweed is a member of the carrot family (Apiaceae) that was introduced into Europe and North America in the early 1900s, originally as a garden and arboretum plant. In the late 1980's it became evident that escapes from cultivation had occurred throughout New York and Pennsylvania, and are now found along ditches, roadsides, stream banks and open wooded areas as well as infesting homeowner flowerbeds and yards.



Giant Hogweed (*Heracleum mantegazzianum*)

Giant Hogweed is now considered a public health hazard because of its potential to cause severe skin irritation and possibly blindness. Plant sap can produce painful, burning blisters within 24 to 48 hours after contact, and plant juices can produce painless red blotches that later develop into purplish or brownish scars that may persist for several years.

Giant Hogweed is a long-lived biennial that comes up as a rosette in early spring from roots or seeds. One flower stalk is produced per plant, but a plant may not produce a flower stalk for several years. Plants die after flowering. Plants are most easily identified when blooming in June or July when the stalks are upwards of 6 feet tall or more, and stalks produce numerous small white flowers clustered into a flat-topped umbel up to 2 ½ feet across. The green stems are hollow, ridged, 2-4 inch in diameter with purple blotches and coarse white hairs. The large diameter leaves are lobed, deeply incised, and are usually at least 12 inches to 3 feet wide. Plants commonly confused with giant hogweed include cow parsnip, angelica, and poison hemlock.

The Pennsylvania Department of Agriculture and USDA/APHIS started the Giant Hogweed Eradication Program in 1998. The program involves early detection efforts and targeted rapid response control measures. Since the program began there have been 520 populations discovered in Pennsylvania. The program is now approaching its final phases as more than half of these populations have been eradicated after 3 or more years of successful treatments. However, riparian infestations are still of high concern, as the rate of spread and distribution of Giant Hogweed is greatest in riparian areas.

A cluster of this noxious weed is known in the vicinity of the Millcreek Mall. A second cluster is located at 42°02' N, 80°06' W near Hershey Road. Finally, there is a known cluster at the mouth of Walnut Creek and Lake Erie. All three of these locations have been treated by the Department of Agriculture since initial discovery and live plants may not exist at these locations. A review of viable sites and controlled sites shows that a large portion of Walnut Creek may have **undiscovered populations** of giant hogweed. Particularly, the area from approximately 80°06' W to 80°14' W (42°04' N) is in need of more surveillance for giant hogweed. For more information on the Giant Hogweed Eradication Program, or to report a new discovery, contact the Giant Hogweed Hotline at: 1-877-464-9333 or contact Melissa A. Bravo: Pennsylvania Department of Agriculture Botanist/Weed Scientist in Harrisburg, PA at 717-787-7204.