Appendix C

DRAFT

Wellhead Protection Plan Part 2:

Potential Contaminant Source Management Strategy

Prepared for
The City of Oakdale, Minnesota

September, 2004

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Oakdale

PUBLIC WATER SUPPLY PROFILE

PUBLIC WATER SUPPLY

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GENERAL INFORMATION

UNIQUE WELL NUMBERS: (1) 208462, (2) 208463, (3) 208454, (5) 127287, (6) 15175, (7) 463534, (8) 572608, (9) 611059
SIZE OF POPULATION SERVED: 29,000
COUNTY: Washington County

DOCUMENTATION LIST

STEP	DATEE PERFORMED
Scoping Meeting 2 Held (4720.5340, subp. 1)	12/20/02
Scoping 2 Decision Notice Received (4720.5340, subp. 2)	1/10/03
Public Hearing Conducted (4720.5350, subp.4)	2/11/03
Remaining Portion of Plan Submitted to Local Units of Government (LUGs) (4720.5350)	_____
Review Received from Local Units of Government (4720.5350, subp. 2)	_____
Review Comments Considered (4720.5350, subp. 3)	_____
Public Hearing after 60 day local review period (4720.5350, subp.4)	_____
Remaining Portion Plan Submitted to MDH (4720.5360, subp. 1)	_____
Final WHP Plan Review Received (4720.5360, subp. 4)	_____
Remaining portion of Plan approved	_____

Executive Summary

The City of Oakdale has completed its Wellhead Protection Plan (Plan) for its eight active municipal wells (Municipal Wells 1, 2, 3, 5, 6, 7, 8, and 9). The Minnesota Unique Well Numbers of these municipal wells are 208462, 208463, 208454, 127287, 151575, 463534, 572608, and 611059. All wells are completed in the Jordan Sandstone aquifer. This report is Part II of the Wellhead Protection Plan and it includes the following:

- A review of the data elements.
- The results of the potential contaminant source inventory.
- A review of changes, issues, problems, and opportunities related to the public water supply and the identified potential contaminant sources.
- A detailed discussion of the potential contaminant source management strategies and corresponding goals, objectives, and an implementation plan.
- A review of the wellhead and source water protection evaluation program and an alternative water supply contingency strategy.

Part I of the Plan was completed in June 2002 and approved by the Minnesota Department of Health (MDH) in September 2002. In Part I of the Plan, the Wellhead Protection Areas (WHPAs) and Drinking Water Supply Management Areas (DWSMAs) were delineated, and vulnerability assessments of the wells and corresponding DWSMAs were completed. Due to the local geologic conditions, all municipal wells were determined to be of low to moderate vulnerability to potential contaminant sources at the land surface. Low, moderate, and high vulnerability areas were distinguished for the two DWSMAs. The information and data contained in Chapters 1 through 4 of this Plan provide support and a basis for the approaches taken in addressing and managing the identified potential contaminant sources within the delineated DWSMAs.

The Oakdale wellhead and source water protection program is concentrating its efforts on managing potential contaminant sources within the DWSMAs, and working with Washington County, Lake Elmo, Mahtomedi, and Pine Springs to help develop or modify plans that could impact Oakdale's DWSMAs which cross into the other cities corporate boundaries. In addition, the program includes providing educational opportunities for Oakdale city staff, residents and businesses regarding wellhead and source water protection.

Wellhead Protection Plan: Part 2
City of Oakdale, Minnesota

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CERTIFICATION

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1.0 Data Elements and Assessment (4720.5200)

Hydrogeological & Modeling Services, Inc. (HMS) was retained by the City of Oakdale, Minnesota to assist in completing Part 2 of its Wellhead Protection Plan. This report is Part II of the Plan. Part I of the Plan was completed in June 2002, and was approved by the Minnesota Department of Health in September 2002 (Appendix A). Delineations of the Wellhead Protection Areas (WHPAs) and the Drinking Water Supply Management Areas (DWSMAs), and vulnerability assessments of the municipal wells and DWSMAs, were completed in Part I of the Plan. Exhibit 2a depicts the finalized DWSMAs and the locations of the municipal wells. The DWSMAs extend beyond the City of Oakdale limits into the City of Lake Elmo, and into the cities of Pine Springs and Mahtomedi.

1.1 Required Data Elements

In accordance with Minnesota Rules Chapter 4720.5200, and the January 10, 2003 MDH Second Scoping Decision Notice (Appendix B), the following subsections discuss and assess the required data elements as they relate to the City of Oakdale wellhead and source water protection program. Since the eastern portions of the DWSMAs were determined to be primarily of moderate and high vulnerability, most of the data elements have been addressed for those DWSMAs. For the areas of the DWSMAs that were determined to have low vulnerability, only select data elements have been reviewed and assessed for that area.

1.1.1 Physical Environment Data Elements

1.1.1.1 Precipitation

According to the Minnesota Department of Natural Resources Climatology office the City of Oakdale averages 33.0 inches of precipitation on an annual basis (Exhibit 1). The monthly average precipitation is given in Table 1.

Precipitation does not significantly affect Oakdale's Wellhead Protection Plan since the vulnerable bedrock aquifer utilized for public water supplies, the Jordan aquifer, is under semi-confined hydrogeologic conditions. There is not a direct hydraulic connection between precipitation and the groundwater in the aquifer. Therefore, the amount of precipitation will not influence the management strategies for the DWSMAs.

1.1.1.2 Geology

The geologic and hydrogeologic conditions in Oakdale impact the vulnerability of most of the municipal wells and DWSMAs, and will therefore affect the management strategies implemented by the City for potential contaminant sources.

An in-depth discussion regarding the regional and local geologic and hydrogeologic conditions in Oakdale was provided in Part I of the Wellhead Protection Plan (HMS, 2002). The bedrock geology is reflected in Figure 2a of the City of Oakdale Wellhead Protection Plan Part 1 and Exhibit 4 here. Generally the first bedrock in the area is the Decorah Shale, the Platteville/Glenwood, the St. Peter Sandstone, or the Prairie du Chien Dolomite Formations.

The source water aquifer used for public water supplies in Oakdale is the Jordan sandstone aquifer which underlies the Prairie du Chien dolomite. All eight municipal wells are open to this aquifer. In some areas of the City, the Prairie du Chien-Jordan Aquifer appears to be confined or semi-confined by overlying, clay-rich glacial deposits, by remnant shaley, basal St. Peter Sandstone, and/or by the Platteville and Glenwood bedrock formations. Where present, these deposits hydraulically separate the source water aquifer from the shallow water table aquifer.

The localized leakage induced by pumping municipal wells has apparently been enhanced by the presence of the Southern Washington County buried bedrock valley, located east of Oakdale (Exhibit 4). The increased leakage explains the vulnerability status of the wells that appears to contradict the low to moderate vulnerability status of the DWSMA in the immediate vicinity of the wells. The young water in Oakdale Wells 3 and 7 appears to have been introduced in the Jordan aquifer not via the overlying soil (in general two or three confining bedrock units overly the Jordan Aquifer at the locations of the wells), but rather through the more permeable soils which may fill the bedrock valley to the northeast. In this area, the bedrock has been eroded down to the Prairie du Chien group, a bedrock unit directly overlying the Jordan aquifer from which the City of Oakdale obtains its water. Therefore, the nature of the valley fill material will influence the management strategies for the DWSMAs.

1.1.1.3 Soils

Oakdale has generally rolling topography. The surficial geology is typified by layers of sand, gravel, silt and clay overlying the bedrock. Exhibit 2 reflects the soil classification system as determined by the United States Department Agriculture Soil Conservation Service in cooperation with the Minnesota Agricultural Experiment Station for the area within the City of Oakdale's DWSMA.

Approximately 65% of the surficial soils in the DWSMA consist of flat to steep well to excessively drained Antigo-Chetek soils in Oakdale or undulated to steep well drained Kingsley-Santiago soils in Lake Elmo.

These upper most soil types do not directly influence Oakdale's Wellhead Protection Plan. The vulnerable source water aquifer is only impacted by characteristics of the surficial soils (uppermost six to ten feet) when the underlying units are also permeable. These conditions may only exist within the Southern Washington County buried bedrock valley.

Therefore, a detailed analysis of the surficial soil types, infiltration rates, or erosion problems is not included in this Plan for use in formulating management strategies for the City of Oakdale DWSMAs. As discussed above, only in the bedrock valley is the nature of the valley fill a determining factor in the protection of the Prairie du Chien/Jordan Aquifer.

1.1.1.4 Water Resources

Exhibit 3 shows the boundaries of minor watershed units. Generally the area west of Interstate 694 flows to the west and is within the Ramsey Washington Metro Watershed District. The area east of Interstate 694 and north of 15th Street flows to the east as is within the Valley Branch Watershed District. The area east of Interstate 694 and south of 15th Street flows to the southeast and is within the South Washington Watershed District. A complete description of surface water and the management of potential contamination sources within the DWSMA is beyond the scope of this report, mainly because there does not appear to be a direct hydraulic connection between surface water and the aquifer used by the city wells. For the same reason, it is not necessary to collect information with respect to surface water quantity and quality.

1.1.2 Land Use Data Elements

1.1.2.1 Land Use

The City of Oakdale has developed as a bedroom community, with most of the development occurring between 1980 and 2000.

Residential developments occupy more than 60% of the total land area within the community. Industrial/office/warehouses occupy approximately 10% of the land area, commercial areas occupy approximate 6% and public land uses 18%, and the 6% balance is open space/wetland area.

By contrast, the portion of Lake Elmo in Oakdale's DWSMA consists or 33% Single Family Residences, 22% undeveloped, 16% open water, 12% agriculture, 10% parks, 3% institutional, and the remaining 4% makes up for Industrial, commercial, major vehicular rights of way and farmsteads.

Exhibit 5 shows land uses within the DWSMA from the year 2000 obtained from the City of Oakdale and the Metropolitan Council.

1.1.2.2 Public utility services

The City of Oakdale provides urban water and sanitary sewer services as reflected in Exhibit 6. Treatment of groundwater for domestic purposes has been limited to fluoride to promote healthy teeth development in adolescents, and chlorine for bacteria control. Xcel Energy provides electricity to a majority of the community, and gas service to the entire community. North St. Paul Electric provides electric service to the portion of the community north of 44th Street and west of Granada Avenue. Qwest provides telephone service, and AT&T provides cable TV services. Minnegasco provides gas service to several commercial/industrial users in a portion of Oakdale in the southeast corner of the community, generally south of 10th Street and east of Interstate 694.

1.1.3 Potential Contaminant Source Inventory (PCSI)

An important component of potential contaminant source inventory (PCSI) was to look for any point sources within the DWSMA that might be a threat to the quality of Oakdale's water supply. An example of a point source would be an underground storage tank or any facility that stores, handles, or disposes of materials that, if introduced into the environment, might degrade the quality of the water pumped from the aquifer.

Information was obtained from City Staff, Washington County, the Minnesota pollution Control Agency, and the Minnesota Department of Health. As part of the PCSI, a well search was performed using the Minnesota Geological Survey (MGS) County Well Index (CWI) Database and information provided by the MDH.

The results of the PCSI search indicated that there are currently 42 point source listings in the moderately to highly vulnerable portions of the City of Oakdale DWSMA. Some of the sites have multiple listings because for example they may have an underground storage tank and be a hazardous waste generator. A listing of these sites is provided in Appendix C, and their approximate locations are depicted in Exhibit 8.

1.1.3.1 MPCA Master Entity System Sites

The Minnesota Pollution Control Agency (MPCA) Master Entity System (MES) is a repository of data regarding disposal and release sites located in the State of Minnesota. The list includes a variety of site types and facilities known or presumed to include hazardous wastes, to less significant sites possessing a lesser potential for harming human health and the environment. These sites are regulated by the MPCA and/or the U.S. EPA. The MES includes the following types of sites:

- National Priorities List (NPL) sites
- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) sites
- Minnesota Permanent List of Priorities (PLP) sites
- Hazardous Waste Generator Investigation and Cleanup (HWIC) sites Permitted Solid Waste Facilities
- RCRA Treatment, Storage, and Disposal Facilities
- 1980 Metropolitan Area Waste Disposal Site Inventory sites
- 1980 Outstate Dump Inventory sites
- Voluntary Investigation and Cleanup (VIC) sites
- Delisted PLP sites
- No Further Remedial Action Planned (NFRAP) sites
- Brownfield sites

Two MES sites were identified within the DWSMAs. None of them are located within the highly vulnerable portion of the DWSMAs. These sites include:

- The Hadley and 15th Street Oakdale Dump
- The Greens North Site

The Greens North Site is located within Well 6 Emergency Management Areas (one-year Wellhead Protection Areas) but is located within an area of low vulnerability. It is managed within the VIC program. The Oakdale Dump had undergone remediation and requires no further remedial action. Therefore, the City considers MES sites to be a low priority in managing potential contaminant sources.

1.1.3.2 Leaking Underground Storage Tanks

Four leaking underground storage tank (LUST) sites were identified within the DWSMA. Exhibit 8 depicts the approximate locations of the LUST sites. Three are located within the moderate vulnerability zone in Oakdale. One is located in Lake Elmo, within a zone of high vulnerability. None are located within the well's Emergency Management Areas. LUST sites are properties on which a release from an underground storage tank has been documented. The chemicals/substances release from storage tanks could infiltrate the subsurface and impact or contaminate the City's source water aquifer, especially in areas identified as highly vulnerable. In addition, most LUST sites have residual soil and/or groundwater contamination remaining even after they have been "cleaned up" and granted site closure by the MPCA. These sites are closely managed by the MPCA. Therefore, the City regards LUST sites a moderate priority in developing and implementing management strategies for the DWSMAs.

1.1.3.3 Open Dumps and Landfills

There are several former 3M industrial disposal sites within Oakdale. The MPCA has a stipulation agreement with 3M that requires continuous monitoring and pumping of the contaminated area. The agreement and pumping operations have been in place since 1985, and run until 2025. The annual reports indicate the pump out recovery program is removing the pollutants, and has reversed the migration of materials out of the contamination areas. The reports are reviewed annually to note any changes in the recovery program and migration of materials. These sites are not located within any of the city's DWSMAs. The contamination was limited to the drift areas below the disposal sites and did not penetrate any of the confining layers above the Prairie du Chien aquifer.

Ramsey and Washington County have a joint landfill facility that was closed and sealed in the late 1980's. The facility has a stipulation agreement with the MPCA and they continue to monitor and document the recovery and treatment of the contaminants. This site is not located within any of the city's DWSMAs. It is located in the City of Lake Elmo just east of Jamaca Avenue between 37th Street and Lake Jane Trail.

Washington County has its own unique PCSI list which includes everything in the MES and a few small open dump inventories not included on the MPCA MES list. A review of Washington Counties open dump inventory showed 20 open dump listings in Oakdale and Lake Elmo. Of these only 2 were located in the DWSMA, and are listed below:

- Castle Green @ 5399 Geneva Ave. N., Oakdale is located in a moderate vulnerability area of the DWSMA. Road construction in area may have resulted in cleanup or burial of golf course access used for dumping. County File # OLE15

- Old City Dump, City built parking lot on top of site @ NE1/4.of Section 30. It is located in a low vulnerability area of the DWSMA. County File #OLE22.

Leachate from the waste in dumps and landfills could migrate down through the ground and contaminate the City's source water aquifer, especially in highly vulnerable areas. However, because solid waste facilities, dumps, and landfills are strictly regulated through the MPCA, and only the two relatively disregarding open dump sites were identified within any DWSMAs, the City intends to regard dumps, landfills, and solid waste facilities a low priority when developing and implementing management strategies for the DWSMAs.

1.1.3.4 Registered Underground and Aboveground Storage

Ten properties within the DWSMAs have been identified as being registered to have and/or use underground and/or aboveground storage tanks (USTs/ASTs). Exhibit 8 depicts the locations of the identified UST/AST sites. None are located within the well's Emergency Management Areas. If storage tanks leak or rupture, the stored chemicals/substances could be released into the environment. Potentially, liquid chemicals from a leak or release could vertically migrate through the subsurface and impact or contaminate the City's source water aquifer, especially in areas of high vulnerability. Seven of the registered tanks are located in areas of moderate vulnerability. Only three of them are located in area of high vulnerability. Underground and aboveground storage tanks are regulated by state and federal agencies. Due to the number of registered storage tanks and the moderate to high vulnerability conditions, UST and AST sites are considered a high priority in managing the City's DWSMAs.

1.1.3.5 Hazardous Waste Generators

Fifteen properties and businesses within the DWSMA have been identified as registered/licensed hazardous waste generators. Only one hazardous waste generator site is located in the Emergency Management Zone for Municipal Well 5, the City of Oakdale Public Work Department. Typically, these facilities generate only small quantities of hazardous wastes and they are strictly regulated by state and federal agencies. Therefore, most hazardous waste generator sites are considered a lower priority in the management strategies for the DWSMAs, except for the Oakdale Public Work Department Site which is given a moderate priority.

1.1.3.6 Wells

An important component of the potential contaminant source inventory was the location of any known wells within the DWSMAs. Since wells may penetrate confining layers, which normally protect an aquifer, improperly constructed, poorly maintained, unused, and/or improperly sealed wells can provide a direct pathway for contaminants at the land surface to reach and impact source water aquifers. A search for current and abandoned wells was undertaken for the entire DWSMA.

The following sources were used to identify wells in the DWSMA.

- MGS CWI Database
- MDH information
- City's sewer and water connection records

The MDH provided a shapefile for located wells that included 303 wells currently in use in the DWSMA, including the municipal supply wells. A listing of these wells is provided in Appendix C, and their approximate locations are depicted in Exhibit 7. Sixty-eight unlocated wells were also identified by the MDH within or near the DWSMA. Of these 68 wells, HMS found during site visit and follow-up correspondence with the MDH that 26 were capped. HMS has successfully field-located 15, and now 27 are left in the DWSMA which have not been located.

Because of their potential to introduce pollutants directly into the source water aquifer, wells are considered a high priority in developing management strategies for the DWSMAs.

1.1.3.7 Other Sites

No cemeteries, golf courses, or gravel pits were identified within the two DWSMAs. The Golf course and gravel pits that were provided by the MDH in the potential list of PCSIs were field verified. All gravel pits but one were either converted to residential or wetlands. The remaining gravel pit and the golf course are located outside of the DWSMAs.

Automotive service stations listed in the yellow pages for Oakdale and Lake Elmo were also contacted by telephone or in person to help identify potential floor drains for used oil. None of the listed Auto Repair & Service stations indicated they had floor drains for used oil. They all indicated that they collected used oil in above ground storage tanks which is permitted by Washington County. All but one facility (Lake Elmo Repair) had their used oil collected by a licensed vendor who recycled the used oil. Lake Elmo repair said they burn their used oil on-site and is not located in the DWSMA. Typically, these facilities generate only small quantities of used oil and they are strictly

regulated by state or county agencies. Therefore, used oil generator sites are considered a lower priority in developing management strategies for the DWSMAs.

1.1.4 Public and Private Utilities

Details regarding the construction and use of the City's municipal wells were included in Part I of the Wellhead Protection Plan. Public and private utilities could influence the management of the DWSMAs since the source water aquifer has been deemed moderately to highly vulnerable to contamination from land surface activities in some of these areas.

Several pipelines belonging to the Amoco Pipeline Company or the Minnesota Pipeline Company were identified within the DWSMAs in Oakdale (Exhibit 8). Sections of the pipelines run within areas of high vulnerability. Releases from these pipelines could potentially reach the aquifer and contaminate the city wells. Releases from the pipelines are thus considered a high priority for the DWSMA management strategies.

The DWSMAs for Oakdale are serviced by storm water and sanitary sewers. The locations of the storm and sanitary sewers are depicted on Exhibit 3a and 6, respectively. Some storm water retention ponds and basins are located in the DWSMAs to contain runoff from precipitation events. Most of the City ponds are located in low vulnerability areas. The ones in the high vulnerability areas are lined. These ponds are not expected to impact the local groundwater conditions. Sanitary sewers are contained and managed systems that do not represent an environmental threat. Therefore, storm and sanitary sewer systems as well as storm water retention ponds are considered a low priority in developing strategies to protect the DWSMAs.

The properties in the DWSMAs within Lake Elmo and Pine Springs are not serviced by storm water and sanitary sewers. They all have septic tanks. Approximate locations of septic tanks are depicted in Exhibit 8. Not all septic tanks are shown for Lake Elmo. Most of the septic tanks are located in areas of high vulnerability. Failing septic tanks have the potential to contaminate the source water aquifer. However, septic system waste is very biodegradable, and distance to the City of Oakdale wells and the depth at which the City of Oakdale wells are open reduce the likelihood of contamination from the septic systems reaching the wells. Therefore failing septic systems are considered a moderate priority for the DWSMA management strategies.

1.1.5 Transportation Corridors

Highways MN5 and 694 are present in the City of Oakdale DWSMAs. Crashes on the highway could potentially cause spills of hazardous chemicals and/or environmental pollutants that could seep into the ground and into the source water aquifer. Therefore, spills are considered a moderate priority for the DWSMA management strategies, and the city is planning to develop procedures for responding to and mitigating spills via the Oakdale Fire Department.

1.1.6 Water Quantity Data Elements

1.1.6.1 Surface water quantity

The City of Oakdale has a Comprehensive Storm Water Management Plan. The plan reflects all ponding areas and discharge structures that are used for flood control. The Ramsey Washington Metro Watershed District and the Valley Branch Watershed Districts have approved this plan. The South Washington Watershed District was created after the completion of the Oakdale plan. Exhibit 3 reflects the sub-watershed districts and the storm sewer system for the City of Oakdale.

There are no known groundwater use conflicts or groundwater-surface water influence issues related to the municipal wells and their corresponding DWSMAs so this is considered a low priority.

1.1.6.2 Groundwater quantity

The City of Oakdale is underlain by several aquifers as detailed in the Wellhead Protection Plan - Part 1 (Appendix A). The source water in Oakdale is adequate to meet the City's current and future public water supply demand. Other significant high-capacity groundwater users in the Oakdale area were identified in Part I of the Wellhead Protection Plan. There are currently no groundwater conflicts or interference issues between the City and other parties, so this is considered a low priority at this time.

1.1.7 Water Quality Data Elements

1.1.7.1 Surface water quality

Surface water does not significantly affect Oakdale's Wellhead Protection Plan since the Jordan aquifer utilized by the City as its source of water is under semi-confined hydrogeologic conditions. There is not a direct hydraulic connection between surface water and the groundwater in the aquifer. Therefore, the surface water quality will not influence the management strategies for the DWSMAs and is considered a low priority.

1.1.7.2 Groundwater quality

The reported groundwater quality has consistently met drinking water standards.

1.2 Assessment of Data Elements

The information collected for each data element appears to be reliable and complete. Information obtained from city, state, and county files was consistent, and follow up reconnaissance confirmed all PCSI locations within high vulnerable DWSMAs.

1.2.1 Use of Municipal Wells

The City of Oakdale has eight public wells scattered around the community. Exhibit 6 shows the public water system for the City of Oakdale. Currently, the City can meet the public water supply demand. The City does not currently know of any new high capacity wells to be constructed in the future near the existing municipal wells or the DWSMAs. Construction of high-capacity wells could potentially affect the municipal wells and DWSMAs.

1.2.2 Quality and Quantity of Water Supplying the Public Water Supply

Water Quality meets MDH standards for drinking water supplies. Projected growth rates for the city indicate they will need on the order of 1.2 billion gallons per year in 2007, or 3.2 million gallons per day. The City anticipates that the demand for public water supplies will not significantly increase over the 10-year life of this Plan, and the City will not likely need to expand its public water supply system within its corporate boundaries. Expansion of the system beyond the corporate boundaries will be in cooperation with the affected community. It does not appear from the information collected for this Plan that groundwater quality issues will have a significant impact on the management of the DWSMAs. At this time, no groundwater conflicts or interference issues have been identified in the DWSMAs regarding the municipal wells and other high-capacity wells or surface waters.

1.2.3 Land and Groundwater Uses in the DWSMA

Land uses within the DWSMAs could affect source water protection efforts and/or the management strategies for the DWSMAs. Throughout the presentation of data elements pertaining to land uses, geology, and potential contaminant source inventory (Section 1.1 above), priorities as they pertain to the development of management strategies were discussed in detail. A summary of this assessment is presented in a management priority matrix in Table 2. These types of land uses/facilities/data

elements have been addressed in the remainder of this Plan. Land uses within the high vulnerable DWSMAs could affect source water protection efforts and/or the management strategies for the DWSMAs. Much of this area is out of Oakdale's corporate boundary and in Lake Elmo. A greater portion of this area is also relatively undeveloped compared to the DWSMAs in Oakdale and other communities. Oakdale will need to work closely with Washington County or the cities of Lake Elmo, Pine Springs, and Mahtomedi to address any concerns regarding well head protection plans in the high vulnerable protection areas.

In Part I of the Wellhead Protection Plan, high-capacity wells were identified in the area. The potential hydrogeologic effects from these wells were incorporated into the delineation of the WHPAs and DWSMAs. The City does not currently know of any new high capacity wells to be constructed in the future near the existing municipal wells or the DWSMAs. Construction of high-capacity wells could potentially affect the municipal wells and DWSMAs have been considered in developing the management strategies for both DWSMAs. Privately-owned wells, especially those that penetrate the same aquifer used for the City's public water supply, have been considered in developing the management strategies for the DWSMAs. Damaged, poorly-constructed or maintained, or used/abandoned wells could provide a direct route for contaminants to enter the source water aquifer.

2.0 Impact of Changes on Public Water Supply Wells (4720.5220)

2.1 Potential Changes Identified

2.1.1 Physical and Land Use Environment

The City of Oakdale has grown at a rapid pace. The population has doubled from 1980 to 2000; however the population growth is expected to taper off due to lack of available area currently zoned for residential development. To address this growth rate, new infrastructure, schools, and housing units have been built and are being built according to the current comprehensive land use plan.

The City of Oakdale continues to experience urban growth pressures. The areas zoned for residential development are virtually all developed. Industrial/office areas continue to development, and there is recent pressure to develop the retail commercial areas. Most of the DWSMA within Oakdale covers areas that are already developed and that are almost completely built out. Thus, there are few expected changes in land use as a result of projected growth.

The DWSMAs include residential and commercial land uses within the City of Oakdale, and rural residential developments in Lake Elmo, Mahtomedi, and Pine Springs. The vacant parcels will likely be developed in accordance with current zoning and land use plans as residential and commercial retail sites. This type of development is not expected to produce potential contaminant sources within the DWSMAs.

2.1.2 Surface and Ground Water

In 1995 the City of Oakdale prepared a Comprehensive Water Plan to program improvements and facilities to meet the projected demands for water in the city. Since that time two wells have been drilled to meet the growth demands. According to the plan, these wells should be adequate to serve the ultimate water needs of the community.

The development of the vacant parcels may alter the water balance slightly on the local basis in that runoff will increase and infiltration decrease.

2.2. Impact of Changes

2.2.1 Expected Changes in Water Use

Average per capita consumption is expected to increase slightly over the next several years. The development of the vacant commercial, retail, office and industrial lands will increase Oakdale's daily consumption levels even though the population will not change.

2.2.2. Influence of Existing Water and Land Government Programs and Regulation

Current, local and state regulations are intended to protect and maintain the local and regional source water aquifer(s). Existing water and land use government programs and regulations will not negatively influence the source water aquifer.

The City utilizes an odd-even lawn sprinkling restriction and a progressive rate structure to encourage conservation. The City Engineer can also recommend a watering restriction or ban to the City Council as deemed necessary. The City's regulations regarding the public water supply are provided in the Oakdale City Code. As stated in the City Code, when a shortage of water supply threatens the City, the City may impose limits on the use of public water supplies. A copy of the Code is available on the City's website at **www.ci.oakdale.mn.us.org**.

The MDNR Waters Appropriations Department and the State of Minnesota MDH Well Management Program will be looked to for assistance in regulating and installing new wells, water appropriation permitting, and the proper sealing/abandonment of existing wells. Various Washington County departments and the MPCA will be relied upon for assistance and enforcement of regulations pertaining to land uses within the DWSMAs.

2.2.3 Administrative, Technical, and Financial Considerations

There should be adequate resources available from the City to regulate the vulnerable source water aquifer used by the City of Oakdale public water supply. Funds to support ongoing wellhead and source water protection efforts will likely come from the City utility water operating fund. The wellhead and source water protection activities will be evaluated on an annual basis, and any changes in the focus of the tasks will be evaluated to determine whether additional funding will be necessary.

For this Plan to be effective, the City will need to raise public awareness of the issues affecting its drinking water supply through public educational programs. Therefore, the wellhead and source water protection actions will be focused on public education, as well as potential contaminant source management. Day-to-day administrative duties will be directed or performed by the Oakdale Wellhead Protection Manager. The Manager will delegate specific tasks and actions to City staff. When beneficial and logistically feasible, the City intends to work in conjunction with Washington County and neighboring communities (Lake Elmo, Mahtomedi, and Pine Springs) as much as possible. Oakdale will coordinate wellhead and source water protection efforts with the Washington County Department of Health & Environment.

3.0 Issues, Problems, and Opportunities (4720.5230)

3.1 Issues, Problems, and Opportunities Related to:

3.1.1 Source Water Aquifer

There are no known sources of contamination that have penetrated to the water supply aquifer. If additional high-capacity wells are installed in either of the DWSMAs, or if there are significant changes in the appropriation permits of existing wells in the DWSMAs, there could be substantial impacts to the source water aquifer and the local public water supply. In addition, changes in groundwater pumping/removal from the aquifer could alter the shape and extent of the WHPAs and DWSMAs delineated for this Plan.

3.1.2. Groundwater Quality

Groundwater obtained from the source water aquifer for the Oakdale public water supply is currently free of pathogenic and disease causing organisms. The public water supply currently meets or exceeds the requirements of the federal Safe Drinking Water Act. To date, no contaminants have been detected in the public water supply in concentrations exceeding federal standards. The water supply will continue to be routinely monitored by the City and the MDH for contamination. If contamination of the source water aquifer is identified, the City intends to work with the MPCA to identify responsible parties and provide collaboration in addressing mitigation efforts.

Terrorist attacks of September 2001 have caused the City to review the safety of Oakdale's public water supply and system. Specifically, concerns have been raised regarding the possibility of contaminants or pollutants being deliberately placed in the public water supply. Access to the municipal wells and their infrastructure is strictly limited to the City's public works staff. Although located on public lands, well houses, and steel storage facilities are secured and locked. Access into the individual well casings is difficult and requires specialized knowledge. The pumped water never leaves a contained distribution system in traveling from the wells to the storage facilities, or from the storage facilities to the end-users. The City intends to complete a Vulnerability Assessment of its public water supply in 2004 as required by federal mandate.

3.1.3 The Drinking Water Supply Management Areas (DWSMAs)

The City of Oakdale DWSMAs do not stay within city limits. They cross corporate boundaries into three other Washington County communities, Lake Elmo, Pine Springs, and Mahtomedi. Management strategies will need to be cooperative efforts with Washington County and these three communities. The City recognizes the potential for spills along major transportation corridors within the DWSMA (i.e., Highway 694 and MN5) could impact the source water aquifer. The City also recognizes the potential for releases from the pipelines owned by Amoco and Minnesota Pipeline Company within the DWSMA could threaten the source water aquifer.

Opportunities may exist in coordinating Oakdale's WHP strategies in with Washington County's annual groundwater work plan. Opportunities may also exist where the city of Lake Elmo receives additional water from the City of Oakdale when the city of Lake Elmo ensures septic system compliance in Oakdale DWSMAs that exist within Lake Elmo Corporate Boundaries.

3.1.4 Public Meetings and Written Comments

The City notified other local units of government of its intention to initiate wellhead and source water protection efforts. With MDH approval, copies of Part I of the Wellhead Protection Plan were sent to the same local units of government. A public information meeting was held on February 11, 2003 to receive any comments from the general public regarding Part I of the Plan. The required 60-day comment period for Part II of the Plan for local government units will be held from October 1, 2004 through December 1, 2004. A public hearing will be held on December 14, 2004 for Part II of the Plan. To date, no significant issues or problems have been disclosed from local units of government or the general public other than issues already addressed in this Plan.

3.1.5 Data Elements

Through Part I of the Plan and this document, the required data elements have been well defined. Local and regional information was available for use in compiling and assessing the data elements. The City intends to continue collecting localized hydrogeologic data as well as pertinent physiographic information during the next 10 years or the life of this Plan. Revisions will be made to this Plan at a minimum of ten-year intervals as required by the Minnesota Wellhead Protection Rules. Updated and more accurate data will be used during each revision of the Plan.

3.1.6 Local, State, and Federal Programs on Water Use and Regulations

3.1.6.1 City of Oakdale

Zoning ordinances are the primary means by which the City of Oakdale controls water and land use within the city. The land in the DWSMA is currently zoned as either residential, community commercial or office/industrial. Other official controls available to the City for regulating land use with the DWSMA include: conditional use permits, special use permits, and other land use regulation ordinances such as erosion control and septic system maintenance ordinances.

3.1.6.2 Cities of Lake Elmo, Pine Springs, and Mahtomedi

Zoning ordinances are the primary means by which the cities control water and land use within their boundaries. The land in the DWSMA is currently zoned as either residential, rural residential, or office/industrial. Other official controls available to these cities for regulating land use with the DWSMA include: conditional use permits, special use permits, and other land use regulation ordinances such as erosion control and septic system maintenance ordinances.

3.1.6.3 Washington County

Their land uses ordinances are not applicable within the Oakdale City limits, nor do they apply within the incorporated areas of Lake Elmo, Mahtomedi, and Pine Springs. The Washington County Department of Health does regulate and manage inspections for the septic systems in all four of these communities.

Washington County does not offer a cost sharing well sealing program any more. It supports local and State plans, policies, and permitting programs that sustain groundwater supplies and related natural resources. Washington County also provides an opportunity to local governmental units to comment on groundwater appropriations permit applications.

3.1.6.4 Ramsey-Washington Metro Watershed District, Valley Branch Watershed District, and the South Washington Watershed District

These three agencies do not regulate land use; however they do have permitting authority over land alteration activities that may impact wetlands or cause sources of erosion. They are working to complete an update of their Watershed Management Plans for their districts which will identify wellhead protection planning as an important consideration in the water resource planning efforts. They will cooperate with the City to address potential land use issues but will ultimately defer land use decisions to the City.

Ramsey-Washington Metro Watershed District offered a well sealing program from 1991 to 2004. The program was not, however, accepting applications at this writing.

4.0 Wellhead Protection Goals and Objectives (4720.5240)

4.1 Goals

The City of Oakdale's wellhead protection plan has the following goals:

1. Continue to provide water that meets or exceeds state and federal drinking water standards.
2. Work cooperatively with other nearby local units of government (Watershed Districts, Washington County, and other cities) on regional aquifer protection activities.

4.2 Objectives

The City of Oakdale will strive to meet these wellhead protection (WHP) goals through new or existing programs by completing the following objectives:

1. Manage Inner Wellhead Management Zone (IWMZ)
2. Maintain Potential Contaminant Source Inventory Data Base
3. Manage Wells
4. Manage Underground and Aboveground Storage Tanks
5. Develop and Implement Pipeline Spill Plan
6. Continue Geologic Data Collection
7. Public Education
8. Manage Septic System (ISTS) Locations and Compliance Information
9. Provide WHP Spill Response Assistance
10. Incorporate Wellhead Protection into Existing Programs
11. Agriculture and Turf Management

The objectives listed above are presented in order from highest priority to lowest based on information obtained for this Part 2 Plan and presented in Section 1.0 Data Elements and Assessment, Section 2.0 Impact of Changes on Public Water Supply Wells, and Section 3.0 Issues, Problems and Opportunities.

5.0 Implementation Plan (4720.5250)

This Implementation Plan describes measures the City of Oakdale will complete to meet the goals and objectives defined above to help protect its DWSMAs. It identifies groups or units of government who they may need to cooperate with to help ensure success of the objectives identified. Time frame and cost estimates are also presented.

5.1 Manage Inner Wellhead Management Zone (IWMZ)

The IWMZ is the area within 200 feet of a public water supply well. In an effort to protect these areas from compromise and prevent contaminants from entering the area immediately adjacent to the wells, the city will implement the following wellhead protection (WHP) measures:

1. The city will work to abate or otherwise minimize the impact of existing NON-COMPLYING potential contaminant sources identified within the IWMZs.

2. The city will monitor setbacks for all new potential sources of contamination located within the IWMZs.

3. The city will review and update the IWMZ surveys for all wells in the system in accordance with the schedule in Table 3.

5.1.1 Source of Action

City Public Works staff

5.1.2 Cooperators

MDH, landowners within 200 feet of city wells.

5.1.3 Time Frame

Will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.1.4 Estimated Cost

No new or additional costs are anticipated for these measures at this time. Time and costs associated with these objectives are already allocated through existing City programs, departments, and budgets.

5.1.5 Goals Achieved

City Staff will remain informed and up-to-date on activities within the IWMZs. This will help the city continue to supply drinking water that meets state and federal drinking water standards.

5.2 Manage Potential Contaminant Source Inventory (PCSI)

The City will maintain a comprehensive PCSI database for potential contaminant sources within the DWSMAs. The City will implement the following measures to complete this objective:

1. Add related information (location(s), responsible party(s), contaminant, status, etc.) to the database developed for this plan (Exhibit 8 and Appendix C) when and if new potential contaminant source sites are identified.

2. In a formal letter, the City will annually request the MPCA to notify the City of any known potential contaminant source site locations (including new underground and above ground storage tanks) within its DWSMAs, and the status of those sites.

3. In a formal letter, the City will annually request an updated list of Washington County's PCSI including state listed sites, and sites not listed in state files such as the Washington County open dumps inventory.

By being aware of the status of existing PCSI sites, and by being notified of new sites, the City will be in a position to identify new potential risks to their source water aquifer. They can also make informed decisions on whether additional action is warranted (i.e., increase water quality sampling to monitor the quality of its public water supplies, or pursue alternate land use management requirements)

5.2.1 Source of Action

City Public Works Department

5.2.2 Cooperators

MPCA, MDH, and Washington County staff

5.2.3 Time Frame

Will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.2.4 Estimated Cost

This task will require approximately 40 hours of City staff time each year.

5.2.5 Goals Achieved

PCSI database management will help the City have a better view of what PCSs need the city's attention and how to allocate its resources.

5.3 Manage Wells

The City will implement the following measures to complete this objective:

1. The City will identify the remaining 27 unidentified wells in its DWSMAs and check to see if they are sealed properly.

2. The City will visit the remaining unidentified well locations, find the wells, and GPS well coordinates for their PCSI database.

3. An annual review of MDH well files located within the DWSMAs will be conducted and the PCSI will be updated accordingly.

4. Based on the review of MDH well files, a list of unused wells within the DWSMAs will be created. The City will send a notice to the well owners to inform them of abandonment requirements.

5. Encourage cost-sharing programs through Washington County, the MDH, and others to help reduce the financial burden on private well owners for sealing wells throughout the DWSMAs.

6. The City will send Washington County a letter that requests all unused, damaged, and mismanaged wells located within the Oakdale DWSMAs be given a high priority for sealing.

7. The City will work with the MDNR Water Appropriations Permit Program, the MDH, and Washington County to identify any new high capacity wells proposed in the city's wellhead protection area so the city may consider aquifer vulnerability factors, potential well head protection boundary changes, and financial responsibility for the changes, if new wells are used. The City will provide interaction with the person or entity proposing the well, in order to minimize potential groundwater conflict(s).

8. The city will continue to maintain a secure storage and distribution system. The city will complete a Vulnerability Assessment in 2004 as required by federal mandate.

5.3.1 Source of Action

City Public Works staff

5.3.2 Cooperators

Oakdale city staff, MDH, MDNR, Washington County, LGUs, Developers, consultants, and reviewing commissions.

5.3.3 Time Frame

Vulnerability Assessment will be completed in 2004. Other measures will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.3.4 Estimated Cost

This task may require 25 to 30 hours of City staff time and technical assistance to locate and GPS the 27 remaining unlocated wells in the DWSMA. Additional well management tasks may take 30-40 hours per year of City Staff time. If new high capacity wells are proposed in or near the city DWSMAs, consulting costs will likely be included to pay for the evaluation of potential impacts.

The City will consider participating in a cost sharing program through Washington County if available, and/or reimbursing a portion of the well sealing costs to local residents.

5.3.5 Goals Achieved

This action will assist with the City's goal to continue to provide public water supplies that meet state and federal drinking water standards.

5.4 Manage Underground and Aboveground Storage Tanks

1. The City will send reminder notices to owners of new and existing tanks located within the DWSMAs about state and federal tank regulations and the importance of early leak detection. Notices will be mailed at least annually.

5.4.1 Source of Action

City Public Works, Planning and Fire Departments

5.4.2 Cooperators

MPCA, Tank owners

5.4.3 Time Frame

Will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.4.4 Estimated Cost

Costs will include postage for mailing the materials, but it is assumed that the pamphlets and informational brochures will be provided free of charge from the MPCA. This task will require approximately 12 hours of City staff time per year.

5.4.5 Goal(s) Achieved

Informing tank owners that they are located within an environmentally sensitive area, and ensuring that they are meeting applicable regulations, will help prevent or minimize the number and severity of releases from tanks. This may in turn help the city to continue to provide drinking water supplies that meet or exceed state and federal drinking water standards.

5.5 Develop Pipeline Spill Response Plan

The City recognizes the potential for releases from the pipelines owned by Amoco and Minnesota Pipeline Companies within the DWSMA could threaten the source water aquifer. Therefore, City staff will implement the following measures to reach this objective:

1. The City will distribute copies of figures depicting the location and extent of the DWSMAs to the Amoco and Minnesota Pipeline Companies and will communicate the vulnerability of the areas and the significance of protecting the source water aquifer.
2. The City will also ask to review the companies' emergency action plans. Should a release occur within the DWSMA, the companies will be requested to immediately notify the Oakdale Wellhead Protection Manager and to take all appropriate action to limit the environmental impact of the release.

5.5.1 Source of Action

City of Oakdale.

5.5.2 Cooperators

Amoco and Minnesota Pipeline Company.

5.5.3 Time Frame

Will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.5.4 Estimated Cost

Limited to City staff time. These measures may take 5-10 hours of City staff time annually. No new or additional costs are anticipated for these measures at this time.

5.5.5 Goals Achieved

Mitigation of a spill may be expedited by following this procedure which may in turn help the city to continue to provide drinking water supplies that meet or exceed state and federal drinking water standards .

5.6 Continue Geologic Data Collection

The city recognizes that more geologic and hydrogeologic data can enhance wellhead protection knowledge and understanding. Of particular interest for Oakdale's DWSMAs is soil boring data that can help define more permeable soil boundaries in the Southern Washington County buried bedrock valley in the northeastern DWSMA (Exhibit 4). Fluctuations in groundwater levels over time in the aquifer are also of interest to evaluate long term aquifer characteristics. Therefore, City staff will implement the following measures to reach this objective:

1. Monitor Static and Pumping Levels in Municipal Wells. The city is installing a new Supervisory Control and Data Acquisition (SCADA) system that will provide greater remote control and alarm information. This system will also allow the City to better assess consumption trends and well interference issues.

2. Acquire new boring and well log data for holes logged in the Southern Washington County buried bedrock valley, as it becomes available.

5.6.1 Source of Action

City Public Works staff or consultant

5.6.2 Cooperators

Minnesota Geologic Survey (MGS), MDH, U.S. Geologic Survey, Washington County.

5.6.3 Time Frame

Will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.6.4 Estimated Cost

Additional costs anticipated for these measures will include consultant fees, or city staff time, to review MDH or MGS files for new well or boring logs and update inferred permeable soil boundaries in the Southern Washington County buried bedrock valley in the northeastern DWSMA (Exhibit 4). No additional costs are anticipated for water level monitoring in wells as this is already built into the city's budget.

5.6.5 Goals Achieved

These activities will help monitor the effectiveness of Oakdale's water conservation program. This activity will also confirm or refute the high vulnerability status of the DWSMA in the Southern Washington County buried bedrock valley area. Knowledge gained from these measures can help the City of Oakdale to continue to provide safe drinking water to its customers.

5.7 Public Education

The city will fund and implement public education activities to help educate the public on wellhead protection issues and requirements. The City will continue to implement the following measures to complete this objective:

1. The City will continue to educate its public water supply customers about wellhead protection in its July Newsletter which is distributed with a Drinking Water Consumer Confidence Report annually.

2. The City will continue to educate the public thorough its Environmental Management Commission which consists of nine citizens appointed by the City Council to assist in establishing plans, policies and procedures in matters affecting the environment. This commission also makes presentations to City of Oakdale citizens several times each year to convey their ideas and present city plans and policies.

5.7.1 Source of Action

City Public Works Department, City Environmental Management Commission

5.7.2 Cooperators

City staff, MDH, General Public

5.7.3 Time Frame

On going.

5.7.4 Estimated Cost

No new or additional costs are anticipated for these measures at this time. Time and costs associated with these measures are already allocated through existing City programs, departments, and budgets.

5.7.5 Goals Achieved

Public education will help inform consumers of how they can help address wellhead protection issues and protect their drinking water from contaminants so it continues to meet state and federal drinking water standards.

5.8 Manage Septic System (ISTS) Locations and Compliance Information

City staff will implement the following measures to meet this objective

1. The city will work with the Cities of Lake Elmo, Mahtomedi, and Pine Springs and Washington County to assure they develop adequate design standards, inspection, and monitoring programs for individual sewage treatment systems (ISTS) to protect the public water supply aquifers in the DWSMA.

2. The city will encourage local cites and Washington County, in a written letter, to conduct inspections of septic systems in the DWSMAs and prioritize the upgrading of non-compliant systems.

3. The city will request Lake Elmo to provide a GIS electronic shape file that identifies all known ISTSs within its corporate boundaries when they request an increase in water usage from Oakdale's facility.

5.8.1 Source of Action

City Public Works Department

5.8.2 Cooperators

Washington County, Neighboring Cities, ISTS Owners.

5.8.3 Time Frame

Will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.8.4 Estimated Cost

This task may require several hours of City staff time per year.

5.8.5 Goals Achieved

This objective will help the city meet its goals of working cooperatively with other local governmental units to promote regional aquifer protection, and help continue to provide safe drinking water to its customers.

5.9 Provide WHP Spill Response Assistance

Spills of hazardous chemicals and substances in Oakdale are responded to by the City's fire department. Therefore, City Public Works Department will do the following to implement this objective:

1. Distribute copies of figures depicting the location and extent of the DWSMAs to the Oakdale City Fire Department and communicate the vulnerability of the areas relative to protecting the source water aquifer.

2. Should a spill occur within DWSMAs within Oakdale's corporate boundaries, the Oakdale fire department staff will immediately notify the Oakdale Wellhead Protection Manager and will take all appropriate actions to limit the environmental impact of the spill.

3. The City of Oakdale will also contact the Cities of Lake Elmo, Mahtomedi, and Pine Springs to discuss potential notification procedures and information exchanges on spills that may occur in the Oakdale DWSMAs within the City of Lake Elmo Corporate Boundaries.

5.9.1 Source of Action

Oakdale Public Works and Fire Departments.

5.9.2 Cooperators

Cities of Lake Elmo, Mahtomedi, and Pine Springs.

5.9.3 Time Frame

Will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.9.4 Estimated Cost

This task may require several hours of City staff time each year.

5.9.5 Goals Achieved

Cooperative efforts between the city of Oakdale and its neighboring cities to mitigate spills may be expedited by implementing these measures which can help the City of Oakdale continue to provide drinking water supplies that meet or exceed state and federal drinking water standards.

5.10 Incorporate Wellhead Protection into Existing Programs

City staff will do the following to implement this objective:

1. The City will participate in advisory group meetings and review draft plans as appropriate for other organizations such as the Ramsey-Washington County Metro Watershed District, Valley Branch Watershed District, and the South Washington County Watershed District planning committees.

2. The city's Wellhead Protection Manager will provide guidance to appropriate city departments in annual, or more frequent if needed, meetings so they can make informed day-to-day decisions that may affect the wellhead protection program.

3. The City will include a section in the annual Wellhead Protection Plan Evaluation reports to identify important issues that may be related to DWSMAs, and if potential problems are identified, indicate how they could be minimized or mitigated.

4. The City will review new development and redevelopment plans within the DWSMAs and discourage activities which could adversely impact aquifer water quality. A section will be included in the development review reports that indicate if the development is in the DWSMAs and if so how potential negative impacts could be minimized or mitigated.

5.10.1 Source of Action

Oakdale City Public Works Department.

5.10.2 Cooperators

Washington County, Watershed Districts, city representatives, developers, consultants, reviewing commissions, and Met Council.

5.10.3 Time Frame

Will begin in 2005 and will proceed in accordance with schedule of WHP measures in Table 3.

5.10.4 Estimated Cost

No new or additional costs are anticipated for these measures at this time. Time and costs associated with this objective are already allocated through existing City programs, departments, and budgets. Costs may include attorney's fees to review and comment on new potential regulations and zoning restrictions. This task may require 50 to 60 hours of City staff time per year.

5.10.5 Goals Achieved

This action will assist the City in widening its source water protection efforts to a regional level working cooperatively with other units of government, and to continue providing drinking water that meets state and federal drinking water standards.

5.11 Agriculture and Turf Management

The City recognizes that best management practices (BMPs) should be followed to help prevent contaminated surface water runoff which can find its way into drinking water supplies over time. To help control unnecessary runoff of fertilizers and pesticides, the City will implement the following measures:

1. Require residents to follow state legislation that prohibits the application of fertilizer containing phosphorus on residential turf in the seven-county metro area.

2. Encourage residents through its community active Environmental Management Commission shows and news letters to prevent runoff into storm sewers, cleanup after pets, and sweep grass clippings from pavements.

3. Encourage agricultural entities through its community active Environmental Management Commission shows and news letters to prevent runoff into storm sewers, and to follow Best Management Practices (BMPs).

5.11.1 Source of Action

City Public Works and Law Enforcement Departments, Oakdale Environmental Management Commission.

5.11.2 Cooperators

City staff, local distributors of lawn care products, landowners, and farmers.

5.11.3 Time Frame

Currently in effect.

5.11.4 Estimated Cost

No new or additional costs are anticipated for these measures at this time. Time and costs associated with these objectives are already allocated through existing City programs, departments, and budgets.

5.11.5 Goals Achieved

Environmentally sound turf management and farming measures (BMPs) will help protect the drinking water from contaminants so it continues to meet state and federal drinking water standards.

6.0 Evaluation Program (4720.5270)

Oakdale will evaluate the progress of the implementation plan on an annual basis. The wellhead protection plan manager will prepare a short progress report to be completed annually and submitted to the City Council. The report will be completed using the MDH Wellhead Protection Program Evaluation form included in this Plan as Appendix E.

The progress report will briefly discuss the measures implemented by the City or any cooperators during the year, and measures that will be completed in the following year. After the City Council's review, the progress report will be submitted to the MDH. A copy of the progress report will be placed in the City's Wellhead Protection file. The intent of the annual reports is to compile a comprehensive study of the implementation of the source management strategies for use when the City must update or revise its Wellhead Protection Plan.

Since it is anticipated that no additional municipal wells will be necessary to serve the ultimate development of Oakdale community, this plan should be implemented for ten years. In accordance with the Wellhead Protection Rules, at a minimum, the Plan will be updated every 10 years

The City will continue to cooperate with the Minnesota Department of Health in the annual monitoring of the City water supply to determine whether the management strategies are having a positive effect and to identify water quality problems that may arise and which must be addressed.

7.0 Alternative Water Supply; Contingency Strategy (4720.5280)

7.1 Purpose

Pursuant to Metropolitan Council requirements, a Water Emergency and Conservation Plan was prepared for the City of Oakdale in 1995. The purpose of this Contingency Plan was to establish, provide, and keep updated certain emergency response procedures and information for the PWS, which may become vital in the event of a partial or total loss of public water supply services as a result of natural disaster, chemical contamination, civil disorder, or human-caused disruptions.

7.2 Public Water Supply Characteristics

7.2.1 Treatment

Presently, Oakdale's groundwater necessitates only fluoride and chlorine treatment. In the event additional treatment is required to address a contaminant, a plan would have to be developed to consider treatment at the eight well locations, or the development of a new central treatment facility.

7.2.2. Storage and Distribution

At the present time the City of Oakdale has four elevated storage facilities. Currently the storage facilities provide sufficient storage capacity for ultimate development of the community. The system is set up so that a storage facility can be taken off line for required maintenance activities. The distribution system is also adequate to serve the existing and ultimate development in Oakdale's community. The distribution system is adequately looped and valved to isolate and repair water mains that may need repair.

7.3 Priority of Water Users during Water Supply Emergency

In the event of a shortage which might require rationing, city staff and police department will notify users of necessary arrangements.

7.4 Alternative Water Supply

7.4.1 Surface Water Sources and Treatment Needs

There are no rivers or significant water bodies within the community that would provide a reliable alternative water supply.

7.4.2 Bottled Water Supplies, Delivery, and Distribution

In the event of a need to supply and distribute bottled water, Oakdale will work with retailers and bottlers to provide the necessary source and delivery of water.

7.4.3 System Interconnects and Other Water Supply Alternatives

At the present time, the City of Oakdale has an inter-connect with the City of Woodbury that allows for an immediate supply of emergency water. Both communities draw water from the same aquifer system and have similar water quality.

7.4.4. Other Alternative Water Resources

In case of a need for additional or replacement water, another inter-connect could be pursued with the Cities of Maplewood or North St. Paul. The City of Maplewood is supplied with water from the St. Paul Water Utility that has a variety of water sources, primarily a lake storage system and the Mississippi River. This would provide for a surface water supply source in the event groundwater supplies become contaminated. An analysis would have to be completed to determine if the geochemistry allows mixing of the surface water and well water and that no water quality or taste problems would result from such mixing. North St. Paul has a groundwater supply system similar to Oakdale's.

7.5 Inventory of Available Emergency Equipment and Materials

The City of Oakdale has several pieces of equipment that would be beneficial in the event of a water emergency. It has a SCADA system, standby generators, hoses, cell phones, and a web site (www.ci.oakdale.mn.us.org) for posting and gathering information.

7.6 Notification Procedures

The Emergency Operation Plan (EOP) states that during an emergency the Mayor is responsible for providing direction and control of City government resources with assistance from the City Emergency Services Manager (CESM). The Oakdale Operating Center is located at Oakdale City Hall, with the Woodbury Police Headquarters as the alternate location. Emergency public information is the responsibility of the public Information Officer (mayor or designees), including communication to the public via newspapers, radio, TV, internet, etc. Warning and notification is by the Washington County Sheriff Weather Sirens and radio to duty squads. Damage assessment will be the responsibility of an Incident Assessment Team as indicated below. Clearance is the responsibility of the Public Works Director, and utility restoration is the responsibility of the Superintendent and Supervisor, as well as the private utility companies.

7.6.1 Lead Coordinating Agency

The Lead Coordinating Agency (Mayor's Office) contacts are presented in Table 4.

7.6.2 Incident Assessment Team

The Incident Assessment Team members are listed on Table 3.

7.6.3 Public Information Plan

7.6.3.1 Primary spokesperson for the media and/or public comment in the event of an emergency or contamination incident

Name _____ Carmen Sarrack _____
Title _____Mayor_____
Address ___1668 Hilo Ave. N., Oakdale, MN 55128_____
Home Phone ____651-731-8254_____
Work Phone ____651-777-2428_____
Public Information Center Location during Emergency
_____Oakdale City Hall_____
Times Available _____As Required_____

7.6.3.2 Information checklist to be conveyed to the public and media

Name of water system _____City of Oakdale_#1820016__

Contaminant of concern and
date_____

Source of contamination
_____

Public health hazard _____

Steps the public can take_____

Steps the water system is
taking_____

Other information_____

7.7 Mitigation and Conservation Plan

7.7.1 Information Identifying Ways to Reduce the Vulnerability of the Water Supply System to Disruption and Improve the Response Capabilities

Location of future wells (if necessary) will take into consideration the information contained within this document. The distribution of wells throughout Oakdale's community has reduced the probability that more than one well will be contaminated by a single contamination source. The city is installing a new Supervisory Control and Data Acquisition (SCADA) system that will give a greater remote control and alarm information. This system will also provide a better ability to assess trends in consumption quantities.

7.7.2 Information Regarding Efforts to Reduce the Amount of Water Used by Residents, Businesses and Industry

7.7.2.1 Water Meters and Rate Structure

The City of Oakdale has metered water consumption since the creation of the water utility system. Oakdale's billing system promotes water conservation by billing based on consumption, and an escalating billing rate.

7.7.2.2. Public education

Customers receive monthly to quarterly bills which reflect their current consumption and a historical summary of consumption over the past year. If the resident notices an unexplainable jump in consumption, they are advised to contact the water utility to assist them in locating a potential leaking faucet or toilet.