

Source Water Assessment Report

Mill City Water Department
Mill City, Oregon
PWS #4100520

January 14, 2002

Prepared for
Mill City Water Department

Prepared by



State of Oregon
Department of
Environmental
Quality

Water Quality Division
Drinking Water Protection Program



Department of Human Services
Oregon Health Division
Drinking Water Program



Oregon

John A. Kitzhaber, M.D., Governor

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January 14, 2002

Mr. John Dickinson
Mill City Water Department
PO Box 256
Mill City, Oregon 97360

RE: Source Water Assessment Report
Mill City Water Department
PWS # 4100520

Dear Mr. Dickinson:

Enclosed is the Source Water Assessment Report for Mill City Water Department. The assessment was prepared under the requirements and guidance of the Federal Safe Drinking Water Act and the US Environmental Protection Agency, as well as a detailed Source Water Assessment Plan developed by a statewide citizen's advisory committee here in Oregon over the past two years. The Department of Environmental Quality (DEQ) and the Oregon Health Division (OHD) are conducting the assessments for all public water systems in Oregon. The purpose is to provide information so that the public water system staff/operator, consumers, and community citizens can begin developing strategies to protect your source of drinking water.

The drinking water intake for the City of Gates and Detroit Water System public water system is also located on the North Santiam River upstream of the Mill City intake. This source water assessment addresses the geographic area providing water to Mill City's intake (Mill City's portion of the drinking water protection area) between Mill City's intake and the upstream intake for City of Gates and Detroit Water System. Information on Mill City's protection area upstream of the City of Gates and Detroit Water System intake is presented in the Source Water Assessment for those public water systems and is summarized in this report.

In addition, there are four drinking water intakes on the North Santiam River downstream of Mill City's intake including the intake for the Lyons Mehama Water District, Salem Public Works, Stayton Water Supply, and the City of Jefferson. Activities and impacts in the Mill City drinking water protection area have the potential to also impact downstream users and Mill City's protection area is included in the drinking water protection area for downstream providers. Therefore they will be provided with copies of your report as well. We encourage you to work with them as you move forward with developing a protection plan.

As you know, the 1996 Amendments to the Safe Drinking Water Act requires *Consumer Confidence Reports* (CCR) by community water systems. CCRs include information about the quality of the drinking water, the source of the drinking water, and a summary of the source water assessment. Public water systems are responsible for notifying their customers of the assessment results. The information from this assessment can be presented by distributing the "Summary Brochure" attached to the report. There is a blank space to insert instructions for how



Mill City Water Department
January 14, 2002
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customers can obtain or review a copy of your source water assessment report. Distribution of any copies of the report must be done at the local level. At a minimum, we would suggest that a copy be placed at the local library, city hall, and/or public water supply office and your customers can review the report at their convenience. By mid-2003, all results of these assessments will also be made available electronically to the public on DEQ's and OHD's websites.

There are no regulatory requirements for you to develop a protection plan using the assessment results, but we hope your community will take the initiative to do so voluntarily. One of the goals of developing a Drinking Water Protection Plan is to address the facilities and land use activities that pose high or moderate risks for contaminating your public water supply. At a minimum, we recommend that the community seek ways to communicate and extend outreach to these facilities/activities with education and technical assistance to minimize the risk of contamination. As you begin thinking about developing a protection plan, it is also important to remember that not all of the assessment's inventoried activities will need to be addressed in a voluntary protection plan. If you move forward with developing a protection plan, the next step is to enhance the assessment inventory and, at that time, the "potential contaminant sources" which pose little to no threat to your public water supply can be eliminated from your list.

We look forward to working with you to move forward with developing a protection plan and can assist you with limited resources at this time. In addition, we are developing some useful written guidance and materials that will assist your protection efforts and you will receive these when complete.

We have enclosed one copy of the large GIS map of the watershed and the assessment results. A smaller version of this exact map is found in the report. If you have a need for additional copies of the large map, we must charge a small fee for each to cover the costs that were not budgeted by the program. Let me know if you need additional copies.

If you have any questions or need more information, please do not hesitate to call me at 503-229-5664 or Sheree Stewart at 503-229-5413.

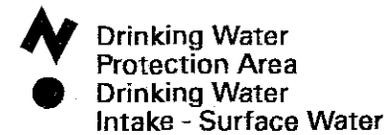
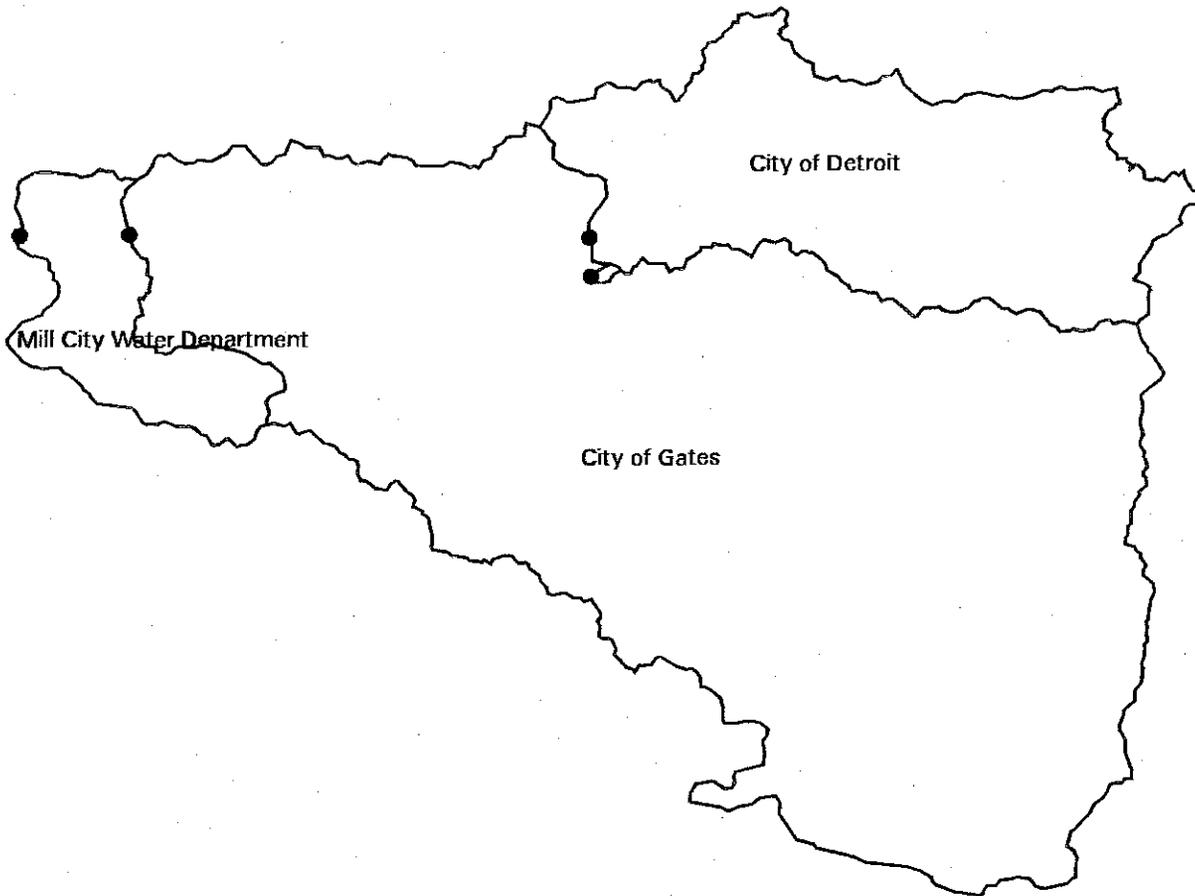
Sincerely,



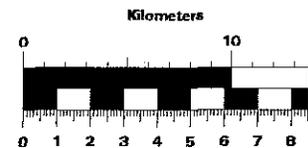
Julie K. Harvey, R.G.
Drinking Water Protection Specialist
Water Quality Division

Enclosures

Mill City Water Department's Drinking Water Protection Area



Watersheds are delineated intake-to-intake: For watersheds with more than one intake, Oregon completes the assessments by segment and each source water assessment represents the area from the public water system's intake to the next intake upstream. All protection areas upstream of the water system's intake are included in the drinking water protection area (DWPA). We encourage water systems located in the same basin to work together during protection planning.



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Oregon Department of Environmental Quality GIS

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Schematic of North Santiam Sub-Basin Drinking Water Protection Areas

Executive Summary

The drinking water for Mill City Water Department is supplied by an intake on the North Santiam River. This public water system serves approximately 1,800 citizens. The intake is located in the Middle North Santiam River Watershed in the North Santiam Sub-Basin of the Willamette Basin. The drinking water intake for the City of Gates and Detroit Water System public water system is also located on the North Santiam River upstream of the Mill City intake. This source water assessment addresses the geographic area providing water to Mill City's intake (Mill City's portion of the drinking water protection area) between Mill City's intake and the upstream intake for City of Gates and Detroit Water System. Information on Mill City's protection area upstream of the City of Gates and Detroit Water System intake is presented in the Source Water Assessment for those public water systems and is summarized in this report. In addition, there are four drinking water intakes on the North Santiam River downstream of Mill City's intake including the intake for the Lyons Mehama Water District, Salem Public Works, Stayton Water Supply, and the City of Jefferson. Activities and impacts in the Mill City drinking water protection area have the potential to also impact downstream users.

The geographic area providing water to Mill City's intake (Mill City's portion of the drinking water protection area) extends upstream approximately 68 miles in an easterly direction and encompasses a total area of 30 square miles. Included in this area are the tributaries to the North Santiam River including Rock Creek. The North Santiam River intake is located at an approximate elevation of 830 feet and the upper edge of the watershed is located at an elevation of approximately 4,713 feet at Monument Peak.

An inventory of potential contamination sources was performed within Mill City's drinking water protection area. The primary intent of this inventory was to identify and locate significant potential sources of contaminants of concern. The inventory was conducted by reviewing applicable state and federal regulatory databases and land use maps, interviewing persons knowledgeable of the area, and conducting a windshield survey by driving through the drinking water protection area to field locate and verify as many of the potential contaminant source activities as possible. The primary contaminants of concern for surface water intakes are sediments/turbidity, microbiological, and nutrients. It is important to remember that the sites and areas identified are only potential sources of contamination to the drinking water, and water quality impacts are not likely to occur when contaminants are used and managed properly.

The delineated drinking water protection area is primarily dominated by managed forestlands. A total of twenty-five (25) potential contamination sources were identified within Mill City's portion of the drinking water protection area. All of those are located in the sensitive areas. The potential contaminant sources identified in the watershed that relate to agricultural/forest management include clear cuts, high road density, stream crossings, non-irrigated crops, and grazing animals. Potential contaminant sources related to commercial and residential land uses include three gas stations, three historic gas stations, three transportation corridors, a salvage yard, auto parts store, rock quarry, water treatment plant, sewage treatment plant, sewer lines, high-density housing, rural homesteads, a school, a cemetery, and a fire station. The potential contaminant sources within the drinking water protection area all pose a relatively higher to moderate risk to the drinking water supply with the exception of the non-irrigated crops, cemetery and fire station which present a lower risk. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the water quality in the watershed.

The susceptibility analysis combines the results of the locations of the potential contaminant sources with the locations of the sensitive areas. Overlaying the locations of the moderate- to high-risk sources within the sensitive areas provides an indication of the areas that are highly susceptible to contamination. In the Mill City portion of the watershed, the results of the susceptibility “analysis” include the distribution of twenty-two (22) identified high- to moderate-risk sources within the areas of highly permeable soils, high erosional soils, high runoff potential soils, and within the 1000’ setback from the streams. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection.

Introduction

In 1996, Congress amended the Safe Drinking Water Act, implemented some new requirements, and provided resources for state agencies to assist communities in protecting the sources of their public water supplies. The US Environmental Protection Agency (EPA) developed guidelines for implementing the new requirements to conduct "source water assessments" (EPA, 1997). In Oregon, the Oregon Health Division (OHD) and the Department of Environmental Quality (DEQ) are conducting the source water assessments. An assessment such as this one will be done for every public water system in Oregon regulated by the Safe Drinking Water Act. DEQ and OHD will each have specific tasks in accomplishing the assessments for a total of 2656 public water systems in Oregon. Of those 2656 public water systems, about 90% of these are groundwater systems drawing water from wells or springs, and 10% are surface water systems with intakes on streams, rivers, or lakes/reservoirs.

The assessments in Oregon include delineating the source area supplying the public water system, identifying areas "sensitive" to contamination, and conducting an inventory of potential contamination sources in the area. Using the results of the inventory and sensitive areas, the susceptibility of the public water system is determined. OHD will provide the delineation for all groundwater systems and the identification of the sensitive areas within their source area. DEQ will delineate and identify the sensitive areas within the watersheds for the surface water systems. DEQ will conduct all inventories of the potential contaminant sources inside the drinking water protection areas and this is then used to estimate the public water system's susceptibility to contamination.

Sources of information reviewed during this assessment included U.S. Geological Survey (U.S.G.S.) documents/websites, DEQ reports, EPA/DEQ databases, and other readily accessible reports. The reference list provides a few of the good sources of information used in the report. Time constraints do not allow research into all existing technical resources available for each system. As the assessment is performed, assistance from municipal water staff, state/federal land management officials, and community members will increase OHD and DEQ's abilities to characterize local hydrogeologic/hydrologic conditions, site-specific information, and ultimately increase the quality of the assessment. Where possible, DEQ staff has consulted local Natural Resource Conservation Service, county planning agencies, irrigation districts, and other natural resource officials.

Many watersheds in Oregon provide water used for public or "domestic" drinking water supplies, irrigation, industry, hydro power, fish hatcheries, and of course, natural in-stream fish rearing. Watersheds vary considerably in terms of overall health and susceptibility to contamination. Most surface water sources for drinking water are filtered and undergo treatment (disinfection) prior to delivery to the consumer. The ability to adequately (and cost-effectively) treat drinking water from a surface water source is directly related to the quality of the water at the intake. Surface water intakes for public water supplies are generally very susceptible to increases in coarse sediments. Treatment facilities for public water supplies are very susceptible to increases in fine sediments, nutrients and other organic and inorganic contaminants. Treatment facilities are also negatively impacted by changes in temperature.

Changes in surface water quality parameters can be caused by a variety of factors in any watershed. Detailed consideration of all the variables was beyond the scope of this assessment. The procedures for conducting these assessments were developed by a statewide advisory committee (Source Water Assessment Plan, 1999). The value of preparing detailed procedures

is in the ability to be consistent from one system to the next. There are also severe time constraints for the amount of time allowed to complete each public water system assessment. It is our intent to provide as much information about the watershed as our program resources allow.

Using the results of this assessment, the public water system and the local community can then move forward with voluntarily developing and implementing a *drinking water protection plan*. The requirements for water quality monitoring of public water systems in Oregon provide some degree of assurance of safe drinking water; however, all systems are vulnerable to potential contamination. One of the best ways to ensure safe drinking water and minimize future treatment costs is to develop a local plan designed to protect against potential contamination. Not only will this measure add a margin of safety, it will raise awareness in the local community of the risks of drinking water contamination, and provide information to them about how they can help protect the system. It is our hope that each community will use the assessment results as a basis for developing a drinking water protection plan.

Background

Mill City is located in Linn County, Oregon about 30 miles east of Salem on Highway 22. The drinking water for Mill City is supplied by an intake on North Santiam River. This public water system serves approximately 1,800 citizens. The intake is located in the Middle North Santiam River Watershed in the North Santiam Sub-Basin in the Willamette Basin, Hydrologic Unit Code (HUC) # 17090005. DEQ obtained the coordinates for the intakes using a Geographic Positioning System (GPS) in February 1999; these coordinates are available to the public water system operator upon request.

The study area for evaluating the extent of the Mill City Drinking Water Protection Area (DWPA) includes US Geological Survey topographic maps for the Mill City South (1985), Lawhead Creek (1985), Mill City North (1985), and Elkhorn (1985) quadrangles at the 1:24,000 scale. The surface water intake plots on the U.S. Geological Survey Mill City North quadrangle topographic map.

The North Santiam Sub-Basin drains a central eastern portion of the Willamette Basin. It is a catchment basin for approximately 771 square miles within Linn and Marion County (USGS). The major tributaries within the sub-basin are the North Santiam River, Whitewater Creek, the Breitenbush River, Little North Santiam River, Rock Creek, and the Santiam River. These systems flow in a westerly direction from the west slope of the Cascade Range through the adjacent foothills to the valley floor of the Willamette Valley.

The climate in the North Santiam Sub-Basin area is characterized by moderate annual temperature and precipitation variations. Information on climate in the Gates area is based on the National Oceanic and Atmospheric Administration's (NOAA) Detroit Dam climate station located at an elevation of 1220 feet above mean sea level (Western Regional Climate Center). The average annual temperature is 51 degrees for the period of 1954 to 2000. Winters are cool and wet. The summers are dry and moderately warm to hot, with temperature highs ranging from 70 to 80 degrees. Average annual precipitation is about 88 inches, with 68% of that occurring between November and March. The Detroit Dam climate station gets an average of 17-inches of total snowfall per year and has approximately one-inch of measurable snow accumulation during the winter months of January and February.

Delineation of the Protection Area

Methodology

The delineation of the source area or the "drinking water protection area" is a fundamental aspect of the assessment of a public water system. For surface water systems such as Mill City's, the drinking water protection area delineation process begins by identifying the *watershed*. The watershed area is also called the *catchment basin* of a receiving water body. The outer boundary of this watershed is the drainage divide formed by the surrounding ridges and hills. The surface water delineation includes the entire watershed area upstream of the public water system intake structure. This watershed area provides "source" water to the surface water intake.

A map of the drinking water protection area provides the community with the knowledge of the geographic area providing the water to the intake. This is the area where contamination poses the greatest threat to the drinking water supply. Information about the drinking water protection area allows the community to develop management strategies that will have the most impact on protecting the source of the drinking water.

Results

DEQ has collected and reviewed data for the purpose of delineating the drinking water protection area for Mill City's intake on North Santiam River. The scope of work for this report included collecting information from the water system operator, researching written reports, and establishing a Geographic Information Systems (GIS) basemap of the delineated watershed. *Mill City's drinking water protection area between Mill City's intake and the upstream intake for City of Gates is shown in Figure 1.* The delineation for the area upstream of the City of Gates and Detroit Water System intake is presented in Appendix B. Mill City's portion of the drinking water protection area extends upstream approximately 68 miles in a easterly direction and encompasses a total area of 30 square miles. Included in this area are the tributaries to the North Santiam River including Rock Creek. The Mill City's intake is located at an approximate elevation of 830 feet as North Santiam River flows into the valley floor from the foothills. The upper edge of the watershed is located at an elevation of approximately 4,713 feet at Monument Peak; therefore, the elevation change from the upper edge of the watershed to the intake is approximately 3,900 feet.

Identification of Sensitive Areas

Methodology

After delineating the entire watershed, DEQ identified the "sensitive areas" within the watershed. *The objective in determining the sensitive areas for surface water sources is to produce reliable information to the community and public water system that is useful in developing and prioritizing protection strategies.* The list of the sensitive areas to be identified within drinking water watersheds was defined by the DEQ advisory committee as the procedures were developed (SWAP, 1999). The sensitive areas within a drinking water watershed includes both setbacks (land adjacent to stream) and other natural factors that increase the risk of contamination of the surface water. The result is an identification of a subset of the entire watershed. *The sensitive areas are those where potential contamination sources or land use activities, if present, have a greater potential to impact the water supply.*

In establishing sensitive areas in a watershed, there are several limiting factors to take into account. In using a Geographic Information System (GIS) to delineate the sensitive areas within the watershed, DEQ locates existing GIS layers and other natural resource agency data sets. Not all areas of the state have been mapped for the natural resource parameters of interest or at the level of detail ideal for this type of analysis. The availability of data at appropriate scales is also a potential limitation. The sensitive area mapping may be limited simply by the lack of readily available data, and conducting additional research is not possible within the time frame allowed to do this assessment. DEQ staff has sought to obtain the best available information for each water system as the source water assessment was performed.

There are four individual characteristics that determine the sensitivity of areas within the drinking water watersheds in the Source Water Assessment Plan (1999) procedures for Oregon water systems. A brief description of the sensitive area characteristics and the sources of the GIS data are included below.

Sensitive Area Setbacks

The first sensitive area is a setback using a consistent 1000' (about 300 meters) distance from the water body. The 1000' sensitive area setbacks are intended to identify those areas where there are higher risks of contamination by spills or other releases, simply due to their proximity to the water body. The sensitive area setbacks are identified as a minimum of 1000' from centerline of the intake stream and all perennial tributaries within the delineated drinking water watershed. The distance of 1000' was based on EPA national guidance for the distance to conduct the potential contamination source inventories adjacent to streams.

High Soil Erosion Potential

The soil erosion potential for *non-Forest Service land* is determined by combining the effects of slope and the soil erodibility factor ("K-factor"). Slopes within a watershed are evaluated using the 1:24,000 SSURGO (Soil Survey Geographic Database) data sets from the *Natural Resources Conservation Service*. The slope for a map unit is a weighted average of the average slope. The soil erodibility factor is also available in the SSURGO database and quantifies the susceptibility of soil particles to detachment and movement by water including the effects of rainfall, runoff, and infiltration. The K-factor used is a weighted average of only the value for the surface layer of the map unit. In the watershed, only soils with "high" erodibility ratings were mapped as sensitive areas. Soils that classify as "high" include soil with slopes greater than 30% and K-factors greater than 0.25. This rating system is based on the *Revised Universal Soil Loss Equation* from the USDA Agricultural Research Service as defined in the Washington's Standard Methodology for Conducting Watershed Analysis (Washington Forest Practices Board, 1993).

Soil Resource Inventory (SRI) information from the US Forest Service was used for Willamette National Forest lands. The SRI data does not provide a soil-erodibility factor that is comparable to SSURGO data. Therefore, the "sediment" attribute with a "high" ranking (which is used as a surrogate for the combination of slope and K Factor) is used to indicate high soil erodibility from the SRI GIS layer. The sediment attribute is the silt and clay sediment yield potential which is defined as the potential for water sedimentation and pollution from silt and clay particle to be carried in suspension following timber harvest, road construction, or other activities. Factors considered in the ratings are soil texture, soil structure, drainage patterns, landform and climate.

High Permeability Soils

Soils identified in the *U.S. Geological Survey* geologic map of Oregon GIS layer (1:500,000 scale) as Recent Alluvial Deposits (Qal), Dune Sand (Qd) and Landslide and Debris Flow Deposits (Qls) are mapped as sensitive areas due to the high potential for groundwater recharge adjacent to the stream. Alluvial deposits, dune sand and landslide deposits are typically very high permeability soils. These areas may be very vulnerable to rapid infiltration of contaminants to groundwater and subsequent discharge to a stream or lake/reservoir.

High Runoff Potential

The potential for high runoff rates for *non-Forest Service land* was evaluated using the 1:24,000 SSURGO (Soil Survey Geographic Database) data sets from the *Natural Resources Conservation Service*. Class D soils, which are defined as soils with very slow infiltration rates were mapped as sensitive areas within the boundaries of the drinking water protection area. Map units are assigned to hydrologic groups based on their majority component. A Class D soil is typified as clayey, has a high water table, or an impervious layer occurs at a shallow depth. Soils with these characteristics would have the potential for rapid runoff and subsequent transport of sediments and possible contaminants to the surface water body supplying the public water system.

For Willamette National Forest lands, the Soil Resource Inventory data does not provide a soil-erodibility factor that is comparable to SSURGO data. Therefore, the "wateryield" attribute with Class III rating from the SRI GIS layer was used to indicate high runoff potential. The "water yield" class is defined as an indication of rate and amount of water yield expected from each soil. Class III soils have "low water detention storage capacity and high rate of runoff".

Additional Sensitive Areas

There may be other natural characteristics within a watershed that can be mapped as sensitive. Modifying the list of sensitive areas in this assessment can be done by the public water system or the community by identifying resources and procedures that are appropriate for the individual system. For example, the local community may choose to add "transient snow zones", high rainfall areas, and landslide/debris-flow hazards to the sensitive areas within their watershed. Due to time constraints, these additional areas will not be mapped by DEQ as part of this source water assessment, but can be added by the local community before developing a protection plan.

Transient snow zones are typically defined as areas above 1500 feet in the Oregon Coast Range, or above 2000 feet in the Cascades. In some watersheds, these areas may be subject to rapid snowmelt or rain-on-snow events which increase the likelihood of transport of sediments to the surface water bodies in the watershed. Areas of high rainfall or irrigation rates may increase the likelihood of transport of sediments and possible contaminants to the surface water body. These areas can be identified using average annual precipitation data from Oregon Climate Service (years 1961 through 1990) and irrigation/water rights data from Oregon Water Resources Department's water rights database. Mapping the high-risk landslide and debris-flow areas can also be useful for evaluating sediment risks from natural hazards within a drinking water watershed. The Department of Forestry has recently completed GIS-based landslide and

debris flow maps for western Oregon (Website address:
<http://www.odf.state.or.us/gis/debris.html>).

The final watershed map for each public water system intake includes a composite of all sensitive areas identified by DEQ within the watershed. This composite or overlay will enable the communities and responsible agencies to focus future protection efforts in these sensitive areas.

Results

The sensitive areas within the Mill City's portion of the drinking water protection area are shown on Figure 2. Maps of the sensitive areas in the drinking water protection area upstream of the City of Gates and Detroit Water System intake is provided in Attachment B. These include the setbacks from the main stem and all perennial tributaries, large areas of high soil permeability, areas of high soil erosion potential and areas of high runoff potential. Good data coverage was available for the Mill City watershed for each of the sensitive areas.

Inventory of Potential Contaminant Sources

Methodology

The primary intent of an inventory is to identify and locate significant potential sources of any of the contaminants of concern within the drinking water protection area. Significant potential sources of contamination can be defined as any facility or activity that stores, uses, or produces the contaminants of concern and has a sufficient likelihood of releasing such contaminants to the environment at levels that could contribute significantly to the concentration of these contaminants in the source waters of the public water supply. An inventory is a very valuable tool for the local community in that it:

- provides information on the locations of potential contaminant sources, especially those that present the greatest risks to the water supply,
- provides an effective means of educating the local public about potential problems,
- provides valuable awareness to those that own or operate facilities and land use activities in the drinking water protection area, and
- provides a reliable basis for developing a local protection plan to reduce the risks to the water supply.

Inventories are focused primarily on the potential sources of contaminants regulated under the federal Safe Drinking Water Act. This includes contaminants with a maximum contaminant level (MCL), contaminants regulated under the Surface Water Treatment Rule, and the microorganism *Cryptosporidium*. The inventory was designed to identify several categories of potential sources of contaminants including micro-organisms (i.e., viruses, *Giardia lamblia*, *Cryptosporidium*, and fecal bacteria); inorganic compounds (i.e., nitrates and metals); organic compounds (i.e., solvents, petroleum compounds and pesticides) and turbidity/sediments. Contaminants can reach a water body (groundwater, rivers, lakes, etc.) from activities occurring on the land surface or below it. Contaminant releases to water bodies can also occur on an area-wide basis or from a single point source.

When identifying potential risks to a public water supply, it is necessary to make "worst-case" assumptions. This is important because it is the POTENTIAL risk that we are attempting to

determine through this procedure and it is simply not possible within our time constraints to conduct individual reviews or inspections at any of the facilities or land uses. The worst-case assumption that is made when considering potential risks to water bodies is that the facility or activity is not employing good management practices or pollution prevention. Under today's regulatory standards and environmental awareness, the majority of the identified activities and land uses employ "best management practices" (BMPs) in handling contaminants or preventing water quality degradation from their operations. It is important to note that while this assessment will list all POTENTIAL risks, many of these do not present actual risks to the water system. Environmental contamination is not likely to occur when contaminants are handled and used properly, or when BMPs are employed. The day-to-day operating practices and environmental (contamination) awareness varies considerably from one facility or land use activity to another. In-depth analysis or research was not completed to assess each specific source's compliance status with local, state and/or federal programs or laws. Further, the inventory process did not include an attempt to identify unique contamination risks at individual sites such as facilities (permitted or not) that do not safely store potentially hazardous materials. After the assessment is completed, the next step is to conduct an "enhanced" inventory that will look at the site-specific practices. The potential sources listed in the assessment that employ BMPs (required through regulations OR voluntarily) can be removed from the list during the next step in the process of developing a voluntary drinking water protection plan.

Assumptions are also made about what potential contamination sources are included in the various types of land uses. For example, it is assumed that rural residences associated with farming operations have specific potential contamination sources such as fuel storage, chemical storage and mixing areas, and machinery repair shops. Again, any errors in these assumptions can be easily corrected as the community moves beyond the assessment to develop a protection plan.

Past, current, and possible future potential sources of contaminants were identified through a variety of methods and resources. In completing this inventory, DEQ used readily available information including review of DEQ, EPA, and other agencies' databases of currently listed sites, interviews with the public water system operator, and field observation as discussed below. The process for completing the inventory for Mill City's drinking water protection area included several steps, which are summarized as follows:

1. Collected relevant information as of August 2001 from applicable state and federal regulatory databases including the following lists:
 - DEQ Environmental Cleanup Site Information System (ECSI) which includes the U.S. EPA National Priorities List (NPL) and the U.S. EPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLA) list;
 - DEQ leaking underground storage tank (LUST) list;
 - DEQ registered underground storage tank (UST) list;
 - DEQ Active Solid Waste Disposal Permits list;
 - DEQ Dry Cleaners list;
 - DEQ Site Information System (SIS) which includes Water Pollution Control Facility (WPCF) and National Pollutant Discharge Elimination System (NPDES) permitted facilities;
 - State Fire Marshall Hazardous Material Handlers (HAZMAT) site list (information on materials in a gas-form was not used since gaseous compounds rarely pose a threat to surface water or groundwater);

- DEQ Underground Injection Control (UIC) list of facilities with registered underground injection control systems; and
- DEQ Hazardous Waste Management Information System (HWIMSY) list which includes U.S. EPA Resource Conservation Recovery Act (RCRA) generators or notifiers and U.S. EPA RCRA Treatment, Storage, and Disposal Facility (TSDF) Permits.

Because of the way various state and federal databases are set up, the specific location of listed sites is not always given or accurate within the database. DEQ verified the presence and approximate location of potential contaminant sources and land uses within the drinking water protection area by consulting with local community members and/or by driving through the area (windshield survey) as discussed below in subsequent inventory steps.

2. Interviewed public water system officials, or someone they designated as knowledgeable of the area to identify potential sources that are not listed elsewhere in databases or on maps and to assist in locating potential sources listed in the state and federal databases.
3. Conducted a windshield survey by driving through the drinking water protection area to field locate and verify as many as possible of the potential contaminant source activities. We looked for potential contaminant sources within four general categories of land use: residential/municipal, commercial/industrial, agricultural/forest, and other land uses (see Table 1).
4. Assigned high-, moderate-, or low-risk ratings to each potential contaminant source based on the Oregon Source Water Assessment Plan (1999). A summary of the types of potential contaminant sources and level of assigned risk is presented in Table 1 (Summary of Potential Contaminant Sources by Land Use). The "comments" section of Table 2 (Inventory Results- List of Potential Contaminant Sources) provides justification for any modifications to the risk rating that may have resulted from field observations that were different from what is typically expected for the specific facility. Relative risk ratings are considered an effective way for the water supply officials and community to prioritize management efforts for the drinking water protection area. When the local water supply officials and community "team" enhance the inventory for use in developing management options, further analysis may need to be conducted to more closely evaluate the actual level of risk.
5. Produced final summary of the inventoried sources and the GIS base map, which are presented in this report.

Results

The results of the inventory were analyzed in terms of current, past, and future land uses; their proximity to the intake; and their associated potential risk. In general, land uses that are closest to the intake and those with the highest risk rating pose the greatest threat to your drinking water supply. The inventory results are summarized in Tables 1 through 3 and are shown on Figure 3. *Maps and tables detailing potential sources of contamination in the drinking water protection area upstream of the City of Gates and Detroit Water System intake are presented in Appendix B of this assessment.*

Mill City's portion of the delineated drinking water protection area is primarily dominated by managed forestlands. A total of 25 potential contaminant sources (detailed on Figure 3 and Table 2) were identified in Mill City's portion of the watershed.

The potential contaminant sources identified include the following:

Forest Management/ Recreation. Clear cuts, high road density, and stream crossings.

Agricultural Management. Grazing animals and non-irrigated crops.

Commercial/Industrial. Hoovers Supply, an historic gas station, Mill City Texaco, Mill City Chevron Service, Stayton Rock Products, Keylock Gas Station, junk/scrap/salvage (at residence), Auto Repair Shop (historic gas station), Gates Garage (historic gas station).

Residential/Municipal. Mill City Water Treatment Plant, Mill City Sewage Treatment Plant, sewer lines, high density housing, Mill City Fire House, Fairview Cemetery, Gate Elementary School, rural homesteads on septic/wells.

Miscellaneous. State Highway 22, railroad, and transmission lines.

The potential contaminant sources within the drinking water protection area all pose a relatively higher to moderate risk to the drinking water supply with the exception of non-irrigated crops, Mill City Fire House, and Fairview Cemetery which present a lower risk.

This inventory of potential contaminant sources within Mill City Water Department's drinking water protection area provides a quick look at the potential sources that could, if improperly managed, impact the water quality in the watershed. Even very small quantities of certain contaminants can significantly impact water bodies. It is important to remember the sites and areas identified in this section are only **potential** sources of contamination to the drinking water.

Susceptibility Analysis

Methodology

Susceptibility can be defined as the potential for contamination in the drinking water protection area to reach the intake on the surface water body being used by a public water system for drinking water purposes. Whether or not a particular drinking water source becomes contaminated depends on three major factors: 1) the occurrence of a facility or land use that releases contamination, 2) the location of the release, and 3) the hydrologic and/or soil characteristics in the watershed that allow the transport of the contaminants to the surface water body.

In conducting a susceptibility analysis the first step is identifying that part of the watershed that is most sensitive to contamination. This was accomplished after the delineation phase of this assessment. The second step consists of identifying and locating the potential contaminant sources in the drinking water protection area. Based on the type of facility and the nature of the chemicals they use, these sources represent a lower-, moderate-, or higher-relative risk to the surface water body. This step was accomplished in the inventory phase of the assessment.

The third step in the susceptibility analysis is to overlay the results of the inventory with the map of the sensitive areas. The results of the inventory are analyzed in terms of current, past, and future land uses; their time-of-travel relationship or proximity to the intake site; and their associated risk rating. In general, land uses that are closest to the intake and those with the highest risk rating pose the greatest threat to a drinking water supply. The presence and locations of the potential contamination sources within the sensitive areas will determine where the water system has the highest susceptibility to contamination. The susceptibility analysis cannot predict when or if contamination will actually occur, but it does recognize conditions that are highly favorable for contamination to occur. If a contaminant release to soils or water should occur in a sensitive area, it is very likely that contamination of the surface water body would occur if remedial actions are not undertaken.

When several high or moderate risk sources are located within the sensitive areas, the public water system may also be said to have a high overall susceptibility to contamination. If a public water system's drinking water source is determined to be of high susceptibility, it is recommended that the system identify those condition(s) that lead to the high susceptibility and take steps to protect the resource (e.g., reducing soil erosion, or working directly with facility operators to implement sound management practices, etc.). Water systems with a low susceptibility should consider all identified factors that could lead to higher susceptibility in the future and take action to prepare a strategy to protect the resource in the future.

Results

The results of the potential contamination source inventory are combined with the locations of the sensitive areas to determine the most susceptible areas within Mill City's portion of the drinking water watershed. The total number of sources within the sensitive areas are summarized as follows:

	Within Sensitive Areas	Outside of Sensitive areas	Total Within Drinking Water Protection Area
Total Number of High and Moderate Risk Potential Contamination Sources	22	0	22
Higher Risk Potential Contamination Sources Identified	14	0	14
Moderate Risk Potential Contamination Sources Identified	8	0	8
Lower Risk Potential Contamination Sources Identified	3	0	3
Total Potential Contamination Sources Identified	25	0	25

Overlaying the locations of the moderate- to high-risk sources with the sensitive areas provides an indication of the areas that are highly susceptible to contamination. The susceptibility

analysis results are shown on Figure 3 (Source Water Assessment Results). *Where the moderate- to higher-risk sources fall within the sensitive areas are those areas most vulnerable to contamination.* In the Mill City portion of the watershed, it includes the distribution of the twenty-five (25) identified sources within the areas of highly permeable soils, high erosional soils, high runoff potential soils, and within the 1000' setback from the streams. In general, potential contaminant sources within the sensitive areas in the lower watershed pose greater risk than those in the higher areas of the watershed. The susceptibility analysis provides the water system with information on where the greatest risk occurs and where to focus resources for protection.

When all of the assessments are completed in Oregon, DEQ will provide a second type of susceptibility analysis for the surface water systems, an "inter-system susceptibility" on a statewide basis. DEQ will develop a summary report describing how the Mill City watershed compares with other drinking water watersheds in the state. To normalize the results of the assessments, the total number of potential contamination sources will not be used. The density of the moderate- to higher-risk sources within the drinking water protection area and within the sensitive areas will be calculated. This comparison will be based upon the number and distribution of the potential contamination sources in the watersheds that serve as drinking water resources. The purpose is not to rank individual systems, but to provide general groupings of overall risk relative to other Oregon public water systems. This will enable state agencies to develop priorities for staffing and funding more detailed assessments and protection measures.

Summary and Recommendations

This assessment provides a basis for focusing limited resources within the community to protect the drinking water source. The delineation provides the community with information regarding the location of the land area that directly supplies the surface water intake, i.e., the drinking water protection area. The sensitive areas are those where potential contamination sources or land use activities, if present, have the greater potential to impact the water supply. When the sensitive area information is combined with the potential contaminant source inventory, the highly vulnerable areas are identified (referred to as a susceptibility analysis). These should become high priority areas to be addressed first with educational information, technical assistance, and focused outreach to landowners to encourage voluntary cooperation in protecting the water quality in this watershed.

This assessment provides a basis for informed decision-making regarding community planning. The delineation, inventory and susceptibility analysis provides the community with a significant amount of information regarding where their drinking water comes from and an identification of some of the potential risks to the quality of that source. For example, knowing the location and status of the source area allows the community's planning authority to potentially make informed decisions regarding proposed land uses that are compatible with both the drinking water resource and the vision of community growth embraced by the community. Educating the community citizens about the susceptibility and risks to your system enables more public involvement in any future decisions about the public water system.

The results of this Source Water Assessment and the recommendations based on the results are summarized below.

- ◆ Mill City Water Department's public water system draws water from North Santiam River. The source of this water is within the North Santiam Sub-Basin of the Willamette Basin. Mill City's drinking water protection area extends approximately 68 miles in an easterly direction and encompasses a total area of 30 square miles. Included in this area are the tributaries to the North Santiam River including Rock Creek.

- ◆ This source water assessment addresses the geographic area providing water to Mill City's intake (Mill City's portion of the drinking water protection area) between Mill City's intake and the upstream intake for City of Gates and Detroit Water System. Information on Mill City's protection area upstream of the City of Gates and Detroit Water System intake is presented in the Source Water Assessment for that public water system and is summarized in this report. In addition, there are four drinking water intakes on the North Santiam River downstream of Mill City's intake including the intake for the Lyons Mehama Water District, Salem Public Works, Stayton Water Supply, and the City of Jefferson. Activities and impacts in the Mill City drinking water protection area have the potential to also impact downstream users.

- ◆ Within the Mill City portion of the drinking water protection area, there are large areas identified as sensitive to contamination. Areas that are adjacent to the streams/river, areas that have high soil erosion potential, high runoff potential, and high permeability should all receive special considerations for protection. These are some of the areas where the risk is greatest for existing **and future** potential sources of contamination impacting the water quality in the watershed. It is recommended that other natural conditions be considered and possibly added to the assessment results before proceeding with voluntary development of a drinking water protection plan.

There are also some highly-permeable soils adjacent to North Santiam River that should be considered higher risk for groundwater contamination. These areas are very sensitive to any spills or release to soils because the contaminants could rapidly infiltrate into groundwater and discharge to North Santiam River. The community should take steps to evaluate current and future land use in areas of highly permeable soils. The facilities or land uses that have been identified either on or in close proximity to these soils should be informed of the sensitive nature of the area and encouraged to adopt best management practices designed to minimize the risk of a contaminant release.

- ◆ The susceptibility of the public drinking water system source depends on both the natural conditions in the watershed as well as the land uses and facilities operating in the watershed. The purpose of the susceptibility exercise is to identify those factors that may pose more of a risk than others within the community's drinking water protection area. It provides information with respect to facilities or land uses in the sensitive areas within the drinking water protection area that should be given greater priority in developing protection strategies. A review of the inventory and the sensitive areas indicates that the Mill City public water system has at least 22 high and moderate-risk sources within the sensitive areas in the watershed. It is highly recommended that the community "enhance" or refine the delineation of the sensitive areas and the identification of the potential contamination sources through further research and local input.

◆ Due to the streamlined procedures for conducting the source water assessments, the results could potentially create a misperception that the “human activities” within the watersheds are higher risks than natural conditions or disturbances such as landslides and storm events. For example, it would be erroneous for communities to conclude that their source water was not at risk from natural conditions that produce sediments if there were no potential contamination sources identified within their watershed. It is recommended that the community take steps to ensure the natural conditions (both those identified in this assessment and any other additional areas identified by the community) within the watershed are considered when developing strategies for protection.

◆ Public water systems may be threatened by contamination already in the surface water. Many public water systems conduct routine tests for contamination in the raw water prior to treatment. It is highly recommended that such data be used to determine existing risks in the watershed. Collecting and analyzing this raw water data by DEQ or OHD has not been done and is beyond the scope of this assessment.

◆ This assessment provides a basis for dealing with future water quality work in the watershed. The delineation, inventory, and susceptibility analysis has been designed to serve as a strong foundation for further in-depth watershed assessments or water quality improvement efforts, such as Oregon’s Total Maximum Daily Load (TMDL) plans.

◆ The primary intent of this source water assessment is to provide the background information for the community to use in developing a local Drinking Water Protection Plan. The Mill City and/or the public water system should assemble a team to assist in the development and implementation of a Drinking Water Protection Plan. Clean safe drinking water is fundamental to the viability of any community. Protecting the drinking water source is a wise and relatively inexpensive investment in the community’s future. The next section will discuss this voluntary process.

Developing a Drinking Water Protection Plan

This Source Water Assessment (SWA) Report for your public water system is a compilation of the results of the delineation of the source area, identification of the sensitive areas, and an inventory of significant risks. The final product, the susceptibility analysis, provides the basis for prioritizing the areas in and around your community that need to be protected. As we discussed in the introduction, our hope is that the community will use the assessment as a basis for developing a "Drinking Water Protection Plan".

The process for developing a complete Drinking Water Protection Plan can be summarized as follows:

ASSESSMENT PHASE (Source Water Assessment Report performed by DEQ and OHD)

1. Delineate the area that serves as the source of the public water supply ("drinking water protection area" for groundwater wells or surface water intakes)
2. Inventory the potential risks or sources of contamination
3. Determine the areas most susceptible to contamination

PROTECTION PHASE (performed by community)

4. Assemble a local Drinking Water Protection Team
5. Enhance the Source Water Assessment
6. Develop a plan to protect the supply (reduce the risks of contamination)
7. Develop a contingency plan to address the potential loss of the system
8. Certify (optional) and implement the Drinking Water Protection Plan

As you know, the assessment phase work was funded by the federal Safe Drinking Water Act. The assessment is simply the first three steps of developing a protection plan for your public water supply. Developing a protection plan is voluntary.

Prior to moving into the protection phase, DEQ recommends the inventory presented in this document be reviewed in detail to clarify the presence, location, operational practices, actual risks, etc. of the identified facilities and land use activities. The SWA inventory should be regarded as a preliminary review of potential sources of contamination within the drinking water protection area. Resources within the community should be used to do an "enhanced inventory" to complete this preliminary list of potential sources of contamination.

It is also important to remember that not all of the inventoried activities will need to be addressed if you choose to develop a Drinking Water Protection Plan. When developing a protection plan, sources which pose little to no threat to your public water supply can be screened out. For example, if any of the land use activities are conducted in a manner that already significantly reduces the risk of a contamination release, the facility would not need to re-evaluate their practices based on drinking water protection "management". One of the goals of developing a Drinking Water Protection Plan based on the inventory results is to address those land use activities that do pose high or moderate risks to your public water supply. The community should target these facilities with greater levels of education and technical assistance to minimize the risk of contamination.

Limited technical assistance is available through both DEQ and OHD for communities that choose to move beyond the assessments and voluntarily develop a Drinking Water Protection Plan. Using the results of the assessment (and enhanced inventory), the local community can

form a "Drinking Water Protection Team" of community members and develop a plan to reduce the risks of contamination from those sources.

Forming a local team to help with the development of a protection plan is very important. Oregon's drinking water protection approach relies upon the concept of "community-based protection", as are many other water quality programs. Community-based protection simply refers to the concept of allowing local control and decision-making to implement the water quality protection effort. Community-based protection is successful only with significant local citizen and stakeholder involvement.

The primary advantage of community-based protection is that it links community needs to environmental needs. Any successful protection program will need to be flexible enough to allow the community to adopt the "tools" or elements that are most appropriate for them. Allowing this local control in making the changes necessary for improving water quality will accomplish two key elements of restoration and protection. Community-based protection can draw on the knowledge and successful adaptive practices of the local area. Landowners generally know best how to achieve water resource restoration and protection as long as a thorough explanation of the problem is provided, the objectives are defined, and some free technical assistance is provided. Secondly, knowing they have more local control, citizens will also be more likely to participate in the program and more willing to assist with the educational and outreach effort which will make the plan successful. We recommend that the protection plan be developed so as to *minimize any burdens on individual property owners, but maximize the equity in responsibility for reducing the risks of future contamination.*

Drinking water protection involves developing protection strategies for groundwater or surface water sources of public water supplies. There are many similarities between this program and other water quality protection programs, and it is essential that water quality efforts are coordinated and linked in each geographic area as much as possible. DEQ is committed to linking the drinking water protection efforts to other habitat and water quality improvement efforts for fish in Oregon, as well as the ongoing work to address Clean Water Act 303(d) water-quality-limited streams. One of the primary means of providing technical assistance is to give your community the information and coordination necessary to create these links. Other agencies will also be involved in providing technical assistance as protection plans are developed. For example, on farmlands, the Oregon Department of Agriculture will provide assistance as provided for under Senate Bill 1010. In developing recommendations for protecting the drinking water source area, your community can maximize the use of existing programs in Oregon that offer free technical assistance. Examples of such programs include:

- pollution prevention technical assistance from the Department of Environmental Quality,
- sanitary survey assistance from the Oregon Health Division,
- household hazardous waste assistance from the Department of Environmental Quality,
- land use planning from the Department of Land Conservation and Development,
- agricultural water quality management plans Oregon Department of Agriculture,
- water conservation education from the Water Resources Department, or
- rural water quality outreach from the Oregon State University Extension Service.

Protecting the drinking water supply in a community can also be a very effective way to encourage all citizens to participate in an issue which directly affects everyone in that community. This often leads to more public involvement in other significant local decisions

concerning future livability issues (i.e., land use planning). In communities already developing and implementing Drinking Water Protection Plans, the process has served to bring many diverse interests together on a common goal and strengthened the local rural and urban relationships through communication and increased understanding. We must continue to do a better job in our outreach efforts to point out that we are all part of the existing water quality problems. The risks and sources of water quality problems are not only from industries, farmers, and managed forests, but every individual living, commuting and working in that area.

We encourage communities interested in developing Drinking Water Protection Plans to contact the DEQ or OHD resources listed below:

For technical assistance with the monitoring and operation of your public water system:

Oregon Health Division
Main Office - Portland Oregon
800 NE Oregon St., Room 611
PO Box 14450, Portland, OR 97293
(503) 731-4317
Fax (503) 731-4077

or:

Dennis Nelson, Groundwater Coordinator, (541) 726-2587
donelson@oregonvos.net
Oregon Health Division
Springfield Field Office
442 A Street, Springfield, OR 97477
Fax (541) 726-2596

For technical assistance with developing plans to protect your public water system:

Department of Environmental Quality
Water Quality Division
811 SW 6th Avenue
Portland, OR 97204-1390
(503) 229-5630 Fax (503) 229-5408
Toll Free 1-800-452-4011

Surface Water - Sheree Stewart, (503) 229-5413
stewart.sheree@deq.state.or.us

Groundwater - Julie Harvey, (503) 229-5664
harvey.julie@deq.state.or.us

References*

- Natural Resource Conservation Service (NRCS). Soil Survey Geographic Database (SURGGO), National Cartography and Geospatial Center, Fort Worth, Texas.
<http://www.ftw.nrcs.usda.gov/ssurgo.html>
- Source Water Assessment Plan: Implementation of the Safe Drinking Water Act 1996 Amendments. Sheree Stewart, Oregon Department of Environmental Quality, and Dennis Nelson, Oregon Health Division, February 1999.
<http://www.waterquality.deq.state.or.us/wq>
- US Environmental Protection Agency, 1997. State Source Water Assessment and Protection Programs Guidance, US EPA Office of Water, EPA816-R-97-009, August 1997.
<http://www.epa.gov/ogwdw/swp.html>
- US Environmental Protection Agency, 1998. US EPA Reach File (RF1) for the Conterminous United States in BASINS. Published 08/01/1998, Washington, DC.
- US Geological Survey, Oregon Hydrologic Units.
http://oregon.usgs.gov/data_dir/orehuclist.html
- US Forest Service (USFS), 1992. Soil Resource Inventory (SRI) Database for the Willamette National Forest.
- Washington Forest Practices Board. 1993. Standard Methodology for Conducting Watershed Analysis, Version 2.0, October 1993
- Western Regional Climate Center, Oregon Climate Summaries.
<http://www.wrcc.dri.edu/summary/climsmor.html>

*Please note that there may be other sources of information for North Santiam River and the North Santiam Sub -Basin. Conducting an exhaustive search of all data and technical reports was beyond the scope of this Source Water Assessment Report.

Figures

Source Water Assessment Report Mill City Water Department PWS # 4100520

Figure 1. Mill City Water Department's Drinking Water Protection Area

Figure 2. Sensitive Areas within Mill City Water Department's Drinking Water Protection Area

Figure 3. Source Water Assessment Results

**Mill City Water Department's Drinking Water Protection Area
with Sensitive Areas and Potential Contamination Sources
(includes Figures 3a and 3b – expanded views)**

Source Water Assessment Results

Mill City Water Department's Drinking Water Protection Area with Sensitive Areas and Potential Contamination Sources

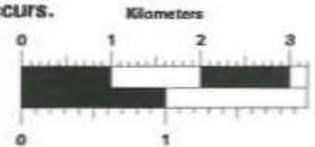
PWS 4100520

-  Drinking Water Protection Area
-  Drinking Water Intake - Surface Water
-  Sensitive Areas
-  Area Feature (see Note 2)
-  Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are used and managed properly.

Note 2: Feature identification markers correspond to the potential contaminant source numbers in the SWA Report. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.



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Oregon Department of Environmental Quality GIS

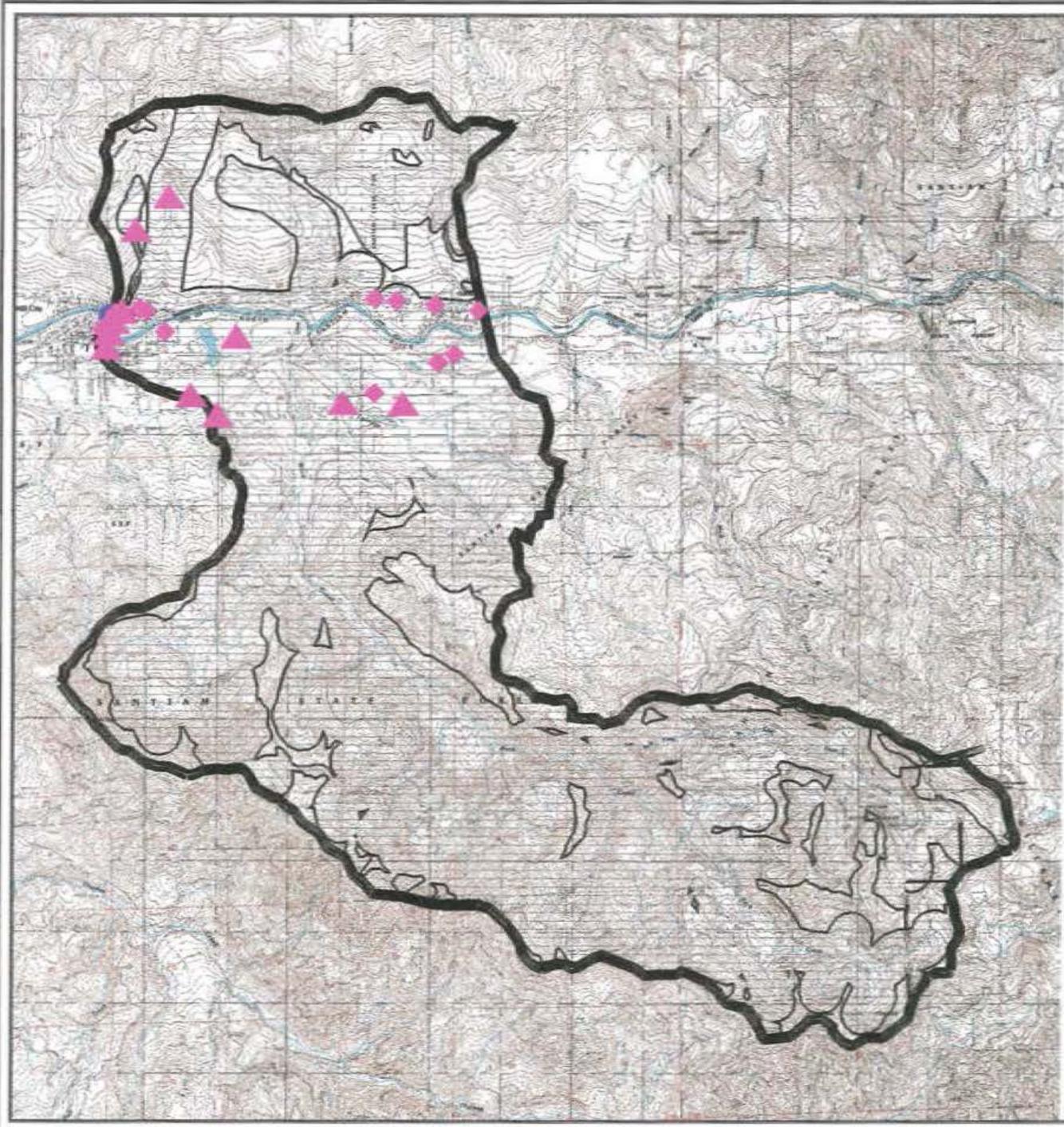




Figure 1:
Mill City Water Department's
Drinking Water Protection Area

PWS 4100520

- Drinking Water Intake - Surface Water
- Drinking Water Protection Area

For watersheds with more than one intake, Oregon completes the assessments by segment and each source water assessment represents the area from the public water system's intake to the next intake upstream. All protection areas for intakes upstream of the water system's intake are included in Mill City Water Department's drinking water protection area. Activities and impacts in Mill City Water Department's drinking water protection area also have the potential to impact downstream water users. See Attachment B for a schematic of upstream and downstream water providers in the North Santiam Sub-Basin.

Note on Base Map: 1:24,000 scale U.S. Geological Survey Digital Raster Graphics (DRGs) for Lawhead Creek (1985), Mill City South (1985), Mill City North (1985), Elkhorn (1985), and are displayed. DRGs are scanned images of topographic sheets. Where the DRGs join, seams and/or gaps may be visible. Between DRGs, variations in information displayed also may be seen.

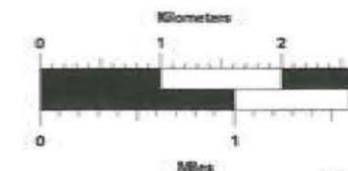
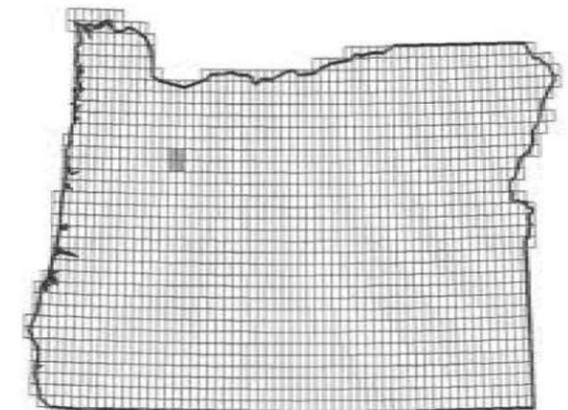


Figure 2:
**Sensitive Areas within the Mill City Water
 Department's Drinking Water Protection Area**

PWS 4100520

-  Drinking Water Intake - Surface Water
-  Drinking Water Protection Area

Sources of Information:

(Marion and Linn County Areas)

High Soil Erodibility: Defined by slopes greater than 30 percent and K factor greater than .25. Soils derived from 1:24,000, USDA, NRCS, SSURGO certified data. Slope is in the SSURGO database Component Table. Slope displayed is a weighted average of the average slope for the map unit. K factor is contained in the SSURGO Layer Table. K factor displayed is a weighted average (of only the surface layer) for the map unit. **High Runoff Potential:** Hydrologic Group D (very slow infiltration rates) from the SSURGO Component Table. SSURGO data have been certified.

(Willamette National Forest)

High Soil Erodibility: Defined by high sedimentation yield potential of the dominant soil. **High Runoff Potential:** Water yield class III in the dominant soil. These data are extracted from the Willamette National Forest Soil Resource Inventory.

(Entire Watershed)

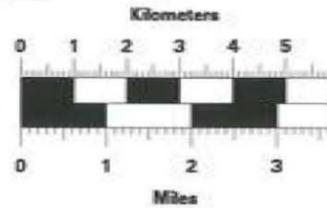
High Permeability Soils: Alluvial deposits (Qal), dune sand (Qd), and landslide and debris-flow deposits (Qls) from the U.S. Geological Survey Geologic Map of Oregon GIS layer.

Sensitive Area Setbacks Adjacent to Streams and Reservoirs: 1000 foot buffer from the centerline of perennial streams and the shoreline of any reservoir.

Note on Sensitive Areas: In determining the most sensitive areas within this Drinking Water Protection Area, DEQ used existing GIS layers and other natural resource agency data sets. Not all areas of the state have been mapped for the natural resource parameters of interest or at the level of detail ideal for this type of analysis. DEQ has sought to obtain the best available information for this composite.

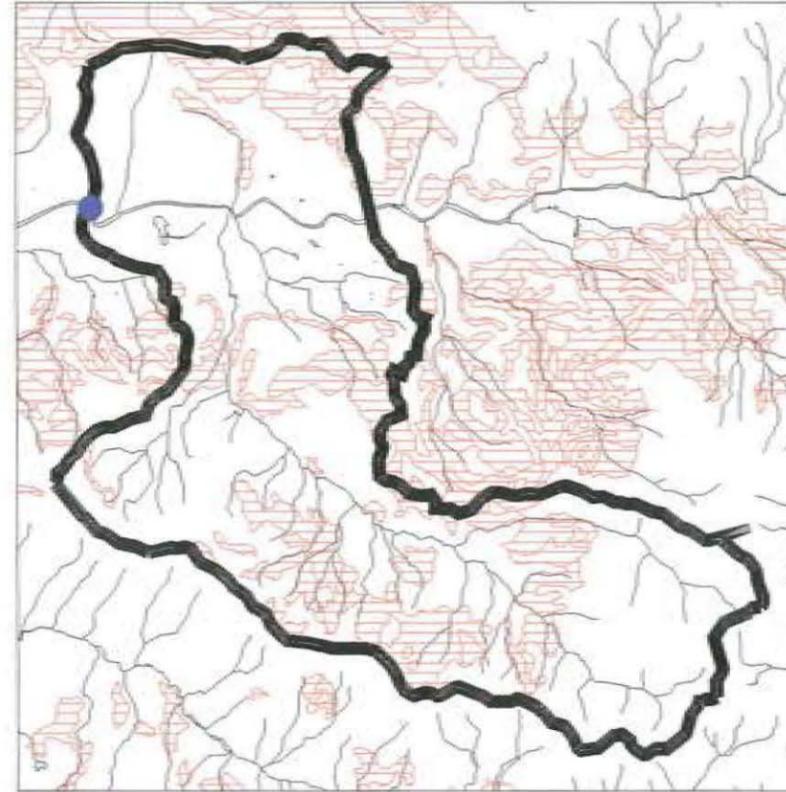


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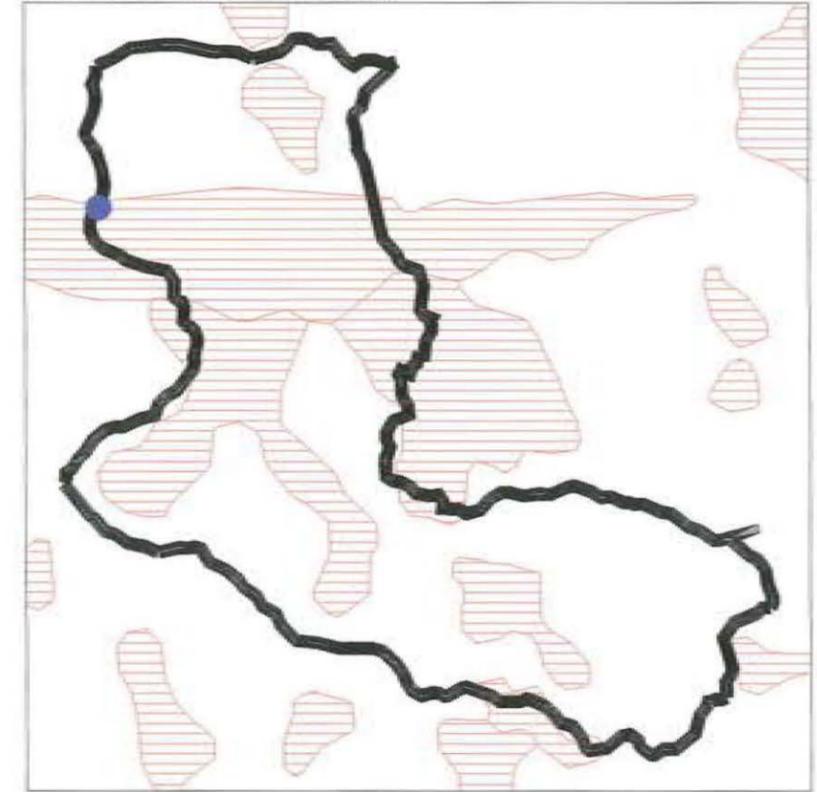


Sensitive Areas in Watershed

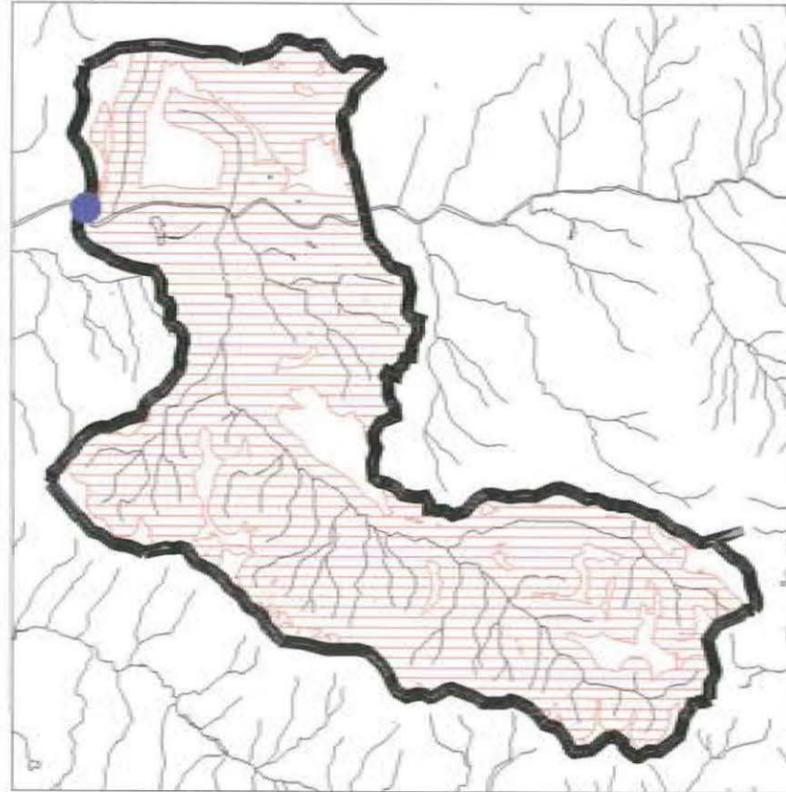
**High Soil Erosion Potential
 (High Sediment Yield Potential)**



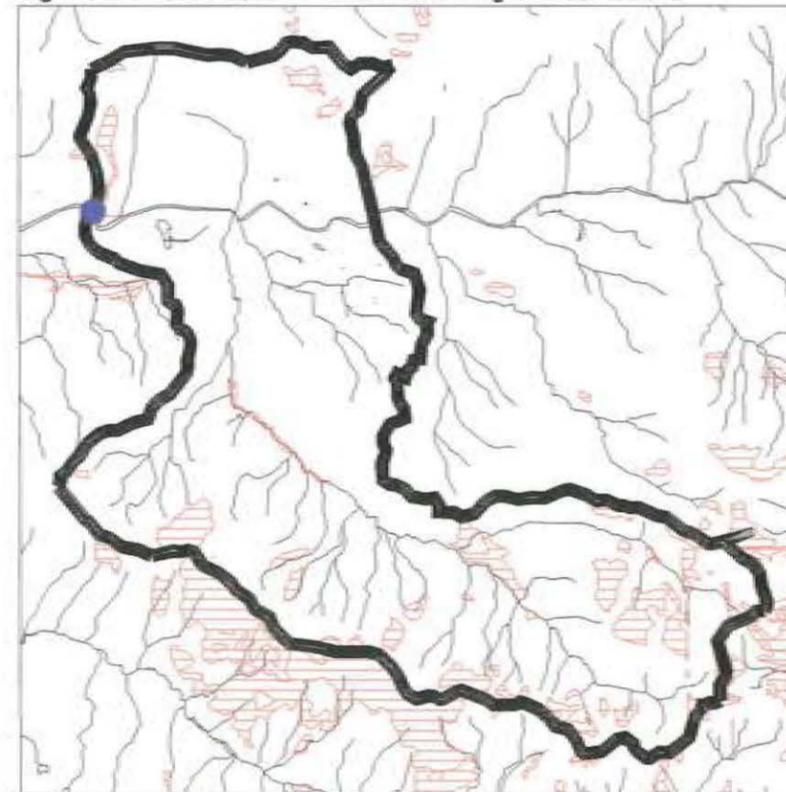
**High Permeability Soils (Alluvial Deposits, Dune Sand,
 Landslide and Debris-flow Deposits)**



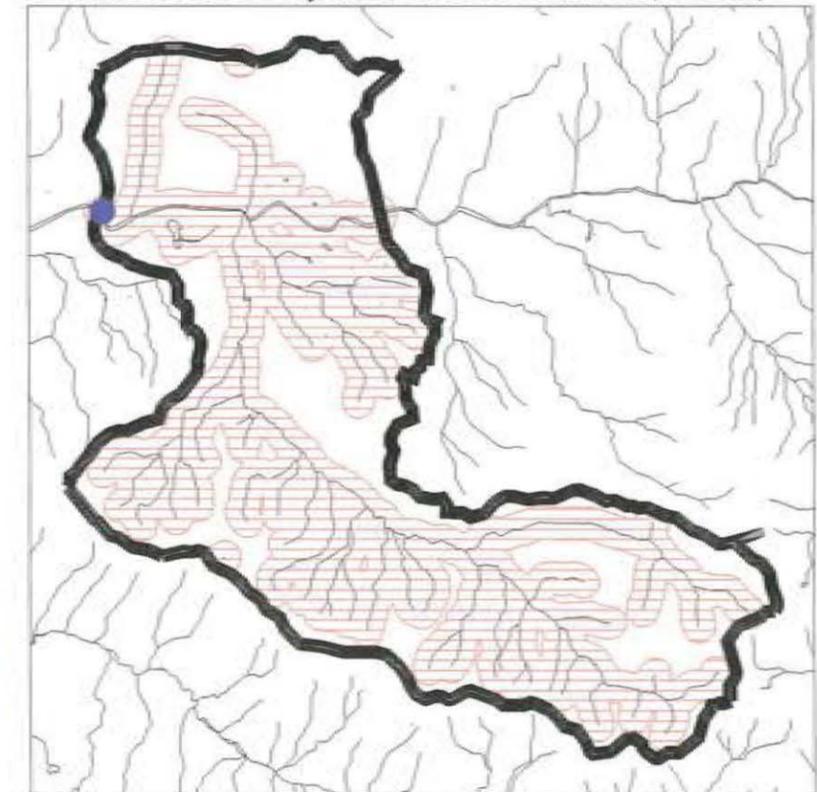
Composite of Sensitive Areas

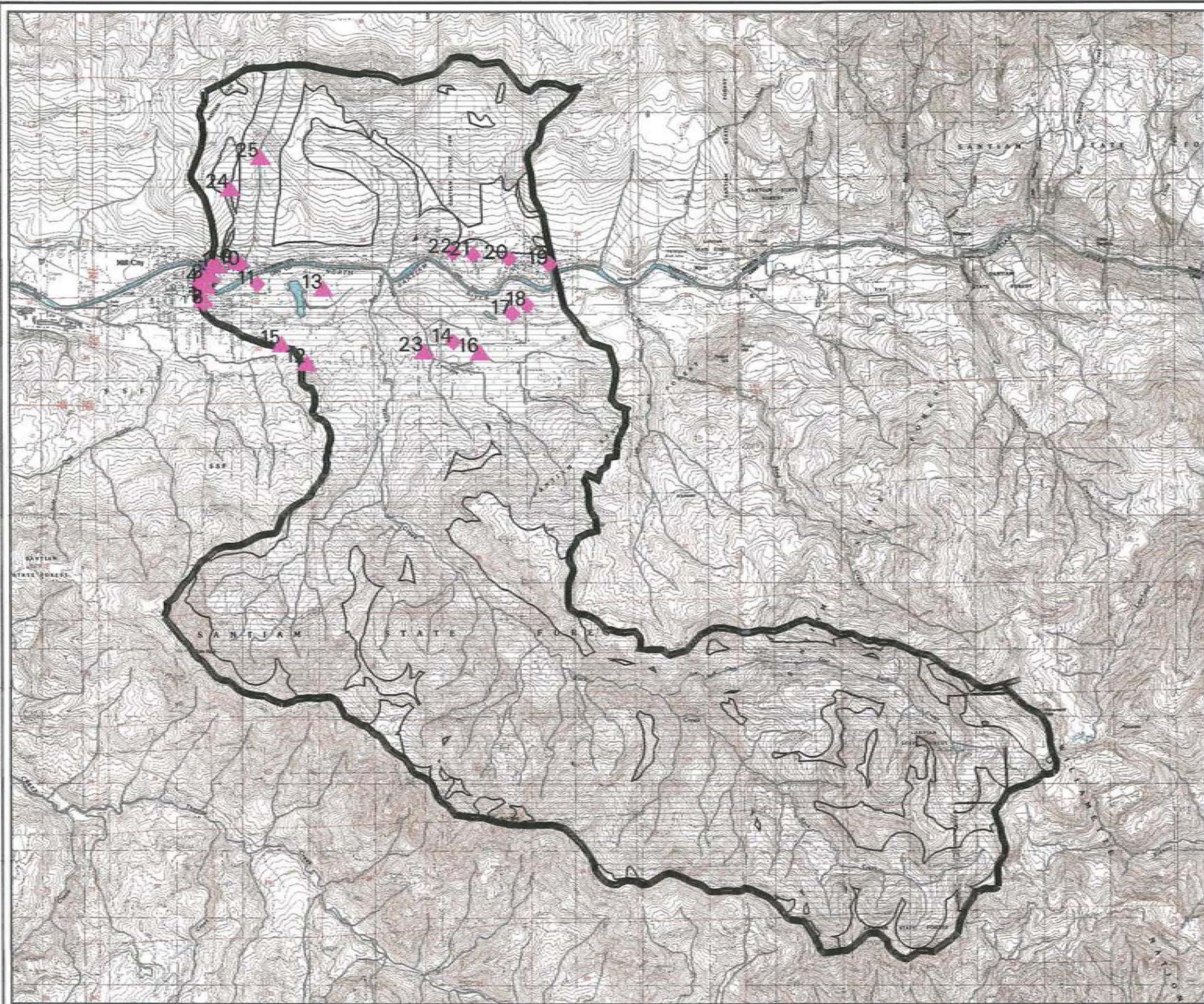


High Runoff Potential (Water Yield Class III - High Rate of Runoff)



Sensitive Area Setbacks Adjacent to Streams and Reservoirs (1000 feet)





**Figure 3:
Source Water Assessment
Results**

**Mill City Water Department's
Drinking Water Protection Area with
Sensitive Areas and Potential
Contamination Sources
PWS 4100520**

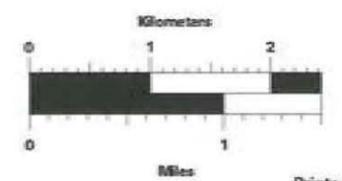
-  Drinking Water Intake - Surface Water
-  Drinking Water Protection Area
-  Sensitive Areas
-  Area Feature (see Note 2)
-  Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.

Note 2: Feature identification numbers correspond to the potential contaminant source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.

For watersheds with more than one intake, Oregon completes the assessments by segment and each source water assessment represents the area from the public water system's intake to the next intake upstream. All protection areas for intakes upstream of the water system's intake are included in Mill City Water Department's drinking water protection area. Activities and impacts in Mill City Water Department's drinking water protection area also have the potential to impact downstream water users. See Attachment B for a schematic of upstream and downstream water providers in the North Santiam Sub-Basin.



**Figure 3a:
Source Water Assessment
Results**

**Mill City Water Department's
Drinking Water Protection Area
with Sensitive Areas and Potential
Contamination Sources**

PWS 4100520

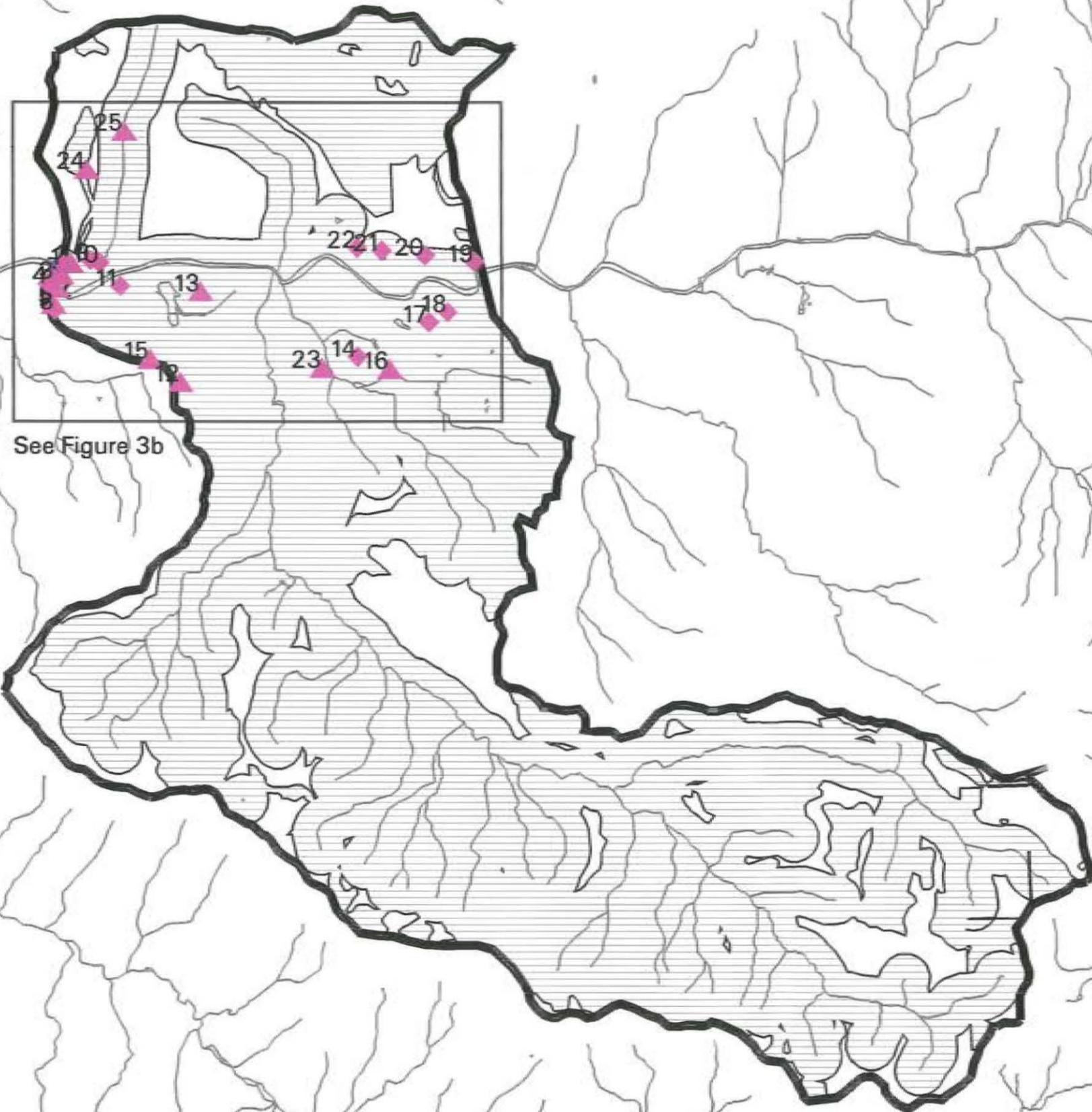
● Drinking Water
Intake - Surface Water

⬮ Drinking Water
Protection Area

≡ Sensitive Areas

▲ Area Feature (see Note 2)

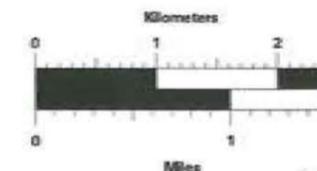
◆ Point Feature (see Note 2)

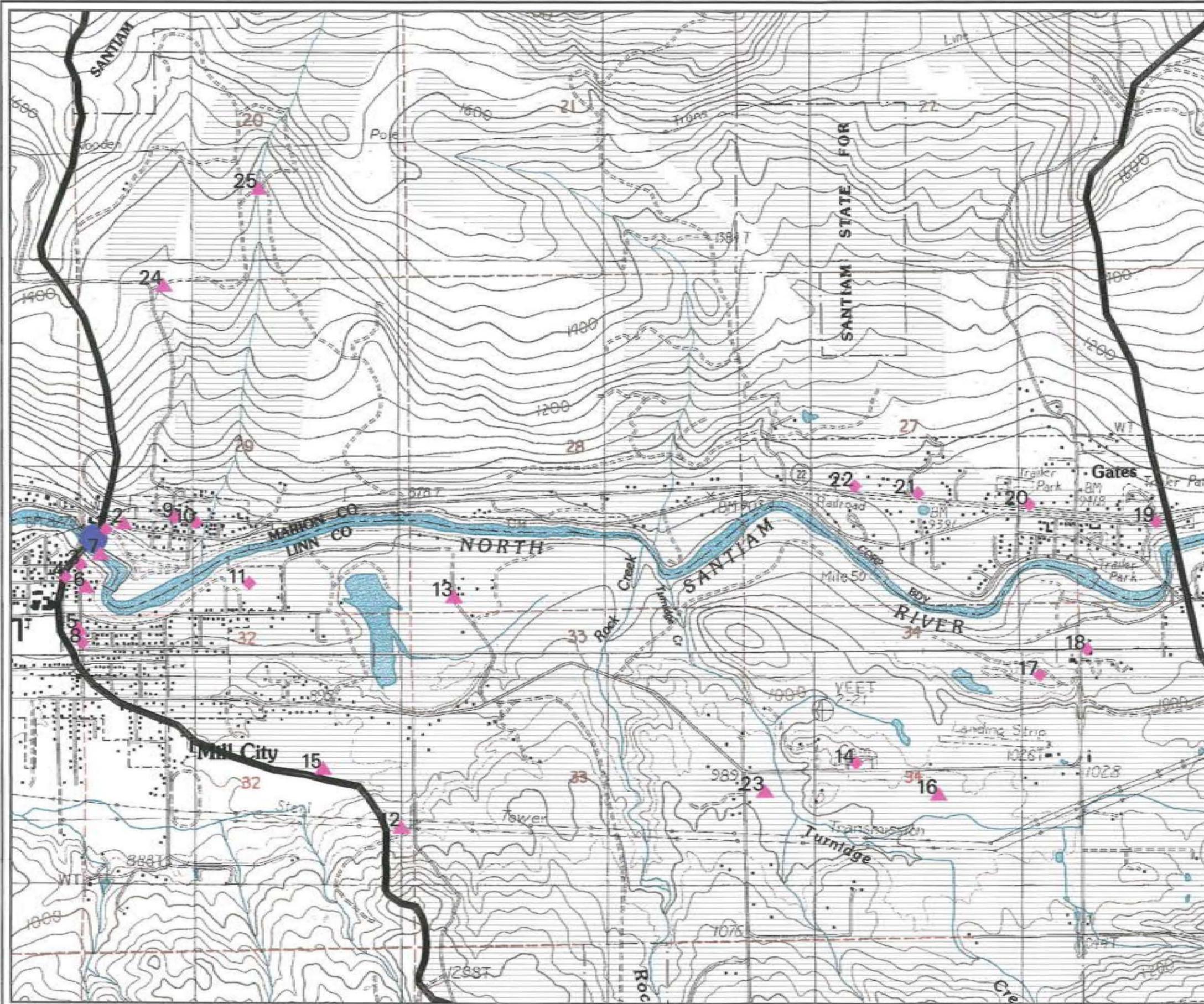


Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.

Note 2: Feature identification numbers correspond to the potential contaminant source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.





**Figure 3b:
Source Water Assessment
Results (Inset)**

**Mill City Water Department's
Drinking Water Protection Area with
Sensitive Areas and Potential
Contamination Sources**

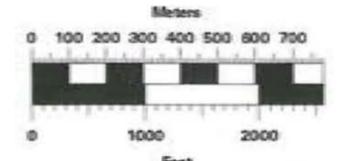
PWS 4100520

- Drinking Water Intake - Surface Water
- Drinking Water Protection Area
- Sensitive Areas
- ▲ Area Feature (see Note 2)
- ◆ Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.

Note 2: Feature identification numbers correspond to the potential contaminant source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.



Tables

Source Water Assessment Report Mill City Water Department PWS # 4100520 Inventory Results

Table 1. Summary of Potential Contaminant Sources by Land Use

Table 2. Inventory Results – List of Potential Contaminant Sources

Table 3. Results of Regulatory Database Search

Notes for Tables

- Sites and areas identified in Tables 1 and 2 are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
- Total number of sources listed in Table 1 in the DWPA may not add up to the total number of potential contaminant sources in Table 2 because more than one type of potential contaminant source may be present at any given facility.
- The data was collected by Rachel Burr DEQ's Western Region Office, on September 4, 2001.

Acronyms

AST - Aboveground Storage Tank

DC - DEQ's Drycleaner database

DEQ - Oregon Department of Environmental Quality

DWPA - Drinking Water Protection Area

ECSI - DEQ's Environmental Cleanup Site Information database

HWIMSY - DEQ's Hazardous Waste Information Management System database

LUST - DEQ's Leaking Underground Storage Tank database

NPDES - National Pollution Discharge Elimination System

PCS - Potential Contaminant Source

PWS - Public Water System

SFM - State Fire Marshall's database of hazardous materials

SIS - DEQ's Source Information System database (includes WPCF and NPDES permits)

SWMS - DEQ's Solid Waste Management System database

UST - DEQ's Underground Storage Tank database or Underground Storage Tank

WPCF - Water Pollution Control Facility

WRD - Oregon Water Resources Division database for water rights information system

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100520 MILL CITY WATER DEPARTMENT

Residential/Municipal Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Airport - Maintenance/Fueling Area		Higher	0
Apartments and Condominiums		Lower	0
Campgrounds/RV Parks	(1)	Lower	0
Cemeteries - Pre-1945		Lower	1
Drinking Water Treatment Plants		Moderate	1
Fire Station		Lower	1
Fire Training Facilities		Moderate	0
Golf Courses		Moderate	0
Housing - High Density (> 1 House/0.5 acres)		Moderate	1
Landfill/Dumps	(1)	Higher	0
Lawn Care - Highly Maintained Areas		Moderate	0
Motor Pools		Moderate	0
Parks		Moderate	0
Railroad Yards/Maintenance/Fueling Areas		Higher	0
Schools		Moderate	1
Septic Systems - High Density (> 1 system/acre)	(1)	Higher	0
Sewer Lines - Close Proximity to PWS	(1)	Moderate	1
Utility Stations - Maintenance Transformer Storage		Higher	0
Waste Transfer/Recycling Stations	(1)	Moderate	0
Wastewater Treatment Plants/Collection Stations	(1)	Higher	1
Other			0

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100520 MILL CITY WATER DEPARTMENT

Commercial/Industrial Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Automobiles - Body Shops		Higher	0
Automobiles - Car Washes		Moderate	0
Automobiles - Gas Stations		Moderate	3
Automobiles - Repair Shops		Moderate	2
Boat Services/Repair/Refinishing		Higher	0
Cement/Concrete Plants		Moderate	0
Chemical/Petroleum Processing/Storage		Higher	0
Dry Cleaners		Higher	0
Electrical/Electronic Manufacturing		Higher	0
Fleet/Trucking/Bus Terminals		Higher	0
Food Processing		Moderate	0
Furniture/Lumber/Parts Stores		Moderate	1
Home Manufacturing		Higher	0
Junk/Scrap/Salvage Yards		Higher	2
Machine Shops		Higher	0
Medical/Vet Offices	(1)	Moderate	0
Metal Plating/Finishing/Fabrication		Higher	0
Mines/Gravel Pits		Higher	1
Office Buildings/Complexes		Lower	0
Parking Lots/Malls (> 50 Spaces)		Higher	0
Photo Processing/Printing		Higher	0
Plastics/Synthetics Producer		Higher	0
Research Laboratories		Higher	0
RV/Mini Storage		Lower	0
Wood Preserving/Treating		Higher	0
Wood/Pulp/Paper Processing and Mills		Higher	0
Other			0

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100520 MILL CITY WATER DEPARTMENT

Agricultural/Forest Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Auction Lots	(1)	Higher	0
Boarding Stables	(1)	Moderate	0
Confined Animal Feeding Operations (CAFOs)	(1)	Higher	0
Crops - Irrigated (inc. orchards, vineyards, nurseries, greenhouses)	(2)	Moderate	0
Crops - Nonirrigated (inc. Christmas trees, grains, grass seed, pasture)		Lower	1
Farm Machinery Repair		Higher	0
Grazing Animals (> 5 large animals or equivalent/acre)	(1)	Higher	1
Lagoons/Liquid Wastes	(1)	Higher	0
Land Application Sites	(1)	Moderate	0
Managed Forest Land - Broadcast Fertilized Areas		Moderate	1
Managed Forest Land - Clearcut Harvest (< 35 yrs.)		Higher	1
Managed Forest Land - Partial Harvest (< 10 yrs.)		Moderate	0
Managed Forest Land - Road Density (> 2 mi./sq. mi.)		Higher	1
Pesticide/Fertilizer/Petroleum Storage, Handling, Mixing, & Cleaning Ar		Higher	0
Recent Burn Areas (< 10 yrs.)		Lower	0
Managed Forest Lands - Status Unknown		Moderate	0
Other			0

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100520 MILL CITY WATER DEPARTMENT

Miscellaneous Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Above Ground Storage Tanks - Excluding Water		Moderate	1
Channel Alterations - Heavy		Lower	0
Combined Sewer Outfalls	(1)	Lower	0
Stormwater Outfalls	(1)	Lower	0
Composting Facilities	(1)	Moderate	0
Historic Gas Stations		Higher	3
Historic Waste Dumps/Landfills	(1)	Higher	0
Homesteads - Rural - Machine Shops/Equipment Maintenance		Higher	0
Homesteads - Rural - Septic Systems (< 1/acre)	(1)(3)	Lower	1
Injection/Dry Wells, Sumps - Class V UICs	(1)	Higher	0
Kennels (> 20 Pens)	(1)	Lower	0
Military Installations		Higher	0
Random Dump Sites		Moderate	0
River Recreation - Heavy Use (inc. campgrounds)	(1)	Lower	0
Sludge Disposal Areas	(1)	Moderate	0
Stormwater Retention Basins	(1)	Moderate	0
Transmission Lines - Right-of-Ways		Higher	1
Transportation - Freeways/State Highways/Other Heavy Use Roads		Higher	1
Transportation - Railroads		Higher	1
Transportation - Right-Of-Ways - Herbicide Use Areas		Moderate	0
Transportation - River Traffic - Heavy		Lower	0
Transportation - Stream Crossing - Perennial		Higher	1
UST - Confirmed Leaking Tanks - DEQ List		Higher	0
UST - Decommissioned/Inactive		Lower	0
UST - Nonregulated Tanks (< 1,100 gals or Large Heating Oil Tanks)		Higher	0
UST - Not Upgraded and/or Registered Tanks		Higher	0
UST - Upgraded/Registered - Active		Lower	2
UST - Status Unknown		Higher	0
Upstream Reservoirs/Dams		Lower	0
Wells/Abandoned Wells		Moderate	1
Large Capacity Septic Systems (serves > 20 people) - Class V UICs	(1)	Moderate	1
Construction/Demolition Areas		Moderate	0
Other: -DEQ Cleanup Program Site		Higher	1

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100520 MILL CITY WATER DEPARTMENT									
Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
1	Drinking Water Treatment Plants	Mill City Water Treatment Plant	North of intake	Mill City	Database (2) Field-Observation	Within sensitive area.	Moderate	Treatment chemicals and equipment maintenance materials may impact groundwater or surface water source.	
2	Transportation - Freeways/State Highways/Other Heavy Use Roads	State Highway 22	Runs west/east through DWPA	Mill City	Field-Observation	Within sensitive area.	Higher	Vehicle use increases the risk for leaks or spills of fuel & other haz. materials. Road building, maintenance & use can increase erosion/slope failure causing turbidity. Over-application or improper handling of pesticides/fertilizers may impact water.	
3	Furniture/Lumber/Parts Stores	Hoovers Supply	South of intake.	Mill City	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of hazardous chemical products and other materials in inventory during transportation, use, storage and disposal may impact the drinking water supply.	
	Junk/Scrap/Salvage Yards						Higher	Spills, leaks, or improper handling of automotive chemicals, batteries, and other waste materials during storage and disposal may impact the drinking water supply.	
	Other -DEQ Cleanup Program Site						Higher	The impacts of this potential contaminant source will be addressed during the enhanced inventory.	
4	Historic Gas Stations	Historic Gas Station	South of intake.	Mill City	Field-Observation	Within sensitive area.	Higher	Historic spills, leaks, or improper handling of solvents and petroleum products may impact the drinking water supply. Abandoned underground storage tanks may be present.	Across the street from Hoovers Supply. Appears to have been the site of a gas station. No pumps present. Potential risk should be verified during enhanced inventory.

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100520 MILL CITY WATER DEPARTMENT									
Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
5	Housing - High Density (> 1 House/0.5 acres)	High Density Housing	Mill City and Gates	Mill City	Field-Observation	Within sensitive area.	Moderate	Improper use, storage, and disposal of household chemicals may impact the drinking water supply. Stormwater run-off or infiltration may carry contaminants to drinking water supply.	
6	Sewer Lines - Close Proximity to PWS	Sewer Lines	Throughout Mill City	Mill City	Interview	Within sensitive area.	Moderate	If not properly designed, installed, and maintained, sewer lines can impact drinking water, especially adjacent to a waterbody or within the 2-year time-of-travel zone for drinking water wells.	
7	Transportation - Railroads	Railroad	Runs west/east through DWPA	Mill City	Field-Observation	Within sensitive area.	Higher	Rail transport elevates the risk for leaks/spills of fuel & other haz. materials. Installation/maintenance of tracks may increase erosion & slope failure causing turbidity. Over-application/improper handling of pesticides may impact the water supply.	
8	Fire Station	Mill City Fire House	South of intake	Mill City	Field-Observation	Within sensitive area.	Lower	Spills, leaks, or improper handling of chemicals and other materials during transportation, use, storage and disposal may impact the drinking water supply.	
9	Automobiles - Gas Stations	Mill City Texaco	Northeast of intake	Mill City	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of fuels and other materials during transportation, transfer, and storage may impact the drinking water supply.	
	Lower						Spills or improper handling during tank filling or product distribution may impact the drinking water supply.		

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100520 MILL CITY WATER DEPARTMENT									
Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
10	Automobiles - Gas Stations	Mill City Chevron Service	Northeast of intake	Mill City	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of fuels and other materials during transportation, transfer, and storage may impact the drinking water supply.	
	UST - Upgraded/Registered - Active						Lower	Spills or improper handling during tank filling or product distribution may impact the drinking water supply.	
11	Wastewater Treatment Plants/Collection Stations	Mill City Sewage Treatment Plant	East of intake	Mill City	Database (2) Field-Observation	Within sensitive area.	Higher	Improper management of wastewater, treatment chemicals, or equipment maintenance materials may impact drinking water supply.	
12	Transmission Lines - Right-of-Ways	Transmission Lines	Throughout DWPA	Mill City	Field-Observation	Within sensitive area.	Higher	Construction and corridor maintenance may contribute to increased erosion and turbidity in drinking water supply. Over-application or improper handling of pesticides or fertilizers may impact drinking water supply.	
13	Wells/Abandoned Wells	Rural Homestead on septic	Southern portion of DWPA.	Mill City	Field-Observation	Within sensitive area.	Moderate	Improperly installed or maintained wells and abandoned wells may provide a direct conduit for contamination to groundwater and drinking water source.	
	Homesteads - Rural - Septic Systems (< 1/acre)						Lower	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water. Use of drain cleaners and dumping household hazardous wastes can result in groundwater contamination.	
14	Cemeteries - Pre-1945	Fairview Cemetery	Southeast of intake	Mill City	Field-Observation	Within sensitive area.	Lower	Embalming fluids (for example, arsenic) and decomposition by-products may impact drinking water supply.	Unsure of the age of the cemetery. Verify

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100520 MILL CITY WATER DEPARTMENT

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
15	Crops - Nonirrigated (inc. Christmas trees, grains, grass seed, pasture)	Non-irrigated crops	Southern portion of DWPA	Mill City	Field-Observation	Within sensitive area.	Lower	Over-application or improper handling of pesticides/fertilizers may impact drinking water. Some agricultural practices may result in excess sediments discharging to surface waters, but non-irrigated crops are generally considered to be a low risk.	
16	Grazing Animals (> 5 large animals or equivalent/acre)	Grazing Animals	Southern portion of DWPA	Mill City		Within sensitive area.	Higher	Improper storage and management of animal wastes may impact drinking water supply. Concentrated livestock may contribute to erosion and sedimentation of surface water bodies.	
17	Mines/Gravel Pits	Stayton Rock Products	Southeast of intake	Gates	Field-Observation	Within sensitive area.	Higher	Spills, leaks, or improper handling of chemicals and wastes generated in mining operations or from heavy equipment may impact the drinking water supply.	
18	Large Capacity Septic Systems (serves > 20 people) - Class V UICs	Gates Elementary School	Southeast of intake	Gates	Database (2) Field-Observation	Within sensitive area.	Moderate	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water.	
	Schools						Moderate	Over-application or improper handling of cleaning products, pesticides or fertilizers used on the school grounds may impact drinking water. Vehicle maintenance wastes may contribute contaminants.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100520 MILL CITY WATER DEPARTMENT

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
19	Above Ground Storage Tanks - Excluding Water	Keylock Gas Station	East of intake- Hwy 22	Gates	Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	Appears to be above ground tanks only.
	Automobiles - Gas Stations						Moderate	Spills, leaks, or improper handling of fuels and other materials during transportation, transfer, and storage may impact the drinking water supply.	Appears to be above ground tanks only.
20	Junk/Scrap/Salvage Yards	Junk/Scrap/Salvage	East of intake- Off Hwy 22	Gates	Field-Observation	Within sensitive area.	Higher	Spills, leaks, or improper handling of automotive chemicals, batteries, and other waste materials during storage and disposal may impact the drinking water supply.	Located at a residence.
21	Historic Gas Stations	Auto Repair Shop	East of intake- Frontier Dr and Hwy22	Gates	Field-Observation	Within sensitive area.	Higher	Historic spills, leaks, or improper handling of solvents and petroleum products may impact the drinking water supply. Abandoned underground storage tanks may be present.	Potential risk should be verified during enhanced inventory. Very old building that looks abandoned. No pumps observed. Verify
	Automobiles - Repair Shops						Moderate	Spills, leaks, or improper handling of automotive fluids, solvents, and repair materials during transportation, use, storage and disposal may impact the drinking water supply.	Potential risk should be verified during enhanced inventory. Very old building that looks abandoned. No pumps observed. Verify

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100520 MILL CITY WATER DEPARTMENT									
Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
22	Automobiles - Repair Shops	Gates Garage	East of intake- On Hwy 22	Gates	Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of automotive fluids, solvents, and repair materials during transportation, use, storage and disposal may impact the drinking water supply.	Potential risk should be verified during enhanced inventory. Very old building that looks abandoned. No pumps observed.
	Historic Gas Stations						Higher	Historic spills, leaks, or improper handling of solvents and petroleum products may impact the drinking water supply. Abandoned underground storage tanks may be present.	Potential risk should be verified during enhanced inventory. Very old building that looks abandoned. No pumps observed.
23	Managed Forest Land - Broadcast Fertilized Areas	Clear Cuts	Throughout DWPA	Mill City	Field-Observation	Within sensitive area.	Moderate	Over-application or improper handling of pesticides or fertilizers may impact the drinking water source.	State forestlands and private landowners may broadcast fertilize their lands. Verify
	Managed Forest Land - Clearcut Harvest (< 35 yrs.)						Higher	Cutting and yarding of trees may contribute to increased erosion, resulting in turbidity and chemical changes in drinking water supply. Over-application or improper handling of pesticides or fertilizers may impact drinking water source.	State forestlands and private landowners may broadcast fertilize their lands. Verify
24	Managed Forest Land - Road Density (> 2 mi./sq. mi.)	Road Density	Throughout DWPA	Mill City	Field-Observation	Within sensitive area.	Higher	Road building, maintenance, and usage may contribute to erosion and slope failure causing turbidity in drinking water supply. Vehicle usage increases the risks of leaks or spills of petroleum products and other hazardous materials.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100520 MILL CITY WATER DEPARTMENT

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
25	Transportation - Stream Crossing - Perennial	Stream Crossings	Throughout DWPA	Mill City	Field-Observation	Within sensitive area.	Higher	Road building, maintenance & use may increase erosion & slope failure causing turbidity. Vehicle use increases the risk of leaks or spills of fuel & other chemicals. Over-application/improper handling of pesticides in right-of-way may also impact water.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 3. RESULTS OF REGULATORY DATABASE SEARCH

PWS# 4100520 MILL CITY WATER DEPARTMENT

Reference No. (1)	Name	Database Listings (2)
1	Mill City Water Treatment Plant	SIS list with a GEN02 NPDES permit for filter backwash. SFM - Calcium Hypochlorite Tablets stored in Plastic Or Non-metallic Drum SFM - Aluminum Sulfate stored in Aboveground Tank
3	Hoovers Supply	ECSI site with suspected contamination.
9	Mill City Texaco	UST list with a status of 5 UST(s) upgraded and 0 not upgraded to DEQ 1998 technical standards. SFM - Gasoline stored in Underground Tank SFM - Diesel Fuel stored in Underground Tank LUST list with unknown status
10	Mill City Chevron Service	UST list with a status of 4 UST(s) upgraded and 0 not upgraded to DEQ 1998 technical standards. SFM - Gasoline stored in Underground Tank
11	Mill City Sewage Treatment Plant	SIS list with a individual WPCF permit for an on-site system.
18	Gates Elementary School	UST list-PWS needs to verify tank permit status SFM - Heating Oil stored in Underground Tank

Notes: (1) See Table 2 and Figure. (2) For State Fire Marshals (SFM) list, information on materials in a gaseous-form is not presented since gaseous compounds rarely pose a threat to groundwater or surface water.

Attachment A

Source Water Assessment Report
Mill City Water Department
PWS # 4100520

Attachment A. Source Water Assessment Summary Brochure

SOURCE WATER ASSESSMENT SUMMARY BROCHURE

MILL CITY WATER DEPARTMENT PWS # 4100520

WHAT IS A SOURCE WATER ASSESSMENT?

The Source Water Assessment was recently completed by the Department of Environmental Quality (DEQ) and the Oregon Health Division (OHD) to identify the surface areas (and/or subsurface areas) that supply water to Mill City Water Department's (Mill City's) public water system intake and to inventory the potential contaminant sources that may impact the water supply.

WHY WAS IT COMPLETED?

The Source Water Assessment was completed to provide information so that Mill City's public water system staff/operator, consumers, and community citizens can begin developing strategies to protect the source of their drinking water, and to minimize future public expenditures for drinking water treatment. The assessment was prepared under the requirements and guidelines of the Federal Safe Drinking Water Act (SDWA).

WHAT AREAS ARE INCLUDED IN MILL CITY'S DRINKING WATER PROTECTION AREA?

The drinking water for Mill City Water Department is supplied by an intake on the North Santiam River. This public water system serves approximately 1,800 citizens. The intake is located in the Middle North Santiam River Watershed in the North Santiam Sub-Basin of the Willamette Basin. The drinking water intake for the City of Gates and Detroit Water System public water system is also located on the North Santiam River upstream of the Mill City intake. This source water assessment addresses the geographic area providing water to Mill City's intake (Mill City's portion of the drinking water protection area) between Mill City's intake and the upstream intake for City of Gates and Detroit Water System. In addition, there are four drinking water intakes on the North Santiam River downstream of Mill City's intake including the intake for the Lyons Mehama

Water District, Salem Public Works, Stayton Water Supply, and the City of Jefferson. Activities and impacts in the Mill City drinking water protection area have the potential to also impact downstream users.

The geographic area providing water to Mill City's intake (Mill City's portion of the drinking water protection area) extends upstream approximately 68 miles in a easterly direction and encompasses a total area of 30 square miles. The boundaries of Mill City's portion of the Drinking Water Protection Area are illustrated on the figure attached to this summary.

WHAT ARE THE POTENTIAL SOURCES OF CONTAMINATION TO MILL CITY'S PUBLIC DRINKING WATER SUPPLY?

The primary intent of this inventory was to identify and locate significant potential sources of contaminants of concern. The delineated drinking water protection area is primarily dominated by managed forest lands. The potential contaminant sources identified in the watershed include clear cuts, high road density areas, stream crossings, non-irrigated crops, grazing animals, current and historic gas stations, three transportation corridors, a salvage yard, auto parts store, rock quarry, water treatment plant, sewage treatment plant, sewer lines, high density housing, rural homesteads, a school, a cemetery, and a fire station. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the water quality in the watershed.

WHAT ARE THE RISKS FOR OUR SYSTEM?

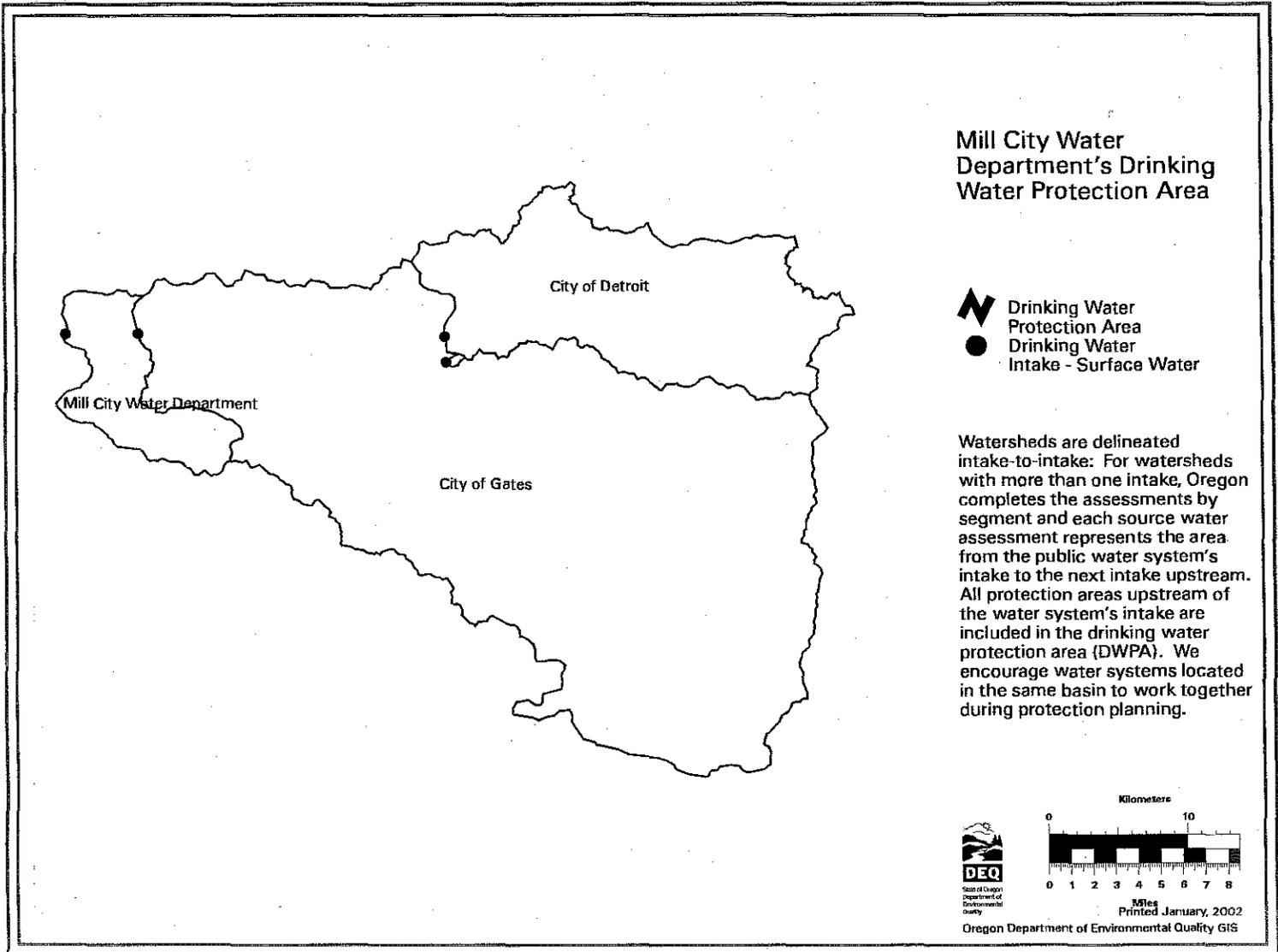
A total of 25 potential contaminant sources were identified in Mill City's drinking water protection area. All of these are located in the sensitive areas and 22 are high- to moderate-risk sources within "sensitive areas". The sensitive areas within the Mill City drinking water protection area include areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply. The information in this

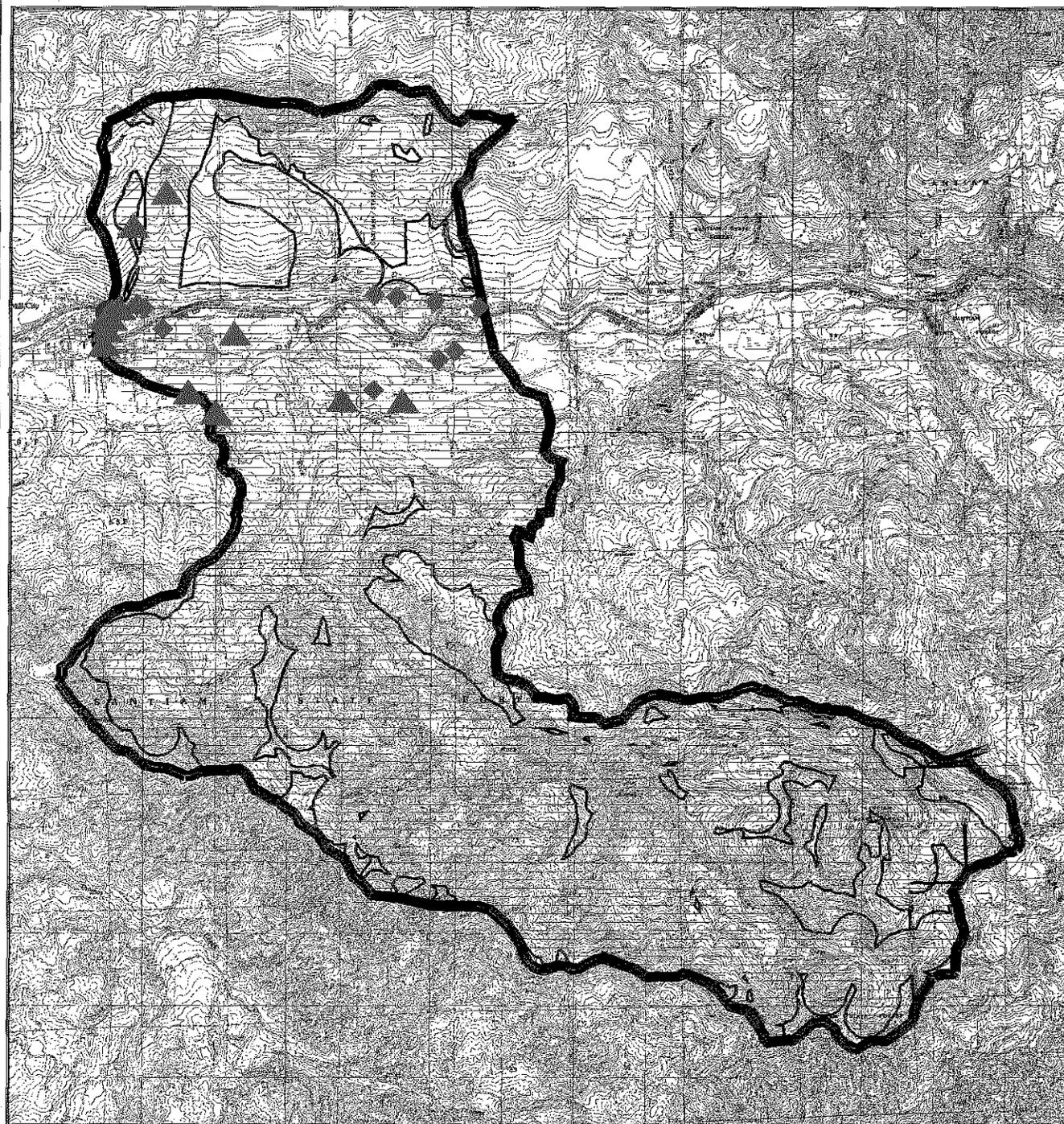
assessment provides a basis for prioritizing areas in and around our community that are most vulnerable to potential impacts and can be used by the Mill City community to develop a voluntary Drinking Water Protection Plan.

NEED MORE INFORMATION?

Mill City's Source Water Assessment Report provides additional details on the methodology and results of this assessment. The full report is available for review at:

Contact City staff if you would like additional information on Mill City's Source Water Assessment results.





Source Water Assessment Results

Mill City Water Department's Drinking Water Protection Area with Sensitive Areas and Potential Contamination Sources

PWS 4100520

-  Drinking Water Protection Area
-  Drinking Water Intake - Surface Water
-  Sensitive Areas

-  Area Feature (see Note 2)
-  Point Feature (see Note 2)

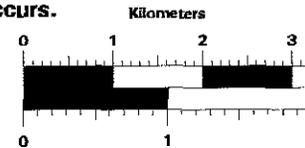
Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are used and managed properly.

Note 2: Feature identification markers correspond to the potential contaminant source numbers in the SWA Report. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.



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Attachment B

Source Water Assessment Report Mill City Water Department PWS # 4100520

Attachment B. Summary of Source Water Assessment Results for Upstream Intakes

Figure – North Santiam Sub-Basin Drinking Water Protection Areas (includes all water providers in the North Santiam River Watershed)

Figure – Mill City Water Department's Protection Area (includes upstream water providers)

City of Gates (PWS #4100317)

Executive Summary

Figures

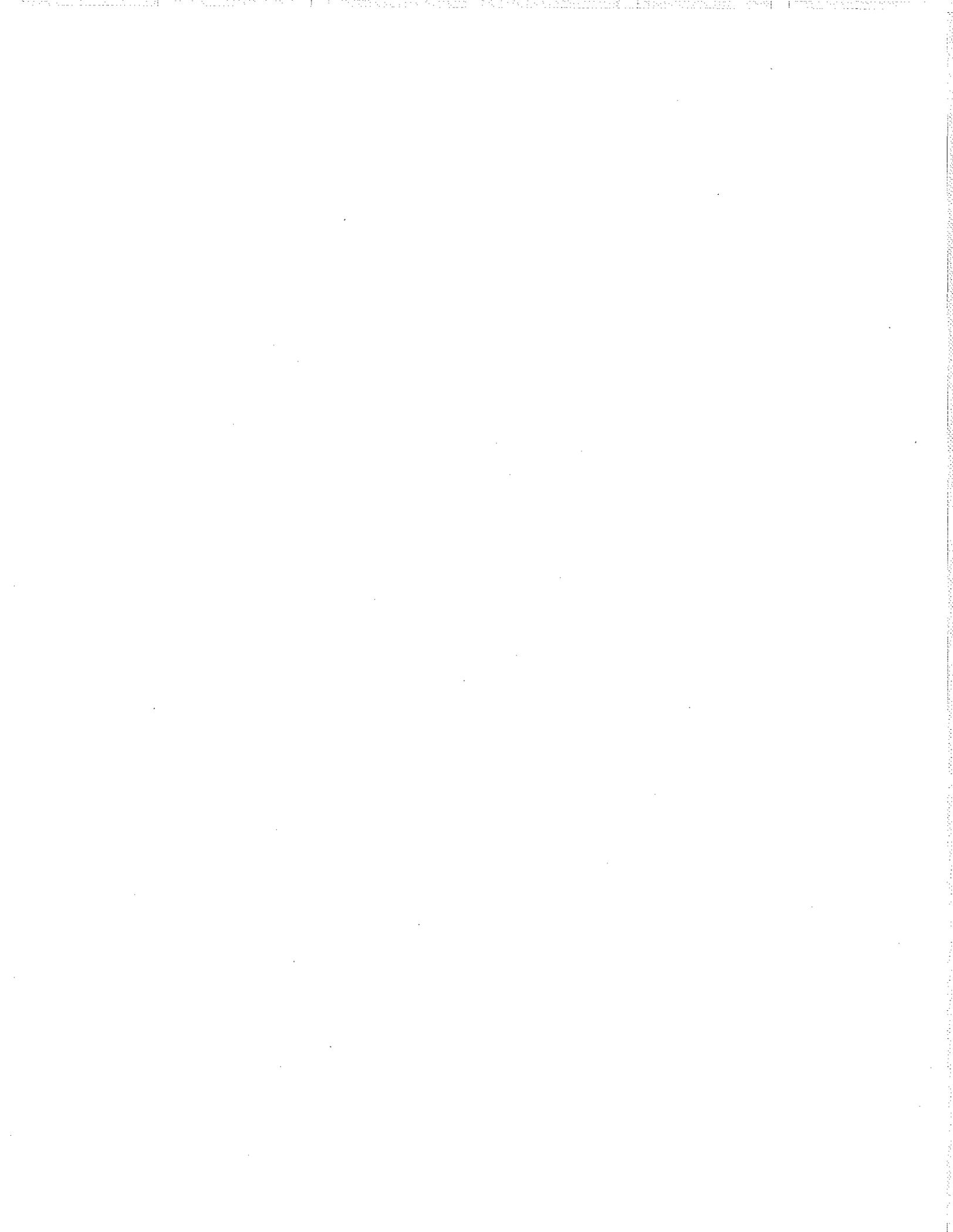
Tables

Detroit Water System (PWS #4100257)

Executive Summary

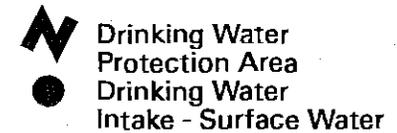
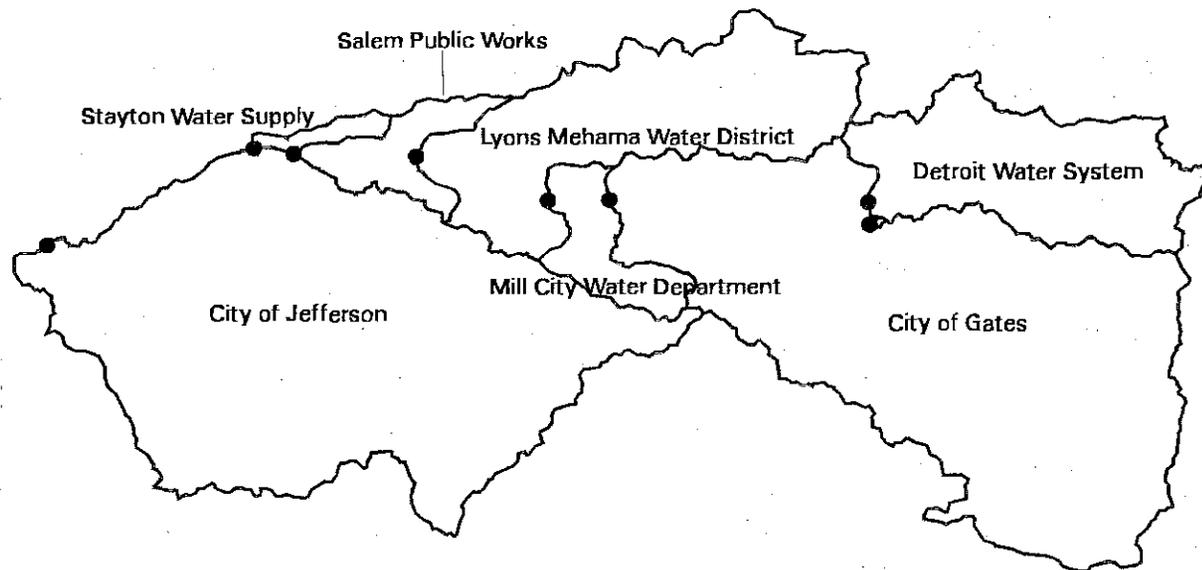
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Tables

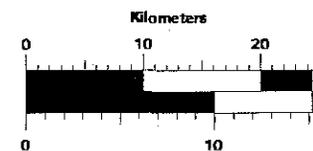


Attachment B

North Santiam Subbasin Drinking Water Protection Areas



Watersheds are delineated intake-to-intake: For watersheds with more than one intake, Oregon completes the assessments by segment and each source water assessment represents the area from the public water system's intake to the next intake upstream. All protection areas upstream of the water system's intake are included in the drinking water protection area (DWPA). We encourage water systems located in the same basin to work together during protection planning.

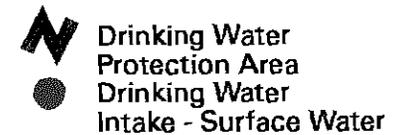
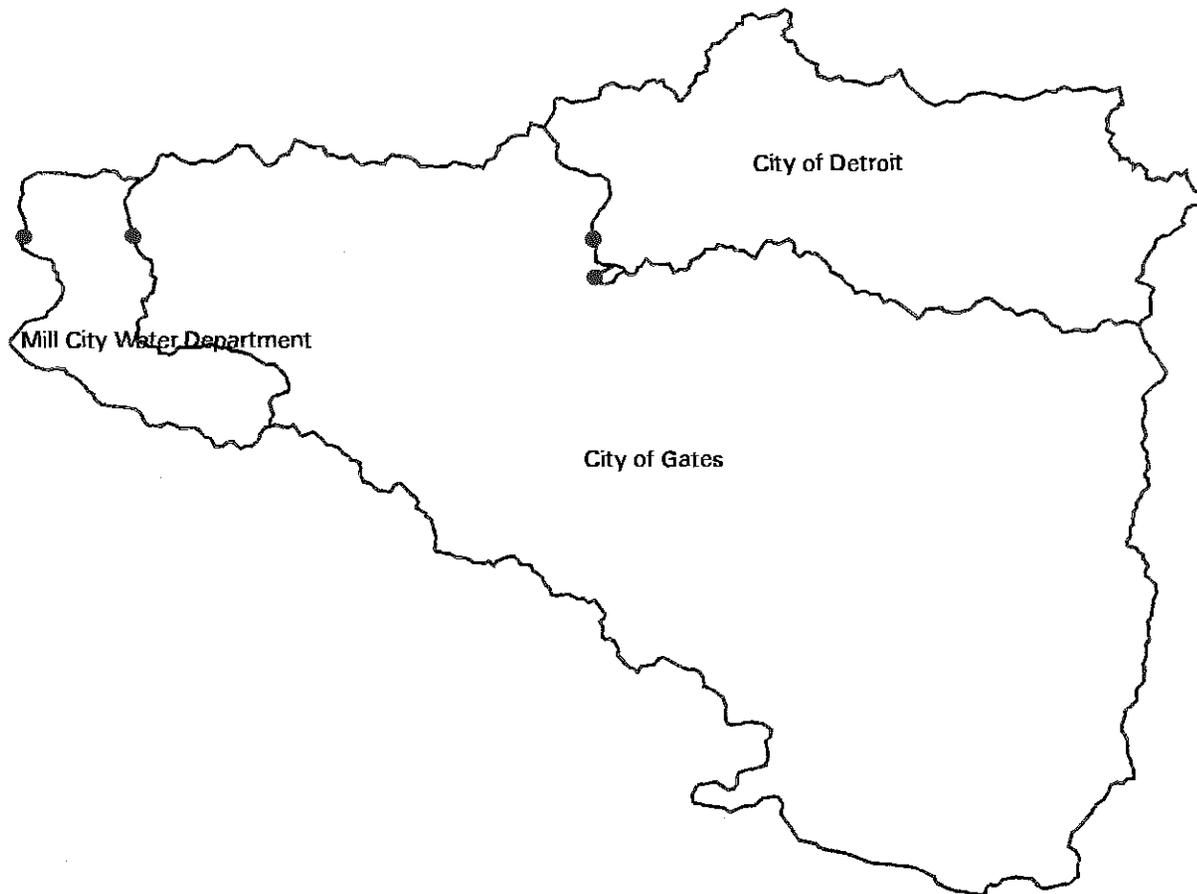


Printed December, 2001

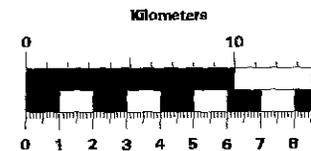
Oregon Department of Environmental Quality GIS

Attachment B

Mill City Water Department's Drinking Water Protection Area



Watersheds are delineated intake-to-intake: For watersheds with more than one intake, Oregon completes the assessments by segment and each source water assessment represents the area from the public water system's intake to the next intake upstream. All protection areas upstream of the water system's intake are included in the drinking water protection area (DWPA). We encourage water systems located in the same basin to work together during protection planning.



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Summary of Source Water Assessment Results for Upstream Intakes

City of Gates (PWS #4100317)

Executive Summary

Figures

Figure 1. City of Gates' Drinking Water Protection Area

Figure 2. Sensitive Areas within City of Gates' Drinking Water Protection Area

Figure 3. Source Water Assessment Results –
City of Gates' Drinking Water Protection Area with
Sensitive Areas and Potential Contamination Sources

Tables

Table 1. Summary of Potential Contaminant Sources by Land Use

Table 2. Inventory Results- List of Potential Contaminant Sources

Table 3. Results of Regulatory Database Search

Executive Summary

The drinking water for City of Gates is supplied by an intake on the North Santiam River. This public water system serves approximately 535 citizens. The intake is located in the Middle North Santiam River/Detroit Reservoir-Blow Out Divide Creek/Upper North Santiam River/North Fork Breitenbush River Watersheds in the North Santiam Sub-Basin of the Willamette Basin. The drinking water intake for the Detroit Water System public water system is also located on the North Santiam River upstream of the Gates intake. This source water assessment addresses the geographic area providing water to Gates' intake (Gates' portion of the drinking water protection area) between Gates' intake and the upstream intake for Detroit Water System. Information on Gates' protection area upstream of the Detroit Water System intake is presented in the Source Water Assessment for that public water system and is summarized in this report. In addition, there are five drinking water intakes on the North Santiam River downstream of Gates' intake including the intakes for the Mill City Water Department, Lyons Mehama Water District, Salem Public Works, Stayton Water Supply, and the City of Jefferson. Activities and impacts in the Gates drinking water protection area have the potential to also impact downstream users.

The geographic area providing water to Gates' intake (Gates' portion of the drinking water protection area) extends upstream approximately 703 miles in an easterly direction and encompasses a total area of 377 square miles. Included in this area are a number of tributaries to the main stem, including tributaries to Detroit Lake (Kinney Creek, Box Canyon Creek, Blowout Creek, and the North Santiam River), Sevenmile Creek and Mad Creek. The protection area within an 8-hour travel time from the intake extends approximately 12.6 miles upstream of the Gates intake. The North Santiam River intake is located at an approximate elevation of 900 feet and the upper edge of the watershed is located at an elevation of approximately 10,500 feet at Mt. Jefferson.

An inventory of potential contamination sources was performed within Gates' drinking water protection area. The primary intent of this inventory was to identify and locate significant potential sources of contaminants of concern. The inventory was conducted by reviewing applicable state and federal regulatory databases and land use maps, interviewing persons knowledgeable of the area, and conducting a windshield survey by driving through the drinking water protection area to field locate and verify as many of the potential contaminant source activities as possible. The primary contaminants of concern for surface water intakes are sediments/turbidity, microbiological, and nutrients. It is important to remember that the sites and areas identified are only potential sources of contamination to the drinking water, and water quality impacts are not likely to occur when contaminants are used and managed properly.

The delineated drinking water protection area is primarily dominated by managed forestlands. A total of thirty-one (31) potential contamination sources were identified within Gates' portion of the drinking water protection area. All of those are located in the sensitive areas. The potential contaminant sources identified in the watershed that relate to agricultural/forest management and recreation include non-irrigated crops, grazing animals, clear cuts, road density, stream crossings, historic mass movement, marinas, and areas of high recreational uses. Potential contaminant sources related to commercial and residential land uses include a water treatment plant, high density housing, rural homesteads, three gas stations, warehouse, dams, two maintenance shops, substation, Forest Service Station, Forest Service Work center, proposed sewer treatment plant, elementary/high school, junk/scrap/salvage, metal fabrication, log hauling, historic mill sites, rock quarries, and a fish hatchery. In addition three transportation

corridors were also identified as potential contaminant sources. The potential contaminant sources within the drinking water protection area all pose a relatively higher to moderate risk to the drinking water supply with the exception of the non-irrigated crops which presents a lower risk. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the water quality in the watershed.

The susceptibility analysis combines the results of the locations of the potential contaminant sources with the locations of the sensitive areas. Overlaying the locations of the moderate- to high-risk sources within the sensitive areas provides an indication of the areas that are highly susceptible to contamination. In the Gates portion of the watershed, the results of the susceptibility "analysis" include the distribution of thirty (30) identified high- to moderate-risk sources within the areas of highly permeable soils, high erosional soils, high runoff potential soils, and within the 1000' setback from the streams. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection.

Figures

Source Water Assessment Report City of Gates PWS # 4100317

Figure 1. City of Gates' Drinking Water Protection Area

Figure 2. Sensitive Areas within City of Gates' Drinking Water Protection Area

**Figure 3. Source Water Assessment Results
City of Gates' Drinking Water Protection Area with
Sensitive Areas and Potential Contamination Sources**

Tables

Source Water Assessment Report City of Gates PWS # 4100317 Inventory Results

Table 1. Summary of Potential Contaminant Sources by Land Use

Table 2. Inventory Results – List of Potential Contaminant Sources

Table 3. Results of Regulatory Database Search

Notes for Tables

- Sites and areas identified in Tables 1 and 2 are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
- Total number of sources listed in Table 1 in the DWPA may not add up to the total number of potential contaminant sources in Table 2 because more than one type of potential contaminant source may be present at any given facility.
- The data was collected by Rachel Burr, DEQ's Western Region Office, on September 4, 2001.

Acronyms

AST - Aboveground Storage Tank
DC - DEQ's Drycleaner database
DEQ - Oregon Department of Environmental Quality
DWPA - Drinking Water Protection Area
ECSI - DEQ's Environmental Cleanup Site Information database
HWIMSY - DEQ's Hazardous Waste Information Management System database
LUST - DEQ's Leaking Underground Storage Tank database
NPDES - National Pollution Discharge Elimination System
PCS - Potential Contaminant Source
PWS - Public Water System
SFM - State Fire Marshall's database of hazardous materials
SIS - DEQ's Source Information System database (includes WPCF and NPDES permits)
SWMS - DEQ's Solid Waste Management System database
UST - DEQ's Underground Storage Tank database or Underground Storage Tank
WPCF - Water Pollution Control Facility
WRD - Oregon Water Resources Division database for water rights information system

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

**PWS # 4100317 GATES, CITY OF
Residential/Municipal Land Uses**

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Airport - Maintenance/Fueling Area		Higher	0
Apartments and Condominiums		Lower	0
Campgrounds/RV Parks	(1)	Moderate	1
Cemeteries - Pre-1945		Moderate	0
Drinking Water Treatment Plants		Moderate	1
Fire Station		Lower	0
Fire Training Facilities		Moderate	0
Golf Courses		Moderate	0
Housing - High Density (> 1 House/0.5 acres)		Moderate	1
Landfill/Dumps	(1)	Higher	1
Lawn Care - Highly Maintained Areas		Moderate	0
Motor Pools		Moderate	0
Parks		Moderate	1
Railroad Yards/Maintenance/Fueling Areas		Higher	0
Schools		Moderate	1
Septic Systems - High Density (> 1 system/acre)	(1)	Moderate	1
Sewer Lines - Close Proximity to PWS	(1)	Higher	0
Utility Stations - Maintenance Transformer Storage		Higher	1
Waste Transfer/Recycling Stations	(1)	Moderate	0
Wastewater Treatment Plants/Collection Stations	(1)	Moderate	0
Other: -Fish Hatchery		Moderate	1
Other: -Future Land Development		Moderate	1

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

**PWS # 4100317 GATES, CITY OF
Commercial/Industrial Land Uses**

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Automobiles - Body Shops		Higher	0
Automobiles - Car Washes		Moderate	0
Automobiles - Gas Stations		Moderate	3
Automobiles - Repair Shops		Higher	0
Boat Services/Repair/Refinishing		Higher	0
Cement/Concrete Plants		Moderate	0
Chemical/Petroleum Processing/Storage		Higher	0
Dry Cleaners		Higher	0
Electrical/Electronic Manufacturing		Higher	0
Fleet/Trucking/Bus Terminals		Higher	0
Food Processing		Moderate	0
Furniture/Lumber/Parts Stores		Moderate	0
Home Manufacturing		Higher	0
Junk/Scrap/Salvage Yards		Higher	1
Machine Shops		Higher	0
Medical/Vet Offices	(1)	Moderate	0
Metal Plating/Finishing/Fabrication		Higher	1
Mines/Gravel Pits		Higher	1
Office Buildings/Complexes		Lower	1
Parking Lots/Malls (> 50 Spaces)		Higher	0
Photo Processing/Printing		Higher	0
Plastics/Synthetics Producer		Higher	0
Research Laboratories		Higher	0
RV/Mini Storage		Lower	0
Wood Preserving/Treating		Higher	0
Wood/Pulp/Paper Processing and Mills		Higher	1
Other: --Warehouse		Moderate	1
Other: -Fire Warehouse		Moderate	1
Other: -Logging equipment/hauling		Moderate	1
Other: -Maintenance shop/warehouse		Moderate	1
Other: -ODOT Highway Department Facility		Moderate	1

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100317 GATES, CITY OF

Agricultural/Forest Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Auction Lots	(1)	Higher	0
Boarding Stables	(1)	Moderate	0
Confined Animal Feeding Operations (CAFOs)	(1)	Higher	0
Crops - Irrigated (inc. orchards, vineyards, nurseries, greenhouses)	(2)	Moderate	0
Crops - Nonirrigated (inc. Christmas trees, grains, grass seed, pasture)		Lower	1
Farm Machinery Repair		Higher	0
Grazing Animals (> 5 large animals or equivalent/acre)	(1)	Higher	1
Lagoons/Liquid Wastes	(1)	Higher	0
Land Application Sites	(1)	Moderate	0
Managed Forest Land - Broadcast Fertilized Areas		Lower	0
Managed Forest Land - Clearcut Harvest (< 35 yrs.)		Higher	1
Managed Forest Land - Partial Harvest (< 10 yrs.)		Moderate	0
Managed Forest Land - Road Density (> 2 mi./sq. mi.)		Higher	1
Pesticide/Fertilizer/Petroleum Storage, Handling, Mixing, & Cleaning Ar		Higher	0
Recent Burn Areas (< 10 yrs.)		Lower	0
Managed Forest Lands - Status Unknown		Moderate	0
Other: -Slide Area		Higher	1

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

**PWS # 4100317 GATES, CITY OF
Miscellaneous Land Uses**

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Above Ground Storage Tanks - Excluding Water		Moderate	5
Channel Alterations - Heavy		Lower	0
Combined Sewer Outfalls	(1)	Lower	0
Stormwater Outfalls	(1)	Lower	0
Composting Facilities	(1)	Moderate	0
Historic Gas Stations		Higher	0
Historic Waste Dumps/Landfills	(1)	Higher	0
Homesteads - Rural - Machine Shops/Equipment Maintenance		Higher	0
Homesteads - Rural - Septic Systems (< 1/acre)	(1)(3)	Lower	1
Injection/Dry Wells, Sumps - Class V UICs	(1)	Higher	0
Kennels (> 20 Pens)	(1)	Lower	0
Military Installations		Higher	0
Random Dump Sites		Moderate	0
River Recreation - Heavy Use (inc. campgrounds)	(1)	Moderate	1
Sludge Disposal Areas	(1)	Moderate	0
Stormwater Retention Basins	(1)	Moderate	0
Transmission Lines - Right-of-Ways		Higher	1
Transportation - Freeways/State Highways/Other Heavy Use Roads		Higher	1
Transportation - Railroads		Moderate	0
Transportation - Right-Of-Ways - Herbicide Use Areas		Moderate	0
Transportation - River Traffic - Heavy		Higher	1
Transportation - Stream Crossing - Perennial		Higher	1
UST - Confirmed Leaking Tanks - DEQ List		Higher	0
UST - Decommissioned/Inactive		Lower	0
UST - Nonregulated Tanks (< 1,100 gals or Large Heating Oil Tanks)		Moderate	1
UST - Not Upgraded and/or Registered Tanks		Higher	0
UST - Upgraded/Registered - Active		Lower	3
UST - Status Unknown		Moderate	3
Upstream Reservoirs/Dams		Moderate	1
Wells/Abandoned Wells		Moderate	3
Large Capacity Septic Systems (serves > 20 people) - Class V UICs	(1)	Moderate	3
Construction/Demolition Areas		Moderate	0
Other: -DEQ Cleanup Program Site		Higher	1
Other: -Marinas'		Higher	1

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100317 GATES, CITY OF									
Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
1	Drinking Water Treatment Plants	Gates Water Treatment Plant	Directly North of intake	Gates	Database (2) Field-Observation	Within sensitive area.	Moderate	Treatment chemicals and equipment maintenance materials may impact groundwater or surface water source.	
2	Housing - High Density (> 1 House/0.5 acres)	High Density Housing	Throughout Gates and Detroit	Gates	Field-Observation	Within sensitive area.	Moderate	Improper use, storage, and disposal of household chemicals may impact the drinking water supply. Stormwater run-off or infiltration may carry contaminants to drinking water supply.	
	Septic Systems - High Density (> 1 system/acre)						Moderate	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water. Cumulative effects of multiple systems in an area may impact drinking water supply.	
3	Transportation - Freeways/State Highways/Other Heavy Use Roads	State Highway 22	Runs west/east through DWPA	Gates	Field-Observation	Within sensitive area.	Higher	Vehicle use increases the risk for leaks or spills of fuel & other haz. materials. Road building, maintenance & use can increase erosion/slope failure causing turbidity. Over-application or improper handling of pesticides/fertilizers may impact water.	
4	Transmission Lines - Right-of-Ways	Transmission Lines	Throughout DWPA	Gates	Field-Observation	Within sensitive area.	Higher	Construction and corridor maintenance may contribute to increased erosion and turbidity in drinking water supply. Over-application or improper handling of pesticides or fertilizers may impact drinking water supply.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100317 GATES, CITY OF									
Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
5	Homesteads - Rural - Septic Systems (< 1/acre)	Rural Homesteads/septic	Throughout DWPA	Gates	Field-Observation	Within sensitive area.	Lower	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water. Use of drain cleaners and dumping household hazardous wastes can result in groundwater contamination.	
	Wells/Abandoned Wells						Moderate	Improperly installed or maintained wells and abandoned wells may provide a direct conduit for contamination to groundwater and drinking water source.	
6	Crops - Nonirrigated (inc. Christmas trees, grains, grass seed, pasture)	Non-irrigated crops	Throughout southwest portion of DWPA	Gates	Field-Observation	Within sensitive area.	Lower	Over-application or improper handling of pesticides/fertilizers may impact drinking water. Some agricultural practices may result in excess sediments discharging to surface waters, but non-irrigated crops are generally considered to be a low risk.	
7	Grazing Animals (> 5 large animals or equivalent/acre)	Grazing Animals	Throughout southwest portion of DWPA	Gates	Field-Observation	Within sensitive area.	Higher	Improper storage and management of animal wastes may impact drinking water supply. Concentrated livestock may contribute to erosion and sedimentation of surface water bodies.	
8	Managed Forest Land - Clearcut Harvest (< 35 yrs.)	Clear cuts	Throughout DWPA	Gates	Field-Observation	Within sensitive area.	Higher	Cutting and yarding of trees may contribute to increased erosion, resulting in turbidity and chemical changes in drinking water supply. Over-application or improper handling of pesticides or fertilizers may impact drinking water source.	
9	Managed Forest Land - Road Density (> 2 mi./sq. mi.)	Road Density	Throughout DWPA	Gates	Field-Observation	Within sensitive area.	Higher	Road building, maintenance, and usage may contribute to erosion and slope failure causing turbidity in drinking water supply. Vehicle usage increases the risks of leaks or spills of petroleum products and other hazardous materials.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
PWS# 4100317 GATES, CITY OF									
10	Transportation - Stream Crossing - Perennial	Stream Crossings	Throughout DWPA	Gates	Field-Observation	Within sensitive area.	Higher	Road building, maintenance & use may increase erosion & slope failure causing turbidity. Vehicle use increases the risk of leaks or spills of fuel & other chemicals. Over-application/improper handling of pesticides in right-of-way may also impact water.	
11	Other --Warehouse	Warehouse	Across from Green Mt. Road	Gates	Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of chemicals and other materials during transportation, use, storage, and disposal may impact the drinking water supply.	Two above ground storage tanks. Unknown operations - needs verification.
	Above Ground Storage Tanks - Excluding Water						Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	Two above ground storage tanks. Unknown operations - needs verification.
12	Above Ground Storage Tanks - Excluding Water	Little Sweden Service Station	Approx 1 mile west of Big Cliff Dam	Gates	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	
	Automobiles - Gas Stations						Moderate	Spills, leaks, or improper handling of fuels and other materials during transportation, transfer, and storage may impact the drinking water supply.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100317 GATES, CITY OF

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
13	Above Ground Storage Tanks - Excluding Water	Big Cliff Dam and Detroit Dam	Hwy 22. East of intake	Detroit	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	Potential risk should be verified during enhanced inventory. Used for flood control and hydro power.
	Moderate						During major storm events, reservoirs may contribute to prolonged turbidity for downstream intakes for drinking water. Construction, fluctuating water levels, and heavy waterside use can increase erosion and turbidity in reservoir/drinking water source.	Potential risk should be verified during enhanced inventory. Used for flood control and hydro power.	
	Upstream Reservoirs/Dams								

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
14	River Recreation - Heavy Use (inc. campgrounds)	Detroit Lake State Park	Along Hwy 22. East of intake	Detroit	Database (2) Field-Observation	Within sensitive area.	Moderate	Inadequate disposal of human wastes may contribute bacteria and nutrients to the drinking water supply. Heavy use may contribute to streambank erosion causing turbidity. Fuel spills and emissions may also contribute to contamination.	There are numerous parks east of Gates along Highway 22. Detroit Lake State Park is a heavy recreational use area.
	Transportation - River Traffic - Heavy						Higher	Heavy river usage may contribute to riverbank erosion and increased turbidity in drinking water supply. Fuel and other chemical leaks, spills and emissions may also contribute to drinking water contamination.	There are numerous parks east of Gates along Highway 22. Detroit Lake State Park is a heavy recreational use area.
	Large Capacity Septic Systems (serves > 20 people) - Class V UICs						Moderate	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water.	There are numerous parks east of Gates along Highway 22. Detroit Lake State Park is a heavy recreational use area.
	Campgrounds/RV Parks						Moderate	Leaks or spills of automotive fluids or improperly managed septic systems and wastewater disposal may impact drinking water supply. Heavy usage along edge of waterbody may contribute to erosion, causing turbidity.	There are numerous parks east of Gates along Highway 22. Detroit Lake State Park is a heavy recreational use area.
	Parks						Moderate	Over-application or improper handling of pesticides/fertilizers may impact drinking water. Excessive irrigation may cause transport of contaminants through runoff. Heavy use along edge of waterbody may contribute to erosion, causing turbidity.	There are numerous parks east of Gates along Highway 22. Detroit Lake State Park is a heavy recreational use area.
15	Other -Maintenance shop/warehouse	State Parks Maintenance Shop	Just east of Tumble Creek	Detroit	Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of chemicals and other materials during transportation, use, storage, and disposal may impact the drinking water supply.	There is fuel storage on site. Unsure if underground or above ground tanks. Needs verified.

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100317 GATES, CITY OF

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
16	Utility Stations - Maintenance Transformer Storage	Substation	Just east of Tumble Creek North of Hwy 22	Detroit	Field-Observation	Within sensitive area.	Higher	Spills, leaks, or improper handling of chemicals and other materials including PCBs during transportation, use, storage and disposal may impact the drinking water supply.	
17	Wells/Abandoned Wells	USFS Workcenter	Just east of Tumble Creek	Detroit	Field-Observation	Within sensitive area.	Moderate	Improperly installed or maintained wells and abandoned wells may provide a direct conduit for contamination to groundwater and drinking water source.	
	Other -Fire Warehouse						Moderate	Spills, leaks, or improper handling of chemicals and other materials during transportation, use, storage, and disposal may impact the drinking water supply.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
18	Office Buildings/Complexes	Detroit Ranger Station	East of Tumble Creek	Detroit	Database (2) Field-Observation	Within sensitive area.	Lower	Spills, leaks, or improper handling of chemicals and other materials stored and used in maintenance or from parking areas may impact the drinking water supply.	2 active/upgraded UST. 4 Decommissioned.
	UST - Upgraded/Registered - Active						Lower	Spills or improper handling during tank filling or product distribution may impact the drinking water supply.	2 active/upgraded UST. 4 Decommissioned.
	Wells/Abandoned Wells						Moderate	Improperly installed or maintained wells and abandoned wells may provide a direct conduit for contamination to groundwater and drinking water source.	2 active/upgraded UST. 4 Decommissioned.
	Large Capacity Septic Systems (serves > 20 people) - Class V UICs						Moderate	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water.	2 active/upgraded UST. 4 Decommissioned.
	Above Ground Storage Tanks - Excluding Water						Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	2 active/upgraded UST. 4 Decommissioned.
19	Automobiles - Gas Stations	Route 22 Gas-Mini Mart	Jct Hwy 22 and Hwy 46	Detroit	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of fuels and other materials during transportation, transfer, and storage may impact the drinking water supply.	4 Upgraded UST.
	UST - Upgraded/Registered - Active						Lower	Spills or improper handling during tank filling or product distribution may impact the drinking water supply.	4 Upgraded UST.

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
20	UST - Status Unknown	Detroit Lake Marina/Kanes Marina	Jct Hwy 22 and Hwy 46	Detroit	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	Kanes Marina located off Clester RD.
	Other -Marinas'						Higher	The impacts of this potential contaminant source will be addressed during the enhanced inventory.	Kanes Marina located off Clester RD.
21	Other -Future Land Development	Proposed Sewage Treatment Plant	Will be located up French Creek Rd	Detroit	Interview	Within sensitive area.	Moderate	The impacts to this potential contaminant source will be addressed during the enhanced inventory.	Contact from City of Detroit indicated that next year a sewage treatment plant will be built.
22	UST - Nonregulated Tanks (< 1,100 gals or Large Heating Oil Tanks)	Detroit Elementary/High School	Santiam Ave	Detroit	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	
	Large Capacity Septic Systems (serves > 20 people) - Class V UICs						Moderate	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water.	
	Schools						Moderate	Over-application or improper handling of cleaning products, pesticides or fertilizers used on the school grounds may impact drinking water. Vehicle maintenance wastes may contribute contaminants.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
23	Automobiles - Gas Stations	Pacific Pride Commercial Refueling	Across from Blowout Rd	Idanha	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of fuels and other materials during transportation, transfer, and storage may impact the drinking water supply.	May be also known as Idanha Cardlock. 4 upgraded UST.
	UST - Upgraded/Registered - Active						Lower	Spills or improper handling during tank filling or product distribution may impact the drinking water supply.	May be also known as Idanha Cardlock. 4 upgraded UST.
24	Above Ground Storage Tanks - Excluding Water	ODOT Maintenance Station	Just east of Boulder Creek	Idanha	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	Location of other ODOT facility is base on database search. Facility is located at MP 65 and is a gravel storage area. PCS location based on regulatory database search - needs verification.
	UST - Status Unknown						Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	Location of other ODOT facility is base on database search. Facility is located at MP 65 and is a gravel storage area. PCS location based on regulatory database search - needs verification.
	Other -ODOT Highway Department Facility						Moderate	Spills, leaks, or improper handling of chemicals and other materials during transportation, use, storage, and disposal may impact the drinking water supply.	Location of other ODOT facility is base on database search. Facility is located at MP 65 and is a gravel storage area. PCS location based on regulatory database search - needs verification.

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
25	Other -Slide Area	Historic Mass Movement	Blowout Creek Drainage	Idanha	Database (2) Field-Observation	Within sensitive area.	Higher	The impacts of this potential contaminant source will be addressed during the enhanced inventory.	According to a USFS contact the Blowout Creek Drainage is characterized by fine clay soils that have high erosion potential.
26	Junk/Scrap/Salvage Yards	Junk/Scrap/Salvage	Just east of Boulder Creek. Off Hwy22	Idanha	Database (2) Field-Observation	Within sensitive area.	Higher	Spills, leaks, or improper handling of automotive chemicals, batteries, and other waste materials during storage and disposal may impact the drinking water supply.	Located at a residence. Unknown operations - needs verification.
27	Metal Plating/Finishing/Fabrication -Small fabrication company	Torman Company	Just east of Boulder Creek	Idanha	Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of solvents, metals, and other chemicals during transportation, use, storage and disposal may impact the drinking water supply.	Risk reduced to Moderate because of the small size of company. Unknown operations - needs verification.
28	Other -Logging equipment/hauling	Harold Hills and Sons Logging	Just east of Boulder Creek	Idanha	Database (2) Field-Observation	Within sensitive area.	Moderate	Spills, leaks, or improper handling of chemicals and other materials during transportation, use, storage, and disposal may impact the drinking water supply.	
	UST - Status Unknown						Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
29	Wood/Pulp/Paper Processing and Mills -Out of business	Historic Mill Sites	Address- 886 and 926 Hwy 22	Idanha	Database (2) Field-Observation	Within sensitive area.	Higher	Spills, leaks, or improper handling of wood preservatives and other chemicals during transportation, use, storage and disposal may impact the drinking water supply.	Also known as Green Veneer Inc., and Quality Veneer and Lumber, Champion Lumber Potential risk should be verified during enhanced inventory.
	Other -DEQ Cleanup Program Site						Higher	The impacts of this potential contaminant source will be addressed during the enhanced inventory.	Also known as Green Veneer Inc., and Quality Veneer and Lumber, Champion Lumber Potential risk should be verified during enhanced inventory.
	Landfill/Dumps						Higher	Water percolating through the landfill waste material may transport contaminants to groundwater or surface water supply.	Also known as Green Veneer Inc., and Quality Veneer and Lumber, Champion Lumber Potential risk should be verified during enhanced inventory.
30	Mines/Gravel Pits	Rock Quarry	Just east of Forest Service road 2233	Idanha	Database (2) Field-Observation Interview	Within sensitive area.	Higher	Spills, leaks, or improper handling of chemicals and wastes generated in mining operations or from heavy equipment may impact the drinking water supply.	Private Company owns this quarry. There are several USFS rock quarries (Minto Rock, Whitewater) located in DWPA.
31	Other -Fish Hatchery	Marion Forks Fish Hatchery	Highway 22. MP 66	Idanha	Database (2) Interview	Within sensitive area.	Moderate	The impacts to this potential contaminant source will be addressed during the enhanced inventory.	13 miles south of Idanha. Unsure of exact location on map.

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

Summary of Source Water Assessment Results for Upstream Intakes

Detroit Water System (PWS #4100257)

Executive Summary

Figures

Figure 1. Detroit Water System's Drinking Water Protection Area

Figure 2. Sensitive Areas within Detroit Water System's Drinking Water Protection Area

Figure 3. Source Water Assessment Results –
Detroit Water System's Drinking Water Protection Area with
Sensitive Areas and Potential Contamination Sources

Tables

Table 1. Summary of Potential Contaminant Sources by Land Use

Table 2. Inventory Results- List of Potential Contaminant Sources

Executive Summary

The drinking water for Detroit is primarily supplied by an intake on Mackey Creek with summer water supply being provided from an intake on the Breitenbush River. This public water system serves approximately 380 citizens. The intakes are located in the Upper North Santiam and North Fork Breitenbush River Watersheds in the North Santiam Sub-Basin of the Willamette Basin. There are several drinking water intakes on the North Santiam River downstream of Detroit's intakes including the intakes for the City of Gates, Mill City Water Department, Lyons Mehama Water District, Salem Public Works, Stayton Water Supply, and the City of Jefferson. Activities and impacts in the Detroit drinking water protection area have the potential to also impact downstream users.

The combination of the geographic areas contributing to the Mackey Creek and Breitenbush Rivers intakes make-up Detroit's drinking water protection area. Mackey Creek extends upstream approximately 0.6 miles from the intake and the watershed encompasses a total area of approximately 0.3 square miles. The Mackey Creek intake is located at an approximate elevation of 2200 feet and the upper edge of the watershed is located at an elevation of approximately 3,760 feet at Hoover Ridge. The streams that contribute to the Breitenbush River intake extend upstream a cumulative total 30.6 miles and the watershed area is 106 square miles. Included in the Breitenbush watershed are a number of tributaries to the main stem including the North and South Forks of Breitenbush River, Hill Creek, Devils Creek, and Humbug Creek. The Breitenbush River intake is located at an approximate elevation of 1570 feet and the upper edge of the watershed is located at an elevation of approximately 7020 feet at Park Butte Peak.

An inventory of potential contamination sources was performed within Detroit's drinking water protection area. The primary intent of this inventory was to identify and locate significant potential sources of contaminants of concern. The inventory was conducted by reviewing applicable state and federal regulatory databases and land use maps, interviewing persons knowledgeable of the area, and conducting a windshield survey by driving through the drinking water protection area to field locate and verify as many of the potential contaminant source activities as possible. The primary contaminants of concern for surface water intakes are sediments/turbidity, microbiological, and nutrients. It is important to remember that the sites and areas identified are only potential sources of contamination to the drinking water, and water quality impacts are not likely to occur when contaminants are used and managed properly.

The delineated drinking water protection area is primarily dominated by managed forestlands. A total of seven potential contamination sources were identified within Detroit Water System's drinking water protection area. All seven potential contaminant sources are located in the sensitive areas. The potential contaminant sources identified in the watershed include transmission lines, high recreation use areas, a resort community, clear cuts, road density, and stream crossings. The potential contaminant sources within the drinking water protection area all pose a relatively higher to moderate risk to the drinking water supply. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the water quality in the watershed.

The susceptibility analysis combines the results of the locations of the potential contaminant sources with the locations of the sensitive areas. Overlaying the locations of the moderate- to high-risk sources within the sensitive areas provides an indication of the areas that are highly susceptible to contamination. In the Detroit watershed, the results of the susceptibility "analysis" include the distribution of seven identified high- to moderate-risk sources within the

areas of highly permeable soils, high erosional soils, high runoff potential soils, and within the 1000' setback from the streams. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection.

Figures

Source Water Assessment Report Detroit Water System PWS # 4100257

Figure 1. Detroit Water System's Drinking Water Protection Area

Figure 2. Sensitive Areas within Detroit Water System's Drinking Water Protection Area

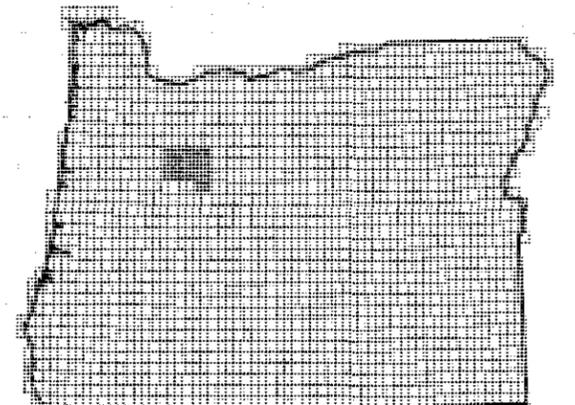
**Figure 3. Source Water Assessment Results
Detroit Water System's Drinking Water Protection Area with
Sensitive Areas and Potential Contamination Sources**

**Figure 1:
City of Gates' Drinking
Water Protection Area**

FWS 4100317

- Drinking Water Intake - Surface Water
- ▮ Drinking Water Protection Area

Note on Base Map: 1:24,000 scale U.S. Geological Survey Digital Raster Graphics (DRGs) for Battle Ax (1985), Mather Lodge Mtn (1985), Mill City South (1985), Elkhorn (1985), Olalie Butte (1985), Mt Bruno (1984), Mt Jefferson (1984), Idanha (1985), Lawhead Creek (1985), Mill City North (1985), Yellowstone Mtn (1985), Quartzville (1985), Chimney Peak (1984), Coffin Mtn. (1984), Marion Forks (1988), Marion Lake (1983), Three Fingers Jack (1988), Santiam Junction (1988), and Detroit (1988) are displayed. DRGs are scanned images of topographic sheets. Where the DRGs join, seams and/or gaps may be visible. Between DRGs, variations in information displayed also may be seen.



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**Figure 2:
Sensitive Areas within the City of Gates'
Drinking Water Protection Area**

PWS 4100317

- Drinking Water Intake - Surface Water
- ⚡ Drinking Water Protection Area

Sources of Information:

(Marion and Linn County Areas)

High Soil Erodibility: Defined by slopes greater than 30 percent and K factor greater than .25. Soils derived from 1:24,000, USDA, NRCS, SSURGO certified data. Slope is in the SSURGO database Component Table. Slope displayed is a weighted average of the average slope for the map unit. K factor is contained in the SSURGO Layer Table. K factor displayed is a weighted average (of only the surface layer) for the map unit. High Runoff Potential: Hydrologic Group D (very slow infiltration rates) from the SSURGO Component Table. SSURGO data have been certified.

(Willamette National Forest)

High Soil Erodibility: Defined by high sedimentation yield potential of the dominant soil. High Runoff Potential: Water yield class III in the dominant soil. These data are extracted from the Willamette National Forest Soil Resource Inventory.

(Entire Watershed)

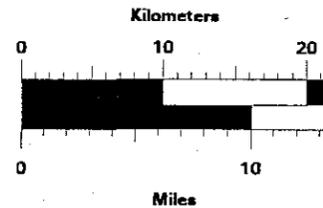
High Permeability Soils: Alluvial deposits (Qal), dune sand (Qd), and landslide and debris-flow deposits (Qls) from the U.S. Geological Survey Geologic Map of Oregon GIS layer.

Sensitive Area Setbacks Adjacent to Streams and Reservoirs: 1000 foot buffer from the centerline of perennial streams and the shoreline of any reservoir.

Note on Sensitive Areas: In determining the most sensitive areas within this Drinking Water Protection Area, DEQ used existing GIS layers and other natural resource agency data sets. Not all areas of the state have been mapped for the natural resource parameters of interest or at the level of detail ideal for this type of analysis. DEQ has sought to obtain the best available information for this composite.

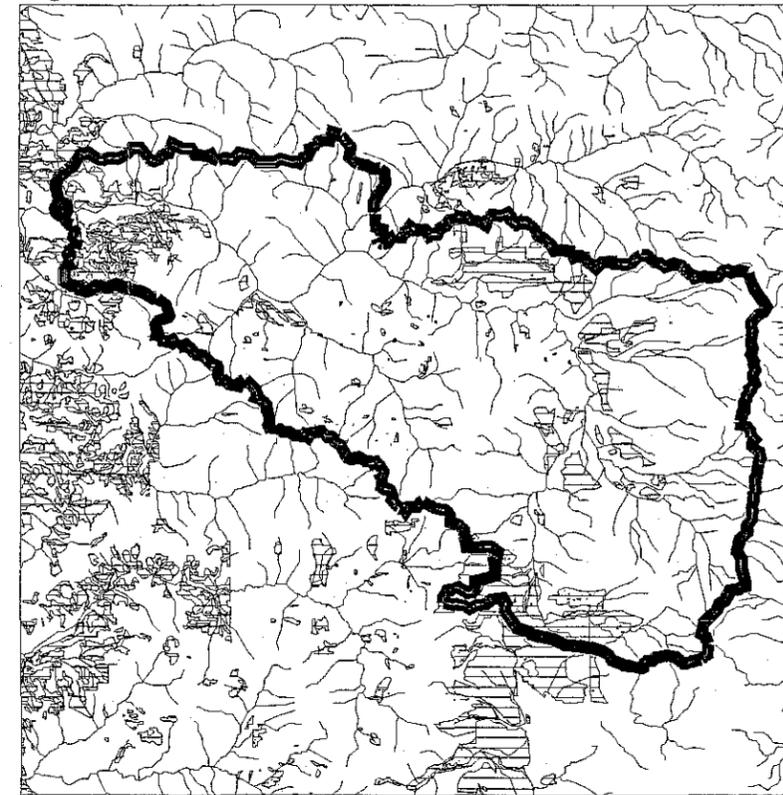


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Oregon Department of Environmental Quality GIS

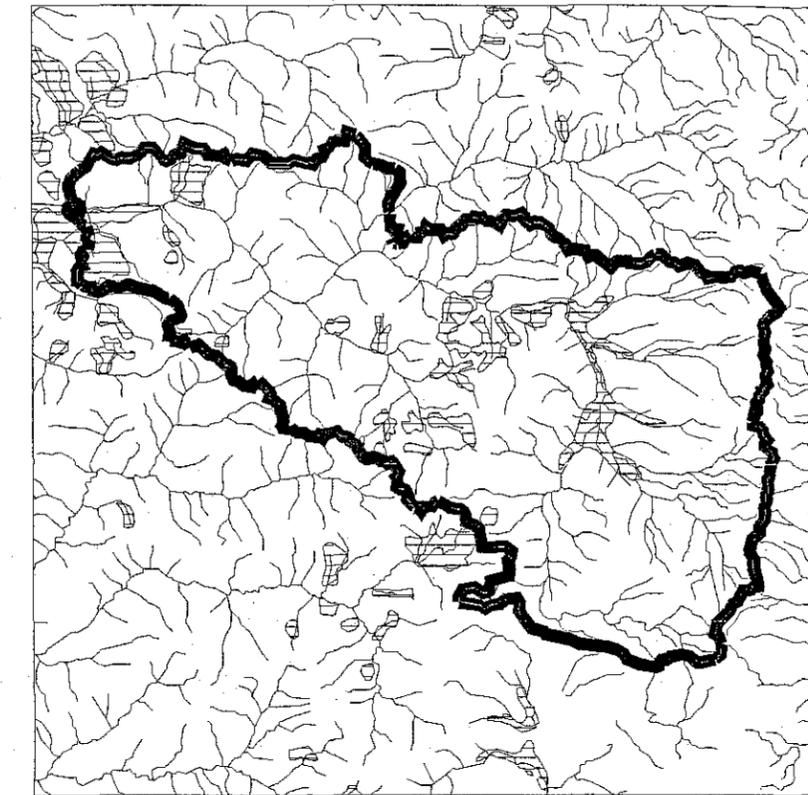


Sensitive Areas in Watershed

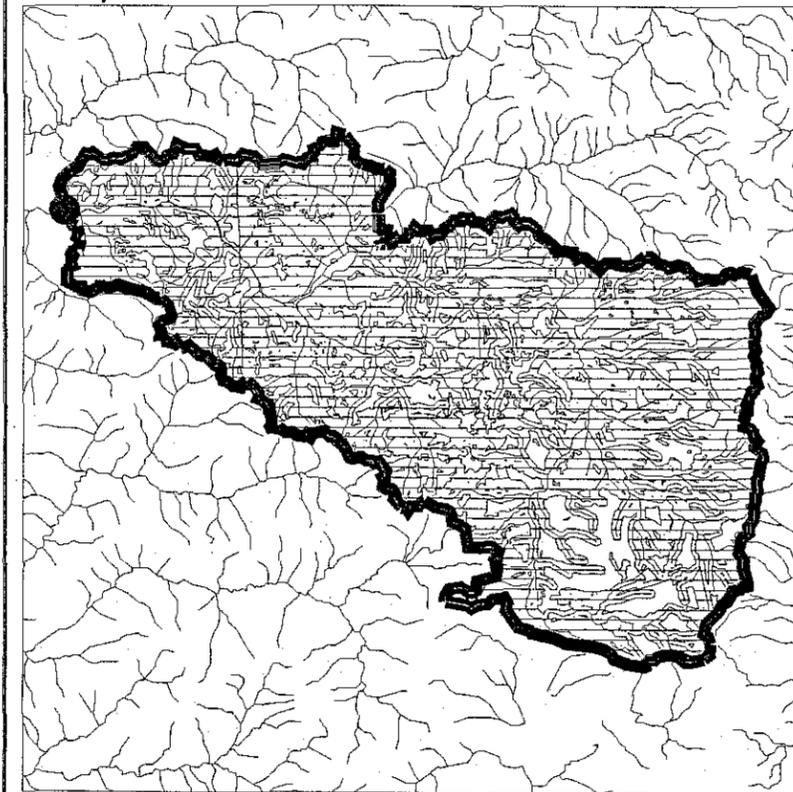
High Soil Erosion Potential
(High Sediment Yield Potential)



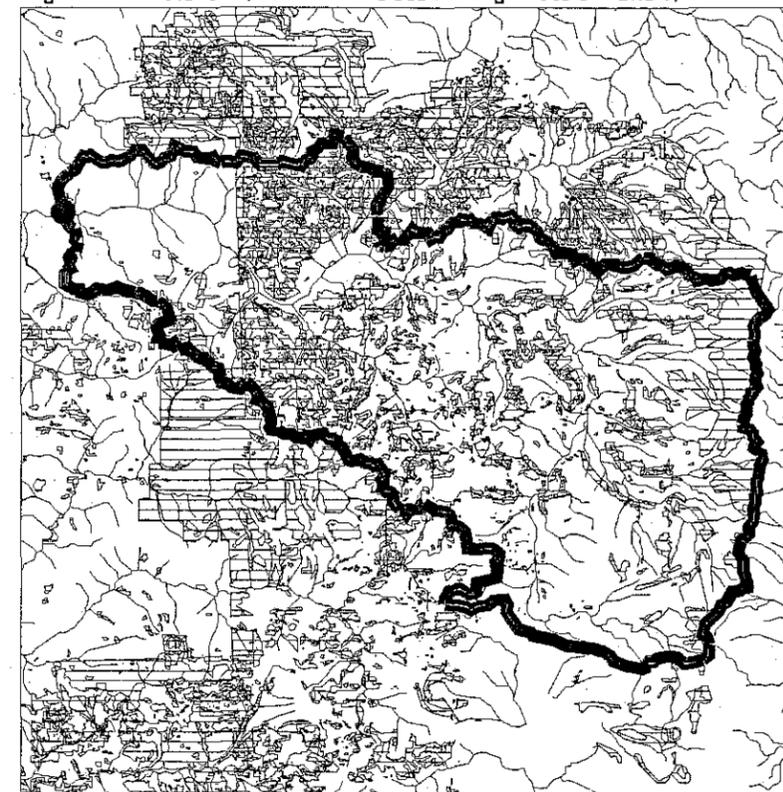
High Permeability Soils (Alluvial Deposits, Dune Sand, Landslide and Debris-flow Deposits)



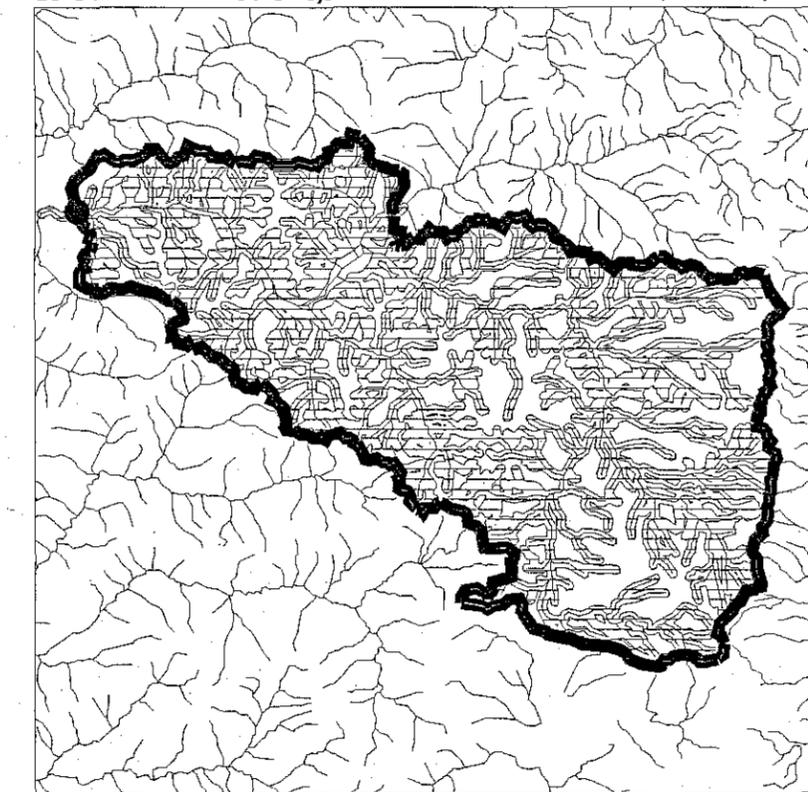
Composite of Sensitive Areas



High Runoff Potential (Water Yield Class III - High Rate of Runoff)



Sensitive Area Setbacks Adjacent to Streams and Reservoirs (1000 feet)



**Figure 3:
Source Water Assessment
Results**

**City of Gates' Drinking Water
Protection Area with Sensitive Areas
and Potential Contamination Sources**

PWS 4100317

- Drinking Water Intake - Surface Water
- ⚡ Drinking Water Protection Area
- ≡ Sensitive Areas
- ▲ Area Feature (see Note 2)
- ◆ Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.

Note 2: Feature identification numbers correspond to the potential contaminant source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.

For watersheds with more than one intake, Oregon completes the assessments by segment and each source water assessment represents the area from the public water system's intake to the next intake upstream. All protection areas for intakes upstream of the water system's intake are included in the City of Gates's drinking water protection area. Activities and impacts in the City of Gates's drinking water protection area also have the potential to impact downstream water users. See Attachment B for a schematic of upstream and downstream water providers in the North Santiam Sub-Basin.

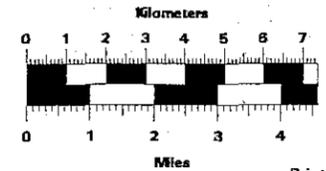
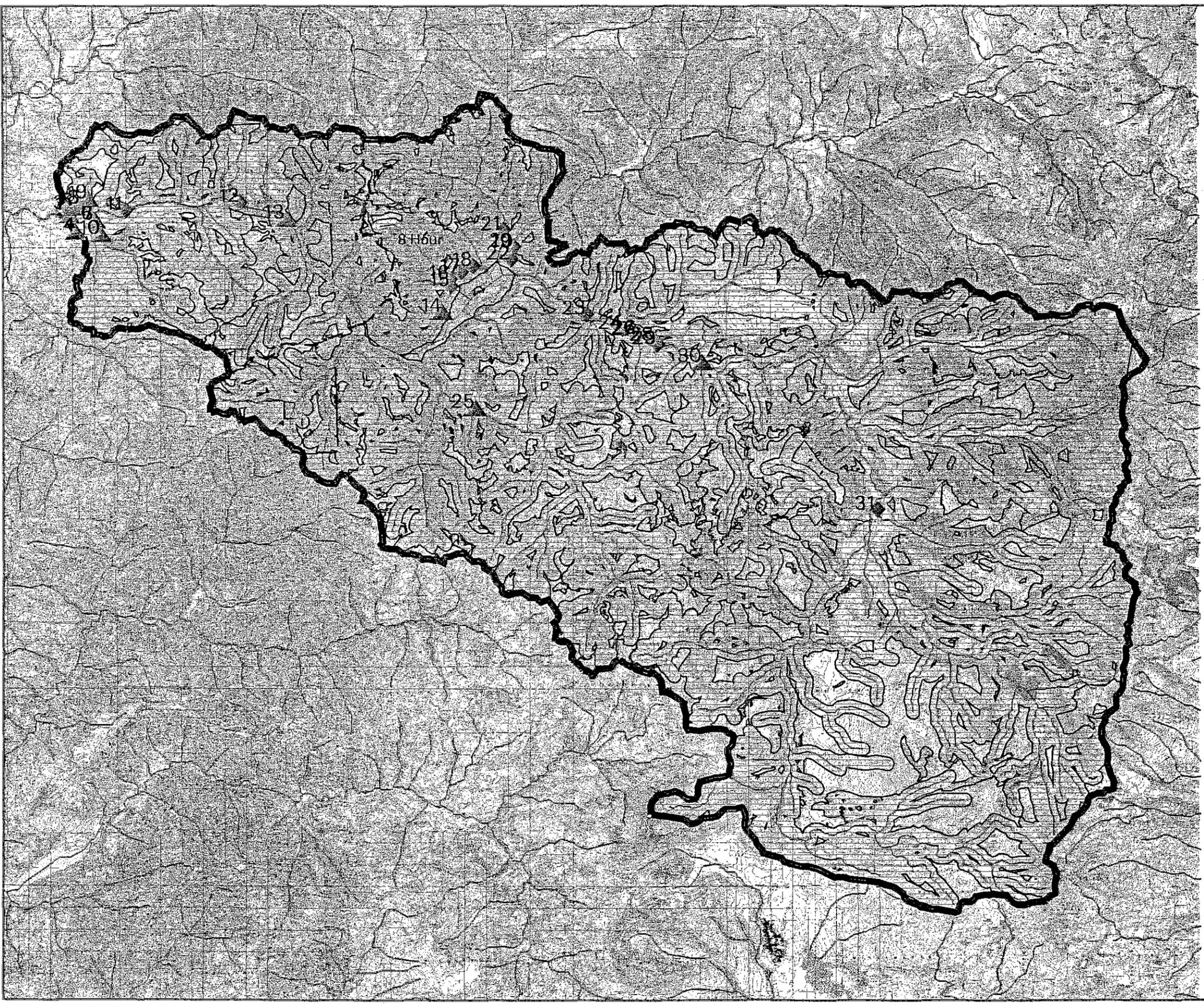


Figure 3a: Source Water Assessment Results

City of Gates' Drinking Water
Protection Area with Sensitive Areas
and Potential Contamination Sources

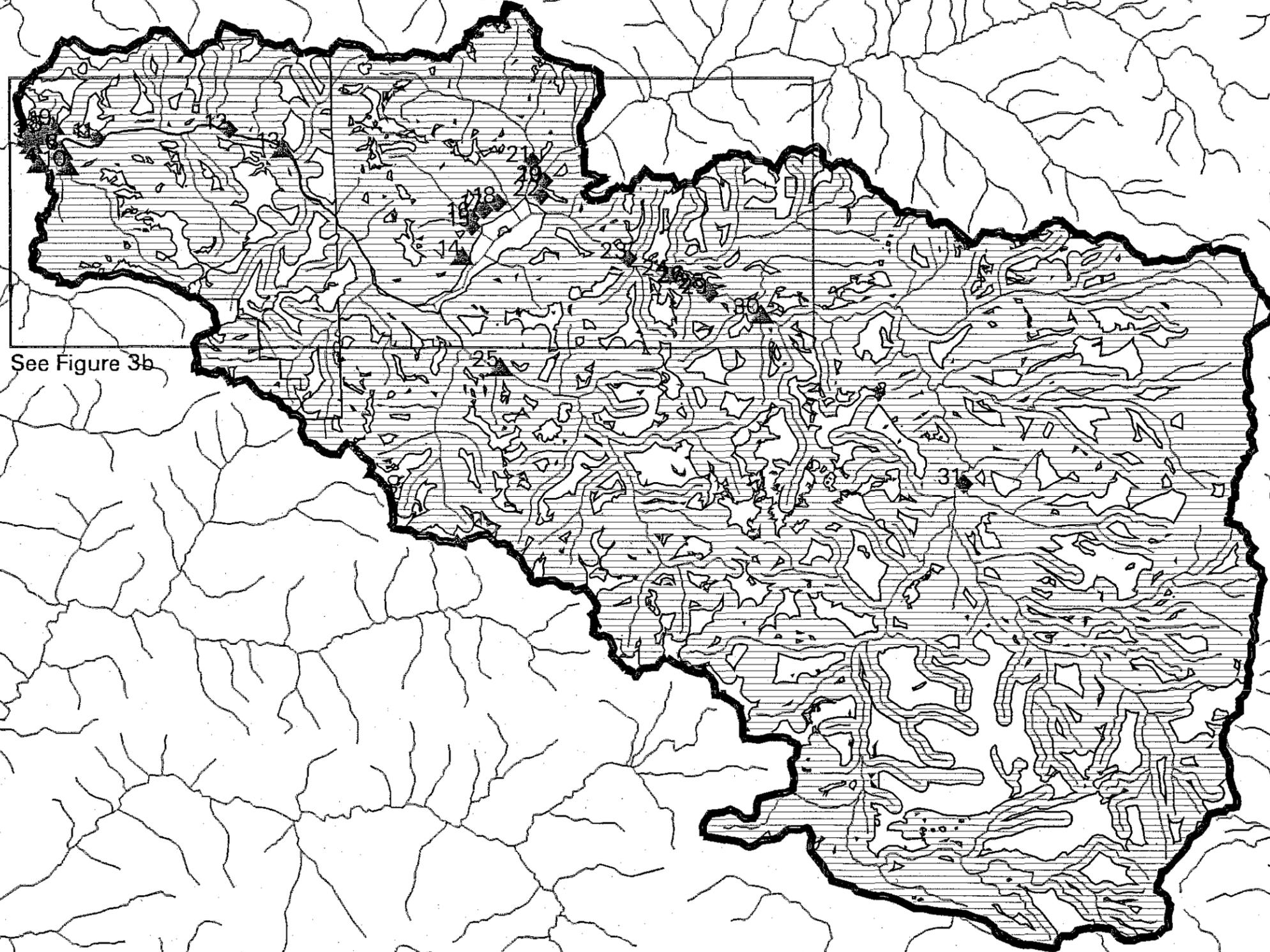
PWS 4100317

- Drinking Water Intake - Surface Water
- ⚡ Drinking Water Protection Area
- ≡ Sensitive Areas
- ▲ Area Feature (see Note 2)
- ◆ Point Feature (see Note 2)

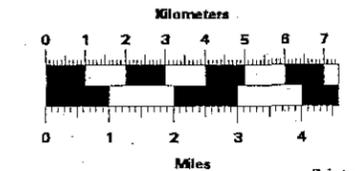
Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.

Note 2: Feature identification numbers correspond to the potential contaminant source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.



See Figure 3b



**Figure 3b:
Source Water Assessment
Results (Inset)**

**City of Gates' Drinking Water
Protection Area with Sensitive Areas
and Potential Contamination Sources**

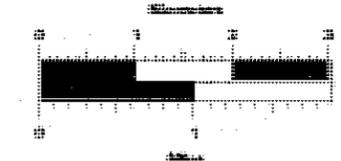
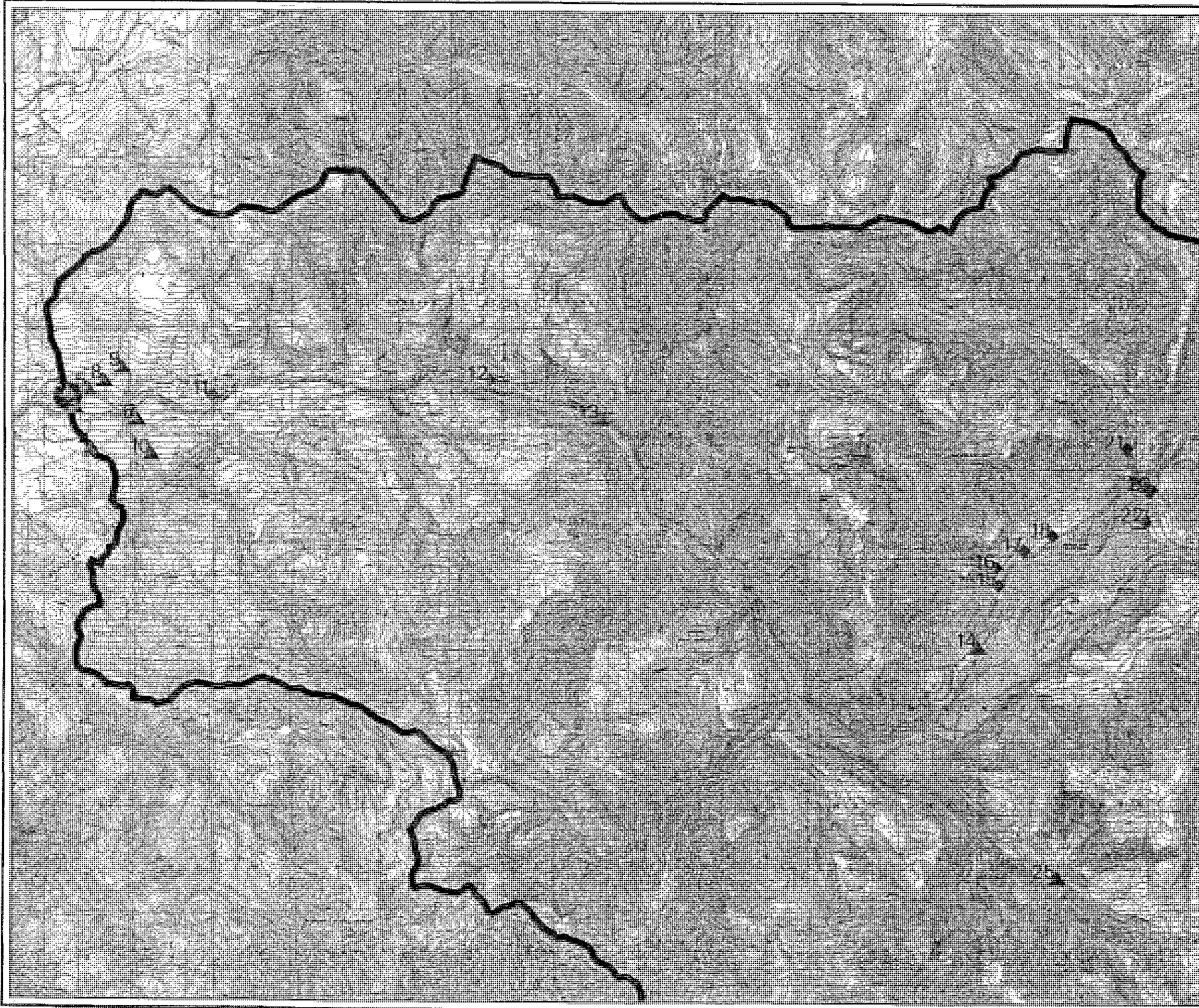
PWS 4100317

- Drinking Water Intake - Surface Water
- ⚡ Drinking Water Protection Area
- ▨ Sensitive Areas
- ▲ Area Feature (see Note 2)
- ◆ Point Feature (see Note 2)

Notes on Potential Contamination Sources

Note 1: Sites and areas noted in this figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.

Note 2: Feature identification numbers correspond to the potential contamination source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.



Tables

Source Water Assessment Report Detroit Water System PWS # 4100257 Inventory Results

Table 1. Summary of Potential Contaminant Sources by Land Use

Table 2. Inventory Results – List of Potential Contaminant Sources

Notes for Tables

- Sites and areas identified in Tables 1 and 2 are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
- Total number of sources listed in Table 1 in the DWPA may not add up to the total number of potential contaminant sources in Table 2 because more than one type of potential contaminant source may be present at any given facility.
- The data was collected by Rachel Burr DEQ's Western Region Office, on September 4, 2001.

Acronyms

AST - Aboveground Storage Tank
DC - DEQ's Drycleaner database
DEQ - Oregon Department of Environmental Quality
DWPA - Drinking Water Protection Area
ECSI - DEQ's Environmental Cleanup Site Information database
HWIMSY - DEQ's Hazardous Waste Information Management System database
LUST - DEQ's Leaking Underground Storage Tank database
NPDES - National Pollution Discharge Elimination System
PCS - Potential Contaminant Source
PWS - Public Water System
SFM - State Fire Marshall's database of hazardous materials
SIS - DEQ's Source Information System database (includes WPCF and NPDES permits)
SWMS - DEQ's Solid Waste Management System database
UST - DEQ's Underground Storage Tank database or Underground Storage Tank
WPCF - Water Pollution Control Facility
WRD - Oregon Water Resources Division database for water rights information system

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100257 DETROIT WATER SYSTEM

Residential/Municipal Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Airport - Maintenance/Fueling Area		Higher	0
Apartments and Condominiums		Lower	0
Campgrounds/RV Parks	(1)	Moderate	1
Cemeteries - Pre-1945		Moderate	0
Drinking Water Treatment Plants		Moderate	0
Fire Station		Lower	0
Fire Training Facilities		Moderate	0
Golf Courses		Moderate	0
Housing - High Density (> 1 House/0.5 acres)		Moderate	1
Landfill/Dumps	(1)	Higher	0
Lawn Care - Highly Maintained Areas		Moderate	0
Motor Pools		Moderate	0
Parks		Moderate	0
Railroad Yards/Maintenance/Fueling Areas		Higher	0
Schools		Lower	0
Septic Systems - High Density (> 1 system/acre)	(1)	Higher	0
Sewer Lines - Close Proximity to PWS	(1)	Higher	0
Utility Stations - Maintenance Transformer Storage		Higher	0
Waste Transfer/Recycling Stations	(1)	Moderate	0
Wastewater Treatment Plants/Collection Stations	(1)	Moderate	0
Other			0

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100257 DETROIT WATER SYSTEM

Commercial/Industrial Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Automobiles - Body Shops		Higher	0
Automobiles - Car Washes		Moderate	0
Automobiles - Gas Stations		Higher	0
Automobiles - Repair Shops		Higher	0
Boat Services/Repair/Refinishing		Higher	0
Cement/Concrete Plants		Moderate	0
Chemical/Petroleum Processing/Storage		Higher	0
Dry Cleaners		Higher	0
Electrical/Electronic Manufacturing		Higher	0
Fleet/Trucking/Bus Terminals		Higher	0
Food Processing		Moderate	0
Furniture/Lumber/Parts Stores		Moderate	0
Home Manufacturing		Higher	0
Junk/Scrap/Salvage Yards		Higher	0
Machine Shops		Higher	0
Medical/Vet Offices	(1)	Moderate	0
Metal Plating/Finishing/Fabrication		Higher	0
Mines/Gravel Pits		Higher	0
Office Buildings/Complexes		Lower	0
Parking Lots/Malls (> 50 Spaces)		Higher	0
Photo Processing/Printing		Higher	0
Plastics/Synthetics Producer		Higher	0
Research Laboratories		Higher	0
RV/Mini Storage		Lower	0
Wood Preserving/Treating		Higher	0
Wood/Pulp/Paper Processing and Mills		Higher	0
Other			0

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100257 DETROIT WATER SYSTEM

Agricultural/Forest Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Auction Lots	(1)	Higher	0
Boarding Stables	(1)	Moderate	0
Confined Animal Feeding Operations (CAFOs)	(1)	Higher	0
Crops - Irrigated (inc. orchards, vineyards, nurseries, greenhouses)	(2)	Moderate	0
Crops - Nonirrigated (inc. Christmas trees, grains, grass seed, pasture)		Lower	0
Farm Machinery Repair		Higher	0
Grazing Animals (> 5 large animals or equivalent/acre)	(1)	Moderate	0
Lagoons/Liquid Wastes	(1)	Higher	0
Land Application Sites	(1)	Moderate	0
Managed Forest Land - Broadcast Fertilized Areas		Lower	0
Managed Forest Land - Clearcut Harvest (< 35 yrs.)		Higher	1
Managed Forest Land - Partial Harvest (< 10 yrs.)		Moderate	0
Managed Forest Land - Road Density (> 2 mi./sq. mi.)		Higher	1
Pesticide/Fertilizer/Petroleum Storage, Handling, Mixing, & Cleaning Ar		Higher	0
Recent Burn Areas (< 10 yrs.)		Lower	0
Managed Forest Lands - Status Unknown		Moderate	0
Other			0

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100257 DETROIT WATER SYSTEM

Miscellaneous Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Above Ground Storage Tanks - Excluding Water		Moderate	1
Channel Alterations - Heavy		Lower	0
Combined Sewer Outfalls	(1)	Lower	0
Stormwater Outfalls	(1)	Lower	0
Composting Facilities	(1)	Moderate	0
Historic Gas Stations		Higher	0
Historic Waste Dumps/Landfills	(1)	Higher	0
Homesteads - Rural - Machine Shops/Equipment Maintenance		Higher	0
Homesteads - Rural - Septic Systems (< 1/acre)	(1)(3)	Lower	0
Injection/Dry Wells, Sumps - Class V UICs	(1)	Higher	0
Kennels (> 20 Pens)	(1)	Lower	0
Military Installations		Higher	0
Random Dump Sites		Moderate	0
River Recreation - Heavy Use (inc. campgrounds)	(1)	Moderate	1
Sludge Disposal Areas	(1)	Moderate	0
Stormwater Retention Basins	(1)	Moderate	0
Transmission Lines - Right-of-Ways		Higher	1
Transportation - Freeways/State Highways/Other Heavy Use Roads		Moderate	0
Transportation - Railroads		Moderate	0
Transportation - Right-Of-Ways - Herbicide Use Areas		Moderate	0
Transportation - River Traffic - Heavy		Lower	0
Transportation - Stream Crossing - Perennial		Higher	1
UST - Confirmed Leaking Tanks - DEQ List		Higher	0
UST - Decommissioned/Inactive		Lower	0
UST - Nonregulated Tanks (< 1,100 gals or Large Heating Oil Tanks)		Higher	0
UST - Not Upgraded and/or Registered Tanks		Higher	0
UST - Upgraded/Registered - Active		Lower	0
UST - Status Unknown		Higher	0
Upstream Reservoirs/Dams		Lower	0
Wells/Abandoned Wells		Moderate	1
Large Capacity Septic Systems (serves > 20 people) - Class V UICs	(1)	Moderate	1
Construction/Demolition Areas		Moderate	0
Other			0

NOTES:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential source of microbial contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100257 DETROIT WATER SYSTEM

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
1	Transmission Lines - Right-of-Ways	Transmission Lines	Throughout DWPA	Detroit	Field-Observation	Within sensitive area.	Higher	Construction and corridor maintenance may contribute to increased erosion and turbidity in drinking water supply. Over-application or improper handling of pesticides or fertilizers may impact drinking water supply.	
2	River Recreation - Heavy Use (inc. campgrounds)	Breitenbush Hot Springs	East of intake	Detroit	Database (2) Field-Observation Interview	Within sensitive area.	Moderate	Inadequate disposal of human wastes may contribute bacteria and nutrients to the drinking water supply. Heavy use may contribute to streambank erosion causing turbidity. Fuel spills and emissions may also contribute to contamination.	
3	Campgrounds/RV Parks	Breitenbush Campground	East of intake	Detroit	Field-Observation	Within sensitive area.	Moderate	Leaks or spills of automotive fluids or improperly managed septic systems and wastewater disposal may impact drinking water supply. Heavy usage along edge of waterbody may contribute to erosion, causing turbidity.	Humbug and Cougar Bend Campgrounds are also located with DWPA.

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
4	Housing - High Density (> 1 House/0.5 acres)	Breitenbush Resort/Community	East of intakes	Detroit	Database (2) Field-Observation Interview	Within sensitive area.	Moderate	Improper use, storage, and disposal of household chemicals may impact the drinking water supply. Stormwater run-off or infiltration may carry contaminants to drinking water supply.	
	Large Capacity Septic Systems (serves > 20 people) - Class V UICs						Moderate	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water.	
	Wells/Abandoned Wells						Moderate	Improperly installed or maintained wells and abandoned wells may provide a direct conduit for contamination to groundwater and drinking water source.	
	Above Ground Storage Tanks - Excluding Water						Moderate	Spills, leaks, or improper handling of stored materials may impact the drinking water supply.	
5	Managed Forest Land - Clearcut Harvest (< 35 yrs.)	Clear Cuts	Throughout DWPA	Detroit	Field-Observation	Within sensitive area.	Higher	Cutting and yarding of trees may contribute to increased erosion, resulting in turbidity and chemical changes in drinking water supply. Over-application or improper handling of pesticides or fertilizers may impact drinking water source.	
6	Managed Forest Land - Road Density (> 2 mi./sq. mi.)	Road Density	Throughout DWPA	Detroit	Field-Observation	Within sensitive area.	Higher	Road building, maintenance, and usage may contribute to erosion and slope failure causing turbidity in drinking water supply. Vehicle usage increases the risks of leaks or spills of petroleum products and other hazardous materials.	

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4100257 DETROIT WATER SYSTEM

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
7	Transportation - Stream Crossing - Perennial	Stream Crossings	Throughout DWPA	Detroit	Field-Observation	Within sensitive area.	Higher	Road building, maintenance & use may increase erosion & slope failure causing turbidity. Vehicle use increases the risk of leaks or spills of fuel & other chemicals. Over-application/improper handling of pesticides in right-of-way may also impact water.	

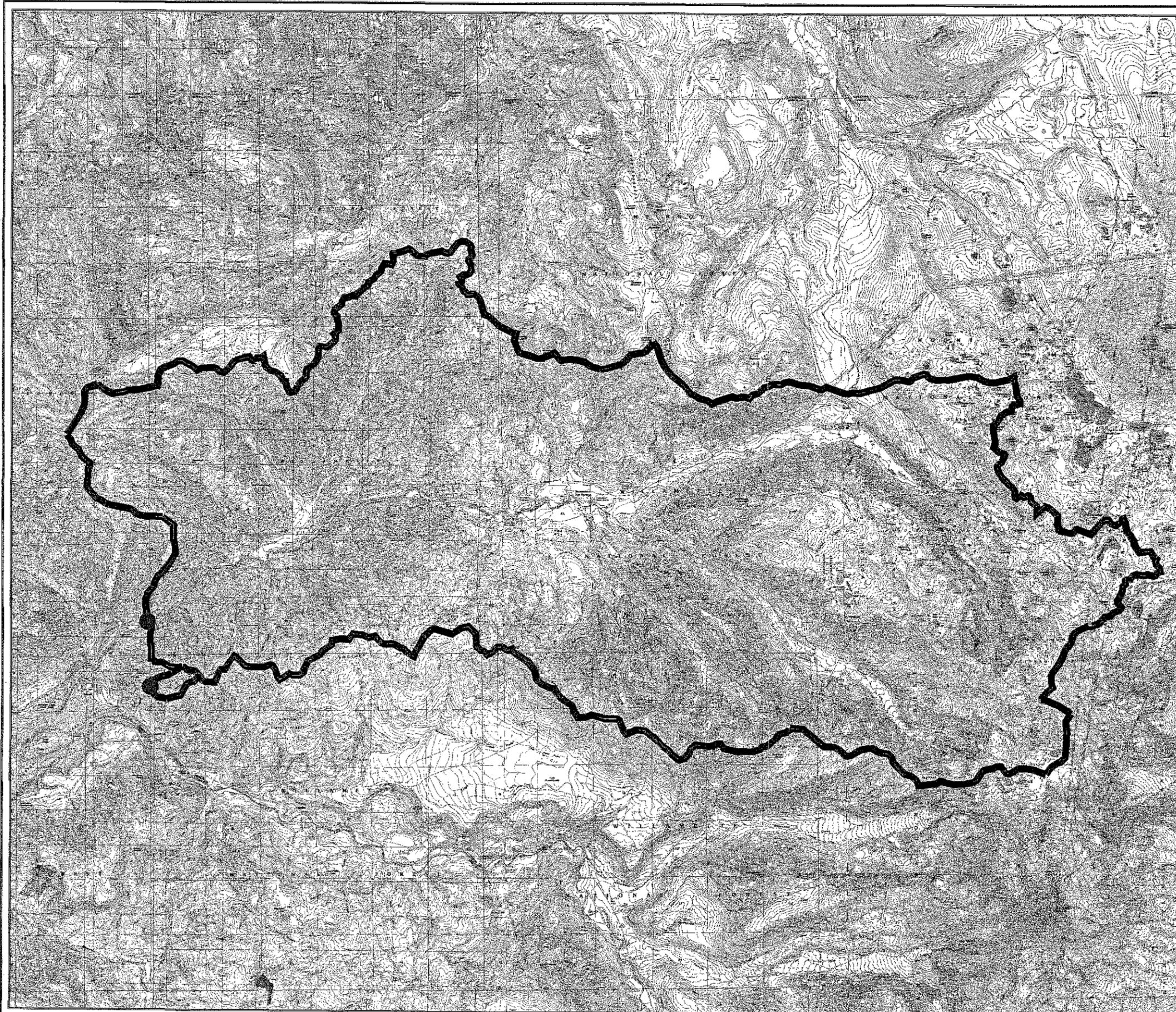
Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

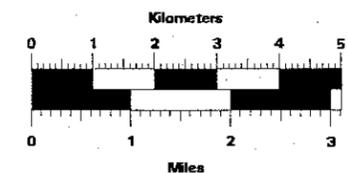
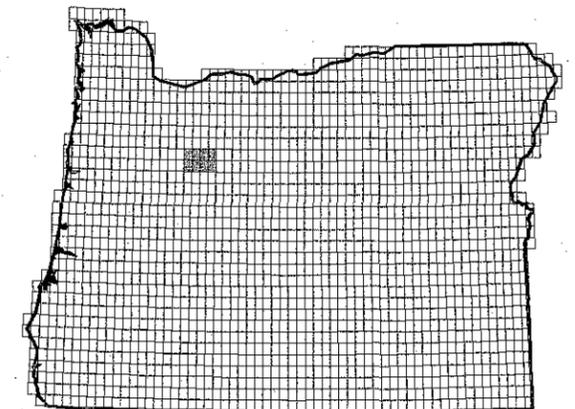
(2) See Table 3 for database listings (if necessary).

Figure 1:
Detroit Water System's
Drinking Water
Protection Area
PWS 4100257

- Drinking Water Intake - Surface Water
- ⚡ Drinking Water Protection Area



Note on Base Map: 1:24,000 scale U.S. Geological Survey Digital Raster Graphics (DRGs) for Battle Ax (1985), Mother Lodge Mtn (1985), Breitenbush Hot Springs (1988), Olallie Butte (1988), Mt Bruno (1994), Mt Jefferson (1994), Idanha (1985) and Detroit (1985) are displayed. DRGs are scanned images of topographic sheets. Where the DRGs join, seams and/or gaps may be visible. Between DRGs, variations in information displayed also may be seen.



**Figure 2:
Sensitive Areas within Detroit Water System's
Drinking Water Protection Area**

PWS 4100257

- Drinking Water Intake - Surface Water
- ▭ Drinking Water Protection Area

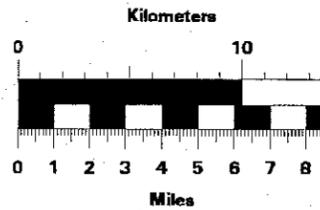
Sources of Information:

High Soil Erodibility: Defined by high sedimentation yield potential of the dominant soil. **High Runoff Potential:** Water yield class III in the dominant soil. These data are extracted from the Willamette National Forest Soil Resource Inventory.
High Permeability Soils: Alluvial deposits (Qal), dune sand (Qd), and landslide and debris-flow deposits (Qls) from the U.S. Geological Survey Geologic Map of Oregon GIS layer.
Sensitive Area Setbacks Adjacent to Streams and Reservoirs: 1000 foot buffer from the centerline of perennial streams and the shoreline of any reservoir.

Note on Sensitive Areas: In determining the most sensitive areas within this Drinking Water Protection Area, DEQ used existing GIS layers and other natural resource agency data sets. Not all areas of the state have been mapped for the natural resource parameters of interest or at the level of detail ideal for this type of analysis. DEQ has sought to obtain the best available information for this composite.

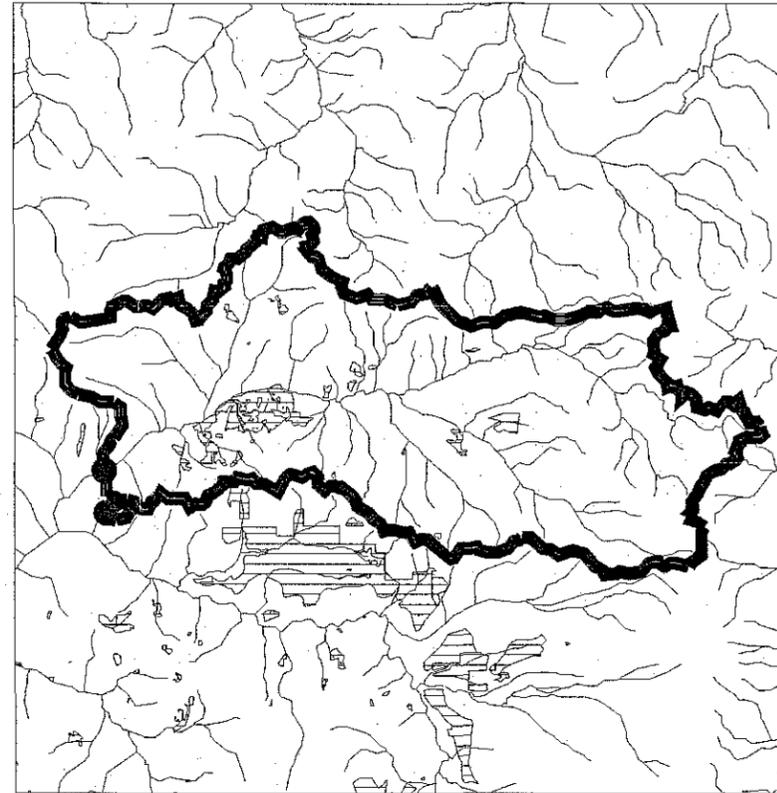


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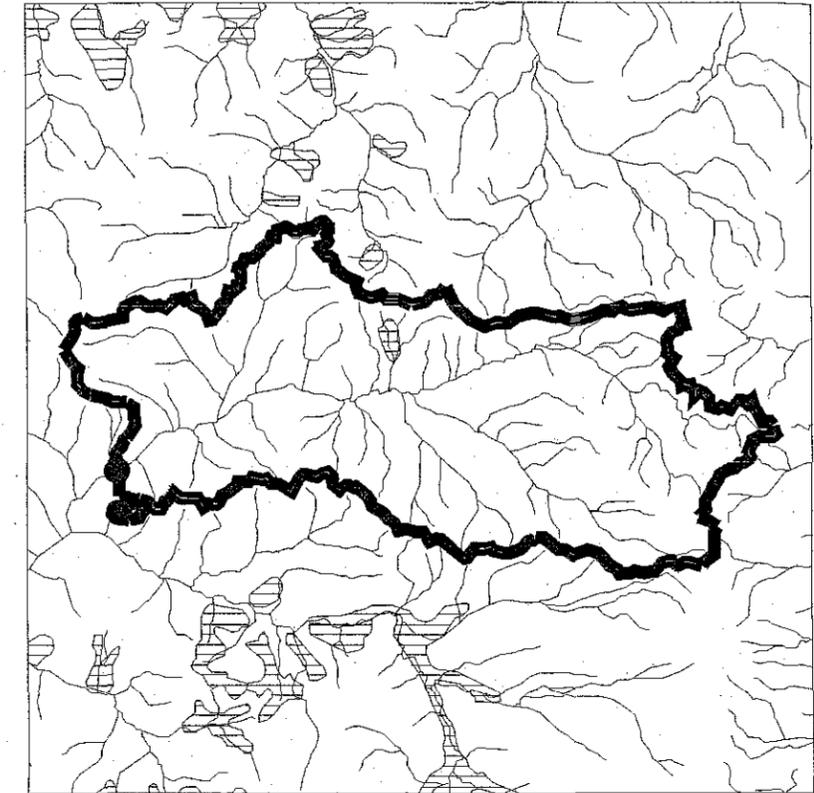


Sensitive Areas in Watershed

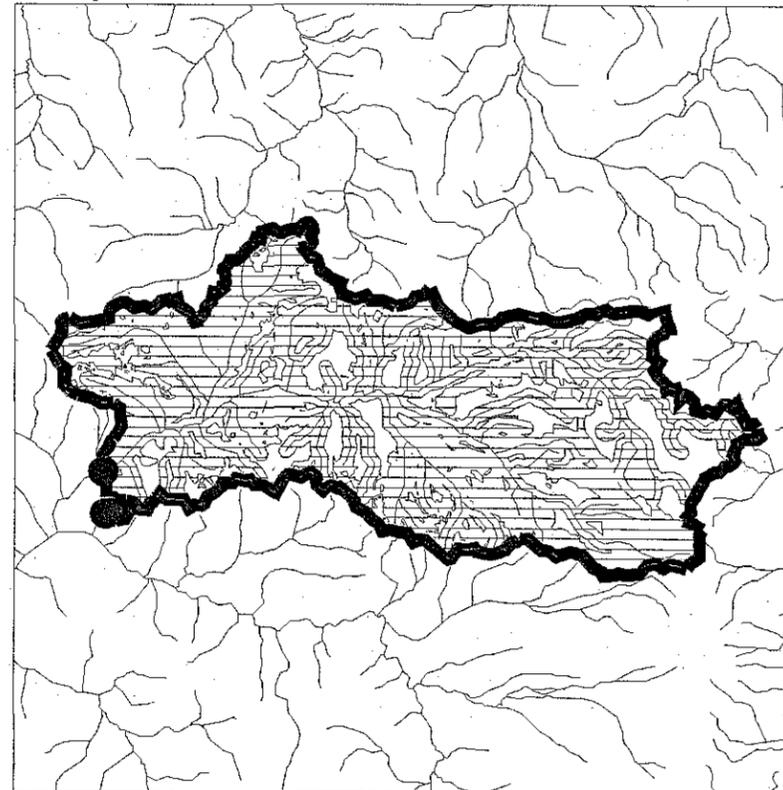
High Soil Erosion Potential
(High Sediment Yield Potential)



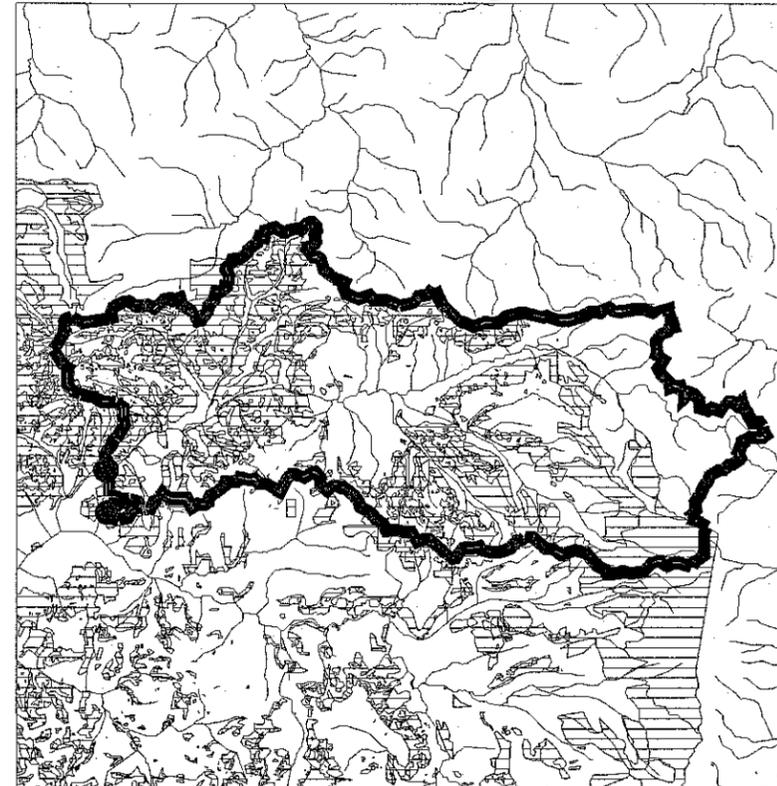
High Permeability Soils (Alluvial Deposits, Dune Sand, Landslide and Debris-flow Deposits)



Composite of Sensitive Areas



High Runoff Potential (Water Yield Class III - High Rate of Runoff)



Sensitive Area Setbacks Adjacent to Streams and Reservoirs (1000 feet)

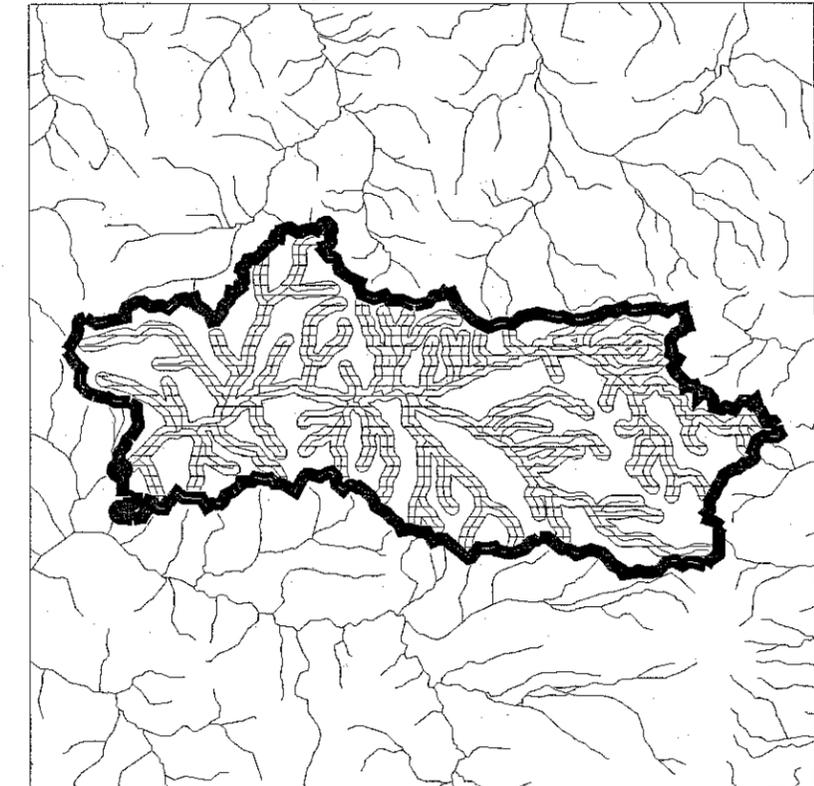


Figure 3a: Source Water Assessment Results

Detroit Water System's
Drinking Water Protection
Area with Sensitive Areas and
Potential Contamination Sources

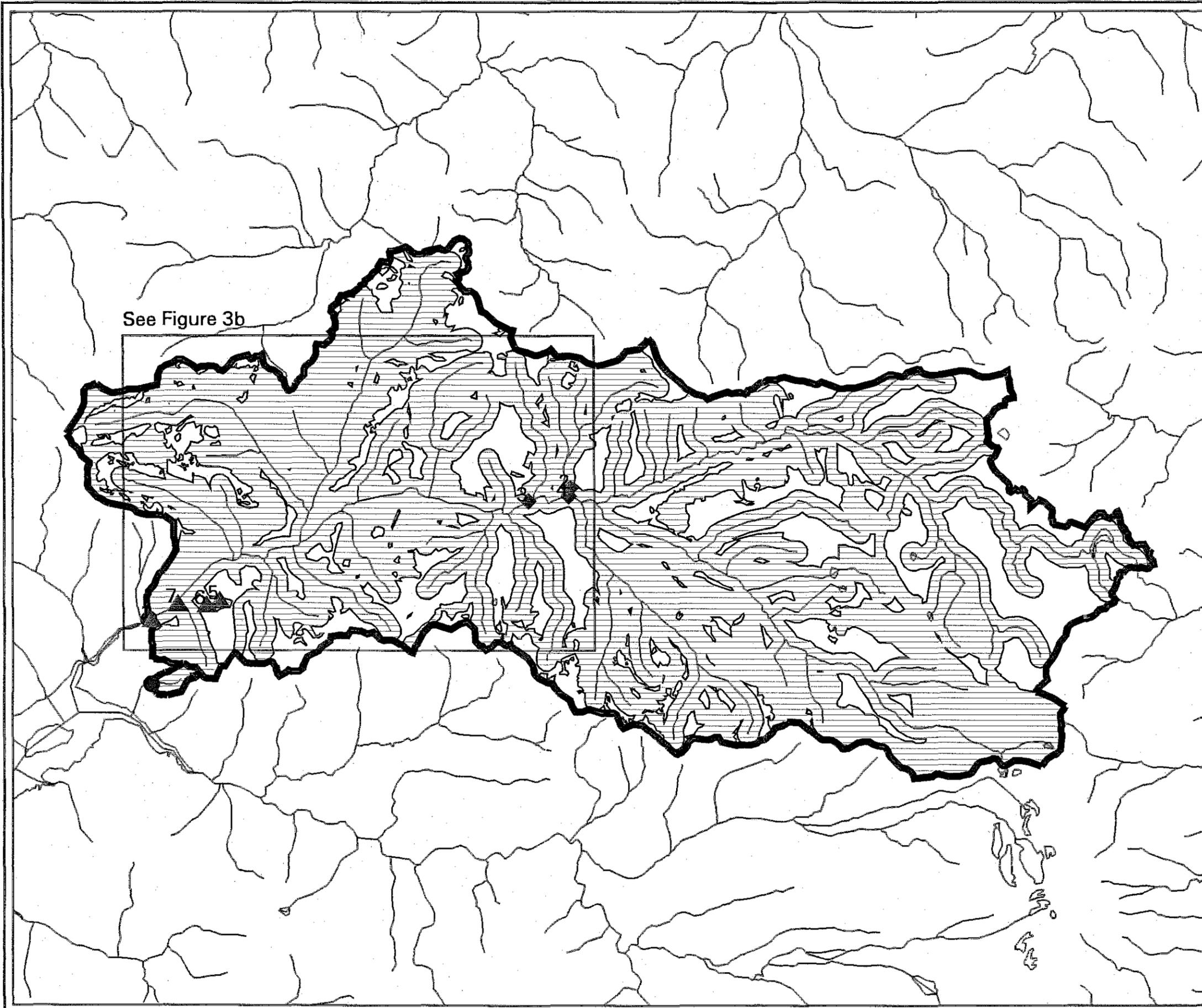
PWS 4100257

- Drinking Water Intake - Surface Water
- ▮ Drinking Water Protection Area
- ▨ Sensitive Areas
- ▲ Area Feature (see Note 2)
- ◆ Point Feature (see Note 2)

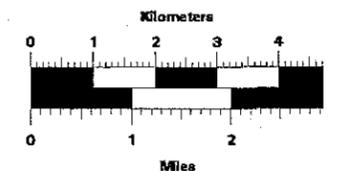
Notes on Potential Contaminant Sources

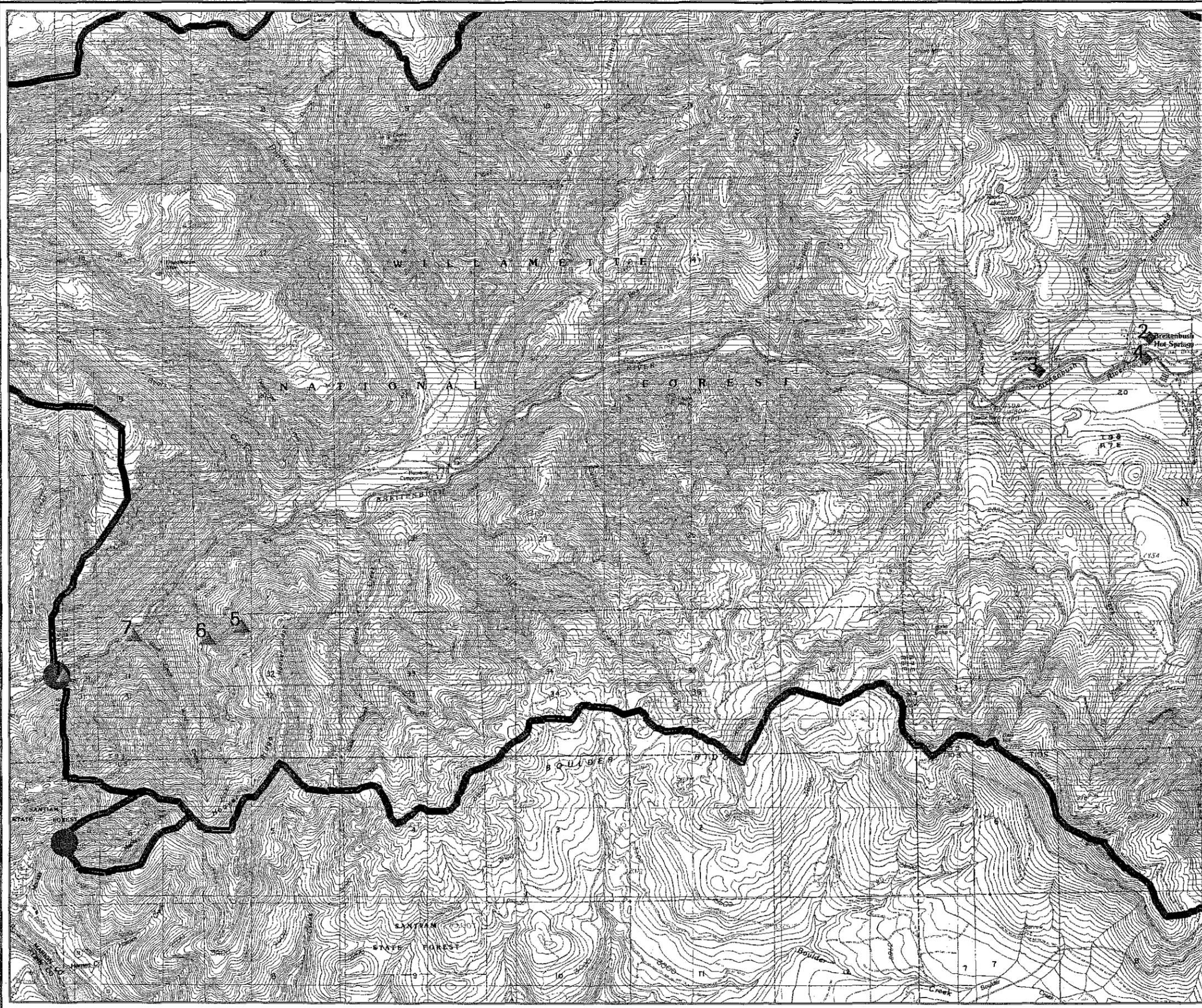
Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.

Note 2: Feature identification numbers correspond to the potential contaminant source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.



See Figure 3b





**Figure 3b:
Source Water Assessment
Results (Inset)**

**Detroit Water System's
Drinking Water Protection
Area with Sensitive Areas and
Potential Contamination Sources**

PWS 4100257

- Drinking Water Intake - Surface Water
- ▨ Drinking Water Protection Area
- ▨ Sensitive Areas
- ▲ Area Feature (see Note 2)
- ◆ Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.

Note 2: Feature identification numbers correspond to the potential contaminant source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.

