Source Water Assessment for Dimond Estates Anchorage, Alaska

A Hydrogeologic Susceptibility and Vulnerability Analysis

DRINKING WATER PROTECTION PROGRAM REPORT 440
PWSID 211075.001

May 2002

Source Water Assessment for Dimond Estates Anchorage, Alaska

By HEATHER A. HAMMOND

DRINKING WATER PROTECTION PROGRAM REPORT 440
PWSID 211075.001

The Drinking Water Protection Program is producing Source Water Assessments in compliance with the Safe Drinking Water Act Amendments of 1996. Each assessment includes a delineation of the source water area, an inventory of potential and existing contaminant sources that may impact the water, a risk ranking for each of these contaminants, and an evaluation of the potential vulnerability of these drinking water sources.

These assessments are intended to provide public water systems owners/operators, communities, and local governments with the best available information that may be used to protect the quality of their drinking water. The assessments combine information obtained from various sources, including the U.S. Environmental Protection Agency, Alaska Department of Environmental Conservation (ADEC), public water system owners/operators, and other public information sources. The results of this assessment are subject to change if additional data becomes available. If you have any additional information that may affect the results of this assessment, please contact the Program Coordinator of DWPP, (907) 269-7521.

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION: 2002

CONTENTS

TABLES

ILLUSTRATIONS

APPENDICES

Source Water Assessment for Dimond Estates, Anchorage, Alaska

A Hydrogeologic Susceptibility and Vulnerability Analysis

By Heather A. Hammond

Drinking Water Protection Program
Alaska Department of Environmental Conservation

EXECUTIVE SUMMARY

Dimond Estates is a Class A (community) water system consisting of two wells in the Anchorage Area. Due to their close proximity, the wells share the same protection area and contaminant source inventory. Identified potential and current sources of contaminants that present the most significant risk to the Dimond Estates' drinking water sources include approximately 238 acres of residential area, sewer lines, Class V industrial process water and wastewater disposal well, Class V motor vehicle waste disposal well, plant nursery, gasoline stations, welding shops, a car wash, underground fuel storage tanks, organic chemicals manufacturing, lawn and gardening supply distributor, and construction trade areas (See Table 1in Appendix B for a comprehensive list of identified potential and existing contaminant sources). These identified potential and existing sources of contamination are considered sources of bacteria and viruses, nitrates and/or nitrites, volatile organic chemicals, heavy metals, synthetic organic chemicals, and other organic chemicals. Overall, the public drinking water source for Dimond Estates received a vulnerability rating of **high** for bacteria and viruses, nitrates and/or nitrites, synthetic organic chemicals, and other organic chemicals; and **very high** for volatile organic chemicals, and heavy metals.

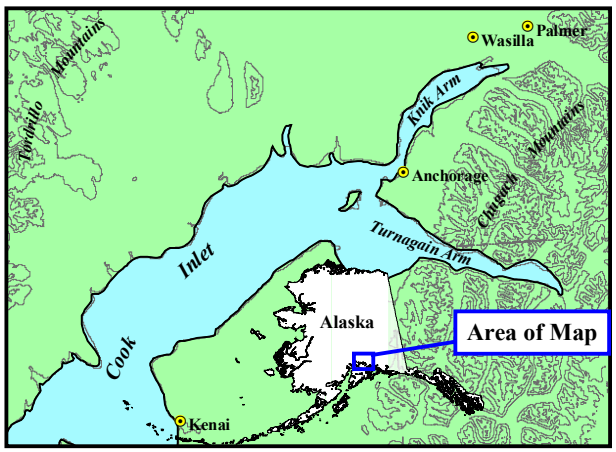


Figure 1. Index map showing the location of Anchorage, Alaska

INTRODUCTION

The purpose of this environmental assessment is to provide public water system owners and/or operators, communities, and local governments with information they can use to preserve the quality of Alaska's public drinking water supplies. This assessment was completed for the sources of public drinking water serving Dimond Estates. This water system consists of two wells in the Anchorage area (see Figure 1). This assessment, known under the Alaska Drinking Water Protection Program as the *Source Water Assessment*, has combined a review of the natural hydrogeologic sensitivity with potential and existing contaminant risks to arrive at an overall vulnerability of the drinking water source to contamination. This assessment has been completed as a basis for local voluntary protection efforts and to assist agencies in their efforts to reduce risk to this public drinking water supply.

DESCRIPTION OF THE ANCHORAGE AREA, ALASKA

Location

Anchorage, located in southcentral Alaska, encompasses 1,698 square miles of land and 264 square miles of water. The area containing a majority of the urban development, commonly referred to as the Anchorage Bowl, encompasses approximately 180 square miles [*Partick, Brabets, and Glass, 1989*] and envelopes the low lands of the area. This area is bounded on the east by the Chugach Mountains and the north, west, and south by the Knik and Turnagain Arm of Cook Inlet (Figure 1). In recent times, urban development has extended eastward along the flanks of the Chugach Mountains. This area, known locally as the Anchorage Hillside, contains development at elevations exceeding 3,700 feet in elevation above sea level.

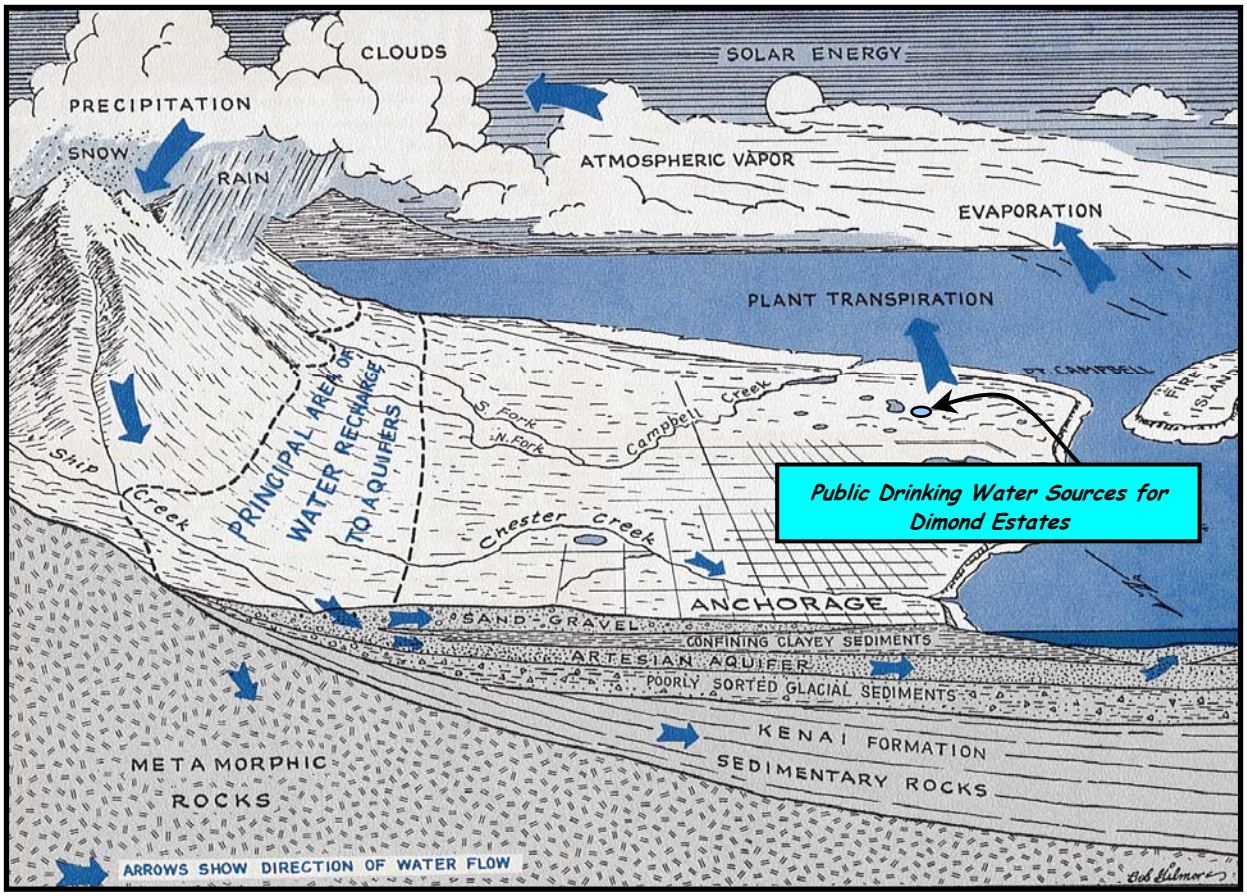


Figure 2. Generalized hydrologic cycle in the Anchorage area [*Barnwell, George, Dearborn,Weeks, and Zenone*, 1972].

Climate

The Anchorage area climate is somewhat transitional in that it does not experience large daily and annual temperature fluctuations like those experienced in the interior of Alaska nor does it experience high amounts of precipitation typified by gulf coast regions. Mean annual precipitation at the Anchorage International Airport is approximately 16 inches per year. On average, Anchorage receives a total snow accumulation of 69 inches per year. Precipitation generally increases inland toward the Chugach Mountains where annual precipitation may exceed 160 inches per year [*Barnwell, George, Dearborn, Weeks, and Zenone*, 1972]. Mean daily temperature ranges from 65^{o} F during July to 8^{o} F in January [*Western Regional Climate Center*, 2000].

Physiography and Groundwater Conditions

Surface elevations in the Anchorage area range from sea level at Knik and Turnagain Arms to well over 5,000 feet in the peaks that bound the area. Glacial moraine and outwash deposits primarily mantle the surface of the Anchorage Bowl.

The backbone of the Chugach Mountains is composed primarily of metamorphic marine and volcanic rocks (bedrock). These high peaks that bound Anchorage's east side are flanked with colluvium or slope deposits. These slope deposits eventually grade into the glacial and stream deposits at lower elevations in the Anchorage Bowl.

In the Anchorage area, two principal groundwater flow systems or aquifers exist (see Figure 2). The upper unconfined aquifer or water-table aquifer is separated from a lower confined aquifer system by layers of silty, clayey glacially derived sediments (confining layer) [*Ulery and Updike*, 1983]. The lower confined aquifer system consists of a series of hydrologically interconnected layers and lenses of gravel, sand and silt that, collectively, form the confined aquifer. The confining layer ranges from 0 to 270 feet thick throughout the Anchorage area and generally thins with increasing distance from Cook Inlet, thus pinching out at the mountain front [*Patrick, Brabets, and Glass*, 1989].

Water enters or recharges these two aquifer systems in several different ways. Along the front of the Chugach Mountains, groundwater seeps from fractures in bedrock into the sediments. At these higher elevations, rain and snowmelt also enters the sediments. This area along the mountain front is considered the principal recharge area

for wells in the Anchorage area. Precipitation in the low lands may also percolate directly into the ground. Lastly, aquifers may also be recharged by streams where surface water percolates into surrounding permeable sediments (losing reaches of streams). Groundwater flow in the confined aquifer is generally east to west from the mountain front toward Cook Inlet and Turnagain Arm, except in areas where the direction of flow is influenced by large municipal or industrial production wells. The direction of groundwater flow in the upper unconfined aquifer is more variable due to the influence from surfacial topography as well as its close connection with surface water bodies.

DIMOND ESTATES

Dimond Estates' Public Drinking Water System is a Class A (community) water system consisting of two wells. Due to the their close proximity, the wells share the same protection area and contaminant source inventory. Both wells are located off of West Dimond Blvd. at an elevation of approximately 75 feet above sea level (see Figure 3).

Installation of Well #1 occurred July 14, 1970 to a total depth of 240 feet below ground surface and was completed in a 6-inch well casing. The well is screened at 204 feet below land surface. According to the most recent Sanitary Survey (06/01/00) the static water level is 30 feet below the top of the well casing. The Sanitary Survey also indicates that the well is grouted. Proper grouting provides added protection against contaminants traveling along the well casing and into source waters.

Installation of Well #2 occurred July 31, 1982 to a total depth of 231 feet below ground surface and was completed in a 10-inch well casing. The well is screened from 202 to 224 feet below ground surface. The static water level for Well #2 was recorded at 33 feet below ground surface at the time of drilling. The well log did not indicate whether grouting was applied at the time of drilling. According to the Sanitary Survey, Well #2

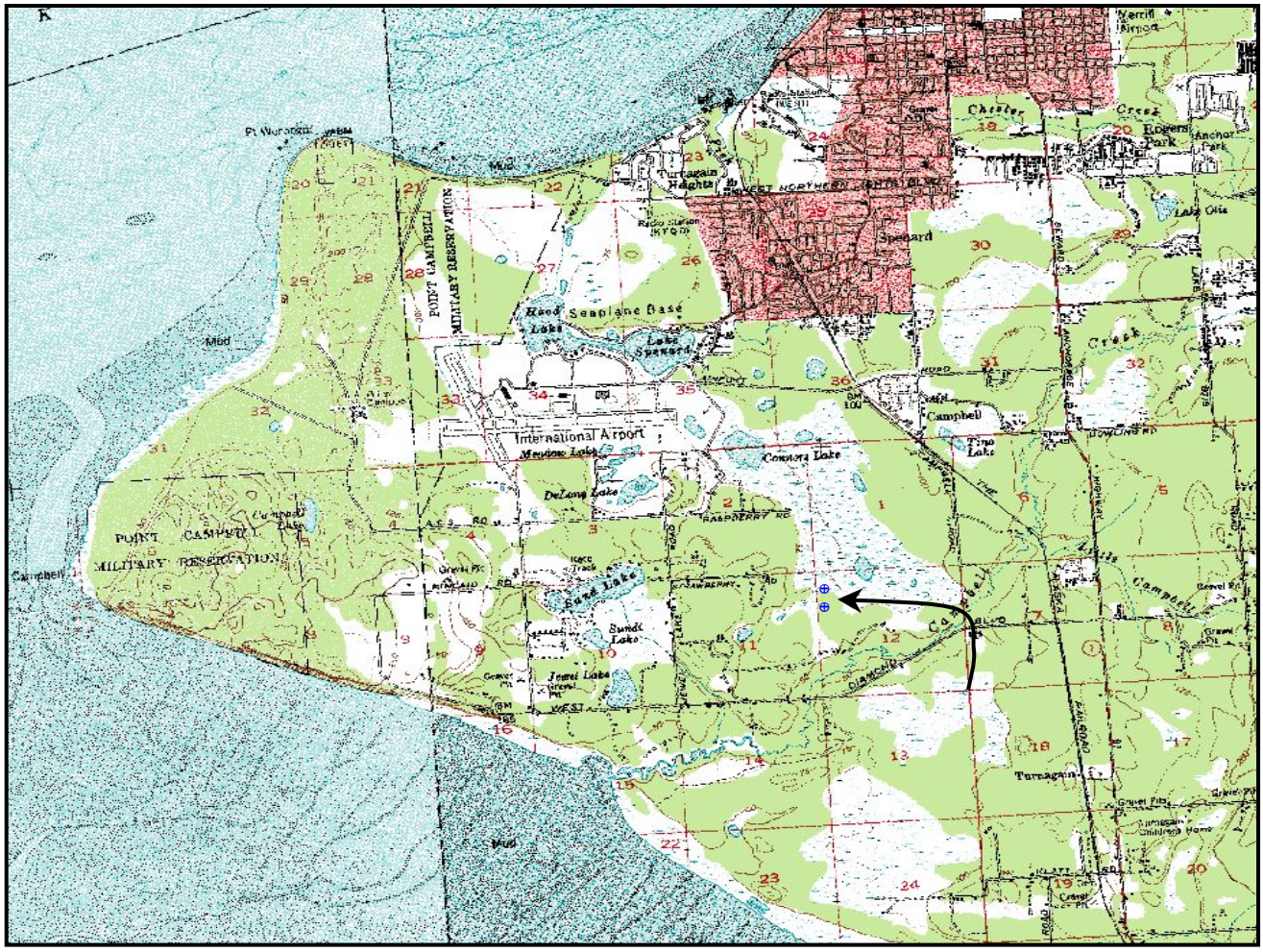


Figure 3. Map showing the location of the drinking water sources for Dimond Estates [Base: USGS Tyonek A1].

serves as the primary source of drinking water for Dimond Estates.

There is a third, inactive well, for Dimond Estates. An As-Built Report of Waterwell Construction for Well #2 by Western States Associates, Inc. notes that the capacity of Well #3 was insufficient to supply the total demand of the system at all times. It was not indicated that the well was properly decommissioned, according to ADEC regulations 18.AAC.80.015. The presence of an abandoned well within the Zone A protection area increases the overall vulnerability of nearby drinking water sources because of the potential for contaminants to enter the source aquifer via the well casing. Abandoned wells are often not monitored and can provide direct routes to the source aquifer increasing the potential for contamination should tampering or vandalism occur.

This system operates year round and serves approximately 1395 residents through 488 service connections.

ASSESSMENT AND PROTECTION AREA FOR DIMOND ESTATES

The Drinking Water Protection and Assessment Area that has been established for Dimond Estates is the area that is most sensitive to contamination. This area serves as a basis for assessing the risk of the drinking water source to contamination. The zones around the drinking water source outline the most critical area for the preservation of the quality of the drinking water for this system. For simplicity, this area will be known as your Drinking Water Protection Area and will serve as the focus for voluntary protection efforts.

Conceptually, groundwater enters the aquifer systems along the front range of the Chugach Mountains (Figure 2) and flows toward Cook Inlet. An analytical calculation was used to determine the size and shape of the area that contributes water to the well. The input parameters describing the attributes of the aquifer in this calculation were adopted from the U.S. Geological Survey [*Patrick, Brabets, and Glass, 1989*]. This analytical calculation was used as a guide as the first step in establishing the protection area for each public drinking water source in Anchorage. Additional methods were further employed to take into account any uncertainties in groundwater flow and aquifer characteristics to arrive at meaningful and conservative protection areas with respect to public health (Please refer to the Guidance Manual for Class A Public Water Systems for additional information).

The Drinking Water Protection Areas established for wells by the Alaska Department of Environmental Conservation are separated into zones. These zones correspond to a time-of-travel. Time-of-travel is the time required for water to move in the saturated zone of the ground from a specific point to the well. The Drinking Water Protection Area for Dimond Estates contains four zones, Zone A through Zone D (See Map 1 in Appendix A). Zone A corresponds to the area between the wells and the distance equal to ¼ of the distance of the 2-year time-of-travel. Depending on where a contaminant source is located within Zone A, travel time for a contaminant to the wells may be on the order of several days to several hours. Zone A also extends downgradient from the wells to take into account the area of the aquifer that is influenced by pumping of the wells. Zone B corresponds to a time-of-travel of less than two years. Zones C and D correspond to those areas between 5 years and 10 years time-of-travel, respectively.

INVENTORY OF POTENTIAL AND EXISTING CONTAMINANT SOURCES

The Drinking Water Protection Program has completed an inventory of potential and existing sources of contamination within the Drinking Water Protection Area for Dimond Estates. This survey was completed through a search of agency records and other publicly available information. Potential sources of contamination to drinking water supplies cover a wide range of categories and types. Potential drinking water contaminants are found within agricultural, residential, commercial, and industrial areas, but can also occur within areas that have little or no development.

For the basis of this assessment and all Class A public water system assessments, six categories of drinking water contaminants were inventoried. They include:

- Bacteria and viruses
- Nitrates and/or nitrites
- Volatile organic chemicals
- Heavy metals, cyanide, and other inorganic chemicals
- Synthetic organic chemicals
- Other organic chemicals

Maps 2 through 9 in Appendix C depict the Contaminant Source Inventory for Dimond Estates. Table 1 in Appendix B lists the inventoried potential sources of contamination within Zones A through D. Below is a summary of the contaminant sources inventoried:

- Approximately 238 acres of residential area;

- sewer lines;
- Class V industrial process water disposal wells;
- Class V motor vehicle waste disposal wells;
- an orchard or nursery;
- gasoline stations;
- welding shops;
- car washes;
- underground fuel storage tanks;
- an organic chemicals manufacturing site;
- lawn and gardening supply distributor;
- and construction trade areas.

These potential and existing contaminant sources present the most significant risk for all six categories of regulated drinking water contaminants, respectively (See Table 1 in Appendix B for a comprehensive list of identified potential and existing contaminant sources).

RANKING OF CONTAMINANT RISKS

Potential and existing sources of contamination have been identified, sorted, and ranked according to what type and level of risk they represent. Ranking of contaminant risks for a "potential" or "existing" source of contamination is a function of toxicity and volumes of specific contaminants associated with that source. Contaminant risks are further a function of the number and density of those types of contaminant sources as well as the proximity of those sources to the public drinking water wells.

VULNERABILITY OF DIMOND ESTATES

Vulnerability of a drinking water source to contamination is a combination of two factors:

- natural susceptibility; and
- contaminant risks.

Each of the six categories of drinking water contaminants have been analyzed and an overall vulnerability score of 0 to 100 ultimately assigned:

Natural Susceptibility (0 – 50 points)

+

Contaminant Risks (0 – 50 points)

=

Vulnerability of the
Drinking Water Source to Contamination (0 – 100).

A score for the Natural Susceptibility is achieved by analyzing the properties of the well and the aquifer.

Susceptibility of the Wellhead (0 – 25 Points)
+
Susceptibility of the Aquifer (0 – 25 Points)

= Natural Susceptibility (Susceptibility of the Well)
(0 – 50 Points)

According to the well logs both wells were completed in a confined aquifer. Well #2, the primary source, was drilled to a total depth of 231 feet below ground surface. Well #1, the secondary source, was drilled to a total depth of 210 feet below ground surface. The confining layer for both wells consists of sandy silty clay. The confining layer tends to be discontinuous in this area and occurs at varying depths for both wells. Well #2 is confined from 57 to 65 feet below ground surface. Well #1 is confined by a layer of hardpan material from 180 to 184 feet below ground surface. These confining layers may provide a protective barrier against the movement of contaminants in the subsurface. However, near the base of the Chugach Mountains, these clay layers tend to be discontinuous and thin toward the mountains. Therefore, contaminants that enter the subsurface near the base of the mountains may enter the confined aquifer uninhibited by the absence of any protective layer. Because of their close proximity (within 100 feet of each other) and similar hyrdogeologic characteristics the wells share the same protection area and vulnerability rating.

Combining the susceptibility of the wellhead and the aquifer to contamination leads to a score (0 – 50 points) and rating of overall Susceptibility of the well to contamination (See Appendix D). Table 1 depicts the overall Susceptibility score and rating for the sources of drinking water serving Dimond Estates.

Table 1. Natural Susceptibility - Susceptibility of the Wellhead and Aquifer to Contamination

	Score	Rating
Susceptibility of the Wellhead	10	Medium
Susceptibility of the Aquifer	21	Very High
Natural Susceptibility	31	High

Contaminant risks to a drinking water source depend on the type, number or density, and distribution of contaminant sources. A score (0 – 50 points) and rating of Contaminant Risks (See Appendix D) is assigned based on the findings of the Contaminant Source Inventory (See Appendix B - Table 1 – Table 7). This portion of the analysis examines any existing or historical contamination that has been detected at the drinking water source through routine sampling. It also reviews contamination that has or may have occurred but has not arrived or been detected at the well. Table 2 summarizes the Contaminant Risks for each category of drinking water contaminants.

Table 2. Contaminant Risks to Dimond Estates

Contaminant Risks	Score	Rating
Bacteria and Viruses	35	High
Nitrates and/or Nitrites	45	Very High
Volatile Organic Chemicals	50	Very High
Heavy Metals, Cyanide, And Other Inorganic Chemicals	50	Very High
Synthetic Organic Chemicals	32	High
Other Organic Chemicals	45	Very High

Appendix D contains fourteen charts, which together form the 'Vulnerability Analysis' for a Class A public drinking water system. Chart 1 analyzes the 'Susceptibility of the Wellhead' to contamination by looking at the construction of the well and its surrounding area. Chart 2 analyzes the 'Susceptibility of the Aquifer' to contamination by looking at the naturally occurring attributes of the water source and influences on the groundwater system that might lead to contamination. Chart 3 analyzes 'Contaminant Risks' for the drinking water source with respect to bacteria and viruses. The 'Contaminant Risks' portion of the analysis considers potential sources of contaminants as well as a review of contamination that has or may have occurred but has not arrived or been detected at the well. Lastly, Chart 4 contains the 'Vulnerability Analysis for Bacteria and Viruses'. Charts 5 through 14 contain the Contaminant Risks and Vulnerability Analysis for nitrates and nitrites, volatile organic chemicals, heavy metals, synthetic organic chemicals, and other organic chemicals, respectively.

Vulnerability of drinking water sources to contamination is the combination of susceptibility of the aquifer and the well with contaminant risks. Table 3 contains the overall vulnerability scores (0 – 100) and ratings for each of the six categories of drinking water contaminants (See Appendix D). Note: scores are rounded off to the nearest five.

Table 3. Overall Vulnerability of Dimond Estates to Contamination by Category

Category	Score	Rating
Bacteria and Viruses	65	High
Nitrates and Nitrites	75	High
Volatile Organic Chemicals	80	Very High
Heavy Metals, Cyanide, and Other Inorganic Chemicals	80	Very High
Synthetic Organic Chemicals	65	High
Other Organic Chemicals	75	High

Tables 2 through 7 in Appendix B contain the ranking of potential and existing sources of contamination with respect to bacteria and viruses, nitrates and/or nitrites, heavy metals, synthetic organic chemicals, and other organic chemicals, respectively.

The contaminant risk for bacteria and viruses is high with residential areas and municipal parks, sewer lines, and a Class V industrial process water disposal well presenting the most significant risk to the drinking water well. After combining the contaminant risk for bacteria and viruses with the natural susceptibility of the well, the overall vulnerability of the well to contamiantion is high from bacteria and viurses.

Review of the historical sampling data indicates that no bacteria and viruses have been detected in Dimond Estates' source waters within the past 5 years (See Chart 3 – Contaminant Risks for Bacteria and Viruses in Appendix D).

Nitrates and/or nitrites are found in natural background concentrations throughout Alaska. Nitrate concentrations in uncontaminanted groundwater are typically less than 2 milligrams per liter (mg/L) and are derived primarily from the decomposition of organic matter in soils [Wang, Strelakos, Jokela, 2000].

Sampling history for Dimond Estates indicates that nitrates have not been detected in Dimond Estates' source waters (See Chart 5 – Contaminant Risks for Nitrates and/or Nitrites in Appendix D).

The contaminant risk for nitrates and/or nitrites is very

high with residential areas and municipal parks, a Class V industrial process water disposal well, sewer lines and an orchard or nursery presenting the most significant risk to the drinking water source. After combining the contaminant risk with the natural susceptibility of the well, the overall vulnerability of the well to contamination is high from nitrates and/or nitrates.

The contaminant risk for volatile organic chemicals is very high with gasoline stations, welding shops, car washes, a Class V industrial process water disposal well, Class V motor vehicle waste disposal wells, and underground fuel storage tanks presenting the most significant risk to the drinking water well. Combining the contaminant risk for volatile organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamiantion is very high from volatile organic chemicals.

There are two Class V motor vehicle waste disposal wells located within the Zone D protection area. According to the United States Environmental Protection Agency's (USEPA) Office on Water, a motor vehicle waste disposal well is a type of Class V injection well which is typically a shallow disposal system that receives or has received fluids from vehicular repair or maintenance activities, such as an auto body repair shop, automotive repair shops, new and used car dealerships, specialty repair shop (e.g., transmission and muffler repair shop), or any area where vehicular repair work is performed.

The USEPA's Office on Water describes motor vehicle waste disposal wells as floor drains or sinks in service bays that are tied into a shallow disposal system (see Figure 4). Most commonly, these shallow systems are septic systems or drywells, but any underground system that receives motor vehicle waste would be considered a

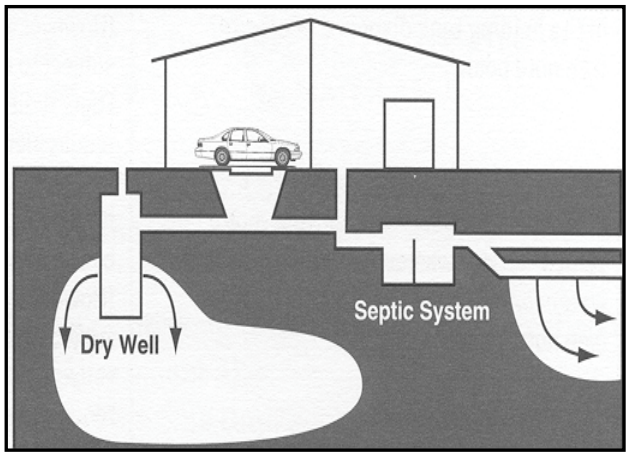


Figure 4. Motor vehicle waste disposal system

motor vehicle waste disposal well. A variety of names are used to describe shallow disposal systems including: cesspools, catchbasins, sink holes, underground vaults, or drain tanks.

Review of the historical sampling data indicate that no volatile organic chemical contamination has been detected in Dimond Estates' source waters (See Chart 7 – Contaminant Risks for Volatile Organic Chemicals in Appendix D).

The contaminant risk for heavy metals and other organic chemicals is very high with a Class V industrial process water disposal well, Class V motor vehicle waste disposal wells, car washes, and underground fuel storage tanks presenting the most significant risk to the drinking water well.
Review if recent sampling history revealed that low concentrations of inorganic chemicals have been detected in Dimond Estates' source waters. Sampling done on January 31, 2002 detected arsenic at 0.00258mg/L or 26% of the MCL for arsenic (See Chart 9 – Contaminant Risks for Heavy Metals and Other Inorganic Chemicals in Appendix D). Combining the contaminant risk with the natural susceptibility of the well leads to an overall vulnerability to heavy metals and other inorganic chemical contamination of very high.

According to the EPA "Arsenic occurs naturally in rocks and soil, water, air, and plants and animals. It can be further released into the environment through natural activities such as volcanic action, erosion of rocks, and forest fires, or through human actions. Approximately 90 percent of industrial arsenic in the U.S. is currently used as a wood preservative, but arsenic is also used in paints, dyes, metals, drugs, soaps, and semi-conductors. Agricultural applications, mining, and smelting also contribute to arsenic releases in the environment." (EPA, 2001).

Studies have linked long-term exposure to arsenic in drinking water to cancer of the bladder, lungs, skin, kidney, nasal passages, liver, and prostate. Non-cancer effects of ingesting arsenic include cardiovascular, pulmonary, immunological, neurological, and endocrine (e.g., diabetes) effects. Short-term exposure to high doses of arsenic can cause other adverse health effects, but such effects are unlikely to occur from U.S. public water supplies that are in compliance with the previous arsenic standard of 50 ppb. (EPA, 2001)

The contaminant risk for synthetic organic chemicals is medium with residential areas, and sewer lines presenting the most significant risk to the drinking water well. After

combining the contaminant risk for synthetic organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamiantion from synthetic organic chemicals is medium.

The contaminant risk for other organic chemicals is very high with Class V motor vehicle waste disposal wells, motor vehicle repair shops, junk yards, machine and metal workshops, gasoline stations, automotive body shops, and heavy equipment storage areas presenting the most significant risk to the drinking water well. After combining the contaminant risk for other organic chemicals the natural susceptibility of the well, the overall vulnerability of the well to contamiantion from other organic chemicals is high.

Historical sampling data indicate that no synthetic organic chemicals or other organic chemicals have been detected in Dimond Estates' drinking water within the past 5 years (See Charts 11 and 13 – Contaminant Risks for Synthetic Organic Chemicals and Other Organic Chemicals in Appendix D, respectively).

SUMMARY

A *Source Water Assessment* has been completed for Dimond Estates. The overall vulnerability of this water source to contamination is **high** for bacteria and viruses, nitrates and/or nitrites, synthetic organic chemicals, and other organic chemicals; and **very high** for volatile organic chemicals, and heavy metals. This assessment of contaminant risks can be used as a foundation for local voluntary protection efforts as well as a basis for continuous efforts on the part of Dimond Estates to protect public health. It is anticipated that *Source Water Assessments* will be updated every five years to reflect any changes in the vulnerability and/or susceptibility of the drinking water sources serving Dimond Estates.

REFERENCES CITED

Barnwell, W.W., George, R.S., Dearborn, L.L., Weeks, J.B., and Zenone, C., 1972, Water for Anchorage: an atlas of the water resources of the Anchorage area, Alaska: U.S. Geological Survey Open-File Report, 76 p.

Patrick, L.D., Brabets, T.P., and Glass, R.L., 1989, Simulation of ground-water flow at Anchorage, Alaska: U.S. Geological Survey Water-Resources Investigations Report 88-4139, 41p.

Ulery, C.A. and Updike, R.G, 1983, Subsurface structure of the cohesive facies of the Bootlegger Cove Formation, Southwest Anchorage, Alaska: Alaska Division of Geological and Geophysical Surveys Professional Report 84, 5 p.

United States Environmental Protection Agency (EPA, Office of Water). 2001, July 23.Retrieved February 2002 [WWW document]. URL http://www.epa.gov/safewater/ars/ars_rule_factsheet.html

United States Environmental Protection Agency, 2002. Region 10: What Should I Know About Motor Vehicle Waste
Disposal Wells? Retrieved April 10 2002. [WWW.document] URL http://www.epa.gov/safewater/uic/cl5oper/motorveh.html

United States Environmental Protection Agency, 2001, Office of Water. Retrieved March 2002. [WWW document] URL http://www.epa.gov/safewater/dwh/c-ioc/nickel.html

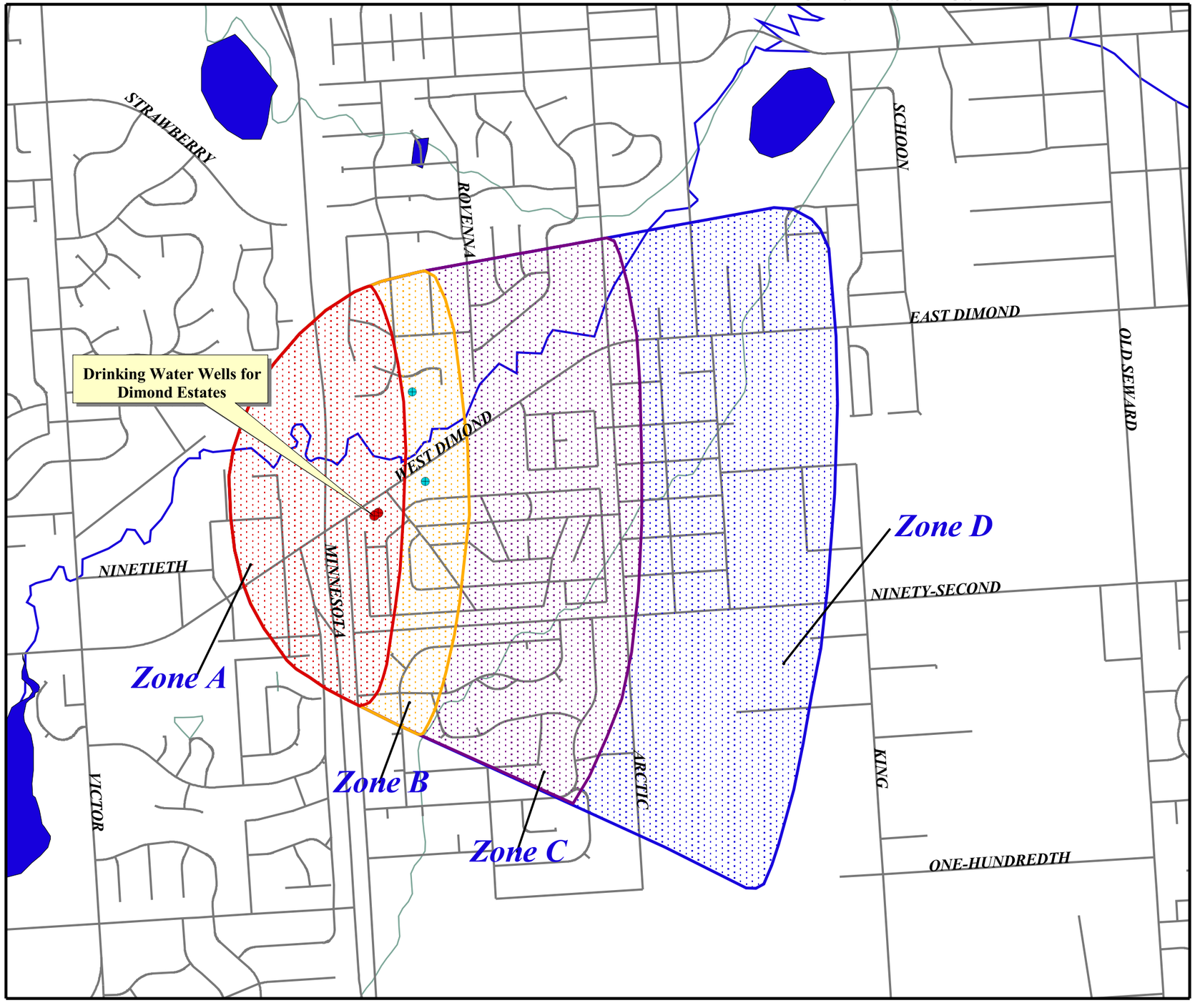
Wang, B., Strelakos, P.M., and Jokela, B., 2000, Nitrate Source Indicators In Groundwater of the Scimitar Subdivision, Peters Creek Area, Anchorage Alaska: U.S. Geological Survey Water-Resources Investigations Report 00-4137, 25p.

Western Regional Climate Center, 2000, August 24, Web extension to the *Western Regional Climate Center* [WWW document]. URL http://www.wrcc.dri.edu/index.html

APPENDIX A

Drinking Water Protection Area for Dimond Estates

Drinking Water Protection Area for Dimond Estates



- Dimond Estates Water System
- Private and Public Wells

Zone A Protection Area
- Several Months Travel Time

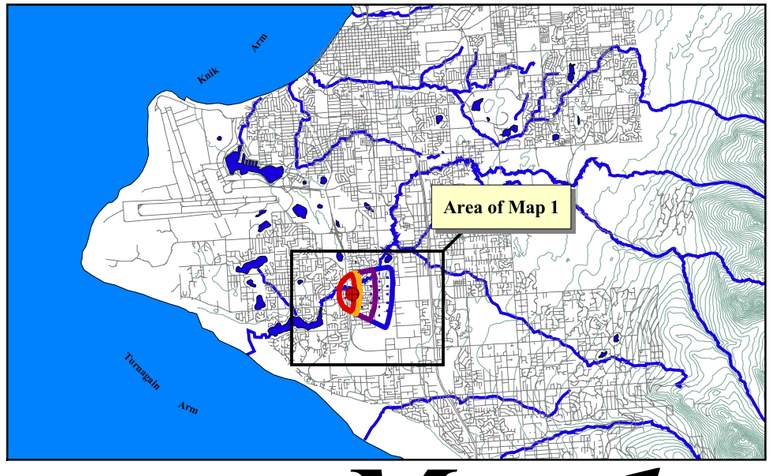
Zone B Protection Area
- Less Than 2 Years Travel Time

Zone C Protection Area
- Less Than 5 Years Travel Time

Zone D Protection Area
- Less Than 10 Years Travel Time

- Anchorage Roads
- Cook Inlet
- Anchorage Lakes
- Anchorage Streams
- Elevation Contours

N W E S



2000 0 2000 4000 Feet

PWSID 211075.001

Map 1

APPENDIX B

Contaminant Source Inventory and Risk Ranking for Dimond Estates

Table 1

Contaminant Source Inventory for ***Dimond Estates Wells 1 & 2***

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Location*	*Map Number*	*Comments*
Gasoline stations (without repair shop)	C15	C15-1	A	Off of West Dimond Blvd.	3	
Gasoline stations (without repair shop)	C15	C15-2	A	Off of West Dimond Blvd.	3	
Motor vehicle rental facilities - cars, trucks, ATV's, snow machines (with service department)	C30	C30-1	A	Off of Runamuck Place	3	
Welding shops	C43	C43-1	A	Off of Runamuck Place	3	
Car washes with engine or undercarriage cleaning	C08	C8-1	A	Off of West Dimond Blvd.	3	
Construction trade areas and materials	C09	C9-1	A	Off of Runamuck Place	4	
Construction trade areas and materials	C09	C9-2	A	Off of Winners Circle	4	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-1	A	Along West Dimond Blvd.	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-10	A	Along Barnett Drive	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-2	A	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-3	A	Along Della Street	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-4	A	Along Wakefield Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-5	A	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-6	A	Intesecting Zone A	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-7	A	Perpindicular to Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-8	A	Along Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-9	A	Along Mentra Court	2	
Residential Areas	R01	R1-1	A	Residentail areas within Zone A	4	Approximately 64 acres of residential area within Zone A.
Tanks, gasoline (above ground)	T10	T10-1	A	Off of West Dimond Blvd.	3	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Location*	*Map Number*	*Comments*
Tanks, gasoline (above ground)	T10	T10-2	A	Off West Dimond Blvd.	3	
Tanks, gasoline (above ground)	T10	T10-3	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-1	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-2	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-3	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-4	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-5	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-6	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-7	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-8	A	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-9	A	Off West Dimond Blvd.	3	
Tanks, diesel (underground)	T08	T8-1	A	Off of West Dimond Blvd.	3	
Tanks, diesel (underground)	T08	T8-2	A	Off of West Dimond Blvd.	3	
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U4-1	A	Off of Runamuck Place	3	Diesel contamination discovered at the site. Contaminated soils were excavated and incinerated (10/11/96).
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U8-1	A	Off West Dimond Blvd.	3	Diesel contaminated soils were discovered upon underground tank removal. Groundwater results show no groundwater was contaminated ave MCL's. Site was closed 3/5/93.
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	West Dimond Blvd.	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	A	Jackson Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	A	Barnett Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-12	A	Winners Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-13	A	Frontage Road	3	
Highways and roads, paved (cement or asphalt)	X20	X20-14	A	Ruby Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-15	A	Gem Place	3	
Highways and roads, paved (cement or asphalt)	X20	X20-16	A	Lazuli Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-17	A	Turquoise Street	3	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-18	A	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-19	A	Demeter Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Carnelian Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-20	A	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-21	A	Aphrodite Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-22	A	Frontage Minnisota	3	
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Fuller Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Minnisota Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Runamuck Place	2	
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Della Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Wakefield Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-8	A	Mentra Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-9	A	Mentra Court	2	
Motor vehicle/general storage yards/facilities	X27	X27-1	A	Off of Della Street	3	
Municipal or city parks (with green areas)	X04	X4-1	A	Anchorage parks intersecting Zone A-D	4	
Municipal or city parks (with green areas)	X04	X4-2	A	Anchorage parks intersecting Zones A through D	4	
Dog walking areas/foot trails	X46	X46-1	A	Trail along west side of Minnisota Drive	2	
Dog walking areas/foot trails	X46	X46-2	A	Trail along east side of Minnisota Drive	2	
Dog walking areas/foot trails	X46	X46-3	A	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-4	A	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-5	A	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-6	A	Trail along south side of West Dimond Blvd.	2	
Hardware stores	C17	C17-1	B	Off of Jackson Drive and Mentra Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-12	B	Along Jackson Drive	5	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Location*	*Map Number*	*Comments*
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-13	B	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-14	B	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-15	B	Connecting West Dimond to subdivision	5	
Residential Areas	R01	R1-2	B	Residential areas located within Zone B	5	Approximately 44 acres of residential area within Zone B.
Highways and roads, paved (cement or asphalt)	X20	X20-23	B	Frank Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-24	B	Crystal Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-25	B	Opal Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-26	B	Cameo Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-27	B	Artemus Circle	5	
Highways and roads, paved (cement or asphalt)	X20	X20-28	B	Artemus Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-29	B	Dorian Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-30	B	Demeter Circle	5	
Orchards or nurseries	A10	A10-1	C	Off of West Dimond Blvd.	8	
Dry cleaners	C10	C10-1	C	Off of West Dimond Blvd.	8	
Lawn and garden supplies/services	C23	C23-1	C	Off of West Dimond Blvd.	8	
Motor /motor vehicle repair shops	C31	C31-2	C	Off of West Dimond - intersecting Zones B and C	8	
Photography supplies/photo processing laboratories	C36	C36-2	C	Off of West Dimond Blvd.	8	
Car washes with engine or undercarriage cleaning	C08	C8-2	C	Off of West Dimond Blvd.	8	
Construction trade areas and materials	C09	C9-3	C	Off of West Dimond Blvd.	8	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-16-42	C	All sewer lines located within Zone C	7	
Injection wells (Class V) Industrial Process Water & Water Disposal Wells	D40	D40-1	C	Off of West Dimond Blvd.	8	
Electrical, electronic, computer, and communications equipment/component manufacturing	I13	I13-1	C	Off of West Dimond Blvd.	8	
Residential Areas	R01	R1-3	C	All residential areas located within Zone C	8	Approximately 130 acres of residential area within Zone C.

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Location*	*Map Number*	*Comments*
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U8-2	C	Off of West Dimond Blvd.	8	Improper tank abandonment caused groundwater to infiltrate into tank. This caused an overflow of product. Residual impacts were confined to immediate vicinity of former storage tank.
Highways and roads, paved (cement or asphalt)	X20	X20-31-58	C	All roads located within Zone C	7	
Medical/veterinary facilities (doctor or dentist offices, hospitals, nursing homes)	X40	X40-1	C	Off of West Dimond Blvd.	8	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	D	Off of West Dimond Blvd.	9	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	Off of West Dimond Blvd.	9	
Organic chemicals manufacturing	I29	I29-1	D	Off of Sorcerer Court	9	
Tanks, lubricants or other petroleum products (aboveground)	T18	T18-1-3	D	Off of West Dimond Blvd.	9	
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U8-3	D	Off of West Dimond Blvd.	9	Gas spill discovered during an underground storage tank removal. Site was cleaned and closed 10/5/99.

Table 2

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2 Sources of Bacteria and Viruses

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Residential Areas	R01	R1-1	A	Low	Residentail areas within Zone A	4	Approximately 64 acres of residential area within Zone A.
Residential Areas	R01	R1-2	B	Low	Residential areas located within Zone B	5	Approximately 44 acres of residential area within Zone B.
Injection wells (Class V) Industrial Process Water & Water Disposal Wells	D40	D40-1	C	High	Off of West Dimond Blvd.	8	
Municipal or city parks (with green areas)	X04	X4-1	A	Medium	Anchorage parks intersecting Zone A-D	4	
Municipal or city parks (with green areas)	X04	X4-2	A	Medium	Anchorage parks intersecting Zones A through D	4	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-1	A	Medium	Along West Dimond Blvd.	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-2	A	Medium	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-3	A	Medium	Along Della Street	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-4	A	Medium	Along Wakefield Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-5	A	Medium	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-10	A	Medium	Along Barnett Drive	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-6	A	Medium	Intesecting Zone A	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-7	A	Medium	Perpindicular to Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-8	A	Medium	Along Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-9	A	Medium	Along Mentra Court	2	
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Low	West Dimond Blvd.	2	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-10	A	Low	Jackson Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	A	Low	Barnett Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-12	A	Low	Winners Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-13	A	Low	Frontage Road	3	
Highways and roads, paved (cement or asphalt)	X20	X20-14	A	Low	Ruby Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-15	A	Low	Gem Place	3	
Highways and roads, paved (cement or asphalt)	X20	X20-16	A	Low	Lazuli Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-17	A	Low	Turquoise Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-18	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-19	A	Low	Demeter Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Low	Carnelian Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-20	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-21	A	Low	Aphrodite Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-22	A	Low	Frontage Minnisota	3	
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Low	Fuller Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Low	Minnisota Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Low	Runamuck Place	2	
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Low	Della Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Low	Wakefield Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-8	A	Low	Mentra Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-9	A	Low	Mentra Court	2	
Dog walking areas/foot trails	X46	X46-1	A	Low	Trail along west side of Minnisota Drive	2	
Dog walking areas/foot trails	X46	X46-2	A	Low	Trail along east side of Minnisota Drive	2	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Dog walking areas/foot trails	X46	X46-3	A	Low	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-4	A	Low	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-5	A	Low	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-6	A	Low	Trail along south side of West Dimond Blvd.	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Medium	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Medium	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-12	B	Medium	Along Jackson Drive	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-13	B	Medium	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-14	B	Medium	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-15	B	Medium	Connecting West Dimond to subdivision	5	
Highways and roads, paved (cement or asphalt)	X20	X20-23	B	Low	Frank Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-24	B	Low	Crystal Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-25	B	Low	Opal Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-26	B	Low	Cameo Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-27	B	Low	Artemus Circle	5	
Highways and roads, paved (cement or asphalt)	X20	X20-28	B	Low	Artemus Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-29	B	Low	Dorian Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-30	B	Low	Demeter Circle	5	
Dry cleaners	C10	C10-1	C	Low	Off of West Dimond Blvd.	8	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-16-42	C	Medium	All sewer lines located within Zone C	7	

Table 2 (continued)

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2 Sources of Bacteria and Viruses

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Residential Areas	R01	R1-3	C	Low	All residential areas located within Zone C	8	Approximately 130 acres of residential area within Zone C.
Highways and roads, paved (cement or asphalt)	X20	X20-31-58	C	Low	All roads located within Zone C	7	
Medical/veterinary facilities (doctor or dentist offices, hospitals, nursing homes)	X40	X40-1	C	Medium	Off of West Dimond Blvd.	8	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	D	Low	Off of West Dimond Blvd.	9	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	Low	Off of West Dimond Blvd.	9	

Table 3

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2 Sources of Nitrates/Nitrites

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Residential Areas	R01	R1-1	A	Low	Residentail areas within Zone A	4	Approximately 64 acres of residential area within Zone A.
Residential Areas	R01	R1-2	B	Low	Residential areas located within Zone B	5	Approximately 44 acres of residential area within Zone B.
Injection wells (Class V) Industrial Process Water & Water Disposal Wells	D40	D40-1	C	High	Off of West Dimond Blvd.	8	
Municipal or city parks (with green areas)	X04	X4-1	A	Medium	Anchorage parks intersecting Zone A-D	4	
Municipal or city parks (with green areas)	X04	X4-2	A	Medium	Anchorage parks intersecting Zones A through D	4	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-1	A	Medium	Along West Dimond Blvd.	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-2	A	Medium	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-3	A	Medium	Along Della Street	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-4	A	Medium	Along Wakefield Circle	2	
Orchards or nurseries	A10	A10-1	C	Medium	Off of West Dimond Blvd.	8	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-10	A	Medium	Along Barnett Drive	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-5	A	Medium	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-6	A	Medium	Intesecting Zone A	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-7	A	Medium	Perpindicular to Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-8	A	Medium	Along Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-9	A	Medium	Along Mentra Court	2	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Low	West Dimond Blvd.	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	A	Low	Jackson Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	A	Low	Barnett Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-12	A	Low	Winners Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-13	A	Low	Frontage Road	3	
Highways and roads, paved (cement or asphalt)	X20	X20-14	A	Low	Ruby Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-15	A	Low	Gem Place	3	
Highways and roads, paved (cement or asphalt)	X20	X20-16	A	Low	Lazuli Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-17	A	Low	Turquoise Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-18	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-19	A	Low	Demeter Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Low	Carnelian Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-20	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-21	A	Low	Aphrodite Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-22	A	Low	Frontage Minnisota	3	
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Low	Fuller Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Low	Minnisota Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Low	Runamuck Place	2	
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Low	Della Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Low	Wakefield Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-8	A	Low	Mentra Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-9	A	Low	Mentra Court	2	
Dog walking areas/foot trails	X46	X46-1	A	Low	Trail along west side of Minnisota Drive	2	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Dog walking areas/foot trails	X46	X46-2	A	Low	Trail along east side of Minnisota Drive	2	
Dog walking areas/foot trails	X46	X46-3	A	Low	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-4	A	Low	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-5	A	Low	Trail intersecting Zone A	2	
Dog walking areas/foot trails	X46	X46-6	A	Low	Trail along south side of West Dimond Blvd.	2	
Hardware stores	C17	C17-1	B	Low	Off of Jackson Drive and Mentra Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Medium	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Medium	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-12	B	Medium	Along Jackson Drive	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-13	B	Medium	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-14	B	Medium	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-15	B	Medium	Connecting West Dimond to subdivision	5	
Highways and roads, paved (cement or asphalt)	X20	X20-23	B	Low	Frank Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-24	B	Low	Crystal Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-25	B	Low	Opal Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-26	B	Low	Cameo Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-27	B	Low	Artemus Circle	5	
Highways and roads, paved (cement or asphalt)	X20	X20-28	B	Low	Artemus Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-29	B	Low	Dorian Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-30	B	Low	Demeter Circle	5	

Table 3 (continued)

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2 Sources of Nitrates/Nitrites

PWSID 211075.001

Contaminant Source Type	***Contaminant Source ID***	***CS ID tag***	***Zone***	***Risk Ranking for Analysis***	***Location***	***Map Number***	***Comments***
Dry cleaners	C10	C10-1	C	Low	Off of West Dimond Blvd.	8	
Lawn and garden supplies/services	C23	C23-1	C	Medium	Off of West Dimond Blvd.	8	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-16-42	C	Medium	All sewer lines located within Zone C	7	
Residential Areas	R01	R1-3	C	Low	All residential areas located within Zone C	8	Approximately 130 acres of residential area within Zone C.
Highways and roads, paved (cement or asphalt)	X20	X20-31-58	C	Low	All roads located within Zone C	7	
Medical/veterinary facilities (doctor or dentist offices, hospitals, nursing homes)	X40	X40-1	C	Low	Off of West Dimond Blvd.	8	

Table 4

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2 Sources of Volatile Organic Chemicals

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Gasoline stations (without repair shop)	C15	C15-1	A	High	Off of West Dimond Blvd.	3	
Gasoline stations (without repair shop)	C15	C15-2	A	High	Off of West Dimond Blvd.	3	
Welding shops	C43	C43-1	A	Medium	Off of Runamuck Place	3	
Car washes with engine or undercarriage cleaning	C08	C8-1	A	High	Off of West Dimond Blvd.	3	
Injection wells (Class V) Industrial Process Water & Water Disposal Wells	D40	D40-1	C	High	Off of West Dimond Blvd.	8	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	D	High	Off of West Dimond Blvd.	9	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	Medium	Off of West Dimond Blvd.	9	
Tanks, gasoline (underground)	T12	T12-1	A	High	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-2	A	High	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-3	A	High	Off West Dimond Blvd.	3	
Motor vehicle rental facilities - cars, trucks, ATV's, snow machines (with service department)	C30	C30-1	A	Medium	Off of Runamuck Place	3	
Construction trade areas and materials	C09	C9-1	A	Low	Off of Runamuck Place	4	
Construction trade areas and materials	C09	C9-2	A	Low	Off of Winners Circle	4	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-1	A	Low	Along West Dimond Blvd.	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-10	A	Low	Along Barnett Drive	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-2	A	Low	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-3	A	Low	Along Della Street	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-4	A	Low	Along Wakefield Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-5	A	Low	Along Runamuck Place	2	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-6	A	Low	Intesecting Zone A	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-7	A	Low	Perpindicular to Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-8	A	Low	Along Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-9	A	Low	Along Mentra Court	2	
Residential Areas	R01	R1-1	A	Low	Residentail areas within Zone A	4	Approximately 64 acres of residential area within Zone A.
Tanks, gasoline (above ground)	T10	T10-1	A	Medium	Off of West Dimond Blvd.	3	
Tanks, gasoline (above ground)	T10	T10-2	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (above ground)	T10	T10-3	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-4	A	High	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-5	A	High	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-6	A	High	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-7	A	High	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-8	A	High	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-9	A	High	Off West Dimond Blvd.	3	
Tanks, diesel (underground)	T08	T8-1	A	High	Off of West Dimond Blvd.	3	
Tanks, diesel (underground)	T08	T8-2	A	High	Off of West Dimond Blvd.	3	
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U04	U4-1	A	Low	Off of Runamuck Place	3	Diesel contamination discovered at the site. Contaminated soils were excavated and incinerated (10/11/96).
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U8-1	A	Low	Off West Dimond Blvd.	3	Diesel contaminated soils were discovered upon underground tank removal. Groundwater results show no groundwater was contaminated ave MCL's. Site was closed 3/5/93.

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Low	West Dimond Blvd.	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	A	Low	Jackson Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	A	Low	Barnett Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-12	A	Low	Winners Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-13	A	Low	Frontage Road	3	
Highways and roads, paved (cement or asphalt)	X20	X20-14	A	Low	Ruby Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-15	A	Low	Gem Place	3	
Highways and roads, paved (cement or asphalt)	X20	X20-16	A	Low	Lazuli Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-17	A	Low	Turquoise Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-18	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-19	A	Low	Demeter Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Low	Carnelian Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-20	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-21	A	Low	Aphrodite Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-22	A	Low	Frontage Minnisota	3	
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Low	Fuller Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Low	Minnisota Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Low	Runamuck Place	2	
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Low	Della Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Low	Wakefield Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-8	A	Low	Mentra Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-9	A	Low	Mentra Court	2	
Motor vehicle/general storage yards/facilities	X27	X27-1	A	Low	Off of Della Street	3	
Hardware stores	C17	C17-1	B	Low	Off of Jackson Drive and Mentra Street	5	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Low	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Low	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-12	B	Low	Along Jackson Drive	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-13	B	Low	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-14	B	Low	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-15	B	Low	Connecting West Dimond to subdivision	5	
Residential Areas	R01	R1-2	B	Low	Residential areas located within Zone B	5	Approximately 44 acres of residential area within Zone B.
Highways and roads, paved (cement or asphalt)	X20	X20-23	B	Low	Frank Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-24	B	Low	Crystal Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-25	B	Low	Opal Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-26	B	Low	Cameo Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-27	B	Low	Artemus Circle	5	
Highways and roads, paved (cement or asphalt)	X20	X20-28	B	Low	Artemus Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-29	B	Low	Dorian Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-30	B	Low	Demeter Circle	5	
Dry cleaners	C10	C10-1	C	High	Off of West Dimond Blvd.	8	
Motor /motor vehicle repair shops	C31	C31-2	C	Medium	Off of West Dimond - intersecting Zones B and C	8	
Photography supplies/photo processing laboratories	C36	C36-2	C	Medium	Off of West Dimond Blvd.	8	
Car washes with engine or undercarriage cleaning	C08	C8-2	C	High	Off of West Dimond Blvd.	8	
Construction trade areas and materials	C09	C9-3	C	Low	Off of West Dimond Blvd.	8	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-16-42	C	Low	All sewer lines located within Zone C	7	
Electrical, electronic, computer, and communications equipment/component manufacturing	I13	I13-1	C	Low	Off of West Dimond Blvd.	8	
Residential Areas	R01	R1-3	C	Low	All residential areas located within Zone C	8	Approximately 130 acres of residential area within Zone C.
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U8-2	C	High	Off of West Dimond Blvd.	8	Improper tank abandonment caused groundwater to infiltrate into tank. This caused an overflow of product. Residual impacts were confined to immediate vicinity of former storage tank.
Highways and roads, paved (cement or asphalt)	X20	X20-31-58	C	Low	All roads located within Zone C	7	
Medical/veterinary facilities (doctor or dentist offices, hospitals, nursing homes)	X40	X40-1	C	Low	Off of West Dimond Blvd.	8	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	High	Off of West Dimond Blvd.	9	
Organic chemicals manufacturing	I29	I29-1	D	Very High	Off of Sorcerer Court	9	
Closed Leaking Underground Fuel Storage Tank (LUST) Sites	U08	U8-3	D	Low	Off of West Dimond Blvd.	9	Gas spill discovered during an underground storage tank removal. Site was cleaned and closed 10/5/99.

Table 5

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2

Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Injection wells (Class V) Industrial Process Water & Water Disposal Wells	D40	D40-1	C	High	Off of West Dimond Blvd.	8	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	D	High	Off of West Dimond Blvd.	9	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	Medium	Off of West Dimond Blvd.	9	
Car washes with engine or undercarriage cleaning	C08	C8-1	A	Medium	Off of West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-1	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-2	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-3	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-4	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-5	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-6	A	Medium	Off West Dimond Blvd.	3	
Gasoline stations (without repair shop)	C15	C15-1	A	Low	Off of West Dimond Blvd.	3	
Gasoline stations (without repair shop)	C15	C15-2	A	Low	Off of West Dimond Blvd.	3	
Motor vehicle rental facilities - cars, trucks, ATV's, snow machines (with service department)	C30	C30-1	A	Low	Off of Runamuck Place	3	
Welding shops	C43	C43-1	A	Low	Off of Runamuck Place	3	
Construction trade areas and materials	C09	C9-1	A	Low	Off of Runamuck Place	4	
Construction trade areas and materials	C09	C9-2	A	Low	Off of Winners Circle	4	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-1	A	Low	Along West Dimond Blvd.	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-10	A	Low	Along Barnett Drive	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-2	A	Low	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-3	A	Low	Along Della Street	2	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-4	A	Low	Along Wakefield Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-5	A	Low	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-6	A	Low	Intesecting Zone A	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-7	A	Low	Perpindicular to Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-8	A	Low	Along Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-9	A	Low	Along Mentra Court	2	
Residential Areas	R01	R1-1	A	Low	Residentail areas within Zone A	4	Approximately 64 acres of residential area within Zone A.
Tanks, gasoline (above ground)	T10	T10-1	A	Medium	Off of West Dimond Blvd.	3	
Tanks, gasoline (above ground)	T10	T10-2	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (above ground)	T10	T10-3	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-7	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-8	A	Medium	Off West Dimond Blvd.	3	
Tanks, gasoline (underground)	T12	T12-9	A	Medium	Off West Dimond Blvd.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Low	West Dimond Blvd.	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	A	Low	Jackson Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	A	Low	Barnett Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-12	A	Low	Winners Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-13	A	Low	Frontage Road	3	
Highways and roads, paved (cement or asphalt)	X20	X20-14	A	Low	Ruby Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-15	A	Low	Gem Place	3	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-16	A	Low	Lazuli Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-17	A	Low	Turquoise Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-18	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-19	A	Low	Demeter Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Low	Carnelian Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-20	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-21	A	Low	Aphrodite Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-22	A	Low	Frontage Minnisota	3	
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Low	Fuller Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Low	Minnisota Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Low	Runamuck Place	2	
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Low	Della Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Low	Wakefield Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-8	A	Low	Mentra Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-9	A	Low	Mentra Court	2	
Municipal or city parks (with green areas)	X04	X4-1	A	Low	Anchorage parks intersecting Zone A-D	4	
Municipal or city parks (with green areas)	X04	X4-2	A	Low	Anchorage parks intersecting Zones A through D	4	
Hardware stores	C17	C17-1	B	Low	Off of Jackson Drive and Mentra Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Low	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Low	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-12	B	Low	Along Jackson Drive	5	

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2

Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-13	B	Low	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-14	B	Low	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-15	B	Low	Connecting West Dimond to subdivision	5	
Residential Areas	R01	R1-2	B	Low	Residential areas located within Zone B	5	Approximately 44 acres of residential area within Zone B.
Highways and roads, paved (cement or asphalt)	X20	X20-23	B	Low	Frank Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-24	B	Low	Crystal Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-25	B	Low	Opal Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-26	B	Low	Cameo Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-27	B	Low	Artemus Circle	5	
Highways and roads, paved (cement or asphalt)	X20	X20-28	B	Low	Artemus Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-29	B	Low	Dorian Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-30	B	Low	Demeter Circle	5	
Orchards or nurseries	A10	A10-1	C	Low	Off of West Dimond Blvd.	8	
Lawn and garden supplies/services	C23	C23-1	C	Low	Off of West Dimond Blvd.	8	
Motor /motor vehicle repair shops	C31	C31-2	C	Medium	Off of West Dimond - intersecting Zones B and C	8	
Photography supplies/photo processing laboratories	C36	C36-2	C	Medium	Off of West Dimond Blvd.	8	
Car washes with engine or undercarriage cleaning	C08	C8-2	C	Medium	Off of West Dimond Blvd.	8	
Construction trade areas and materials	C09	C9-3	C	Low	Off of West Dimond Blvd.	8	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-16-42	C	Low	All sewer lines located within Zone C	7	
Electrical, electronic, computer, and communications equipment/component manufacturing	I13	I13-1	C	Low	Off of West Dimond Blvd.	8	

Table 5 (continued)

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2

Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Residential Areas	R01	R1-3	C	Low	All residential areas located within Zone C	8	Approximately 130 acres of residential area within Zone C.
Highways and roads, paved (cement or asphalt)	X20	X20-31-58	C	Low	All roads located within Zone C	7	
Medical/veterinary facilities (doctor or dentist offices, hospitals, nursing homes)	X40	X40-1	C	Low	Off of West Dimond Blvd.	8	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	High	Off of West Dimond Blvd.	9	
Organic chemicals manufacturing	I29	I29-1	D	High	Off of Sorcerer Court	9	
Tanks, lubricants or other petroleum products (aboveground)	T18	T18-1-3	D	Low	Off of West Dimond Blvd.	9	

Table 6

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2 Sources of Synthetic Organic Chemicals

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Residential Areas	R01	R1-1	A	Low	Residentail areas within Zone A	4	Approximately 64 acres of residential area within Zone A.
Residential Areas	R01	R1-2	B	Low	Residential areas located within Zone B	5	Approximately 44 acres of residential area within Zone B.
Municipal or city parks (with green areas)	X04	X4-1	A	Low	Anchorage parks intersecting Zone A-D	4	
Municipal or city parks (with green areas)	X04	X4-2	A	Low	Anchorage parks intersecting Zones A through D	4	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-1	A	Low	Along West Dimond Blvd.	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-2	A	Low	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-3	A	Low	Along Della Street	2	
Organic chemicals manufacturing	I29	I29-1	D	Very High	Off of Sorcerer Court	9	
Orchards or nurseries	A10	A10-1	C	High	Off of West Dimond Blvd.	8	
Lawn and garden supplies/services	C23	C23-1	C	Medium	Off of West Dimond Blvd.	8	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-10	A	Low	Along Barnett Drive	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-4	A	Low	Along Wakefield Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-5	A	Low	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-6	A	Low	Intesecting Zone A	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-7	A	Low	Perpindicular to Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-8	A	Low	Along Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-9	A	Low	Along Mentra Court	2	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Low	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-12	B	Low	Along Jackson Drive	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-13	B	Low	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-14	B	Low	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-15	B	Low	Connecting West Dimond to subdivision	5	
Photography supplies/photo processing laboratories	C36	C36-2	C	Low	Off of West Dimond Blvd.	8	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-16-42	C	Low	All sewer lines located within Zone C	7	
Residential Areas	R01	R1-3	C	Low	All residential areas located within Zone C	8	Approximately 130 acres of residential area within Zone C.
Medical/veterinary facilities (doctor or dentist offices, hospitals, nursing homes)	X40	X40-1	C	Low	Off of West Dimond Blvd.	8	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	D	Low	Off of West Dimond Blvd.	9	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	Low	Off of West Dimond Blvd.	9	

Table 7

Contaminant Source Inventory and Risk Ranking for Dimond Estates Wells 1 & 2 Sources of Other Organic Chemicals

PWSID 211075.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Residential Areas	R01	R1-1	A	Low	Residentail areas within Zone A	4	Approximately 64 acres of residential area within Zone A.
Residential Areas	R01	R1-2	B	Low	Residential areas located within Zone B	5	Approximately 44 acres of residential area within Zone B.
Motor vehicle rental facilities - cars, trucks, ATV's, snow machines (with service department)	C30	C30-1	A	Medium	Off of Runamuck Place	3	
Car washes with engine or undercarriage cleaning	C08	C8-1	A	Medium	Off of West Dimond Blvd.	3	
Gasoline stations (without repair shop)	C15	C15-1	A	Low	Off of West Dimond Blvd.	3	
Gasoline stations (without repair shop)	C15	C15-2	A	Low	Off of West Dimond Blvd.	3	
Construction trade areas and materials	C09	C9-1	A	Low	Off of Runamuck Place	4	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	D	Medium	Off of West Dimond Blvd.	9	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	Medium	Off of West Dimond Blvd.	9	
Organic chemicals manufacturing	I29	I29-1	D	Very High	Off of Sorcerer Court	9	
Welding shops	C43	C43-1	A	Low	Off of Runamuck Place	3	
Construction trade areas and materials	C09	C9-2	A	Low	Off of Winners Circle	4	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-1	A	Low	Along West Dimond Blvd.	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-10	A	Low	Along Barnett Drive	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-2	A	Low	Along Runamuck Place	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-3	A	Low	Along Della Street	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-4	A	Low	Along Wakefield Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-5	A	Low	Along Runamuck Place	2	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-6	A	Low	Intesecting Zone A	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-7	A	Low	Perpindicular to Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-8	A	Low	Along Mentra Circle	2	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-9	A	Low	Along Mentra Court	2	
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Low	West Dimond Blvd.	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	A	Low	Jackson Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	A	Low	Barnett Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-12	A	Low	Winners Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-13	A	Low	Frontage Road	3	
Highways and roads, paved (cement or asphalt)	X20	X20-14	A	Low	Ruby Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-15	A	Low	Gem Place	3	
Highways and roads, paved (cement or asphalt)	X20	X20-16	A	Low	Lazuli Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-17	A	Low	Turquoise Street	3	
Highways and roads, paved (cement or asphalt)	X20	X20-18	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-19	A	Low	Demeter Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Low	Carnelian Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-20	A	Low	Ninty-Second Ave.	3	
Highways and roads, paved (cement or asphalt)	X20	X20-21	A	Low	Aphrodite Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-22	A	Low	Frontage Minnisota	3	
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Low	Fuller Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Low	Minnisota Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Low	Runamuck Place	2	

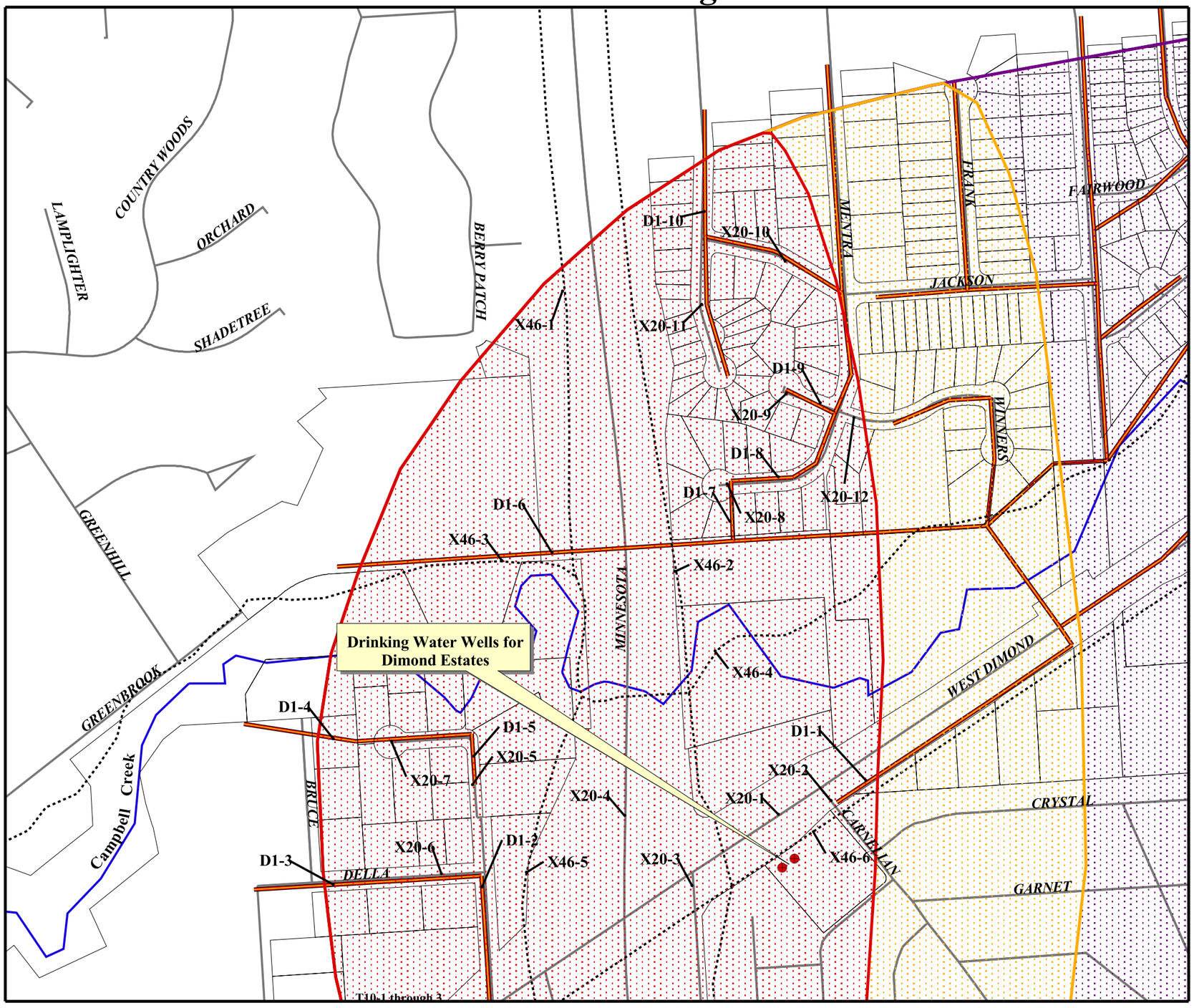
Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Low	Della Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Low	Wakefield Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-8	A	Low	Mentra Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-9	A	Low	Mentra Court	2	
Motor vehicle/general storage yards/facilities	X27	X27-1	A	Low	Off of Della Street	3	
Hardware stores	C17	C17-1	B	Low	Off of Jackson Drive and Mentra Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Low	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-11	B	Low	Along Frank Street	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-12	B	Low	Along Jackson Drive	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-13	B	Low	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-14	B	Low	Along Winners Circle	5	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-15	B	Low	Connecting West Dimond to subdivision	5	
Highways and roads, paved (cement or asphalt)	X20	X20-23	B	Low	Frank Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-24	B	Low	Crystal Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-25	B	Low	Opal Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-26	B	Low	Cameo Street	5	
Highways and roads, paved (cement or asphalt)	X20	X20-27	B	Low	Artemus Circle	5	
Highways and roads, paved (cement or asphalt)	X20	X20-28	B	Low	Artemus Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-29	B	Low	Dorian Drive	5	
Highways and roads, paved (cement or asphalt)	X20	X20-30	B	Low	Demeter Circle	5	
Orchards or nurseries	A10	A10-1	C	Low	Off of West Dimond Blvd.	8	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Motor /motor vehicle repair shops	C31	C31-2	C	Medium	Off of West Dimond - intersecting Zones B and C	8	
Photography supplies/photo processing laboratories	C36	C36-2	C	Low	Off of West Dimond Blvd.	8	
Car washes with engine or undercarriage cleaning	C08	C8-2	C	Medium	Off of West Dimond Blvd.	8	
Construction trade areas and materials	C09	C9-3	C	Low	Off of West Dimond Blvd.	8	
Domestic wastewater collection systems (sewer lines or lift stations)	D01	D1-16-42	C	Low	All sewer lines located within Zone C	7	
Injection wells (Class V) Industrial Process Water & Water Disposal Wells	D40	D40-1	C	High	Off of West Dimond Blvd.	8	
Electrical, electronic, computer, and communications equipment/component manufacturing	I13	I13-1	C	Low	Off of West Dimond Blvd.	8	
Residential Areas	R01	R1-3	C	Low	All residential areas located within Zone C	8	Approximately 130 acres of residential area within Zone C.
Highways and roads, paved (cement or asphalt)	X20	X20-31-58	C	Low	All roads located within Zone C	7	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-2	D	Medium	Off of West Dimond Blvd.	9	

APPENDIX C

Drinking Water Protection Area and Potential & Existing Contaminant Sources for Dimond Estates

Drinking Water Protection Area and
Potential & Existing Contaminant Sources for Dimond Estates



- Dimond Estates Water System

Zone A Protection Area
- Several Months Travel Time

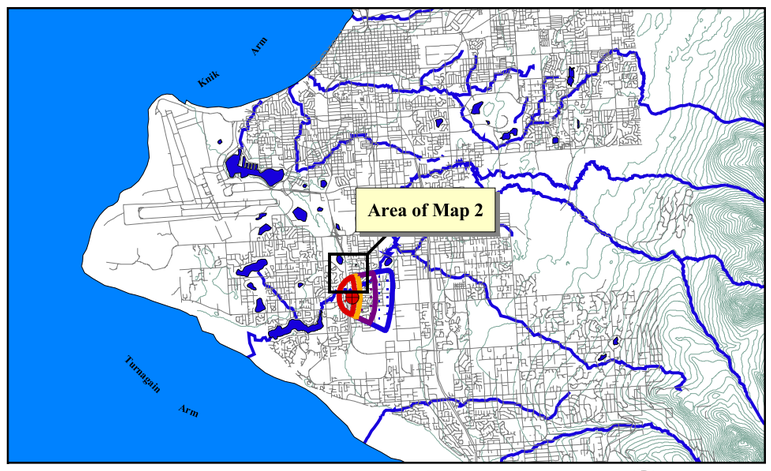
Zone B Protection Area
- Less Than 2 Years Travel Time

Zone C Protection Area
- Less Than 5 Years Travel Time

Zone D Protection Area
- Less Than 10 Years Travel Time

- Anchorage Land Parcels
- Underground Storage Tanks
- Anchorage Trails (X46)
- Sewer Lines (D1)
- Anchorage Roads (X20)
- Anchorage Streams
- Elevation Contours

N
W E
S

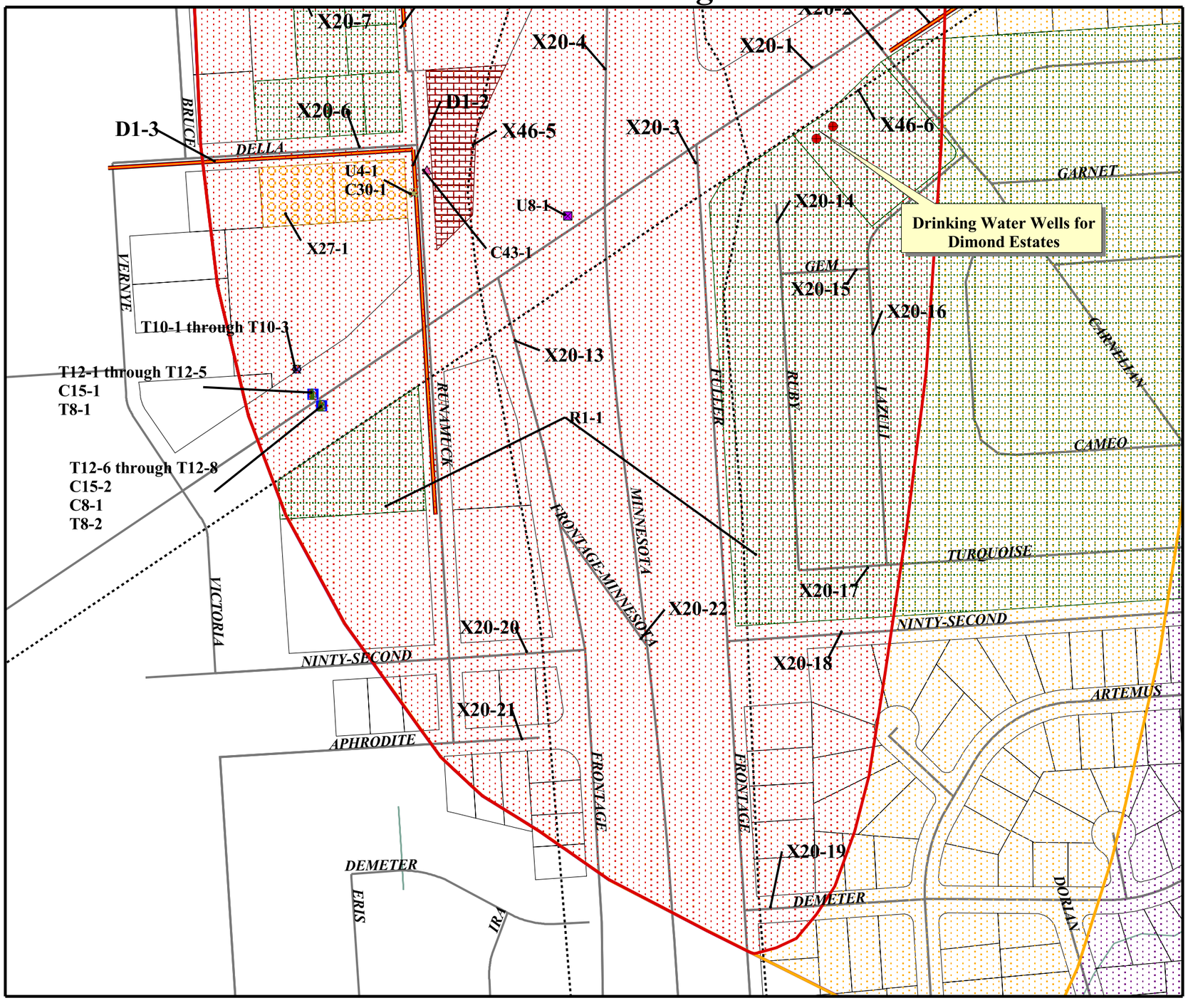


500 0 500 1000 Feet

PWSID 211075.001

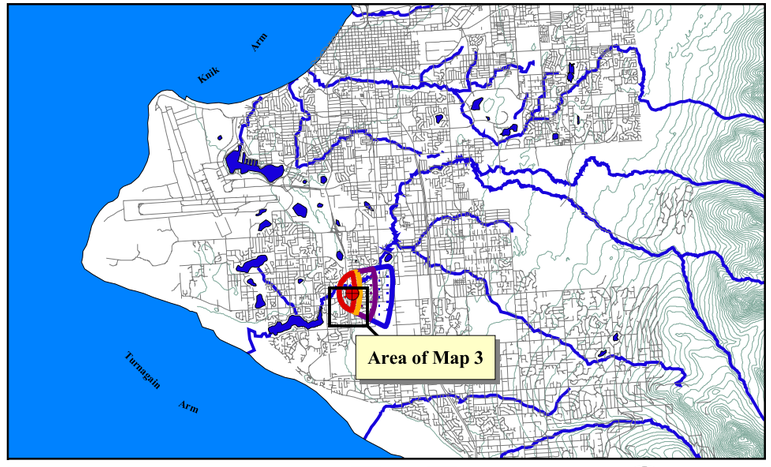
Map 2

Drinking Water Protection Area and Potential & Existing Contaminant Sources for Dimond Estates



- Dimond Estates Water System
- Zone A Protection Area
  - Several Months Travel Time
- Zone B Protection Area
  - Less Than 2 Years Travel Time
- Zone C Protection Area
  - Less Than 5 Years Travel Time
- Zone D Protection Area
  - Less Than 10 Years Travel Time
  - Motor Vehicle/General Storage (X27)
  - Construction Trade Areas (C9)
  - Lawns and Gardens (R1)
  - Underground Storage Tanks
- Potential Contaminant Sources
  - Orchards or Nurseries (A10)
  - Dry Cleaners (C10)
  - Gasoline Stations - Without Repair Shops (C15)
  - Hardware Stores (C17)
  - Heavy Equipment Rental/Storage (C18)
  - Lubrication Shops (C25)
  - Appliand Repair Shops (C3)
  - Motor Vehicle Rental Facilities (C30)
  - Photography Studios (C36)
  - Printers, Publishers, Copiers (C37)
  - Welding Shops (C43)
  - Car Washes with Engine/Undercarriage Cleaning (C8)
  - Construction Trade Areas (C9)
  - Class V Industrial Injection Wells (D40)
  - Class V Motor Vehicle Waste Injection Wells (D42)
  - Electrical, Electronic, Computer Communications (I13)
  - Organic Chemicals Manufacturing (I29)
  - Tanks, Gasoline - Underground (T12)
  - Tanks, Diesel - Underground (T8)
  - Contaminated Sites - DEC Recognized (U4)
  - Petroleum Bulk Stations/Terminals (X11)
  - Medical/Veterinary Facilities (X40)
  - Closed Leaking Underground Feul Storage Tank (U8-1)
- Anchorage Land Parcels
- Anchorage Trails (X46)
- Sewer Lines (D1)
- Anchorage Roads (X20)
- Anchorage Streams
- Elevation Contours

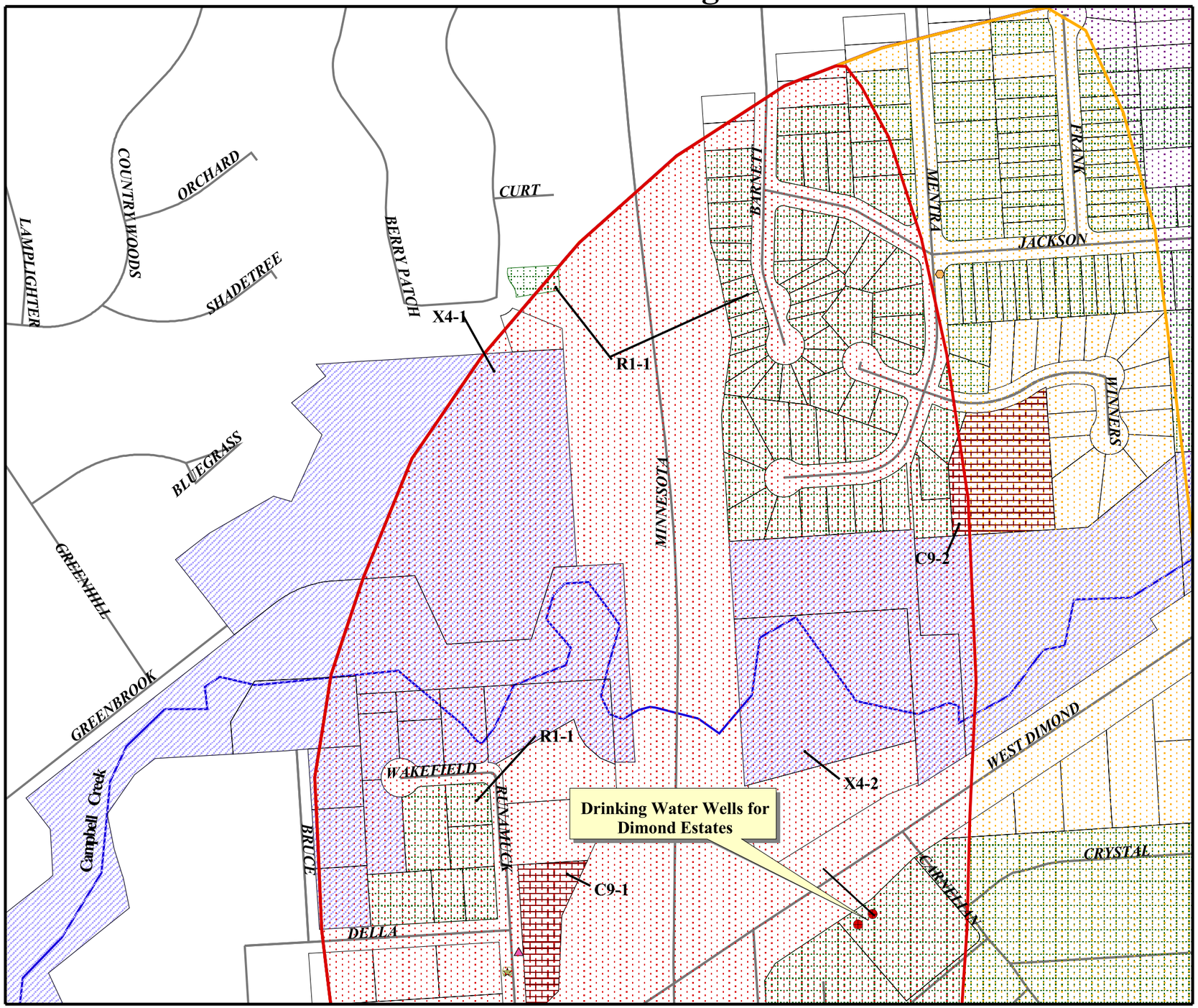
N
W E
S



PWSID 211075.001

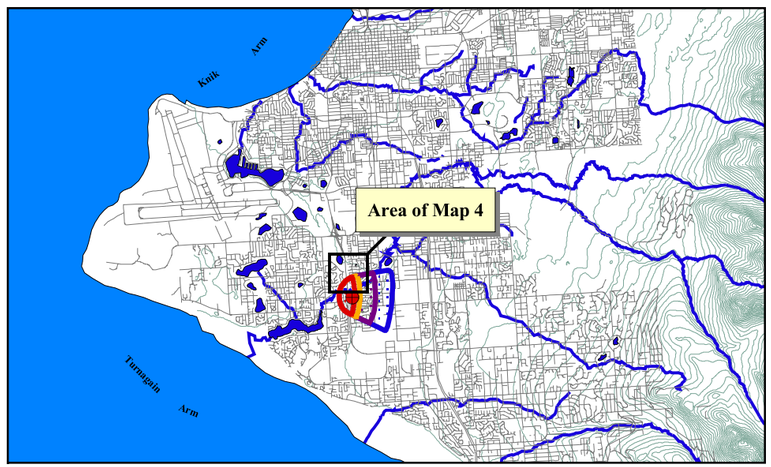
Map 3

Drinking Water Protection Area and
Potential & Existing Contaminant Sources for Dimond Estates



- Dimond Estates Water System
- Zone A Protection Area
  - Several Months Travel Time
- Zone B Protection Area
  - Less Than 2 Years Travel Time
- Zone C Protection Area
  - Less Than 5 Years Travel Time
- Zone D Protection Area
  - Less Than 10 Years Travel Time
- Potential Contaminant Sources
  - Orchards or Nurseries (A10)
  - Dry Cleaners (C10)
  - Gasoline Stations - Without Repair Shops (C15)
  - Hardware Stores (C17)
  - Heavy Equipment Rental/Storage (C18)
  - Lubrication Shops (C25)
  - Appliand Repair Shops (C3)
  - Motor Vehicle Rental Facilities (C30)
  - Motor/Motor Vehicle Repair Shops (C31)
  - Pharmicies (C35)
  - Photography Studios (C36)
  - Printers, Publishers, Copiers (C37)
  - Welding Shops (C43)
  - Car Washes with Engine/Undercarriage Cleaning (C8)
  - Construction Trade Areas (C9)
  - Class V Industrial Injection Wells (D40)
  - Class V Motor Vehicle Waste Injection Wells (D42)
  - Electrical, Electronic, Computer Communications (I13)
  - Organic Chemicals Manufacturing (I29)
  - Tanks, Gasoline - Underground (T12)
  - Tanks, Diesel - Underground (T8)
  - Contaminated Sites - DEC Recognized (U4)
  - Petroleum Bulk Stations/Terminals (X11)
  - Medical/Veterinary Facilities (X40)
- Anchorage Land Parcels
- Anchorage Parks (X4)
- Construction Trade Areas (C9)
- Lawns and Gardens (R1)
- Anchorage Roads (X20)
- Anchorage Streams
- Elevation Contours

N
W E
S

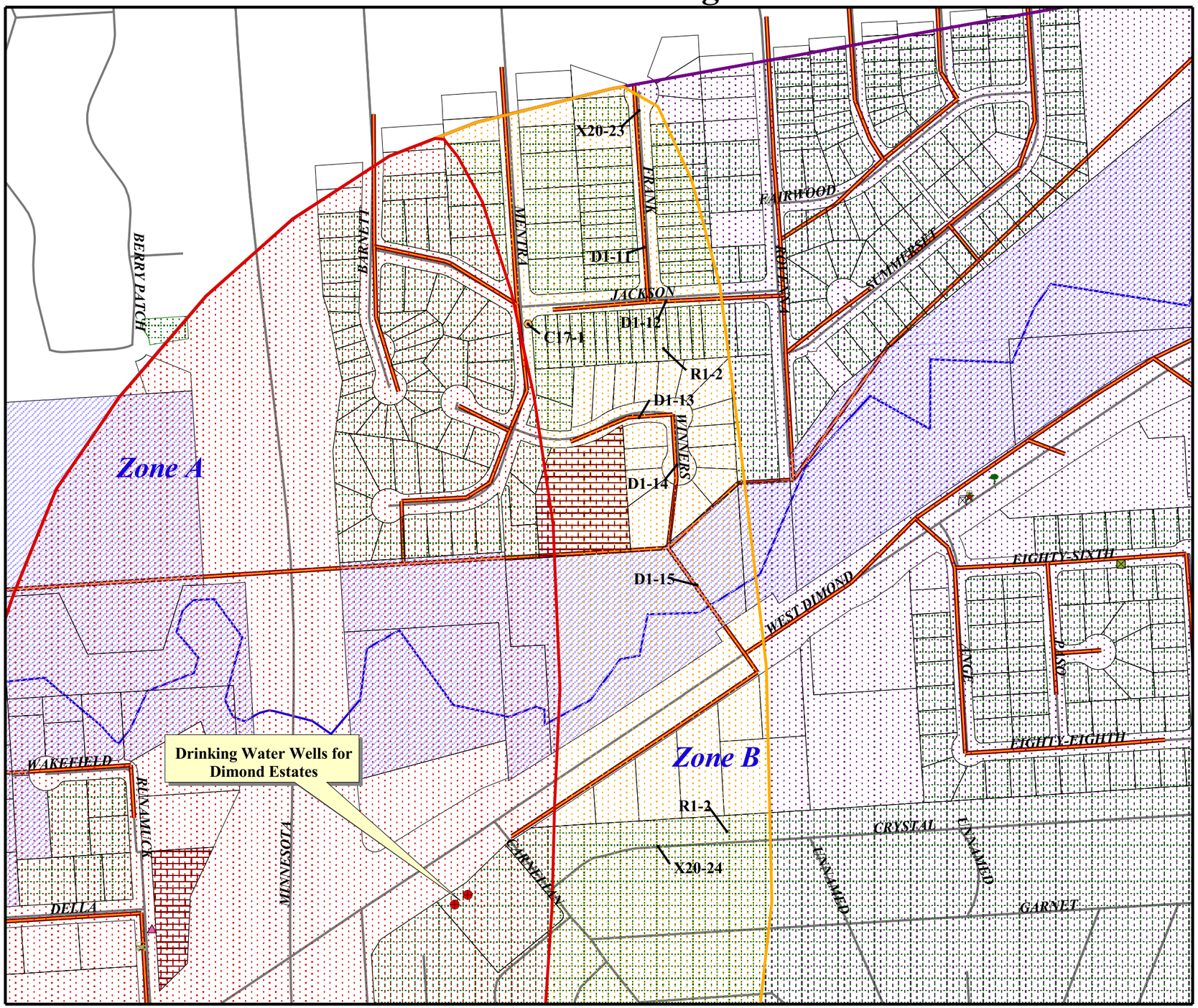


500 0 500 1000 Feet

PWSID 211075.001

Map 4

Drinking Water Protection Area and
Potential & Existing Contaminant Sources for Dimond Estates



- Dimond Estates Water System

Zone A Protection Area
- Several Months Travel Time

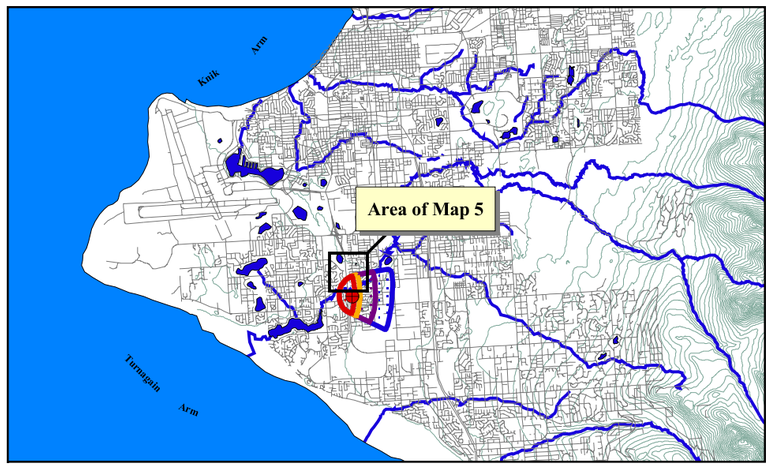
Zone B Protection Area
- Less Than 2 Years Travel Time

Zone C Protection Area
- Less Than 5 Years Travel Time

Zone D Protection Area
- Less Than 10 Years Travel Time

Potential Contaminant Sources
- Orchards or Nurseries (A10)
- Dry Cleaners (C10)
- Gasoline Stations - Without Repair Shops (C15)
- Hardware Stores (C17)
- Heavy Equipment Rental/Storage (C18)
- Lubrication Shops (C25)
- Appliand Repair Shops (C3)
- Motor Vehicle Rental Facilities (C30)
- Motor/Motor Vehicle Repair Shops (C31)
- Pharmicies (C35)
- Photography Studios (C36)
- Printers, Publishers, Copiers (C37)
- Welding Shops (C43)
- Car Washes with Engine/Undercarriage Cleaning (C8)
- Construction Trade Areas (C9)
- Class V Industrial Injection Wells (D40)
- Class V Motor Vehicle Waste Injection Wells (D42)
- Electrical, Electronic, Computer Communications (I13)
- Organic Chemicals Manufacturing (I29)
- Tanks, Gasoline - Underground (T12)
- Tanks, Diesel - Underground (T8)
- Contaminated Sites - DEC Recognized (U4)
- Petroleum Bulk Stations/Terminals (X11)
- Medical/Veterinary Facilities (X40)
- Anchorage Land Parcels
- Anchorage Parks (X4)
- Construction Trade Areas (C9)
- Lawns and Gardens (R1)
- Sewer Lines (D1)
- Anchorage roads (x20).shp
- Anchorage Streams
- Elevation Contours

N W E S

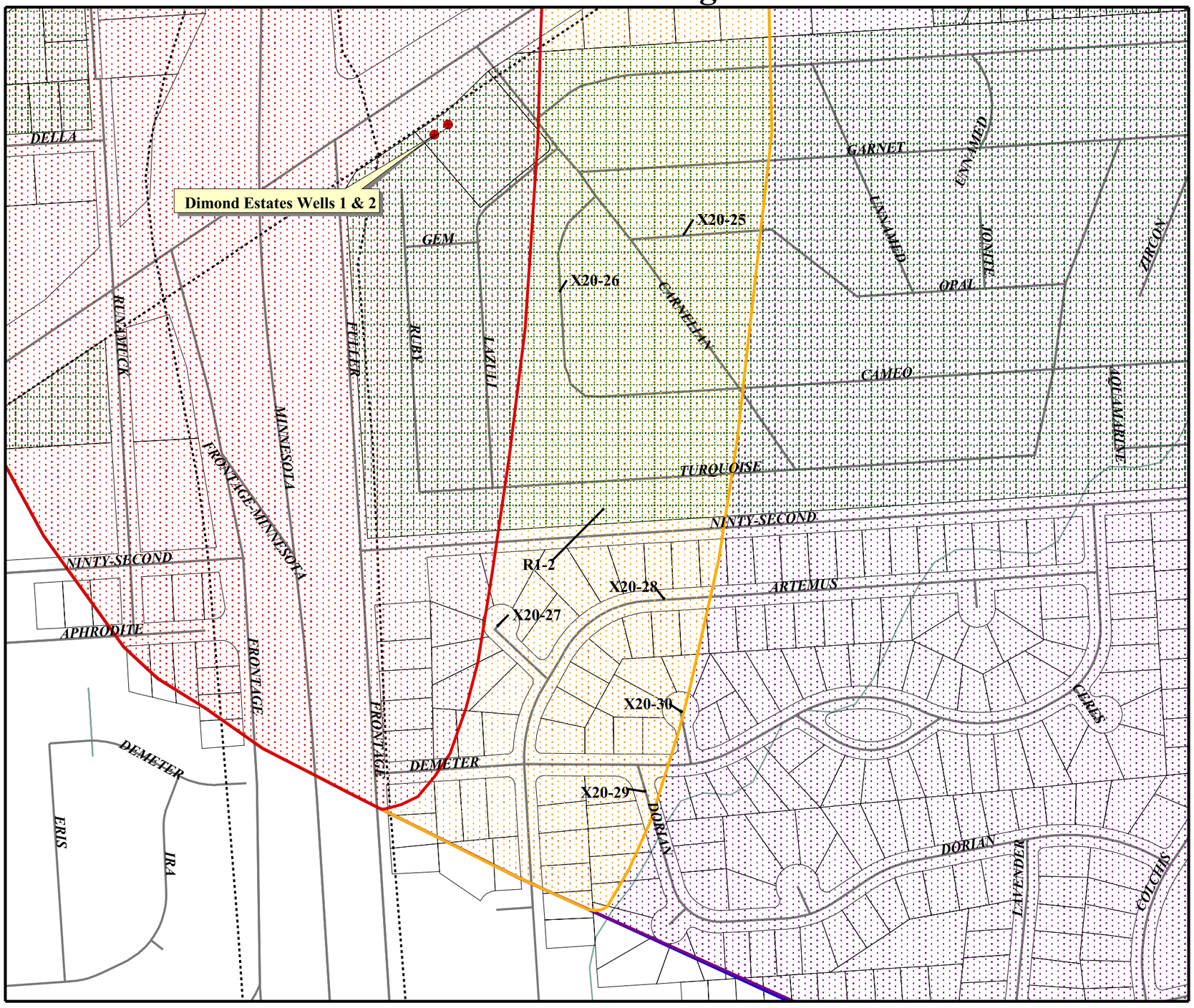


600 0 600 1200 Feet

PWSID 211075.001

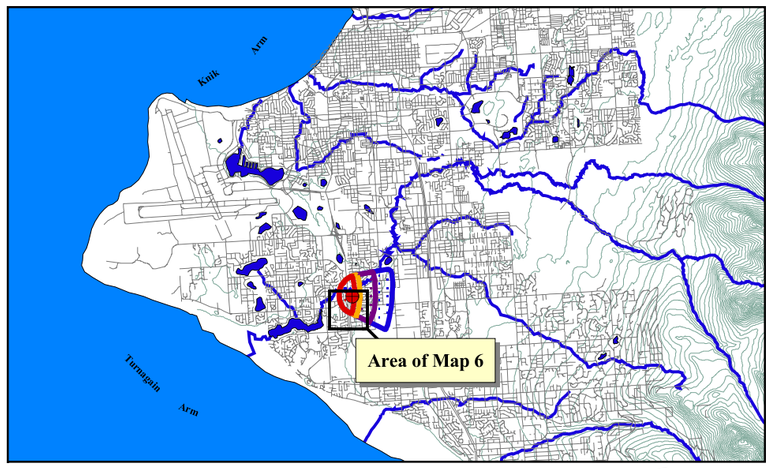
Map 5

Drinking Water Protection Area and
Potential & Existing Contaminant Sources for Dimond Estates



- Dimond Estates Water System
- Zone A Protection Area
  - Several Months Travel Time
- Zone B Protection Area
  - Less Than 2 Years Travel Time
- Zone C Protection Area
  - Less Than 5 Years Travel Time
- Zone D Protection Area
  - Less Than 10 Years Travel Time
- Anchorage Land Parcels
- Lawns and Gardens (R1)
- Anchorage Trails (X46)
- Anchorage Roads (X20)
- Elevation Contours

N
W E
S

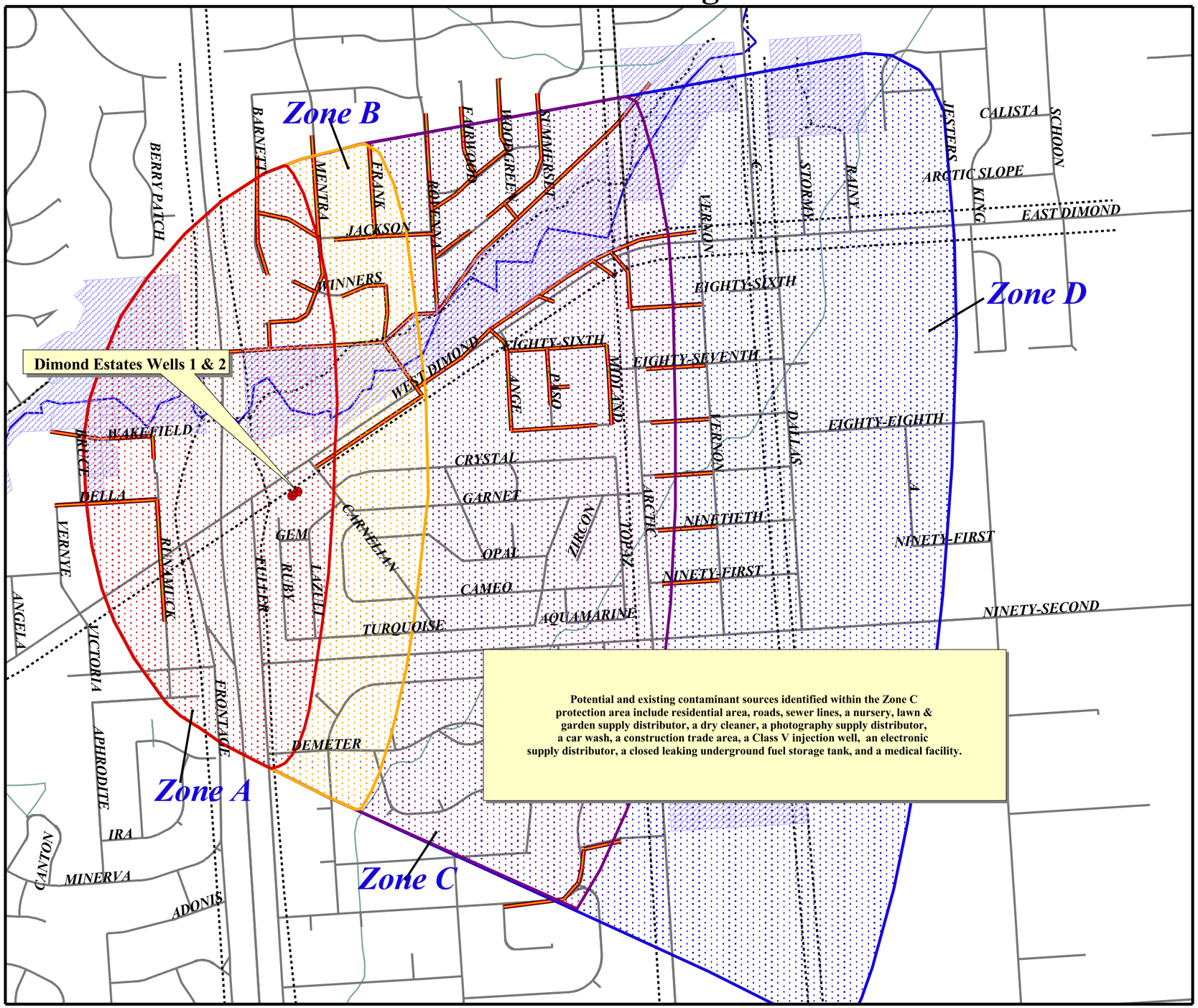


600 0 600 1200 Feet

PWSID 211075.001

Map 6

Drinking Water Protection Area and
Potential & Existing Contaminant Sources for Dimond Estates



Potential and existing contaminant sources identified within the Zone C protection area include residential area, roads, sewer lines, a nursery, lawn & garden supply distributor, a dry cleaner, a photography supply distributor, a car wash, a construction trade area, a Class V injection well, an electronic supply distributor, a closed leaking underground fuel storage tank, and a medical facility.

- Dimond Estates Water System

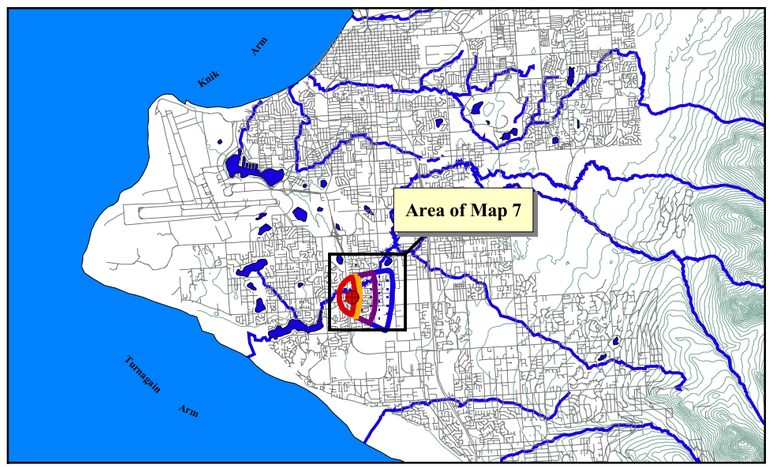
Zone A Protection Area
- Several Months Travel Time

Zone B Protection Area
- Less Than 2 Years Travel Time

Zone C Protection Area
- Less Than 5 Years Travel Time

Zone D Protection Area
- Less Than 10 Years Travel Time
- Anchorage Parks (X4)
- Anchorage Trails (X46)
- Sewer Lines (D1)
- Anchorage Roads (X20)
- Anchorage Streams
- Elevation Contours

N W E S

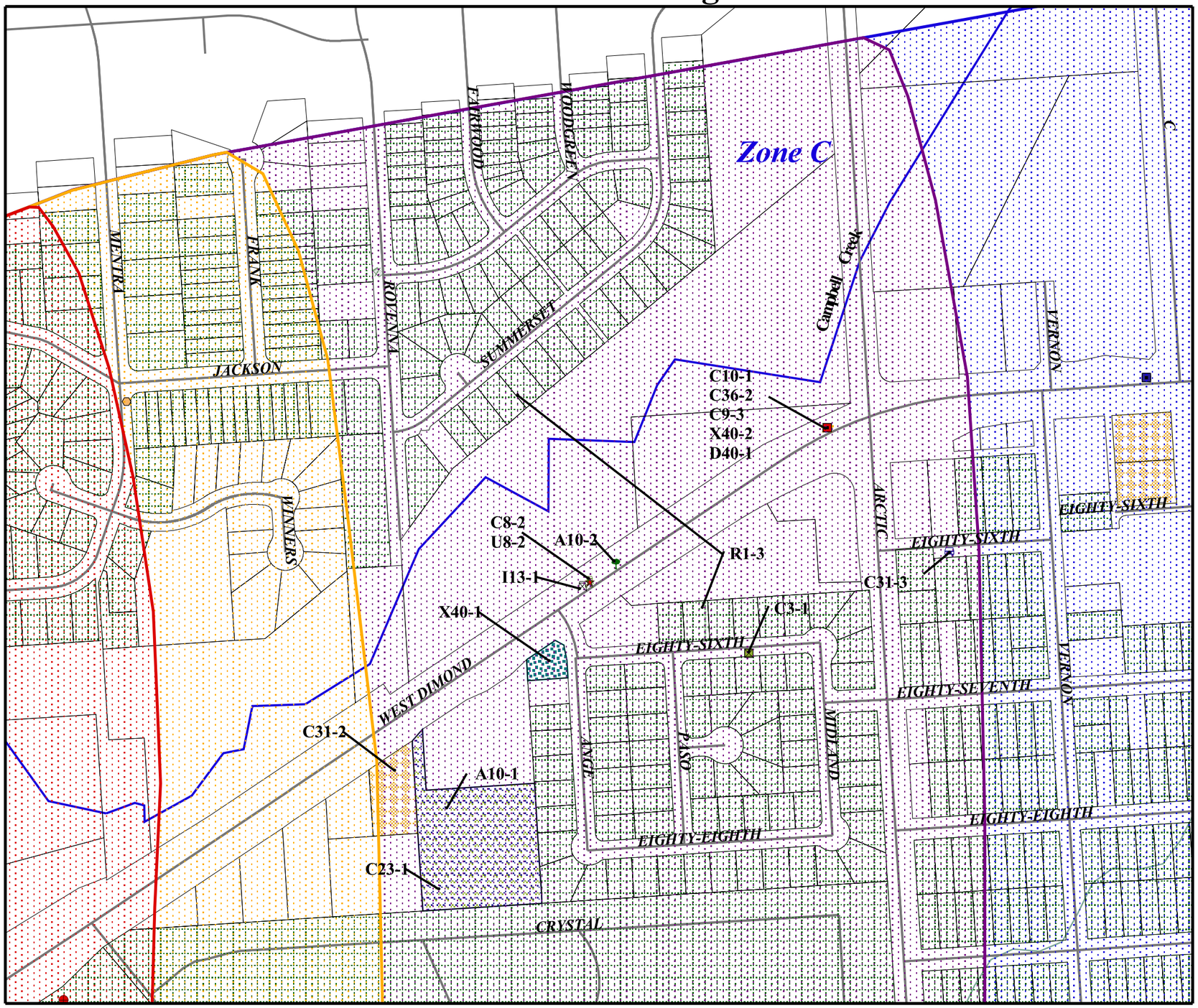


1000 0 1000 2000 Feet

PWSID 211075.001

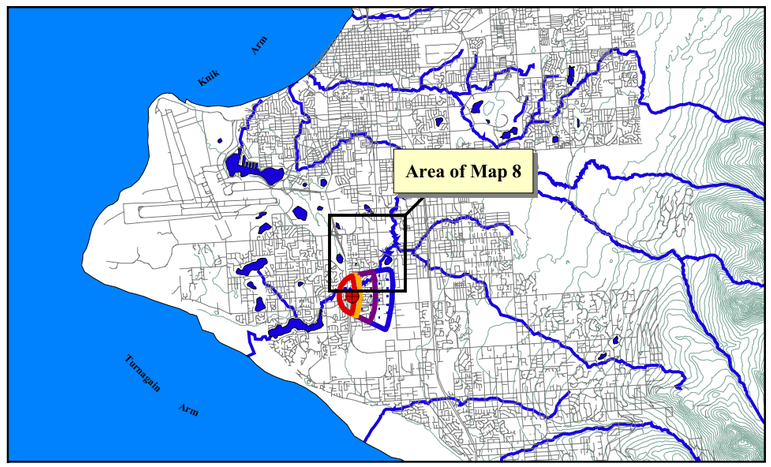
Map 7

Drinking Water Protection Area and
Potential & Existing Contaminant Sources for Dimond Estates



Dimond Estates Water System
Zone A Protection Area
Several Months Travel Time
Zone B Protection Area
Less Than 2 Years Travel Time
Zone C Protection Area
Less Than 5 Years Travel Time
Zone D Protection Area
Less Than 10 Years Travel Time
Anchorage Land Parcels
Potential Contaminant Sources
Orchards or Nurseries (A10)
Dry Cleaners (C10)
Gasoline Stations - Without Repair Shops (C15)
Hardware Stores (C17)
Heavy Equipment Rental/Storage (C18)
Lubrication Shops (C25)
Appliand Repair Shops (C3)
Motor Vehicle Rental Facilities (C30)
Motor/Motor Vehicle Repair Shops (C31)
Pharmicies (C35)
Photography Studios (C36)
Printers, Publishers, Copiers (C37)
Welding Shops (C43)
Car Washes with Engine/Undercarriage Cleaning (C8)
Construction Trade Areas (C9)
Class V Industrial Injection Wells (D40)
Class V Motor Vehicle Waste Injection Wells (D42)
Electrical, Electronic, Computer Communications (I13)
Organic Chemicals Manufacturing (I29)
Tanks, Gasoline - Underground (T12)
Tanks, Diesel - Underground (T8)
Contaminated Sites - DEC Recognized (U4)
Petroleum Bulk Stations/Terminals (X11)
Medical/Veterinary Facilities (X40)
Lawn and Garden Supplies/Services (C23)
Medical/Veterinary Facilities (X40)
Motor/Motor Vehicle Repair Shops (C31)
Lawns and Gardens (R1)
Orchards and Nurseries (A10)
Anchorage Roads (X20)
Anchorage Streams
Elevation Contours

N
W
E
S

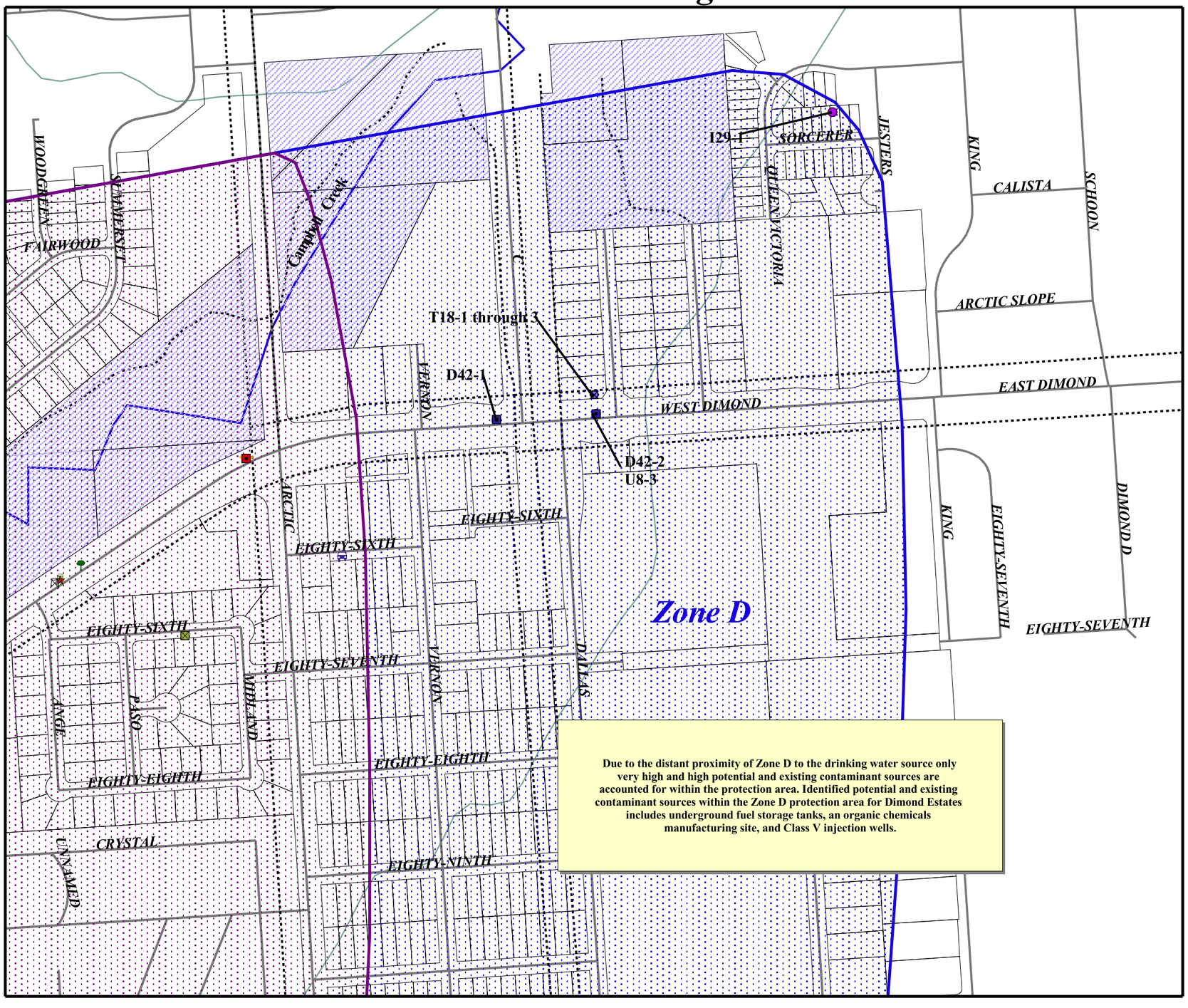


400 0 400 800 Feet

PWSID 211075.001

Map 8

Drinking Water Protection Area and Potential & Existing Contaminant Sources for Dimond Estates



Due to the distant proximity of Zone D to the drinking water source only very high and high potential and existing contaminant sources are accounted for within the protection area. Identified potential and existing contaminant sources within the Zone D protection area for Dimond Estates includes underground fuel storage tanks, an organic chemicals manufacturing site, and Class V injection wells.

500 0 500 1000 Feet

- Dimond Estates Water System

Zone A Protection Area
- Several Months Travel Time

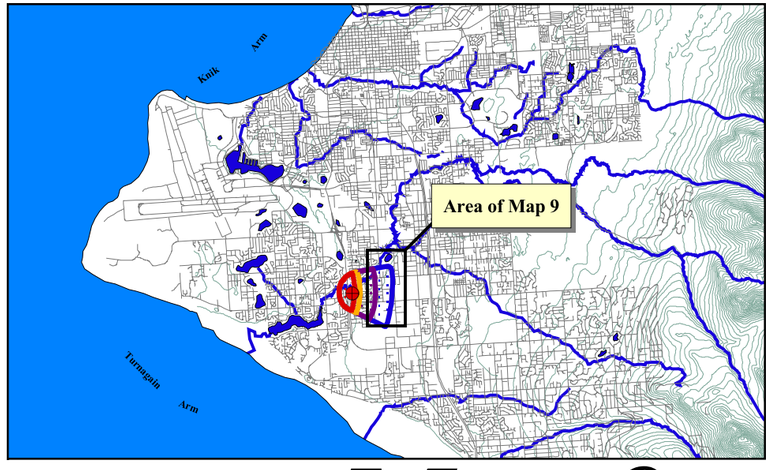
Zone B Protection Area
- Less Than 2 Years Travel Time

Zone C Protection Area
- Less Than 5 Years Travel Time

Zone D Protection Area
- Less Than 10 Years Travel Time

Potential Contaminant Sources
- Orchards or Nurseries (A10)
- Dry Cleaners (C10)
- Gasoline Stations - Without Repair Shops (C15)
- Hardware Stores (C17)
- Heavy Equipment Rental/Storage (C18)
- Lubrication Shops (C25)
- Appliand Repair Shops (C3)
- Motor Vehicle Rental Facilities (C30)
- Motor/Motor Vehicle Repair Shops (C31)
- Pharmicies (C35)
- Photography Studios (C36)
- Printers, Publishers, Copiers (C37)
- Welding Shops (C43)
- Car Washes with Engine/Undercarriage Cleaning (C8)
- Construction Trade Areas (C9)
- Class V Industrial Injection Wells (D40)
- Class V Motor Vehicle Waste Injection Wells (D42)
- Electrical, Electronic, Computer Communications (I13)
- Organic Chemicals Manufacturing (I29)
- Tanks, Gasoline - Underground (T12)
- Tanks, Diesel - Underground (T8)
- Contaminated Sites - DEC Recognized (U4)
- Petroleum Bulk Stations/Terminals (X11)
- Medical/Veterinary Facilities (X40)
- Anchorage Land Parcels
- Anchorage Parks (X4)
- Underground Storage Tanks
- Anchorage Trails (X46)
- Anchorage Roads (X20)
- Anchorage Streams
- Elevation Contours

N W E S



PWSID 211075.001

Map 9

APPENDIX D

Vulnerability Analysis for Dimond Estates

Chart 1. Susceptibility of the wellhead - Dimond Estates Wells 1 & 2

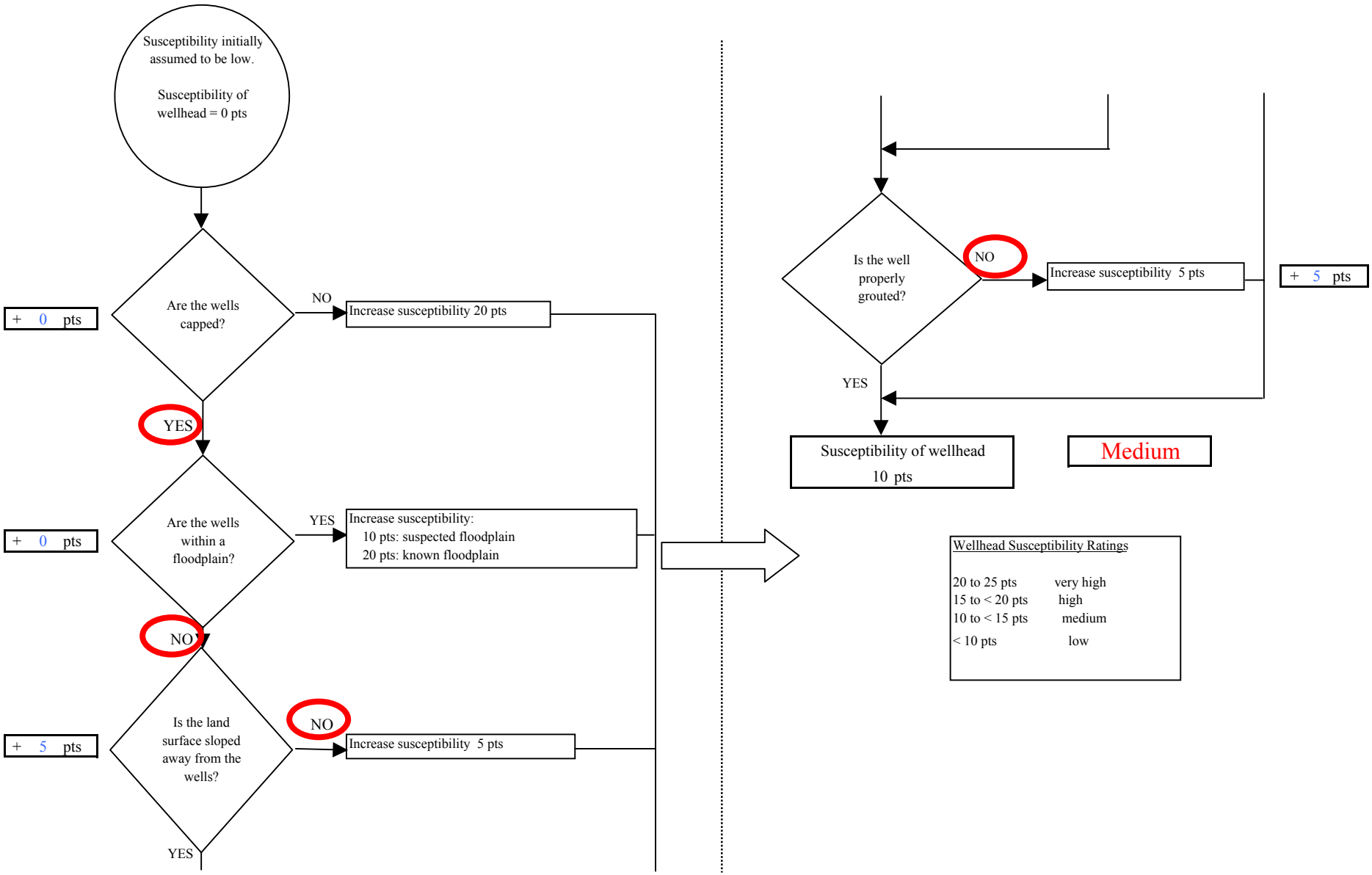


Chart 2. Susceptibility of the aquifer - Dimond Estates Wells 1 & 2

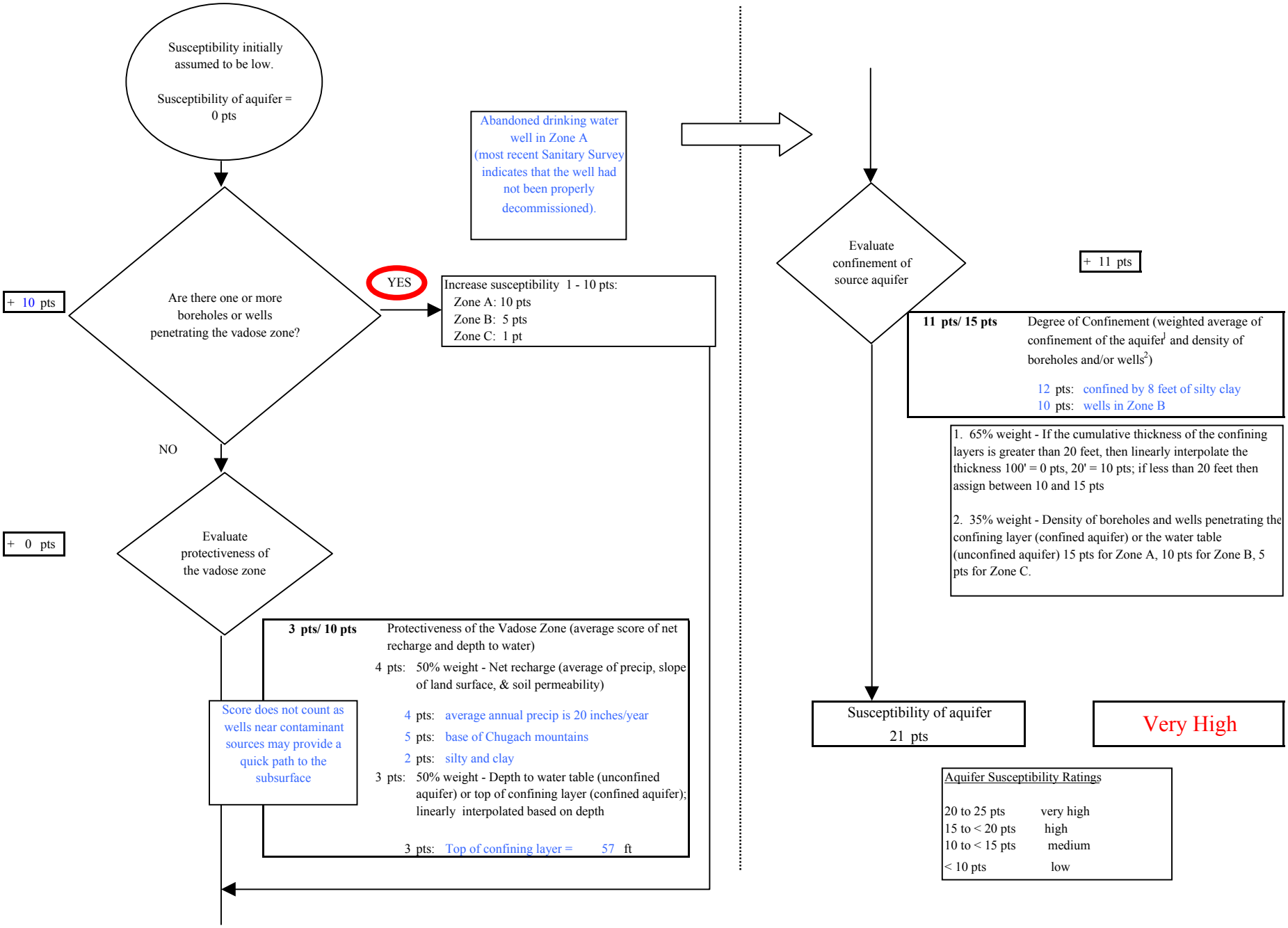
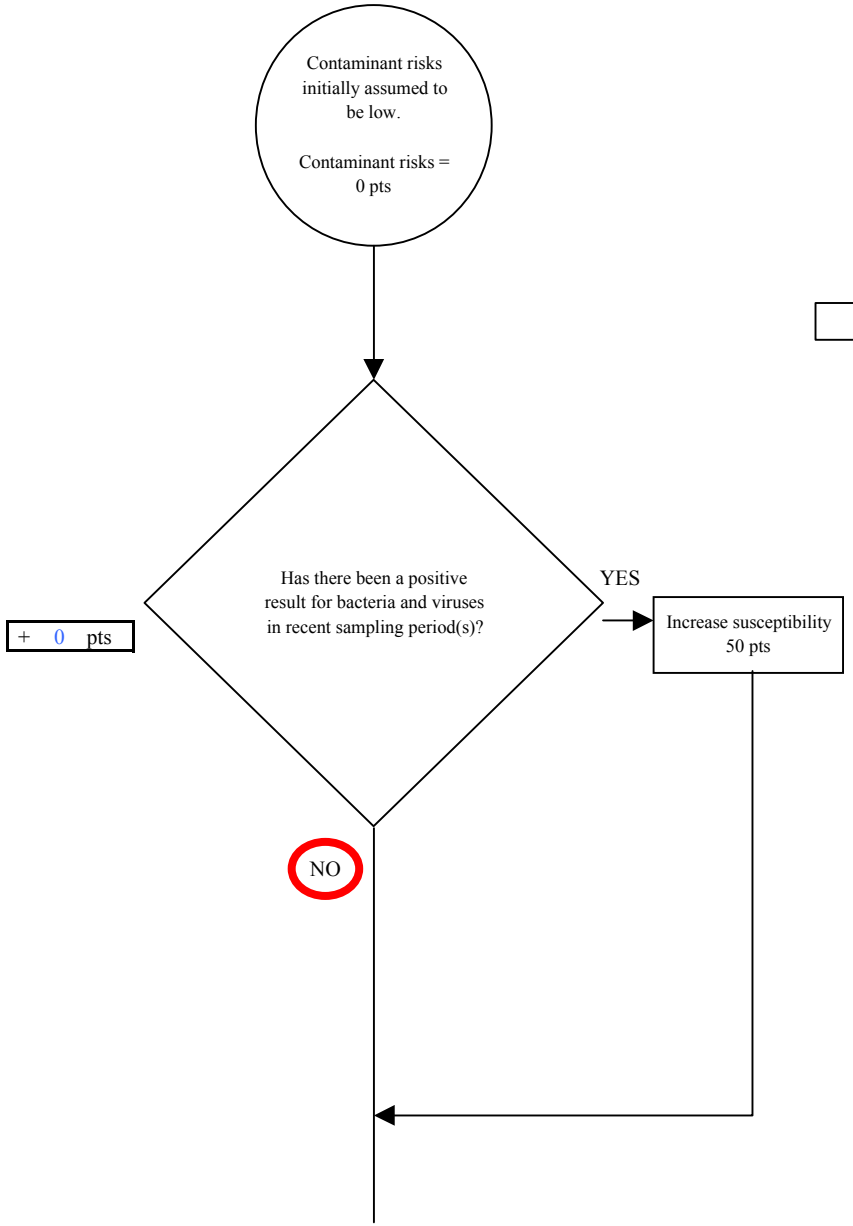
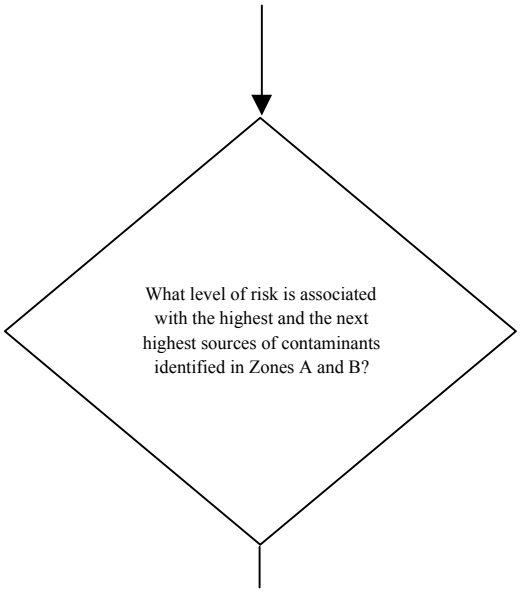


Chart 3. Contaminant risks for Dimond Estates Wells 1 & 2 - Bacteria & Viruses





+ 25 pts

Risk Rankings for Contaminant Sources Identified in Zones A and B

	Zone A	Zone B	Total
Very Highs(s)	0	0	0
High(s)	0	0	0
Medium(s)	3	0	3
Low(s)	10	3	13

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

Matrix Score 25

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.

Chart 3. Contaminant risks for Dimond Estates Wells 1 & 2 - Bacteria & Viruses

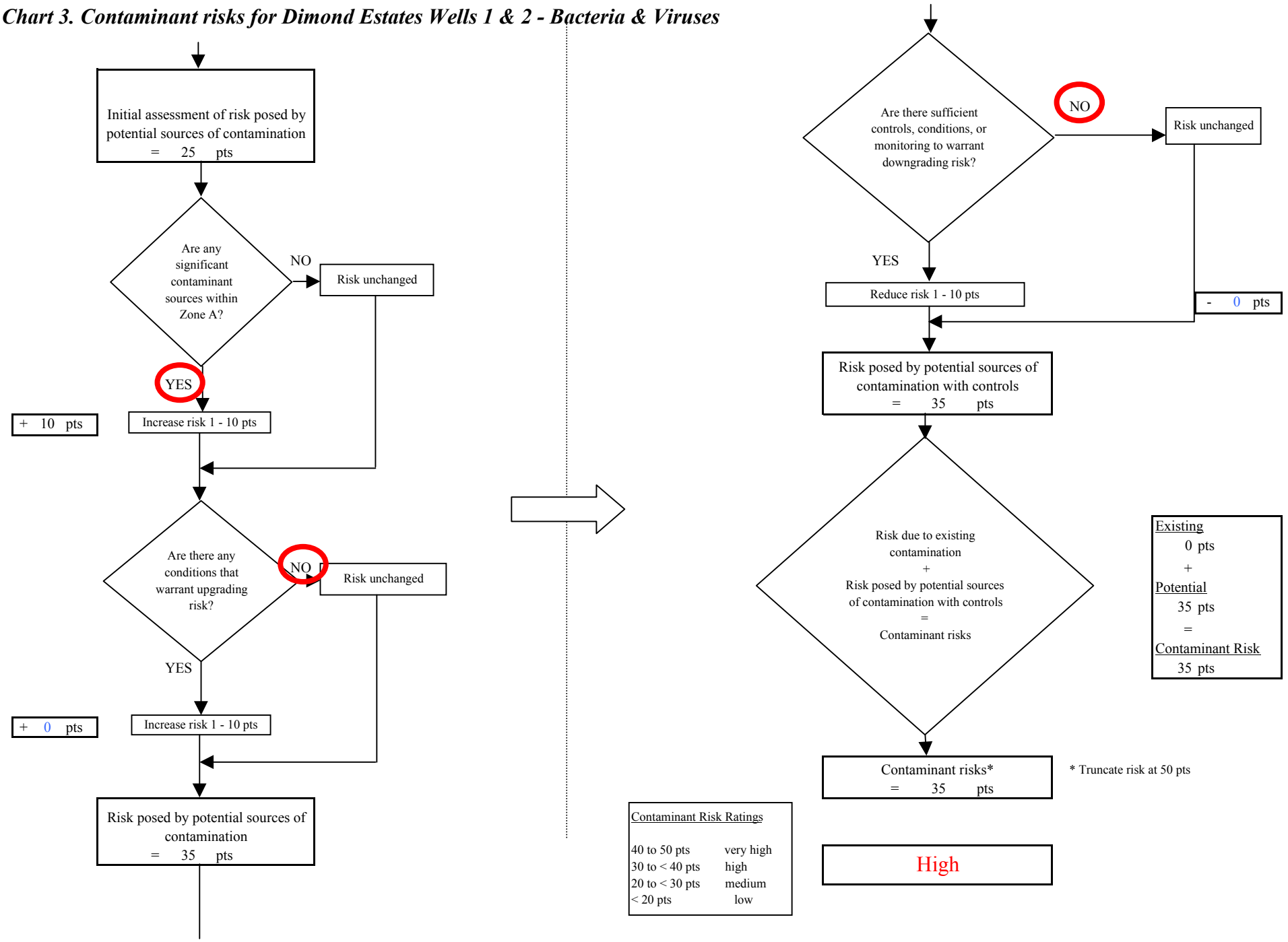


Chart 4. Vulnerability analysis for Dimond Estates Wells 1 & 2 - Bacteria & Viruses

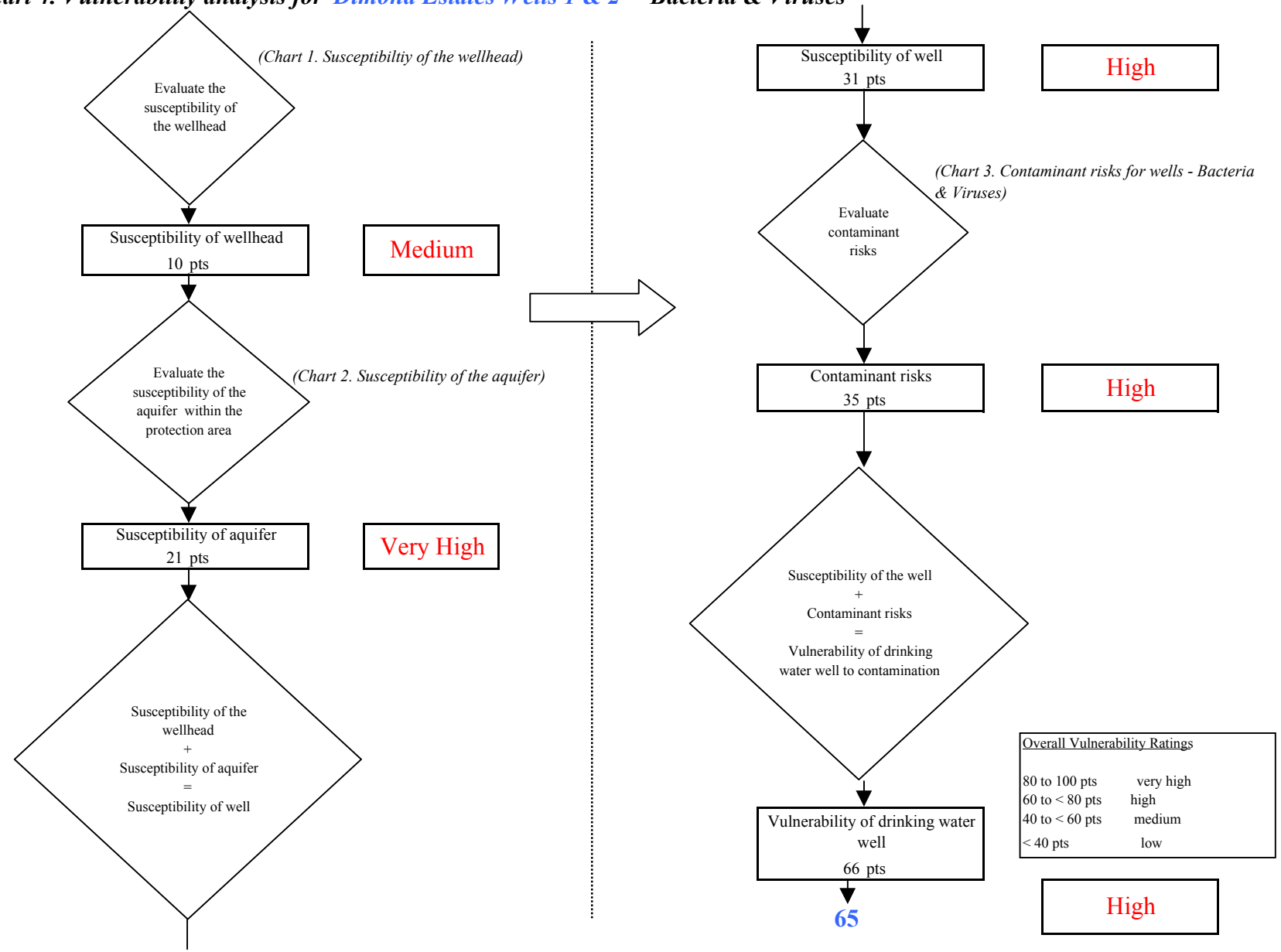


Chart 5. Contaminant risks for Dimond Estates Wells 1 & 2 - Nitrates and Nitrites

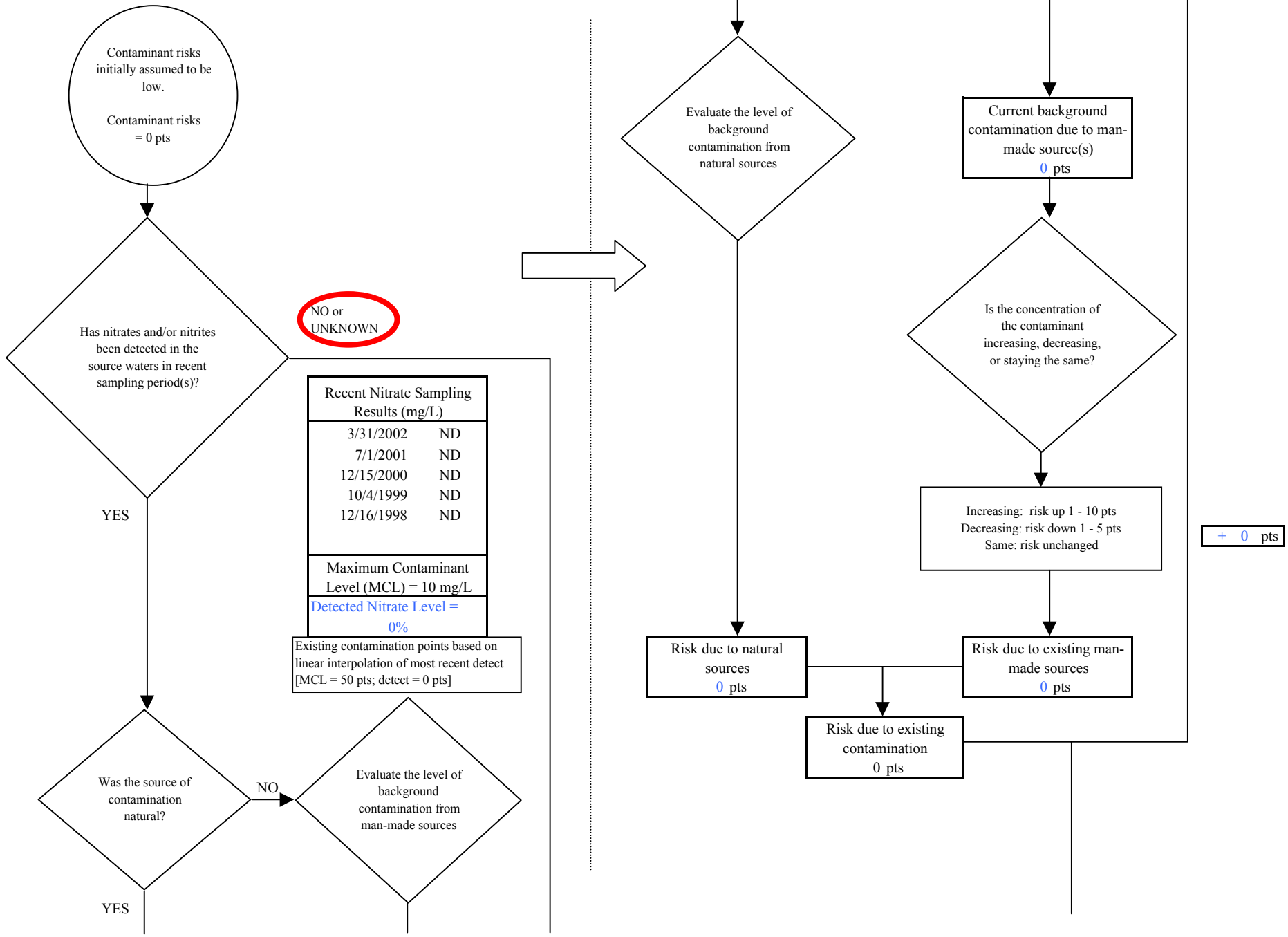


Chart 5. Contaminant risks for Dimond Estates Wells 1 & 2 - Nitrates and Nitrites

+ 35 pts

What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A, B and C?

Risk Levels for Contaminant Sources identified in Zones A, B and C

	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	0	1	1
Medium(s)	3	2	5
Low(s)	10	10	20

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

Matrix Score 35

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.

Initial assessment of risk posed by potential sources of contamination = 35 pts

Is the source aquifer fractured rock or karst?

YES

NO

Are all of the higher risk sources beyond Zones A and B?

NO

Risk unchanged

YES

Decrease risk 1 - 10 pts

- 0 pts

Are any significant sources within Zone A?

NO

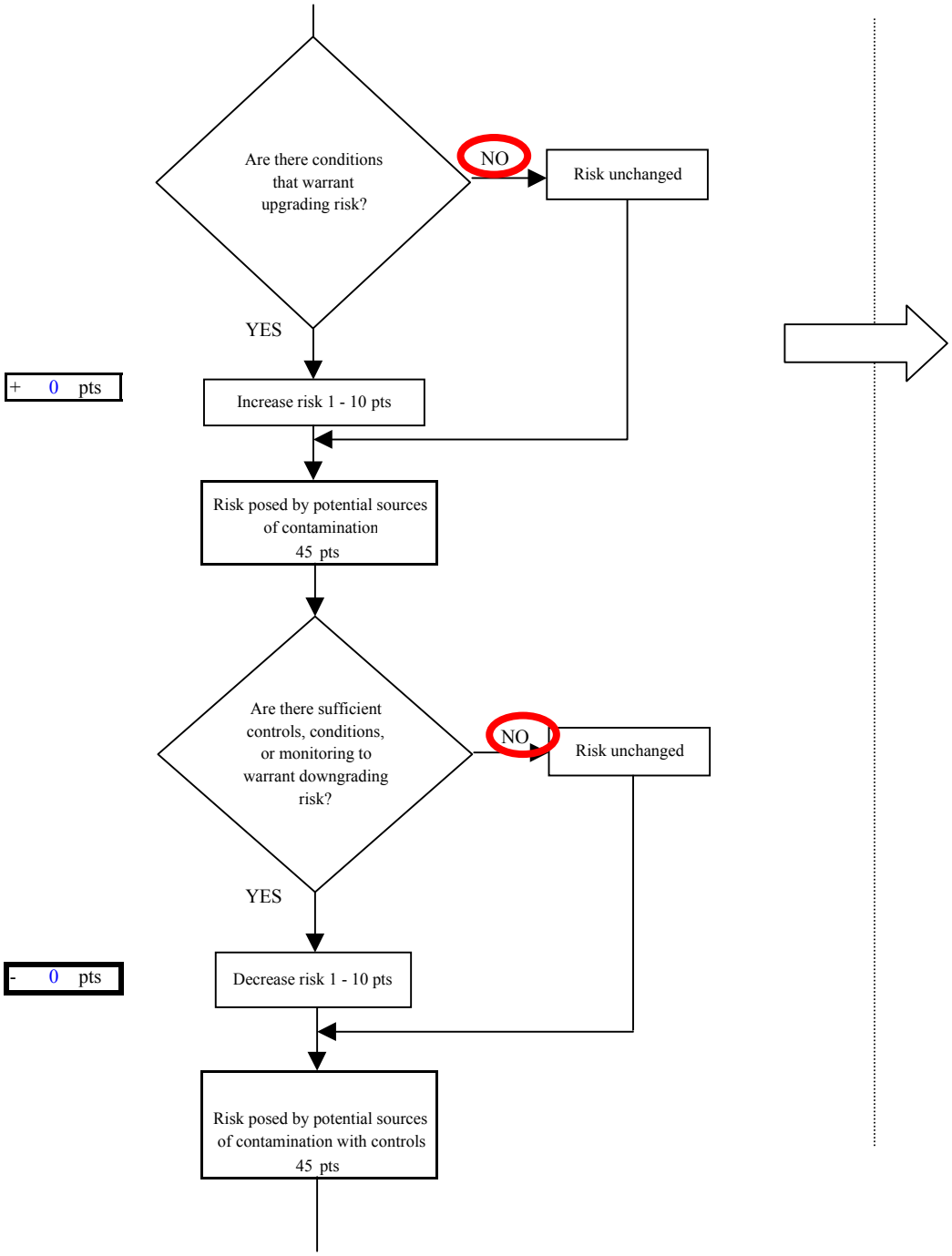
Risk unchanged

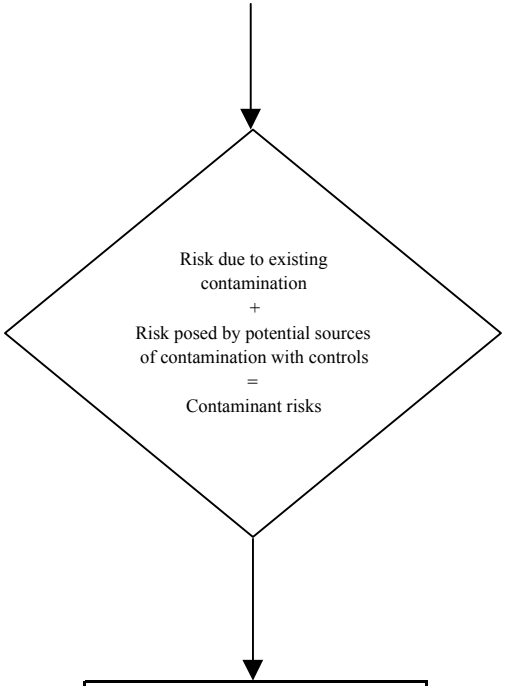
YES

Increase risk 1 - 10 pts

+ 10 pts

Chart 5. Contaminant risks for Dimond Estates Wells 1 & 2 - Nitrates and Nitrites





Existing
0 pts
+
Potential
45 pts
=
Contaminant Risk
45 pts

Contaminant risks*
= 45 pts

*Truncate risk at 50 pts

Very High

Contaminant Risk Ratings

40 to 50 pts	very high
30 to < 40 pts	high
20 to < 30 pts	medium
< 20 pts	low

Chart 6. Vulnerability analysis for Dimond Estates Wells 1 & 2 - Nitrates and Nitrites

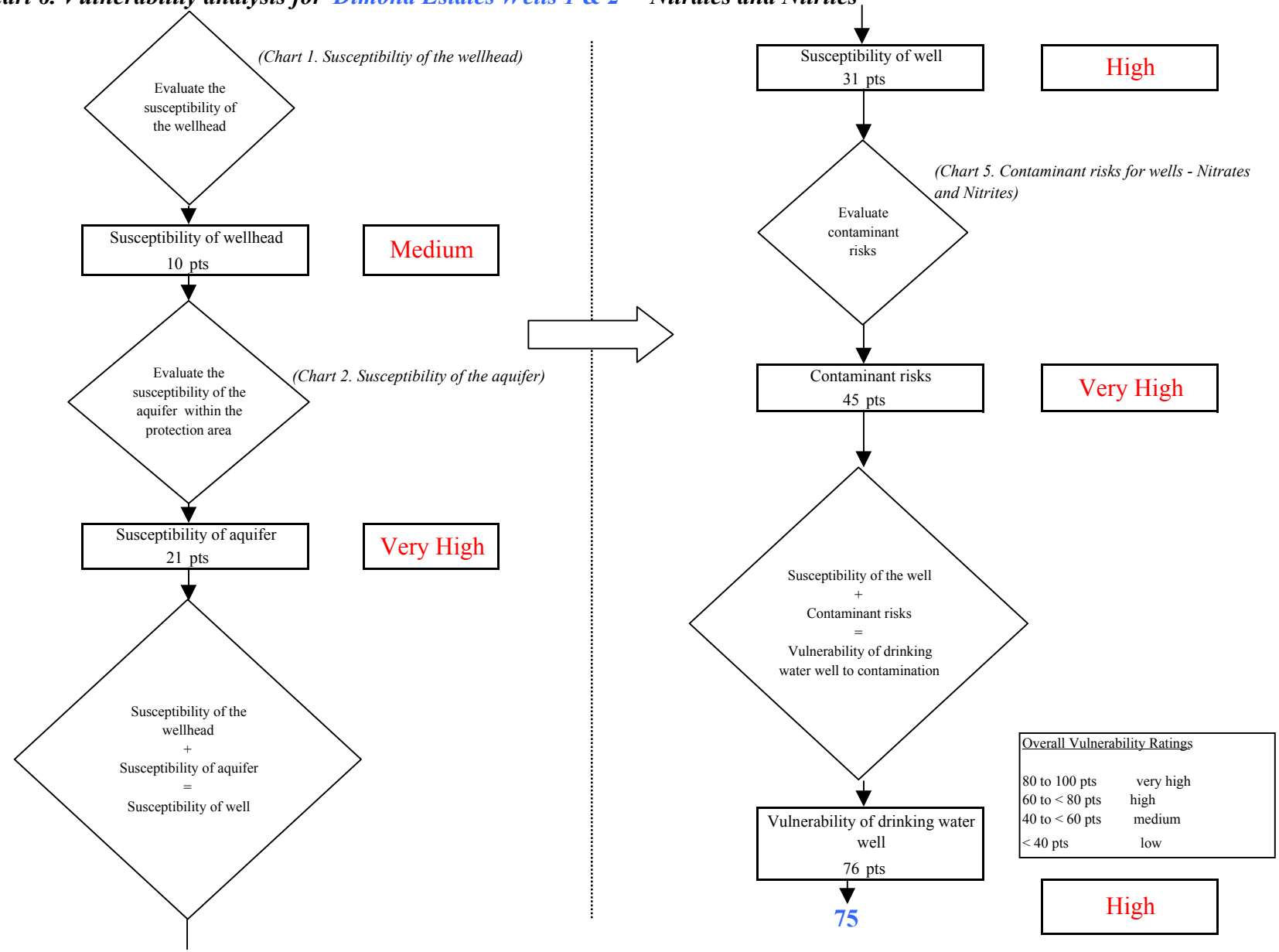


Chart 7. Contaminant risks for Dimond Estates Wells 1 & 2 - Volatile Organic Chemicals

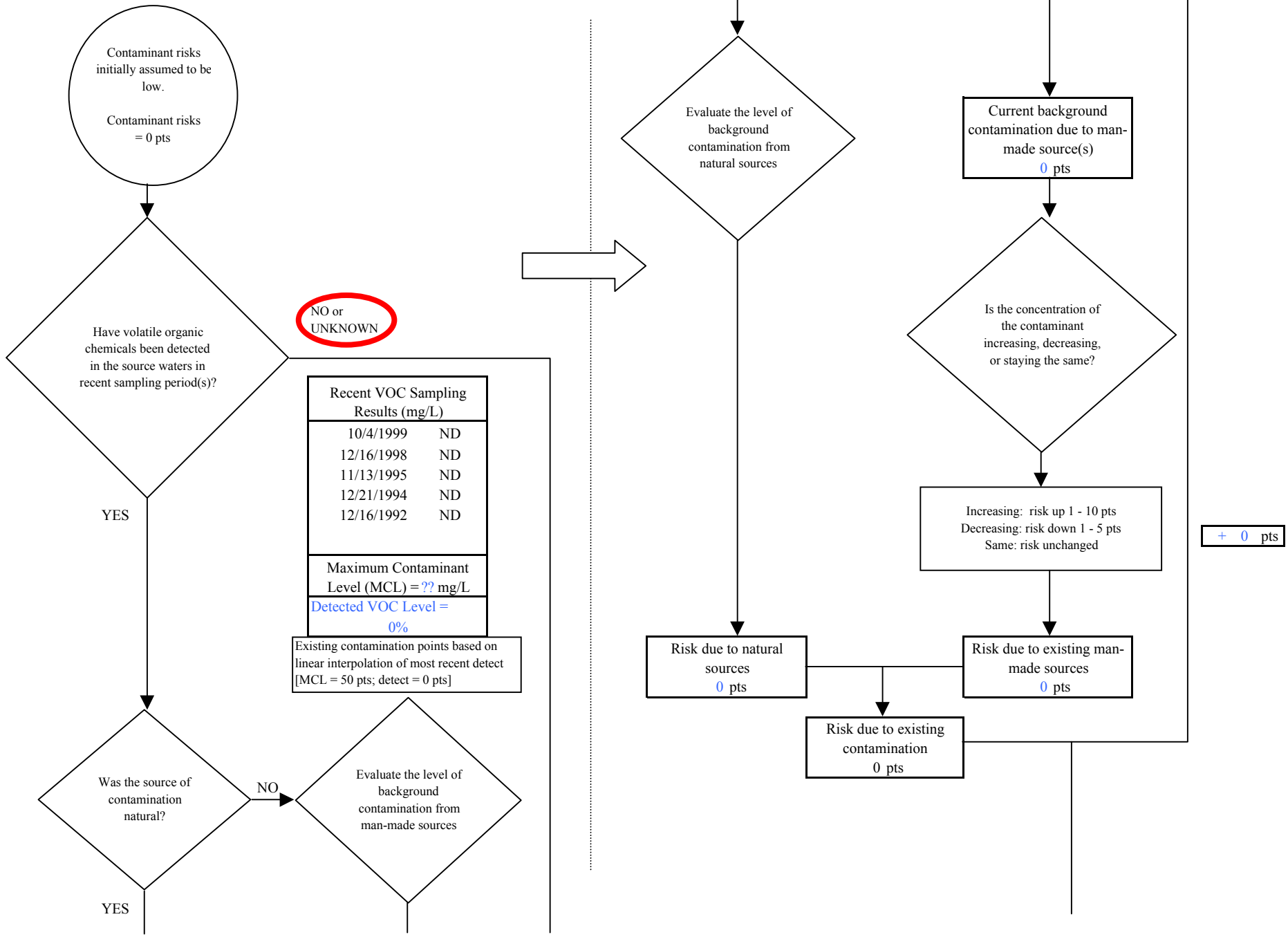


Chart 7. Contaminant risks for Dimond Estates Wells 1 & 2 - Volatile Organic Chemicals

+ 50 pts

What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A, B and C?

Risk Levels for Contaminant Sources identified in Zones A, B and C

	Zone A	Zones B&C	Total
Very Highs(s)	0	1	1
High(s)	15	4	19
Medium(s)	5	2	7
Low(s)	9	7	16

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

Matrix Score 50

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.

Initial assessment of risk posed by potential sources of contamination = 50 pts

Is the source aquifer fractured rock or karst?

YES

NO

Are all of the higher risk sources beyond Zones A and B?

NO

Risk unchanged

YES

Decrease risk 1 - 10 pts

- 0 pts

Are any significant sources within Zone A?

NO

Risk unchanged

YES

Increase risk 1 - 10 pts

+ 10 pts

Chart 7. Contaminant risks for Dimond Estates Wells 1 & 2 - Volatile Organic Chemicals

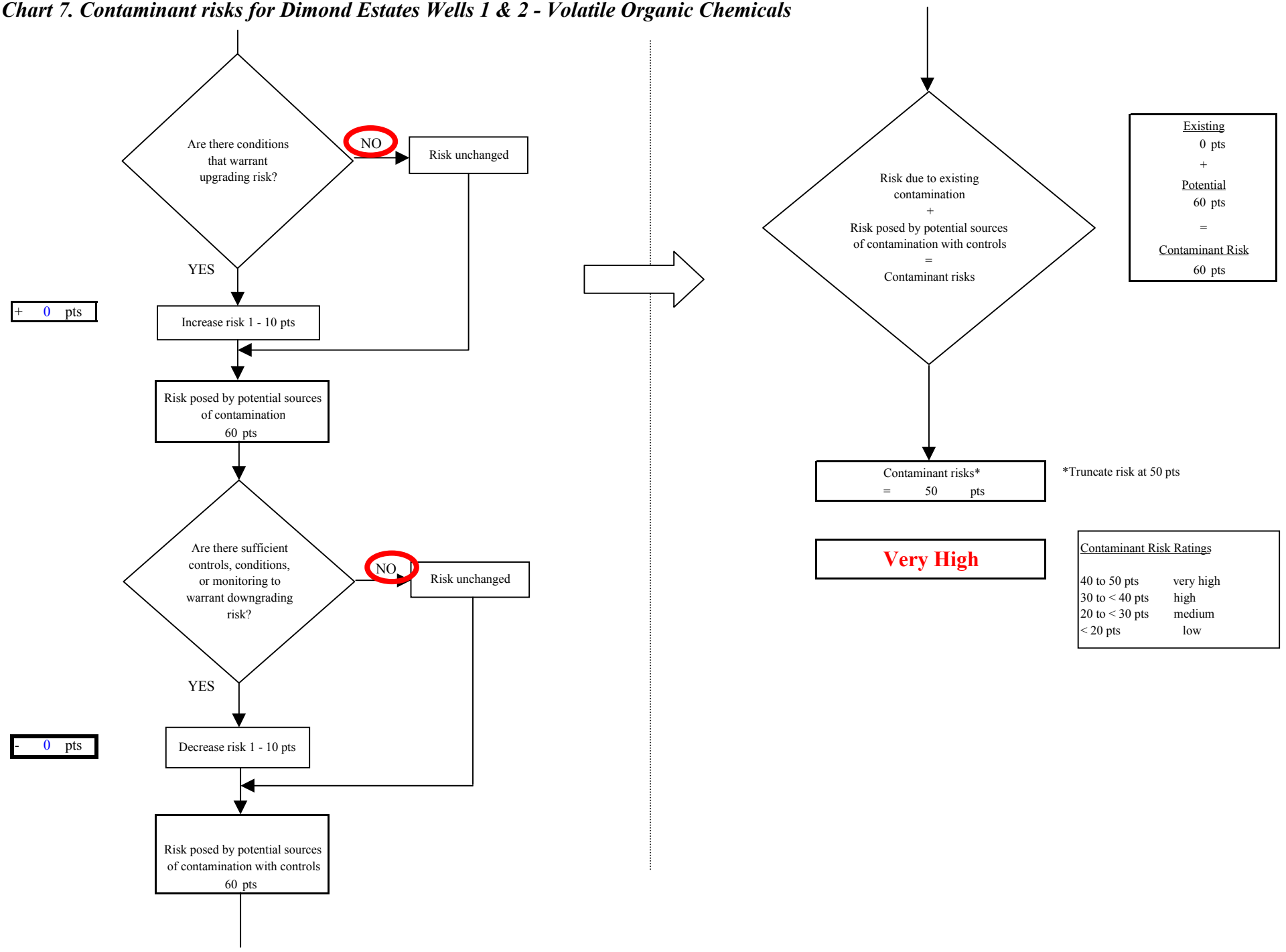


Chart 8. Vulnerability analysis for Dimond Estates Wells 1 & 2 - Volatile Organic Chemicals

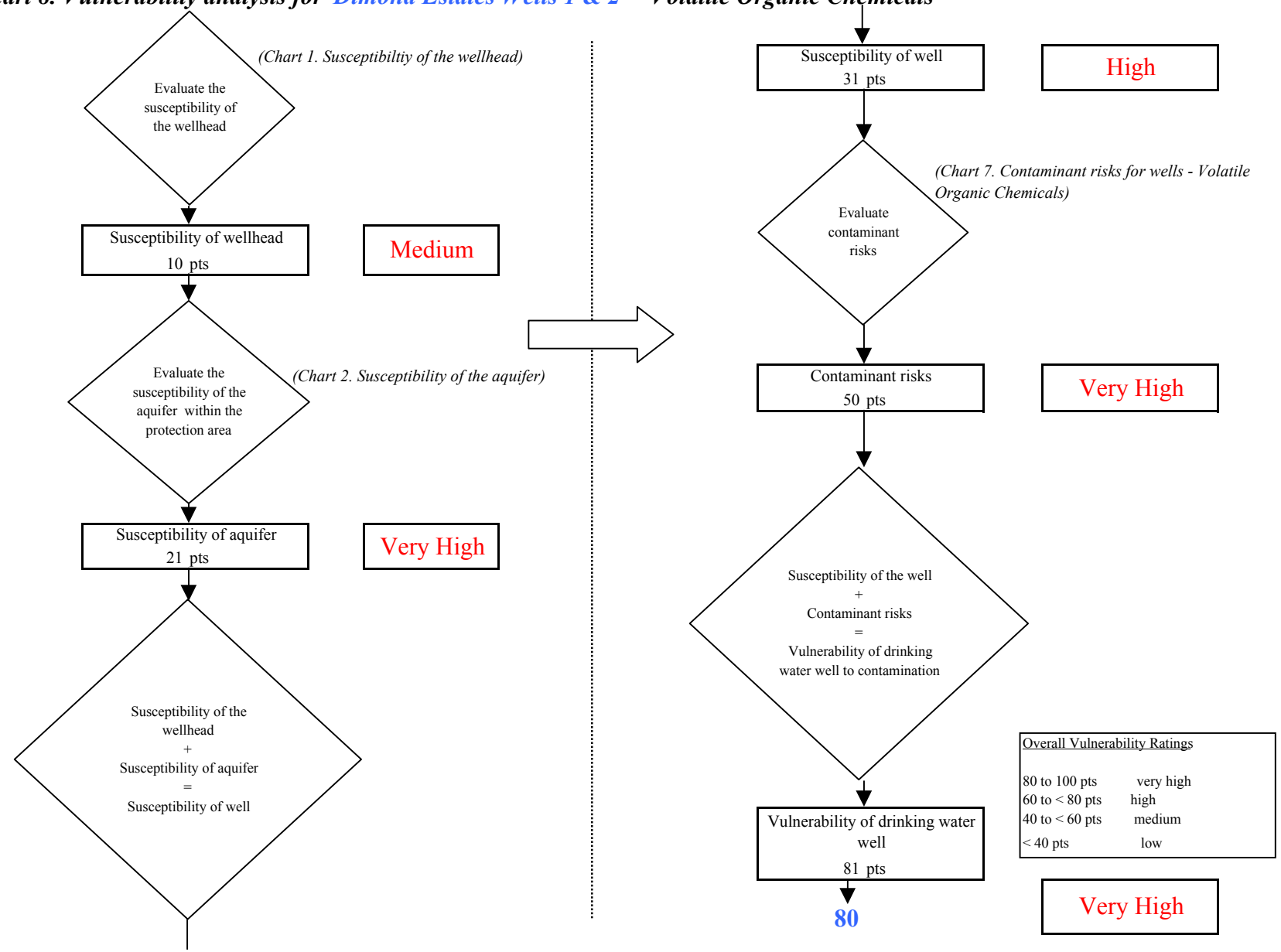


Chart 9. Contaminant risks for Dimond Estates Wells 1 & 2 - Heavy Metals, Cyanide and Other Inorganic Chemicals

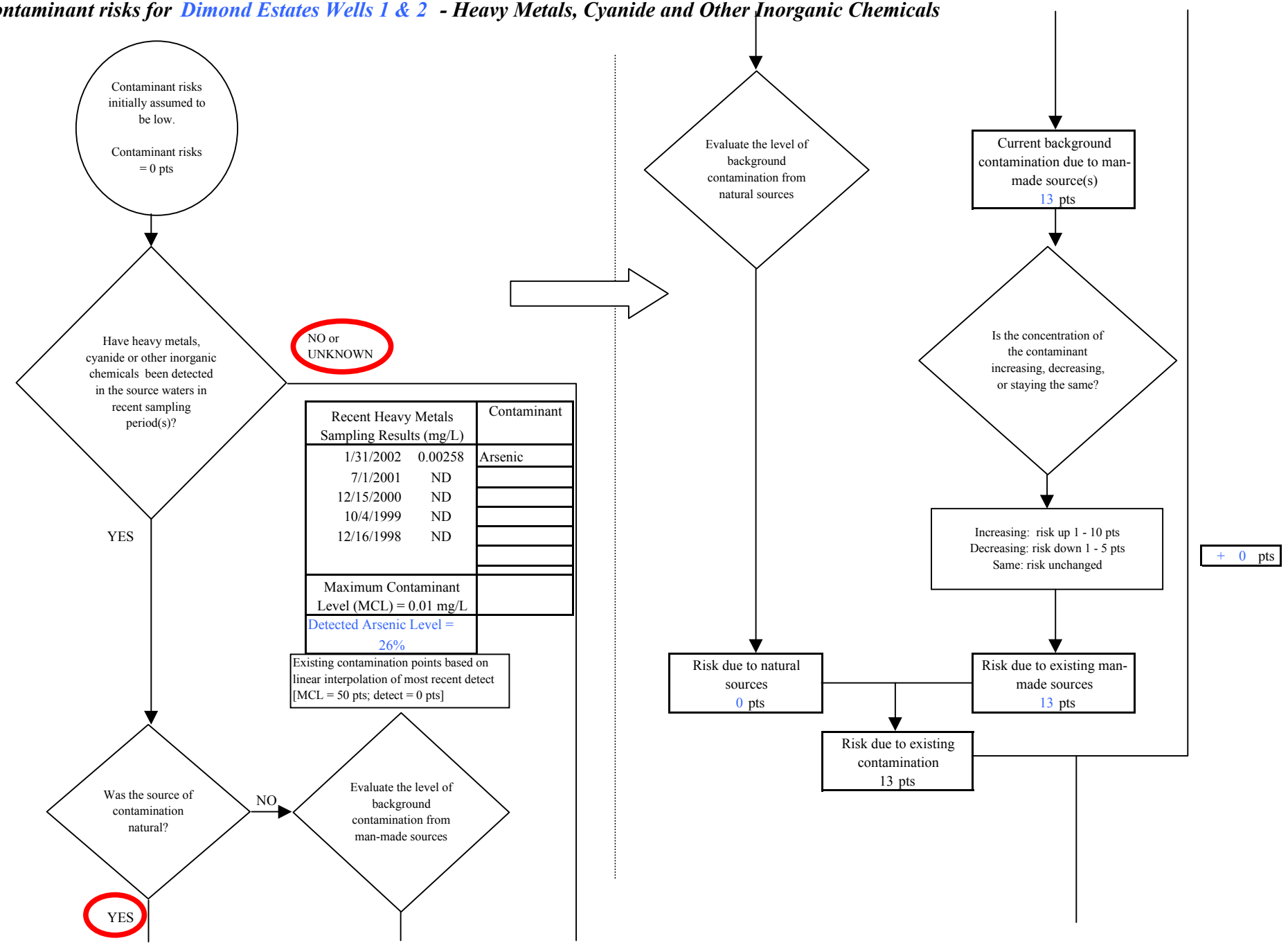
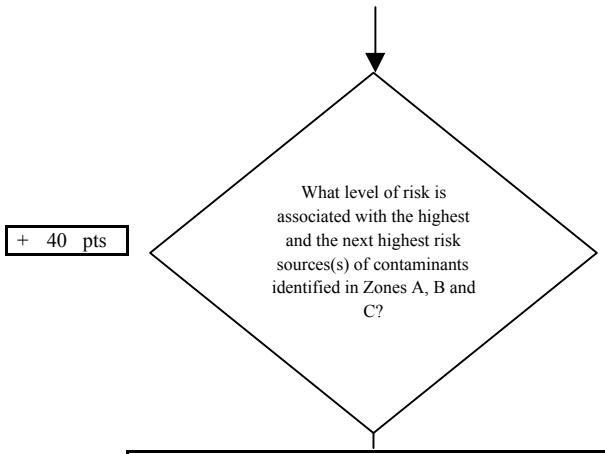


Chart 9. Contaminant risks for Dimond Estates Wells 1 & 2 - Heavy Metals, Cyanide and Other Inorganic Chemicals



+ 40 pts

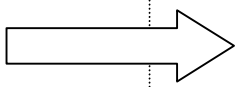
Risk Levels for Contaminant Sources identified in Zones A, B and C

	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	0	2	2
Medium(s)	13	3	16
Low(s)	11	8	19

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

Matrix Score 40

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.



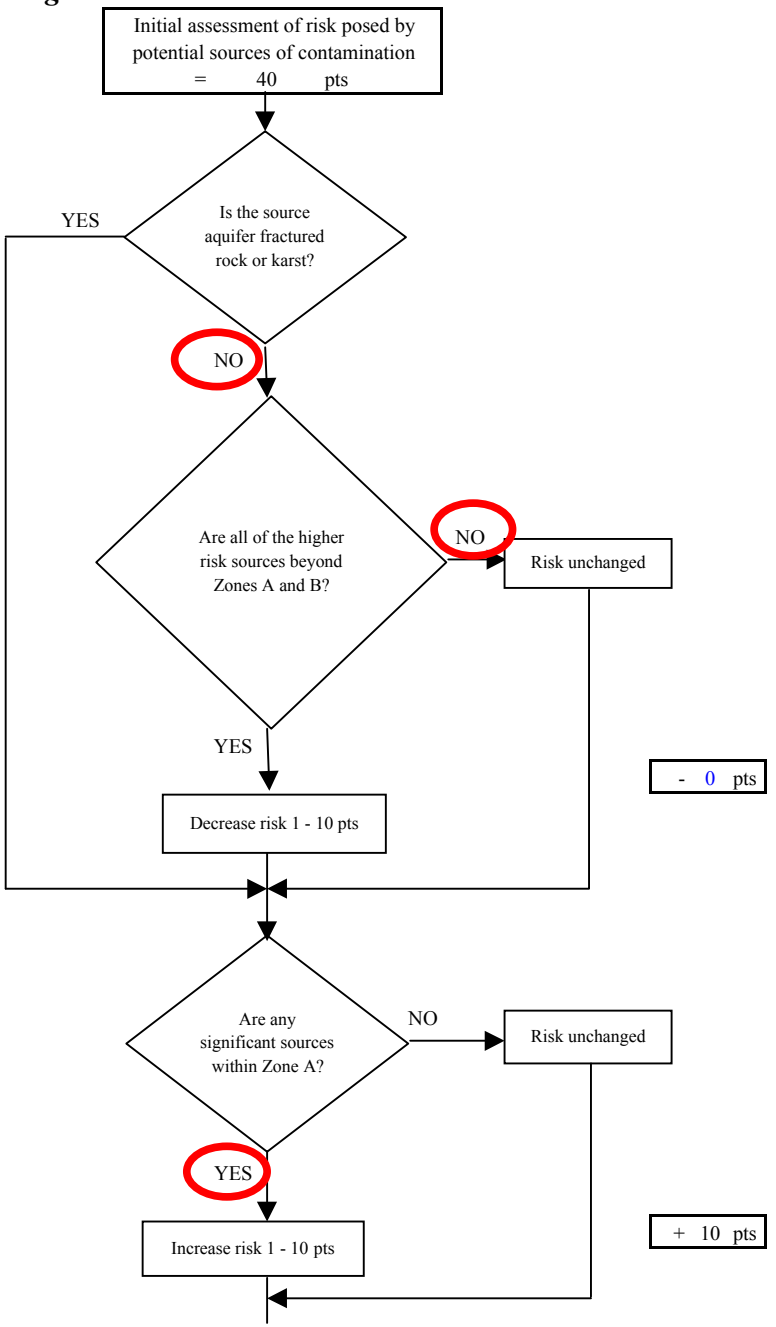


Chart 9. Contaminant risks for Dimond Estates Wells 1 & 2 - Heavy Metals, Cyanide and Other Inorganic Chemicals

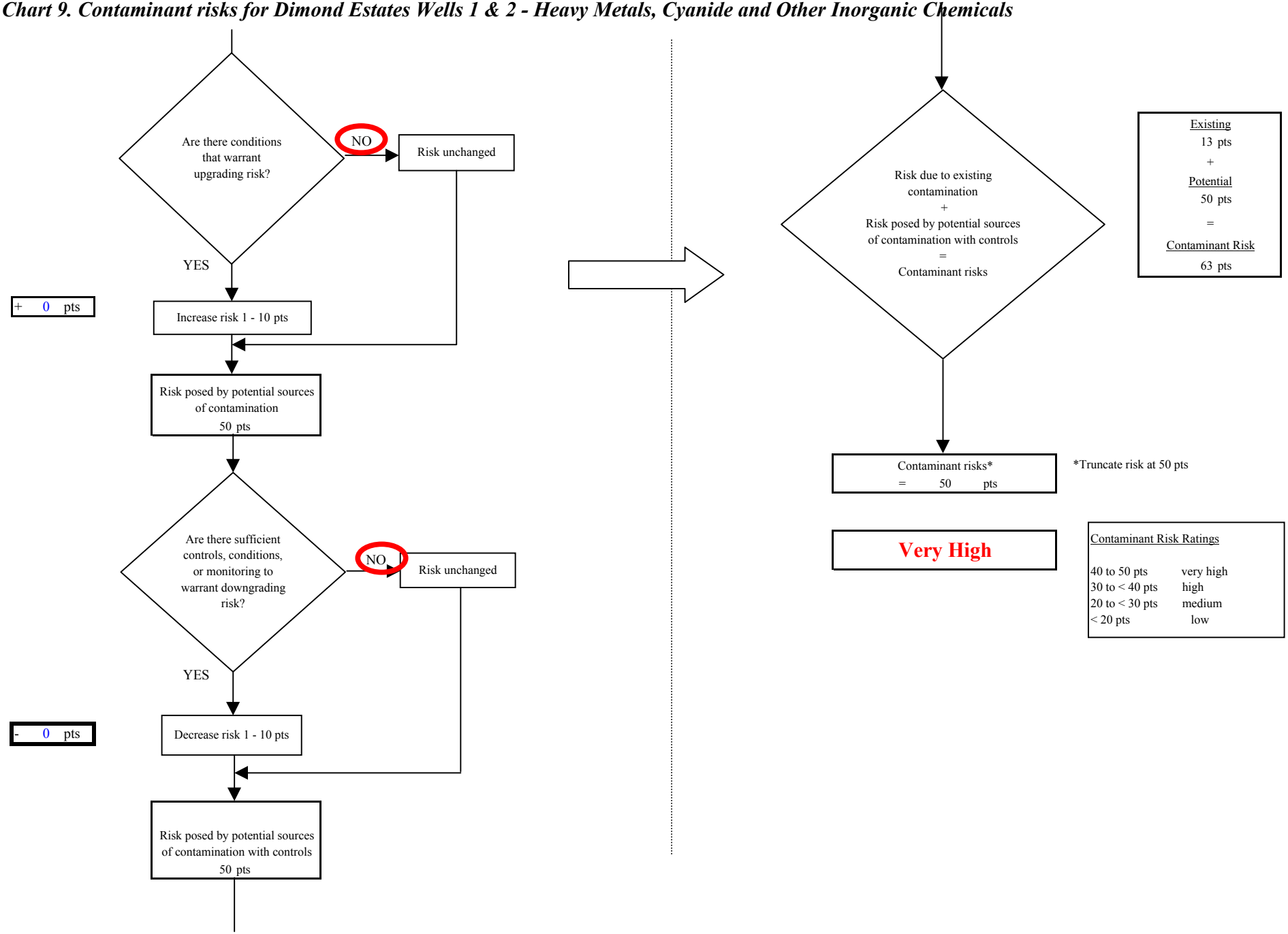


Chart 10. Vulnerability analysis for Dimond Estates Wells 1 & 2 - Heavy Metals, Cyanide and Other Inorganic Chemicals

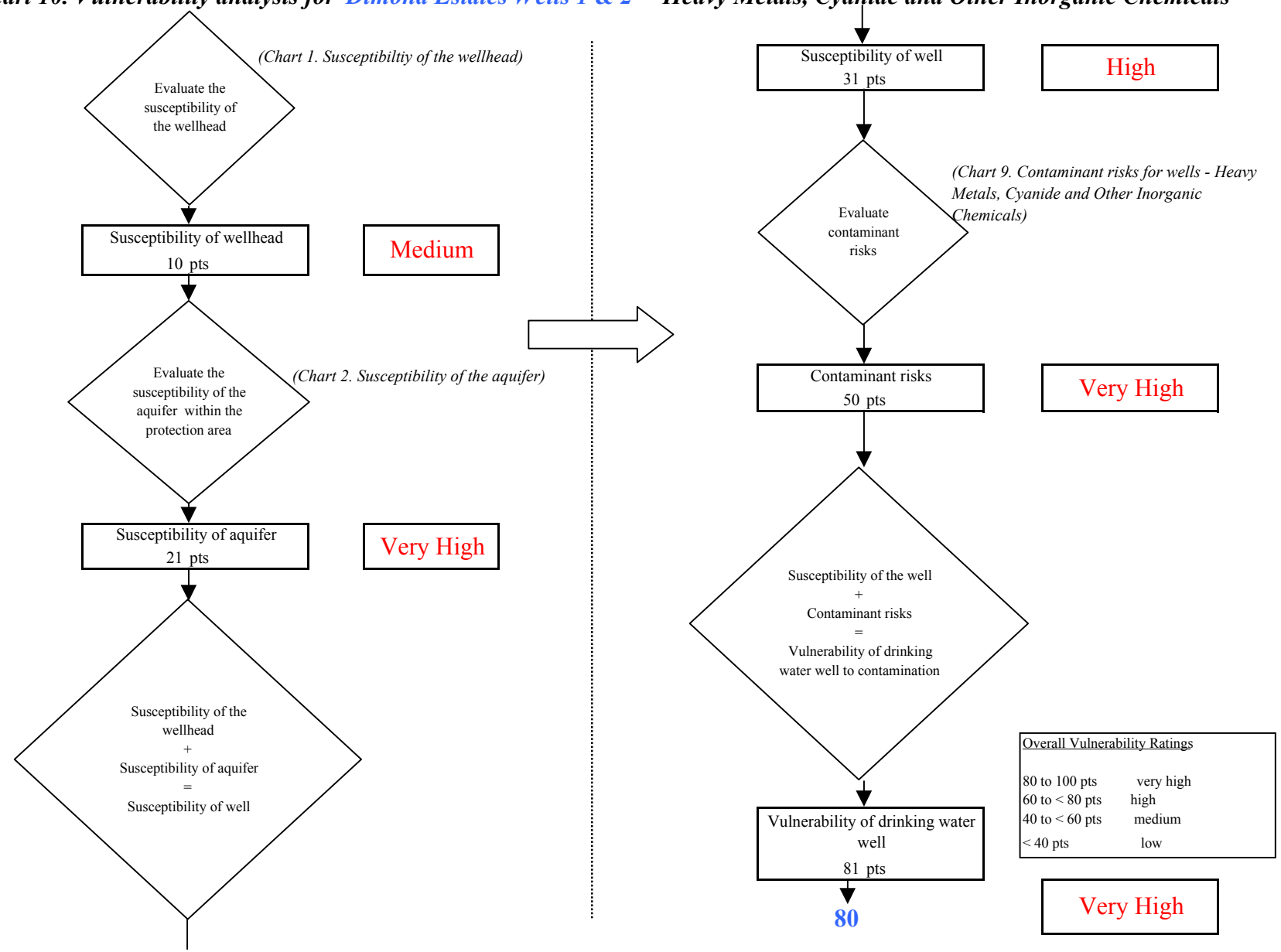


Chart 11. Contaminant risks for Dimond Estates Wells 1 & 2 - Synthetic Organic Chemicals

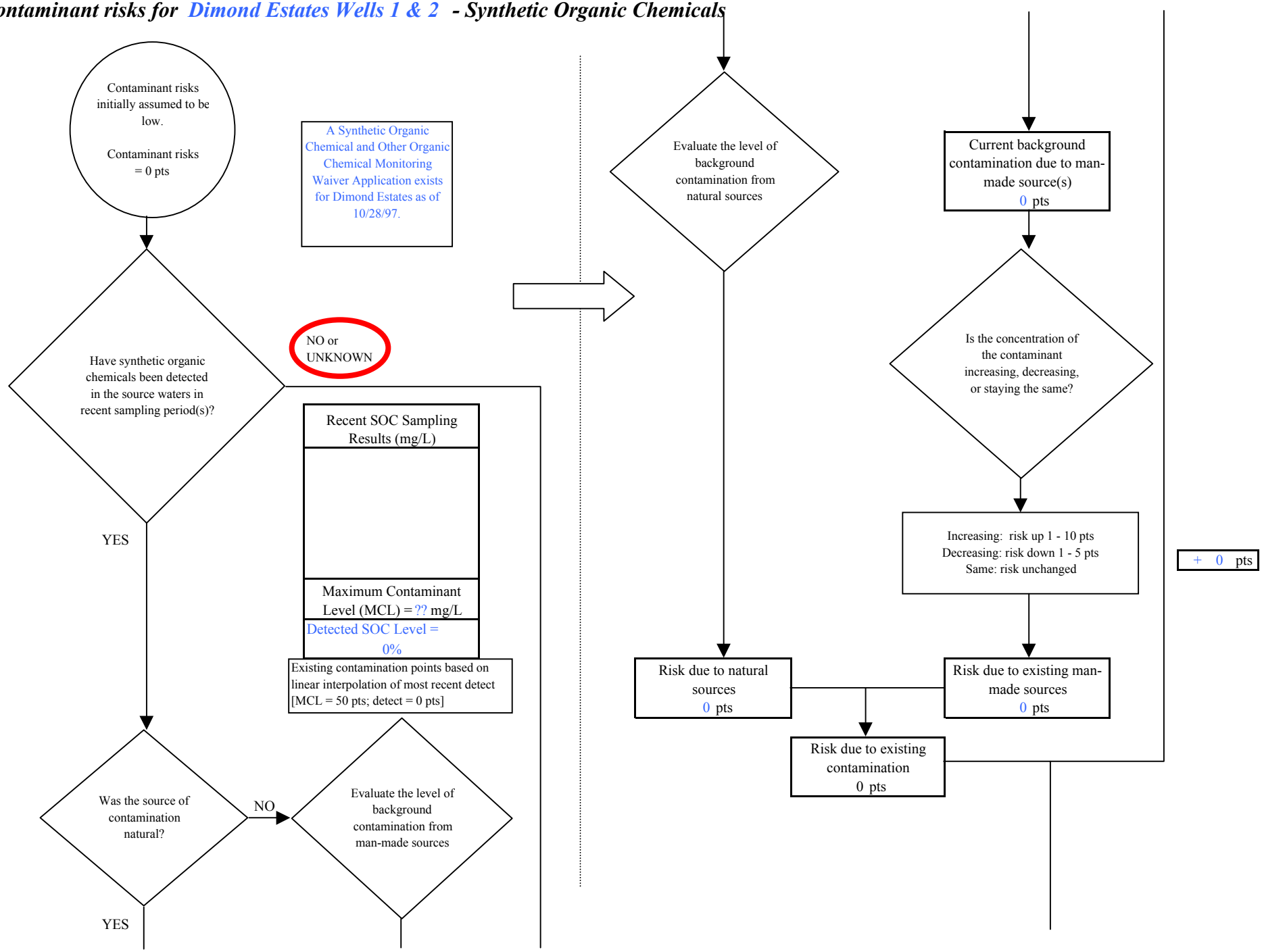


Chart 11. Contaminant risks for Dimond Estates Wells 1 & 2 - Synthetic Organic Chemicals

+ 30 pts

What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A, B and C?

Risk Levels for Contaminant Sources identified in Zones A, B and C

	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	0	1	1
Medium(s)	0	1	1
Low(s)	4	4	8

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

Matrix Score 30

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.

Initial assessment of risk posed by potential sources of contamination = 30 pts

Is the source aquifer fractured rock or karst?

YES

NO

Are all of the higher risk sources beyond Zones A and B?

NO

Risk unchanged

YES

Decrease risk 1 - 10 pts

- 0 pts

Are any significant sources within Zone A?

NO

Risk unchanged

YES

Increase risk 1 - 10 pts

+ 2 pts

Chart 11. Contaminant risks for Dimond Estates Wells 1 & 2 - Synthetic Organic Chemicals

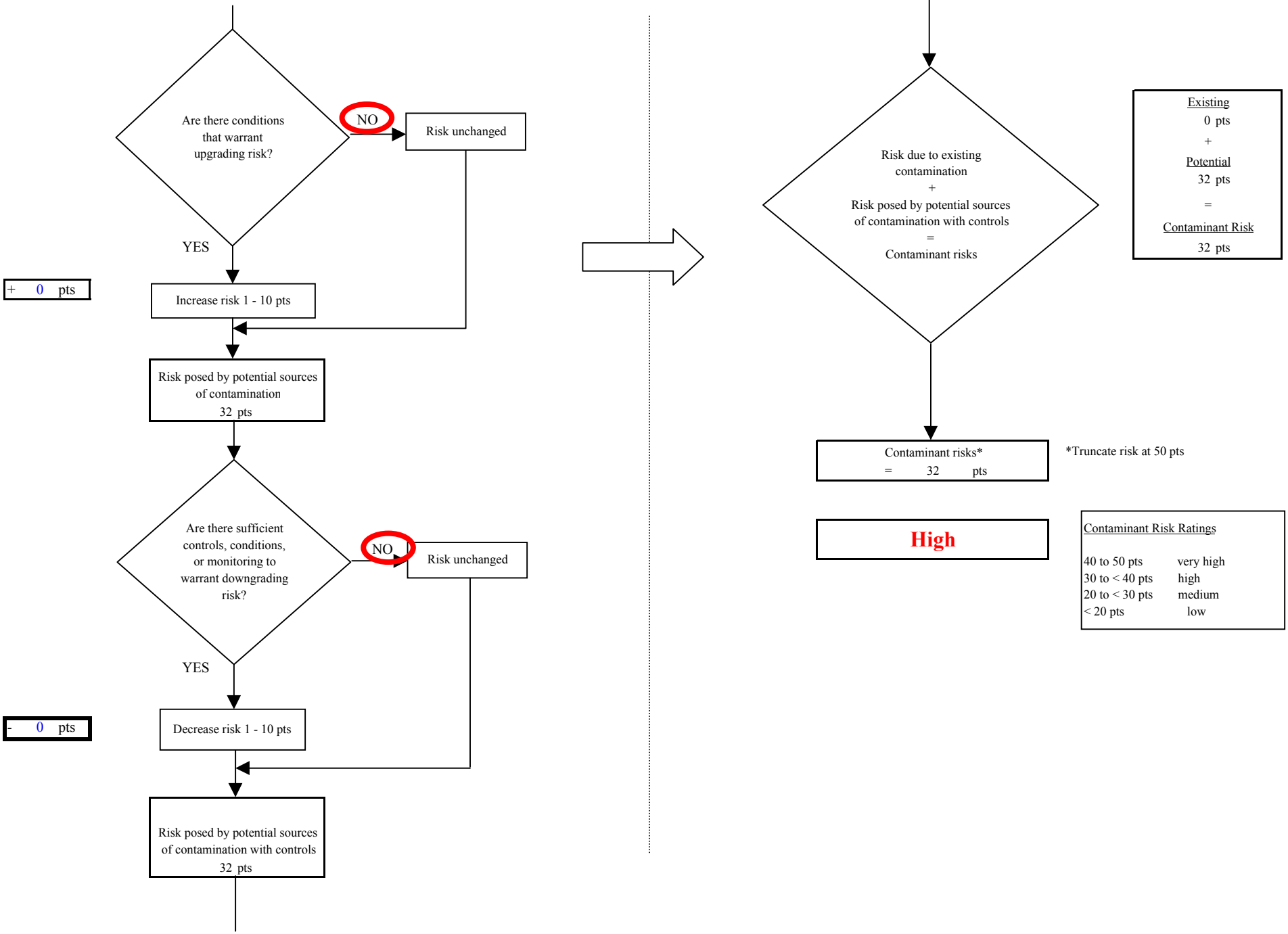


Chart 12. Vulnerability analysis for Dimond Estates Wells 1 & 2 - Synthetic Organic Chemicals

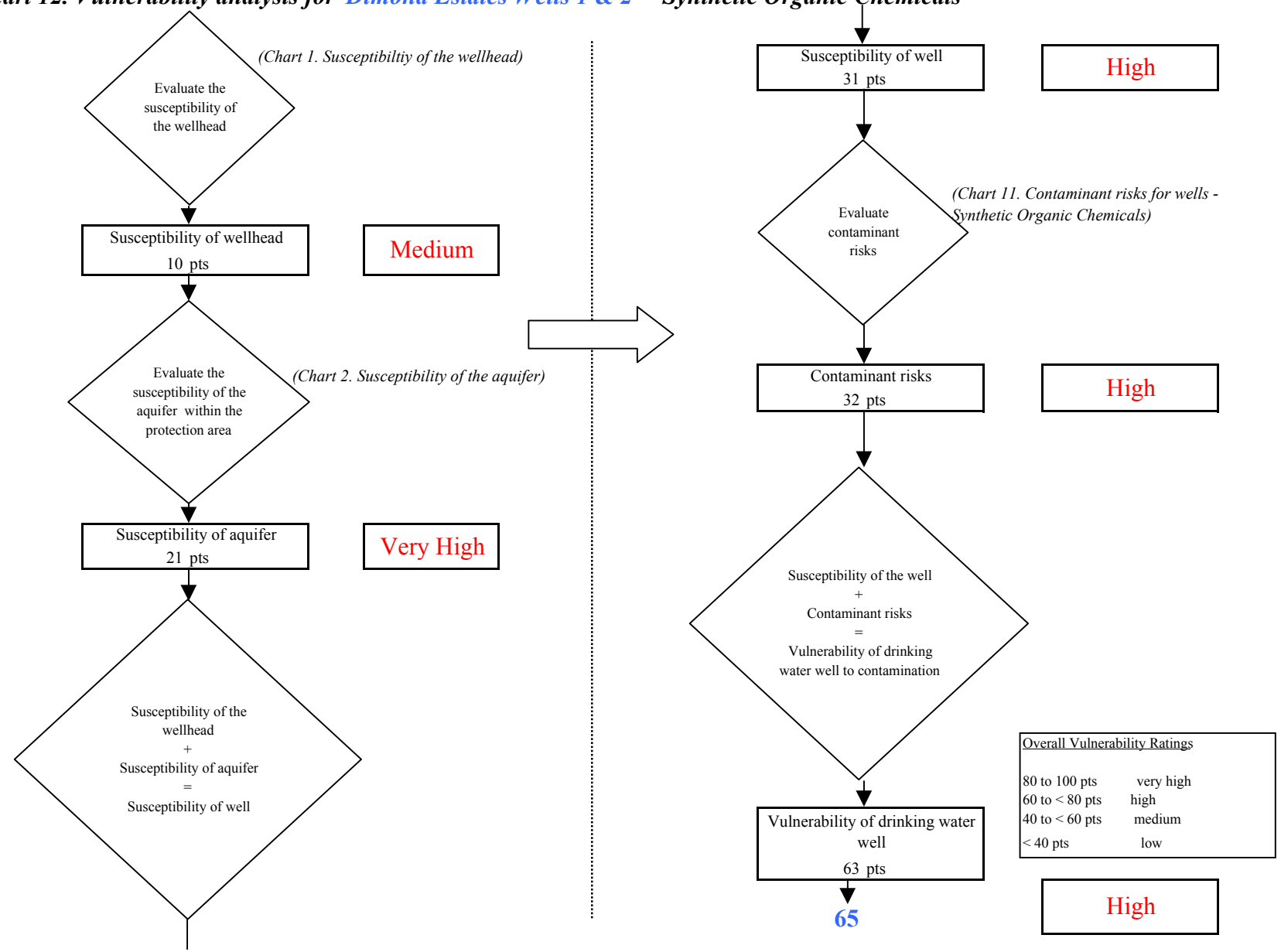


Chart 13. Contaminant risks for Dimond Estates Wells 1 & 2 - Other Organic Chemicals

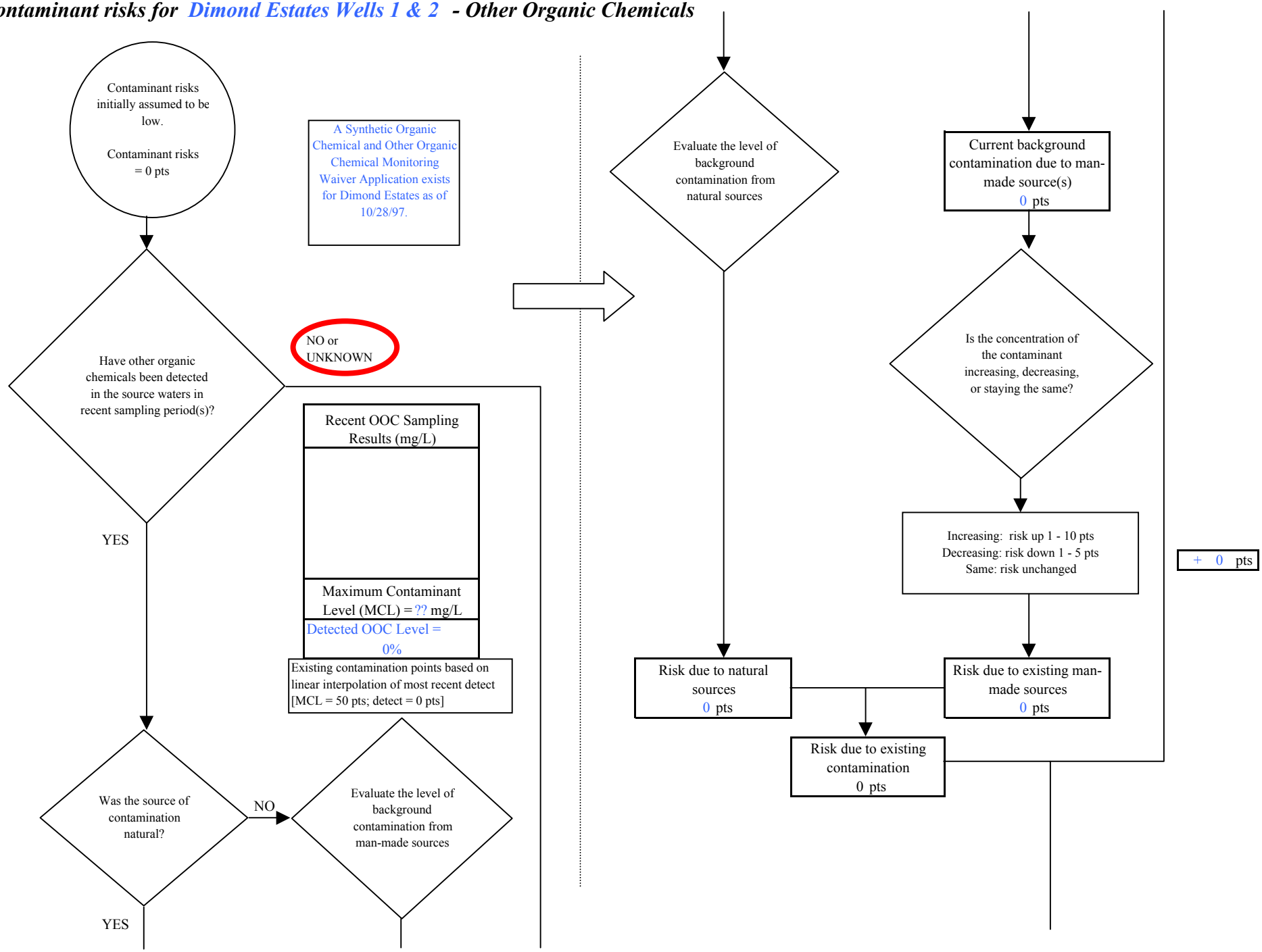


Chart 13. Contaminant risks for Dimond Estates Wells 1 & 2 - Other Organic Chemicals

+ 40 pts

What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A, B and C?

Risk Levels for Contaminant Sources identified in Zones A, B and C

	Zone A	Zones B&C	Total
Very Highs(s)	0	1	1
High(s)	0	1	1
Medium(s)	2	2	4
Low(s)	9	6	15

	LOW 10 pts	**MEDIUM** 20 pts	**HIGH** 30 pts	**VERY HIGH** 40 pts
LOW	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
MEDIUM	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

Matrix Score 40

Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.

Initial assessment of risk posed by potential sources of contamination = 40 pts

Is the source aquifer fractured rock or karst?

YES

NO

Are all of the higher risk sources beyond Zones A and B?

NO

Risk unchanged

YES

Decrease risk 1 - 10 pts

- 0 pts

Are any significant sources within Zone A?

NO

Risk unchanged

YES

Increase risk 1 - 10 pts

+ 5 pts

Chart 13. Contaminant risks for Dimond Estates Wells 1 & 2 - Other Organic Chemicals

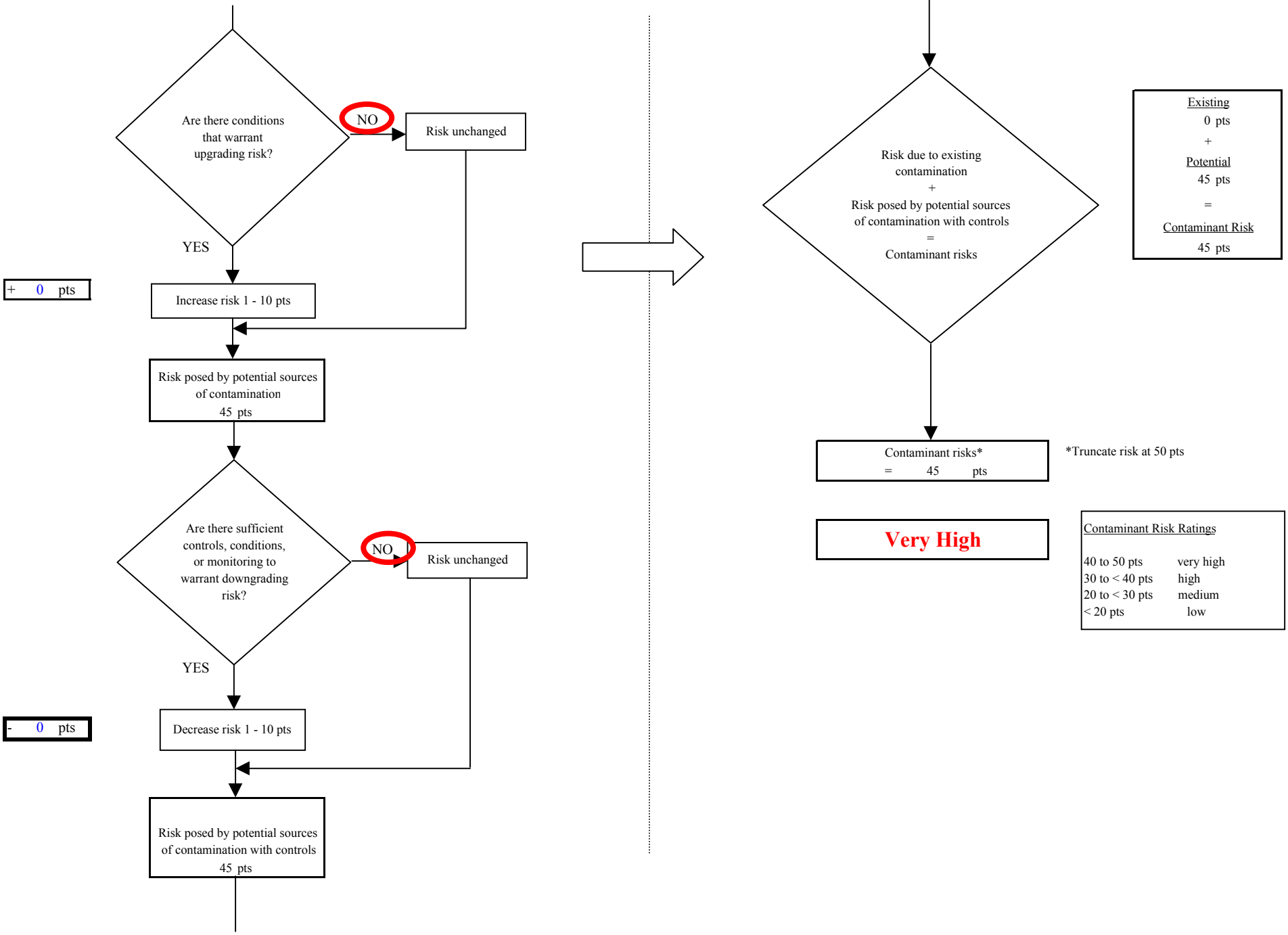


Chart 14. Vulnerability analysis for Dimond Estates Wells 1 & 2 - Other Organic Chemicals