Source Water Assessment:

Hydrogeologic Susceptibility and Vulnerability Assessment for Alaska R&R Laundry and RV Park Drinking Water Well, Wasilla, Alaska

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DRINKING WATER PROTECTION PROGRAM REPORT *80*

October 2001

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By Shannon & Wilson, Inc.

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ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION: OCTOBER 2001

CONTENTS

TABLES

ILLUSTRATIONS

APPENDICES

Hydrogeologic Susceptibility and Vulnerability Assessment for Alaska R&R Laundry and RV Park Public Drinking Water Source, Wasilla, Alaska

By Shannon & Wilson, Inc.

Drinking Water Protection Program
Alaska Department of Environmental Conservation

EXECUTIVE SUMMARY

The Alaska R&R Laundry and RV Park well is a Class B drinking water source consisting of one well. The well is located in the Meadow Creek watershed, in Big Lake, Alaska. Identified potential and current sources of contaminants for Alaska R&R Laundry and RV Park include: high-capacity septic systems, motor vehicle waste disposal systems, log milling activities, a residential heating oil tank, nonresidential aboveground heating oil tanks, residential septic systems, highways and roads. Alaska Department of Environmental Conservation (ADEC) recognized contaminated sites, a laundromat, an RV dump station, an aboveground residential fuel tank, a campground/RV park, a hardware store, underground gasoline tanks, a rail corridor, gasoline stations, a motor vehicle repair shop, a boat engine/body repair shop, and approximately 27 acres of residential area. These identified potential and existing sources of contamination are considered sources of bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals. Overall, Alaska R&R Laundry and RV Park public water source received vulnerability ratings of **High** for bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals.

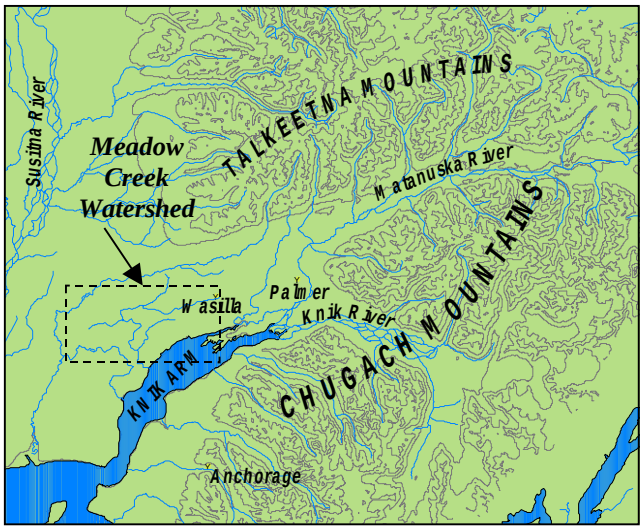

Figure 1. Index Map showing the location of the Matanuska-Susitna Valley and the Meadow Creek Watershed.

INTRODUCTION

The purpose of this environmental assessment is to provide public water system owners/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 Alaska R&R Laundry and RV Park source of public drinking water. This source consists of one well in the Meadow Creek Watershed (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 MEADOW CREEK - AREA, ALASKA

Location

The Meadow Creek watershed, located in southcentral Alaska, lies within the Matanuska-Susitna Borough. The Borough encompasses 24,694 square miles and supports a population in 2000 of 59,322. The Borough is contained within the watersheds of the Matanuska and Susitna Rivers which flow from the glacier melt waters in the Alaska Range, Talkeetna Mountains, and the Chugach Mountains to tidewater in the Knik Arm of Upper Cook Inlet *(Jokela, Munter and Evans, 1991)* (Figure 1). The area between the Matanuska and Susitna Valley is commonly referred to as the Mat-Su Valley. The Meadow Creek watershed contains 115 lakes, including Big Lake, and extends from an area northwest of Wasilla to the west end of Big *Lake (Jokela, Munter and Evans, 1991*), as shown in Figure 1.

The Borough's close proximity to Anchorage and its abundance of surface-water resources has helped contribute to rapid growth over the last two decades. The population has tripled since 1980. As of 1998, approximately 9% of the state's population resided in the Matanuska-Susitna Borough. The projected growth

rate is expected to be 3.3% per year, three times higher then the state rate. At this rate, the Borough will have approximately 13% of the state's population by 2018 *(ADOL, 1999).*

Climate

The Meadow Creek-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.

The mean daily temperature ranges from 69.4 degrees Fahrenheit during the summer months to 13.8 degrees Fahrenheit during the winter months. The annual precipitation in the Meadow Creek-area is approximately 20 inches per year and total snow is around 59 inches per year. The average snow depth during snowy months is 6.4 inches *(Western Regional Climate Center, 2000).* Precipitation generally increases inland toward the Talkeetna Mountains where annual precipitation may exceed 60 inches per year *(Brabets, 1997).*

Physiography and Groundwater Conditions

Surface elevations in the Matanuska-Susitna Borough range from sea level where the Knik River and Matanuska River enter the Cook Inlet to well over 6,000 feet in the peaks that bound the area. Glacial moraine and outwash deposits primarily mantle the surface of the Mat-Su Valley.

The regional geology and ground water conditions of the Mat-Su Valley vary greatly depending on location. The terrain is dominated by distinctive landforms created by repeated glacial advances and retreats during the Pleistocene epoch (2 million to 10,000 years before present). The unconsolidated layers, layers of sediment that are not cemented together, are comprised of various mixtures of fine- to coarse-grained particles (clay to boulders). The majority of wells in the Mat-Su Valley are located in unconsolidated layers consisting of relatively well sorted sands and gravels. These unconsolidated layers vary substantially in size and distribution throughout the Valley. In general, the unconsolidated layers increase in thickness as you move towards Cook Inlet. *(Jokela, Munter, Evans,*

Figure 2. Map showing regional ground-water flow in Matanuska-Susitna Valley. ***(Jokela, Munter and Evans, 1991)***

1991). Throughout the area numerous confining layers ranging from less than 1- to 60-feet thick separate the unconsolidated layers.

In the Mat-Su Valley, the groundwater is primarily recharged by snowmelt and precipitation infiltrating into the foothill slopes of the Talkeetna or Chugach Mountains and by direct precipitation and snowmelt throughout the study area.

Groundwater flow in the confined aquifer is generally, north to south in the central region of the valley, toward the Matanuska River in the eastern region and the slope is predominantly northeast to northwest in the western region. The direction of groundwater flow in the upper unconfined aquifer's are more variable due to the influence from surficial topography as well as its close connection with surface water bodies. *(Jokela, Munter and Evans, 1991)* (Figure 2).

ALASKA R&R LAUNDRY AND RV PARK PUBLIC WATER SOURCE

Alaska R&R Laundry and RV Park public water source is located in the Meadow Creek watershed located at approximately Mile 49.5 Parks Highway. The system is a Class B public drinking water source and is owned and operated by Rose and Rich Welker. The source consists of one well near the southeastern edge of the property. It is located at an elevation of approximately 250 feet above sea level. The well is inferred to tap the underlying, unconfined aquifer. According to the well log, the Alaska R&R Laundry and RV Park well does not appear to be grouted and penetrates silty clay, silty gravel, and coarse gravel to a total depth of 115 feet below land surface. The well is cased to a depth of 115 feet below land surface with the lower 40 feet of casing perforated. Based on test hole log for septic system evaluation the static water level of 15 feet below land surface at the time of drilling.

This water source is assumed to operate year round. The Alaska R&R Laundry and RV Park drinking water source is assumed to serve 4 residents and approximately 26 non-residents through one service connection.

ASSESSMENT AND PROTECTION AREA FOR ALASKA R&R LAUNDRY AND RV PARK DRINKING WATER SOURCE

The Drinking Water Protection and Assessment Area that has been established for Alaska R&R Laundry and RV Park is the area that is most sensitive to contamination. This area has served as a basis for assessing the risk of the drinking water source to contamination. This zone around the drinking water source is the most critical area for the preservation of the quality of the drinking water for this source. For simplicity, this area will be known as your Drinking Water Protection Area and will serve as the area of focus for voluntary protection efforts.

Groundwater recharge for the Alaska R&R Laundry and RV Park water system enters the aquifer system through infiltration of direct precipitation within the area. An analytical calculation was used to calculate 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 well logs from the surrounding area and from past studies *(Jokela, Munter and Evans, 1991).* This analytical calculation was used as a guide as the first step in establishing the protection area for Alaska R&R Laundry and RV Park. Additional methods were further employed to take into account any uncertainties in groundwater flow and aquifer characteristics in an attempt to arrive at a meaningful and conservative protection area with respect to public health (please refer to the Guidance Manual for Class B 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 Areas for Alaska R&R Laundry and RV Park contain four zones, Zone A, Zone B, Zone C and Zone D (See Map 1 in Appendix A). Zone A corresponds to the area between the well 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 well may be on the order of several days to several hours. Zone A also extends downgradient from the well to take into account the area of the aquifer that is influenced by pumping of the well.

The Zone B protection area for Alaska R&R Laundry and RV Park corresponds to a time-of-travel of less than two years and extends eastward. The Zone C protection area extends from the 2-year time of travel to the 5-year time of travel. Lastly, Zone D extends from Zone C to the end of the protection area, roughly 1.1 miles from the Alaska R&R Laundry and RV Park well.

INVENTORY OF POTENTIAL AND EXISTING CONTAMINANT SOURCES

The Drinking Water Protection Program has completed an inventory of potential and existing sources of contamination within Alaska R&R Laundry and RV Park's Drinking Water Protection Area. This survey was completed through a search of agency records and other publicly available information, as well as a reconnaissance of the area surrounding the well.

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 B public water system assessments, three categories of drinking water contaminants were inventoried. They include:

- Bacteria and viruses;
- Nitrates and/or nitrites;
- Volatile organic chemicals;

Map 2 through Map 4 in Appendix C depict the Contaminant Source Inventory for Alaska R&R Laundry and RV Park. Inventoried potential sources of contamination within Zones A through Zone B were associated with residential and commercial type activities (see Table 1 in Appendix B). Zone C contains roads, residential areas, gasoline stations, two ADEC-recognized contaminated sites, and other commercial activity. Only high and very high potential and existing sources of contamination were inventoried within Zone D. None were identified in Zone D. Below is a summary of the contaminant sources inventoried within the Alaska R&R Laundry and RV Park protection area:

- high-capacity septic systems,
- motor vehicle waste disposal systems,
- logging activities,
- a residential heating oil tank,
- residential roads,
- nonresidential aboveground heating oil tanks,
- residential septic systems,
- highways and roads,
- a leaking underground storage tanks,
- a contaminated site,
- monitoring wells,
- a laundromat,
- an RV dump station,
- an aboveground residential fuel tank,
- a campground/RV park,
- a hardware store,
- underground gasoline tanks,
- a rail corridor,
- gasoline stations,
- a motor vehicle repair shop,
- a boat engine/body repair shop,
- and approximately 27 acres of residential area

These potential contaminant sources present risk for all three categories of drinking water contaminants for Alaska R&R Laundry and RV Park drinking water source.

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 well.

VULNERABILITY OF ALASKA R&R LAUNDRY AND RV PARK DRINKING WATER SOURCES

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

- Natural susceptibility; and
- Contaminant risks.

Each of the three categories of drinking water contaminants has been analyzed and an overall vulnerability score of 0 to 100 is 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)

Alaska R&R Laundry and RV Park's well is completed in an unconfined aquifer setting. Therefore, contaminants that enter the subsurface within the vicinity of the well and Drinking Water Protection Area may enter the aquifer uninhibited by the absence of any protective layer. It is unclear whether the well is grouted. For purposes of this study, it is assumed that the well is not grouted. The absence of grouting can allow the transport of contaminants from the surface along the well casing. Combining the susceptibility of the wellhead and the aquifer to contamination leads to a score (0 – 50 points) and rating of overall Susceptibility (See Appendix D). Table 1 shows the overall

Susceptibility score and rating for Alaska R&R Laundry and RV Park.

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

	Score	Rating
Susceptibility of the Wellhead	5	Low
Susceptibility of the Aquifer	16	High
Natural Susceptibility	21	Medium

Contaminant risks to a drinking water source depend on the type, number or density, and distribution of contaminant sources. Large Capacity septic systems, motor vehicle waste disposal systems, a residential heating oil tank, nonresidential aboveground heating oil tanks, a closed and an open leaking underground storage tank, a contaminated site, an RV dump station, an aboveground residential fuel tank, a campground/RV park, underground gasoline tanks, gasoline stations, a motor vehicle repair shop, and a boat engine/body repair shop contribute the highest risk for potential contamination to the Alaska R&R Laundry and RV Park source of public drinking water.

A score (0 – 50 points) and rating of Contaminant Risks (See Appendix D) is assigned based on the findings of the Contaminant Source Inventory (Appendix B - Table 1 – Table 4). 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

Contaminant Risks	Score	Rating
Bacteria and Viruses	50	Very High
Nitrates and/or Nitrites	50	Very High
Volatile Organic Chemicals	45	Very High

Appendix D contains eight charts, which together form the 'Vulnerability Analysis' for a source water assessment for a public drinking water source. 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 8 contain the Contaminant Risks and Vulnerability Analysis for nitrates and nitrites and volatile organic chemicals, respectively.

Vulnerability of the drinking water source 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 three categories of drinking water contaminants (See Appendix D). Note: scores are rounded off to the nearest five.

Table 3. Overall Vulnerability of Alaska R&R Laundry and RV Park Public Drinking Water Source to Contamination by Category

Category	Score	Rating
Bacteria and Viruses	70	High
Nitrates and Nitrites	70	High
Volatile Organic Chemicals	65	High

Tables 2 through 4 in Appendix B contain the ranking of potential and existing sources of contamination with respect to bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals.

Overall, the contaminant risks for bacteria and viruses and nitrate/nitrites category are very high with large capacity septic systems driving the scores. Combining the potential contamination risk for each category with the susceptibility of the well, yields an overall vulnerability to these contaminants as high for this source of public drinking water.

Nitrates and/or nitrites are found in natural background concentrations at the site, as elsewhere in Alaska. The sampling history of the Alaska R&R Laundry and RV Park source water indicates low concentrations of nitrate were reported in June 1996. (See Chart 6-Contaminant Risks for Nitrates/Nitrites in Appendix D). The reported nitrate contamination is less than 10% of the allowable limit (MCL) for this contaminant. Due to high solubility and weak retention by soil, nitrates are very mobile in soil, moving approximately the same rate as water. Nevertheless, the current nitrate concentration in the Alaska R&R Laundry and RV Park water source remains at safe levels, with respect to human health.

There are 2 gasoline stations within 2,500 feet of the well. One station is reportedly being built, and the other (Tesoro station) has two ADEC leaking

underground storage tank (LUST) case numbers assigned to it, Recky numbers 96220026801 and 96220009201. These cases have been assigned to the site due to contamination resulting from former underground storage tanks that were located at the site. The site is currently being remediated by an active, in situ remediation system and a groundwater monitoring program has been implemented. The gasoline station currently utilizes underground storage tanks for the storage of fuel. These tanks remain a potential source for VOC contamination. In addition, the B&J Center contaminated site has an ADEC file #1993220110601 associated with it. This is apparently due to a release of used oil at the site. The site status is unknown but it is noted in ADEC's Contaminated Sites Database as a low priority site, suggesting that the impact to groundwater and the potential for migration of contaminants are low. The public water system is not required to sample for volatile organic chemicals (VOCs), thus it is unknown if any VOCs from these or other sources are reaching the source.

In addition, the on-site laundromat (Alaska R&R Laundry and RV Park) is located within 100 feet of the well, within Zone A. Potential contaminants from Laundromats consist of solvents and cleaning agents that may contaminate the well source.

SUMMARY

A *Source Water Assessment* has been completed for the Alaska R&R Laundry and RV Park source of public drinking water. The overall vulnerability of this source to contamination is **High** for bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals. This assessment of contaminant risks can be used as a foundation for local voluntary protection efforts as well as a basis for the continuous efforts on the part of the Alaska Department of Environmental Conservation 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 public drinking water source.

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APPENDIX A

Alaska R&R Laundry and RV Park
Drinking Water Protection Area

APPENDIX B

Contaminant Source Inventory and Risk Ranking for Alaska R&R Laundry and RV Park

APPENDIX C

Alaska R&R Laundry and RV Park
Drinking Water Protection Area
and Potential & Existing Contaminant Sources

APPENDIX D

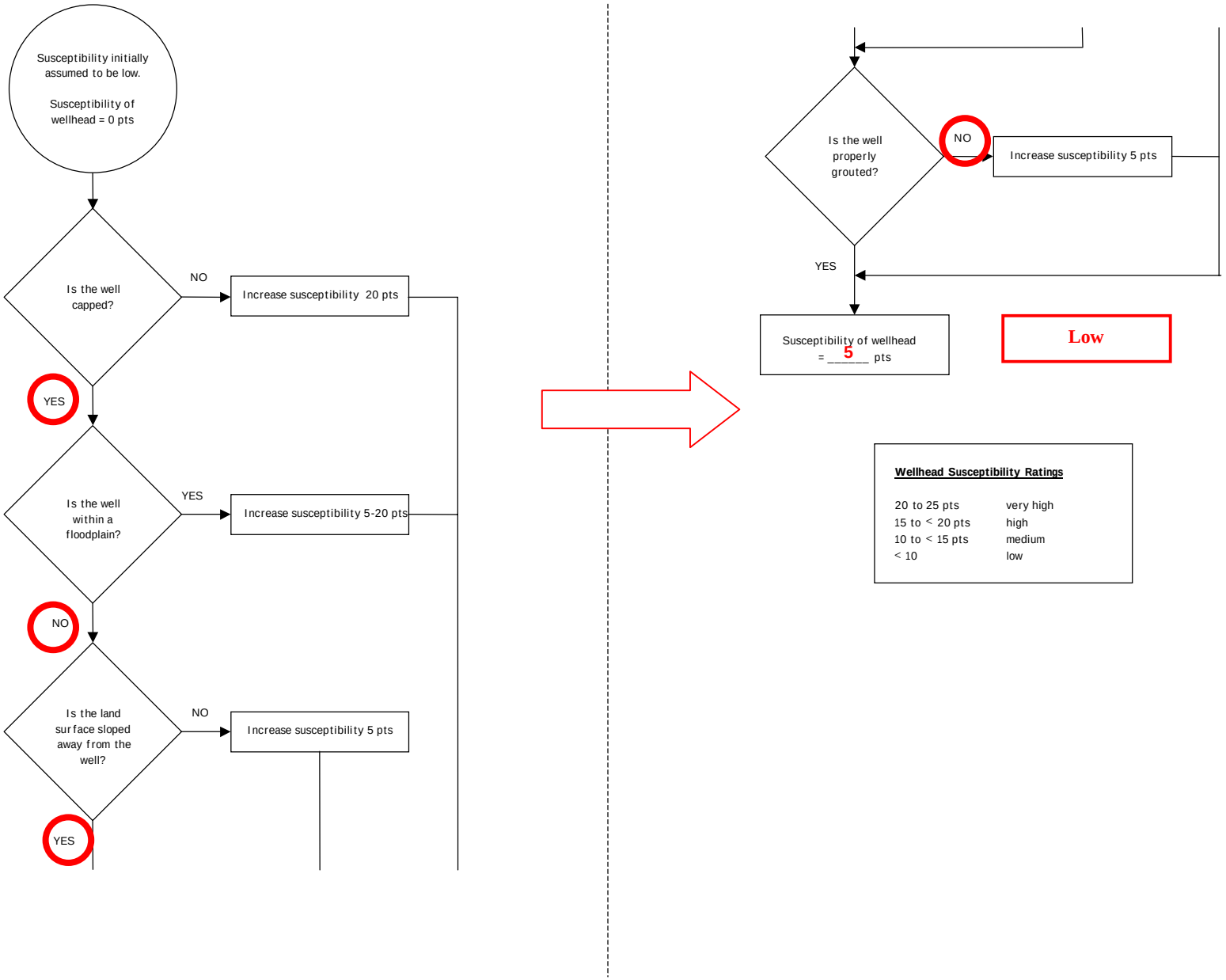
Vulnerability Analysis for Alaska R&R Laundry and RV Park Public Drinking Water Source

Contaminant Source Category	Contaminant Source ID	CS ID Tag	Zone	Location	Map	Comments
Laundromats without dry cleaning	*C22*	*C22-1*	*A*	*AK R&R Laundromat*	*3*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-1*	*A*	*North of Well*	*3*	
RV dump stations	*D18*	*D18-1*	*A*	*North of AK R&R Well*	*3*	
Tanks, fuel, residential (above ground)	*R7*	*R7-1*	*A*	*Northwest of AK R&R Well*	*3*	
Highways and roads, paved (cement or asphalt)	*X20*	*X20-1*	*A*	*Parks Hwy*	*2*	
Campgrounds and RV Parks	*X35*	*X35-1*	*A*	*AK R&R Laundry and RV Park*	*3*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-2*	*B*	*Parcel North of AK R&R*	*3*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-3*	*B*	*Across Parks Hwy*	*3*	
Residential Areas	*R1*	*R1-1*	*B*	*Corner of Meadow Lakes Loop and Parks Hwy*	*2*	*4 Acres*
Septic systems (serves one single-family home)	*R2*	*R2-1*	*B*	*Northeast of AK R&R*	*2*	
Septic systems (serves one single-family home)	*R2*	*R2-2*	*B*	*Northeast of AK R&R*	*3*	
Highways and roads, dirt/gravel	*X24*	*X24-1*	*B*	*Meadow Lakes Loop*	*2*	
Gasoline stations (without repair shop)	*C15*	*C15-2*	*C*	*Corner of Sylvan and Parks Hwy*	*4*	
Hardware stores	*C17*	*C17-1*	*C*	*Mile 49 Parks Hwy*	*4*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-4*	*C*	*Next to B+J Rainbow Center*	*3*	

Contaminant Source Category	Contaminant Source ID	CS ID Tag	Zone	Location	Map	Comments
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-5	C	Southeast of Tesoro-Parks	4	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-6	C	East of Tesoro-Parks	4	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-7	C	Across Parks Hwy from Tesoro-Parks	4	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	C	East of Anna Marie Dr	4	
Logging (active or inactive?)	E2	E2-1	C	East of Tesoro	4	
Residential Areas	R1	R1-2	C	North and South of Parks Hwy	2	23 Acres
Septic systems (serves one single-family home)	R2	R2-3-- >10	C	8 Septics within Zone C	3	
Tanks, heating oil, residential (above ground)	R8	R8-1	C	South of Tesoro	4	
Tanks, gasoline (underground)	T12	T12-1	C	Corner of Parks Hwy and Sylvan Rd	4	
Tanks, gasoline (underground)	T12	T12-2	C	Corner of Parks Hwy and Sylvan Rd	4	
Tanks, gasoline (underground)	T12	T12-3	C	Corner of Sylvan and Parks Hwy	4	
Tanks, gasoline (underground)	T12	T12-4	C	Corner of Sylvan and Parks Hwy	4	
Tanks, gasoline (underground)	T12	T12-5	C	Corner of Sylvan and Parks Hwy	4	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-1	C	Across Parks Hwy from Tesoro	4	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-2	C	Across Parks Hwy from Tesoro	4	
Closed Leaking Underground Fuel Storage Tank (LUST) (diesel)	U14	U14-1	C	Corner of Parks Hwy and Sylvan Rd	4	

Contaminant Source Category	Contaminant Source ID	CS ID Tag	Zone	Location	Map	Comments
Closed Leaking Underground Fuel Storage Tank (LUST) (diesel)	U14	U14-2	C	Corner of Parks Hwy and Sylvan Rd	4	
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U4	U4-1	C	Mile 49 Parks Hwy	4	Waste Oil is a known contaminant
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U4	U4-2	C	Tesoro-Parks	4	Leaking Underground Diesel Tanks
Highways and roads, paved (cement or asphalt)	X20	X20-2	C	Sylvan Rd	2	
Highways and roads, paved (cement or asphalt)	X20	X20-3	C	Pittman Rd	2	
Highways and roads, dirt/gravel	X24	X24-2	C	Blondell Rd	2	
Highways and roads, dirt/gravel	X24	X24-3	C	Anna Marie Dr	2	
Highways and roads, dirt/gravel	X24	X24-4	C	Trevett Ave	2	
Highways and roads, dirt/gravel	X24	X24-5	C	Golden Dr	2	
Rail corridors	X30	X30-1	C	Generally runs east-west	3	
Gasoline stations (without repair shop)	C15	C15-1	C	Corner of Parks Hwy and Meadow Lakes Loop	4	Under Construction
Motor /motor vehicle repair shops	C31	C31-1	D	Across Parks Hwy	4	
Boat engine/body repair shops	C4	C4-1	D	Across Parks Hwy from Tesoro	4	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-8	D	Northeas across Parks Hwy from Tesoro-Parks	4	

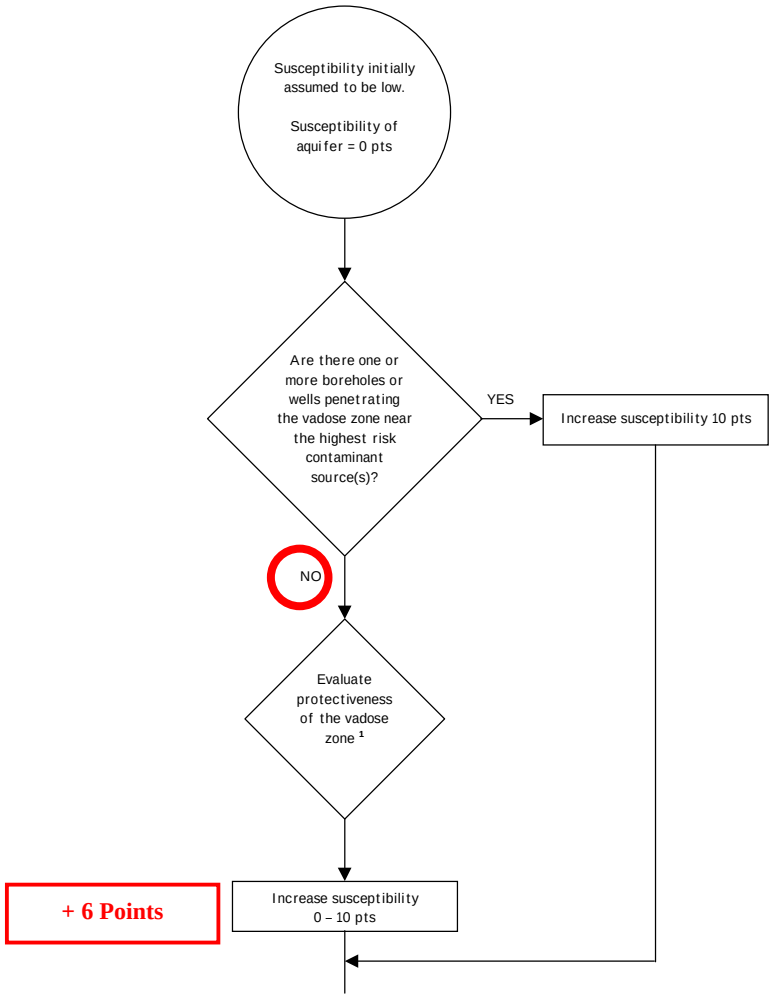
Chart 1. Susceptibility of the Wellhead – Alaska R&R Laundry and RV Park

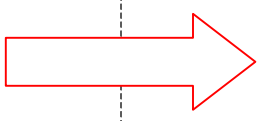


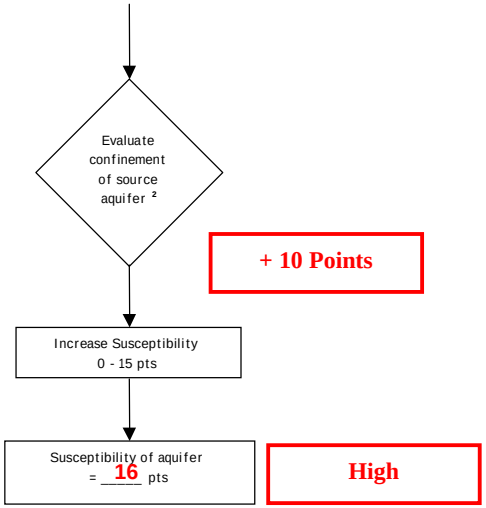
Contaminant Source Category	Contaminant Source ID	CS ID Tag	Zone	Risk Ranking for Analysis	Overall Rank After Analysis	Location	Map	Comments
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-1	A	High	1	North of Well	3	
Laundromats without dry cleaning	C22	C22-1	A	Low		AK R&R Laundromat	3	
RV dump stations	D18	D18-1	A	Low		North of AK R&R Well	3	
Campgrounds and RV Parks	X35	X35-1	A	Low		AK R&R Laundry and RV Park	3	
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Very Low		Parks Hwy	2	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-2	B	High	2	Parcel North of AK R&R	3	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-3	B	High	3	Across Parks Hwy	3	
Residential Areas	R1	R1-1	B	Low		Corner of Meadow Lakes Loop and Parks Hwy	2	4 Acres
Septic systems (serves one single-family home)	R2	R2-1	B	Very Low		Northeast of AK R&R	2	
Septic systems (serves one single-family home)	R2	R2-2	B	Very Low		Northeast of AK R&R	3	
Highways and roads, dirt/gravel	X24	X24-1	B	Very Low		Meadow Lakes Loop	2	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-4	C	High	4	Next to B+J Rainbow Center	3	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-5	C	High	5	Southeast of Tesoro-Parks	4	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-6	C	High		East of Tesoro-Parks	4	

Contaminant Source Category	Contaminant Source ID	CS ID Tag	Zone	Risk Ranking for Analysis	Overall Rank After Analysis	Location	Map	Comments
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-7	C	High		Across Parks Hwy from Tesoro-Parks	4	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	C	Low		East of Anna Marie Dr	4	
Residential Areas	R1	R1-2	C	Low		North and South of Parks Hwy	2	23 Acres
Septic systems (serves one single-family home)	R2	R2-3-->10	C	Very Low		8 Septics within Zone C	3	
Highways and roads, paved (cement or asphalt)	X20	X20-2	C	Very Low		Sylvan Rd	2	
Highways and roads, paved (cement or asphalt)	X20	X20-3	C	Very Low		Pittman Rd	2	
Highways and roads, dirt/gravel	X24	X24-2	C	Very Low		Blondell Rd	2	
Highways and roads, dirt/gravel	X24	X24-3	C	Very Low		Anna Marie Dr	2	
Highways and roads, dirt/gravel	X24	X24-4	C	Very Low		Trevett Ave	2	
Highways and roads, dirt/gravel	X24	X24-5	C	Very Low		Golden Dr	2	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-8	D	High		Northeas across Parks Hwy from Tesoro-Parks	4	
Boat engine/body repair shops	C4	C4-1	D	Medium		Across Parks Hwy from Tesoro	4	

Chart 2. Susceptibility of the Aquifer – Alaska R&R Laundry and RV Park







1. Protectiveness of the Vadose Zone

- net recharge (function of precipitation, slope of land surface, & permeability of soils)
  [0 – 10 pts; 50% weight]
- depth to water table (unconfined aquifer) or top of confining layer (confined aquifer)
  [interpolate linearly: 100' – 20', 0 – 5 pts; 20' – 0', 5 – 10 pts; 50% weight]

Precipitation=20"/Yr.= 4 pts.
Soil = Silt/Loam = 4 pts.
Slope = 0-5% = 10 pts.
18 pts./3 = 6 pts.
6 pts. X 50% = **3 pts.**

Depth to water table = 15 feet
Interpolate linearly = 6 pts.
6 pts. X 50% = **3 pts.**

Total = 6 of 10 Points

2. Degree of Confinement

- confined verses unconfined aquifer
  [confined: K ≤ 10^{-6} cm/s, minimum thickness of at least one layer = 20 ft, interpolate linearly 100' – 20', 0 – 10 pts; unconfined = 10 - 15 pts; 65% weight]
- density of boreholes and wells penetrating the confining layer (confined aquifer) or the water table (unconfined aquifer)
  [confined: 0 – 15 pts; unconfined = 10-15 pts; 35% weight]

Unconfined Aquifer

Well depth 115 feet = 10 pts.
Few wells/boreholes in proximity = 10 pts.

10(65%) + 10(35%) =**10 pts.**

Total = 10 of 15 Points

Aquifer Susceptibility Ratings

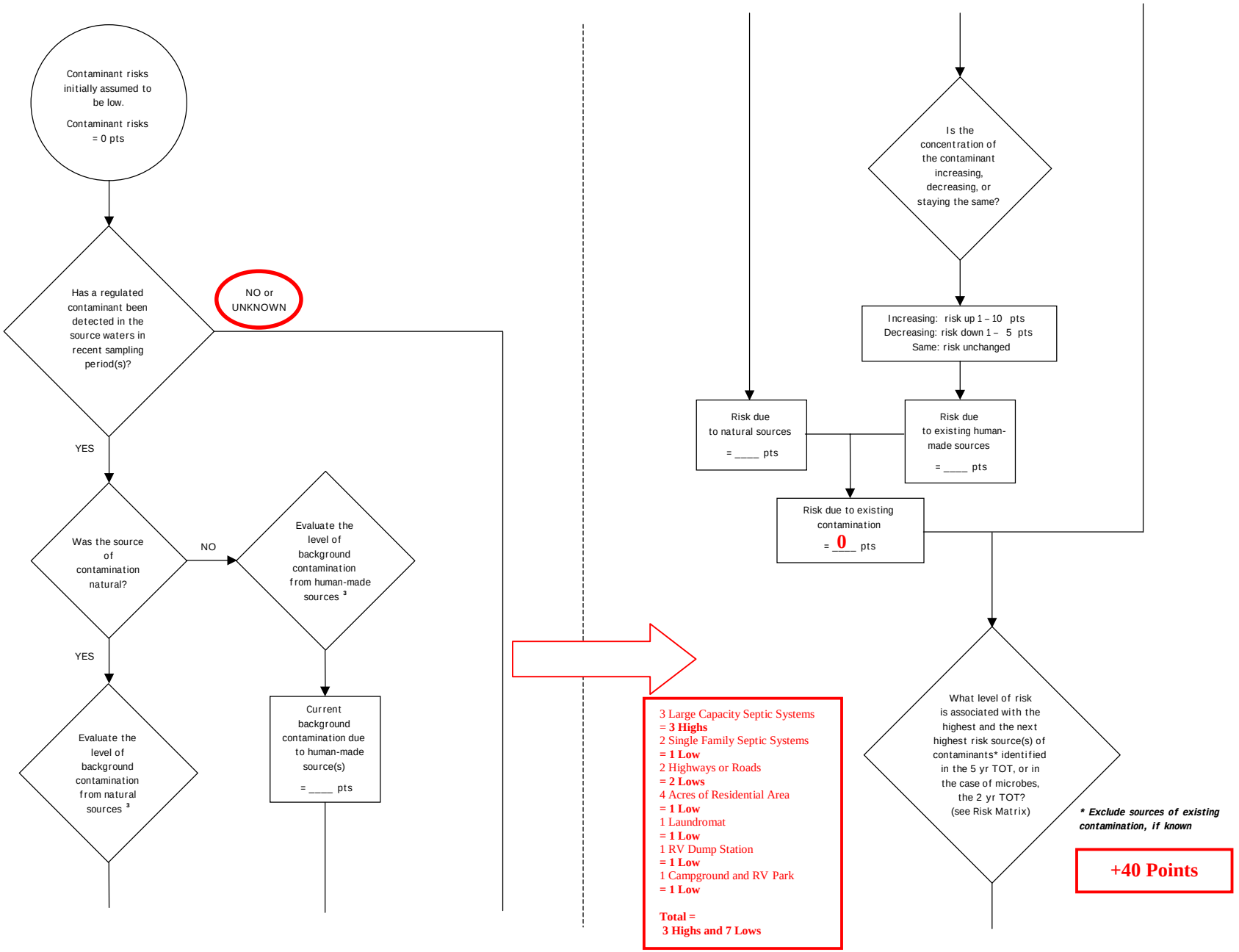
20 to 25 pts	very high
15 to < 20 pts	high
10 to < 15 pts	medium
< 10	low

High

Contaminant Source Category	*Contaminant Source ID*	*CS ID Tag*	*Zone*	*Risk Ranking for Analysis*	*Overall Rank After Analysis*	*Location*	*Map*	*Comments*
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-1*	*A*	*High*	*1*	*North of Well*	*3*	
Laundromats without dry cleaning	*C22*	*C22-1*	*A*	*Low*		*AK R&R Laundromat*	*3*	
RV dump stations	*D18*	*D18-1*	*A*	*Low*		*North of AK R&R Well*	*3*	
Campgrounds and RV Parks	*X35*	*X35-1*	*A*	*Low*		*AK R&R Laundry and RV Park*	*3*	
Highways and roads, paved (cement or asphalt)	*X20*	*X20-1*	*A*	*Very Low*		*Parks Hwy*	*2*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-2*	*B*	*High*	*2*	*Parcel North of AK R&R*	*3*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-3*	*B*	*High*	*3*	*Across Parks Hwy*	*3*	
Residential Areas	*R1*	*R1-1*	*B*	*Low*		*Corner of Meadow Lakes Loop and Parks Hwy*	*2*	*4 Acres*
Septic systems (serves one single-family home)	*R2*	*R2-1*	*B*	*Very Low*		*Northeast of AK R&R*	*2*	
Septic systems (serves one single-family home)	*R2*	*R2-2*	*B*	*Very Low*		*Northeast of AK R&R*	*3*	
Highways and roads, dirt/gravel	*X24*	*X24-1*	*B*	*Very Low*		*Meadow Lakes Loop*	*2*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-4*	*C*	*High*	*4*	*Next to B+J Rainbow Center*	*3*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-5*	*C*	*High*	*5*	*Southeast of Tesoro-Parks*	*4*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-6*	*C*	*High*		*East of Tesoro-Parks*	*4*	

Contaminant Source Category	*Contaminant Source ID*	*CS ID Tag*	*Zone*	*Risk Ranking for Analysis*	*Overall Rank After Analysis*	*Location*	*Map*	*Comments*
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-7*	*C*	*High*		*Across Parks Hwy from Tesoro-Parks*	*4*	
Hardware stores	*C17*	*C17-1*	*C*	*Low*		*Mile 49 Parks Hwy*	*4*	
Logging (active or inactive?)	*E2*	*E2-1*	*C*	*Low*		*East of Tesoro*	*4*	
Residential Areas	*R1*	*R1-2*	*C*	*Low*		*North and South of Parks Hwy*	*2*	*23 Acres*
Septic systems (serves one single-family home)	*R2*	*R2-3--10*	*C*	*Very Low*		*8 Septics within Zone C*	*3*	
Highways and roads, paved (cement or asphalt)	*X20*	*X20-2*	*C*	*Very Low*		*Sylvan Rd*	*2*	
Highways and roads, paved (cement or asphalt)	*X20*	*X20-3*	*C*	*Very Low*		*Pittman Rd*	*2*	
Highways and roads, dirt/gravel	*X24*	*X24-2*	*C*	*Very Low*		*Blondell Rd*	*2*	
Highways and roads, dirt/gravel	*X24*	*X24-3*	*C*	*Very Low*		*Anna Marie Dr*	*2*	
Highways and roads, dirt/gravel	*X24*	*X24-4*	*C*	*Very Low*		*Trevett Ave*	*2*	
Highways and roads, dirt/gravel	*X24*	*X24-5*	*C*	*Very Low*		*Golden Dr*	*2*	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-8*	*D*	*High*		*Northeas across Parks Hwy from Tesoro-Parks*	*4*	

Chart 3. Contaminant risks for Alaska R&R Laundry and RV Park – Bacteria & Viruses



Contaminant Source Category	Contaminant Source ID	CS ID Tag	Zone	Risk Ranking for Analysis	Overall Rank After Analysis	Location	Map	Comments
Laundromats without dry cleaning	C22	C22-1	A	Low		AK R&R Laundromat	3	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-1	A	Low		North of Well	3	
RV dump stations	D18	D18-1	A	Low		North of AK R&R Well	3	
Campgrounds and RV Parks	X35	X35-1	A	Low		AK R&R Laundry and RV Park	3	
Tanks, fuel, residential (above ground)	R7	R7-1	A	Medium		Northwest of AK R&R Well	3	
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Very Low		Parks Hwy	2	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-2	B	Low		Parcel North of AK R&R	3	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-3	B	Low		Across Parks Hwy	3	
Residential Areas	R1	R1-1	B	Low		Corner of Meadow Lakes Loop and Parks Hwy	2	4 Acres
Septic systems (serves one single-family home)	R2	R2-1	B	Very Low		Northeast of AK R&R	2	
Septic systems (serves one single-family home)	R2	R2-2	B	Very Low		Northeast of AK R&R	3	
Highways and roads, dirt/gravel	X24	X24-1	B	Very Low		Meadow Lakes Loop	2	
Gasoline stations (without repair shop)	C15	C15-2	C	High	1	Corner of Sylvan and Parks Hwy	4	
Injection wells (Class V) Motor Vehicle Waste Disposal Well	D42	D42-1	C	High	2	East of Anna Marie Dr	4	
Tanks, gasoline (underground)	T12	T12-1	C	High	3	Corner of Parks Hwy and Sylvan Rd	4	
Tanks, gasoline (underground)	T12	T12-2	C	High	4	Corner of Parks Hwy and Sylvan Rd	4	

Contaminant Source Category	Contaminant Source ID	CS ID Tag	Zone	Risk Ranking for Analysis	Overall Rank After Analysis	Location	Map	Comments
Tanks, gasoline (underground)	T12	T12-3	C	High	5	Corner of Sylvan and Parks Hwy	4	
Tanks, gasoline (underground)	T12	T12-4	C	High		Corner of Sylvan and Parks Hwy	4	
Tanks, gasoline (underground)	T12	T12-5	C	High		Corner of Sylvan and Parks Hwy	4	
Hardware stores	C17	C17-1	C	Low		Mile 49 Parks Hwy	4	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-4	C	Low		Next to B+J Rainbow Center	3	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-5	C	Low		Southeast of Tesoro-Parks	4	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-6	C	Low		East of Tesoro-Parks	4	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-7	C	Low		Across Parks Hwy from Tesoro-Parks	4	
Logging (active or inactive?)	E2	E2-1	C	Low		East of Tesoro	4	
Residential Areas	R1	R1-2	C	Low		North and South of Parks Hwy	2	23 Acres
Tanks, heating oil, nonresidential (aboveground)	T14	T14-1	C	Low		Across Parks Hwy from Tesoro	4	
Tanks, heating oil, nonresidential (aboveground)	T14	T14-2	C	Low		Across Parks Hwy from Tesoro	4	
Rail corridors	X30	X30-1	C	Low		Generally runs east-west	3	
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U4	U4-1	C	High		Tesoro-Parks	4	Waste Oil is a known contaminant
Contaminated sites, DEC recognized, non-Superfund, non-RCRA	U4	U4-2	C	Very High		Tesoro-Parks	4	
Tanks, heating oil, residential (above ground)	R8	R8-1	C	Medium		South of Tesoro	4	

Contaminant Source Category	*Contaminant Source ID*	*CS ID Tag*	*Zone*	*Risk Ranking for Analysis*	*Overall Rank After Analysis*	*Location*	*Map*	*Comments*
Septic systems (serves one single-family home)	*R2*	*R2-3-->10*	*C*	*Very Low*		*8 Septics within Zone C*	*3*	
Highways and roads, paved (cement or asphalt)	*X20*	*X20-2*	*C*	*Very Low*		*Sylvan Rd*	*2*	
Highways and roads, paved (cement or asphalt)	*X20*	*X20-3*	*C*	*Very Low*		*Pittman Rd*	*2*	
Highways and roads, dirt/gravel	*X24*	*X24-2*	*C*	*Very Low*		*Blondell Rd*	*2*	
Highways and roads, dirt/gravel	*X24*	*X24-3*	*C*	*Very Low*		*Anna Marie Dr*	*2*	
Highways and roads, dirt/gravel	*X24*	*X24-4*	*C*	*Very Low*		*Trevett Ave*	*2*	
Highways and roads, dirt/gravel	*X24*	*X24-5*	*C*	*Very Low*		*Golden Dr*	*2*	
Gasoline stations (without repair shop)	*C15*	*C15-1*	*C*	*High*		*Corner of Parks Hwy and Meadow Lakes Loop*	*4*	*Under Construction*
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	*D10*	*D10-8*	*D*	*Low*		*Northeas across Parks Hwy from Tesoro-Parks*	*4*	
Motor /motor vehicle repair shops	*C31*	*C31-1*	*D*	*Medium*		*Across Parks Hwy*	*4*	
Boat engine/body repair shops	*C4*	*C4-1*	*D*	*Medium*		*Across Parks Hwy from Tesoro*	*4*	

Chart 3. Contaminant risks for Alaska R&R Laundry and RV Park – Bacteria & Viruses (Continued)

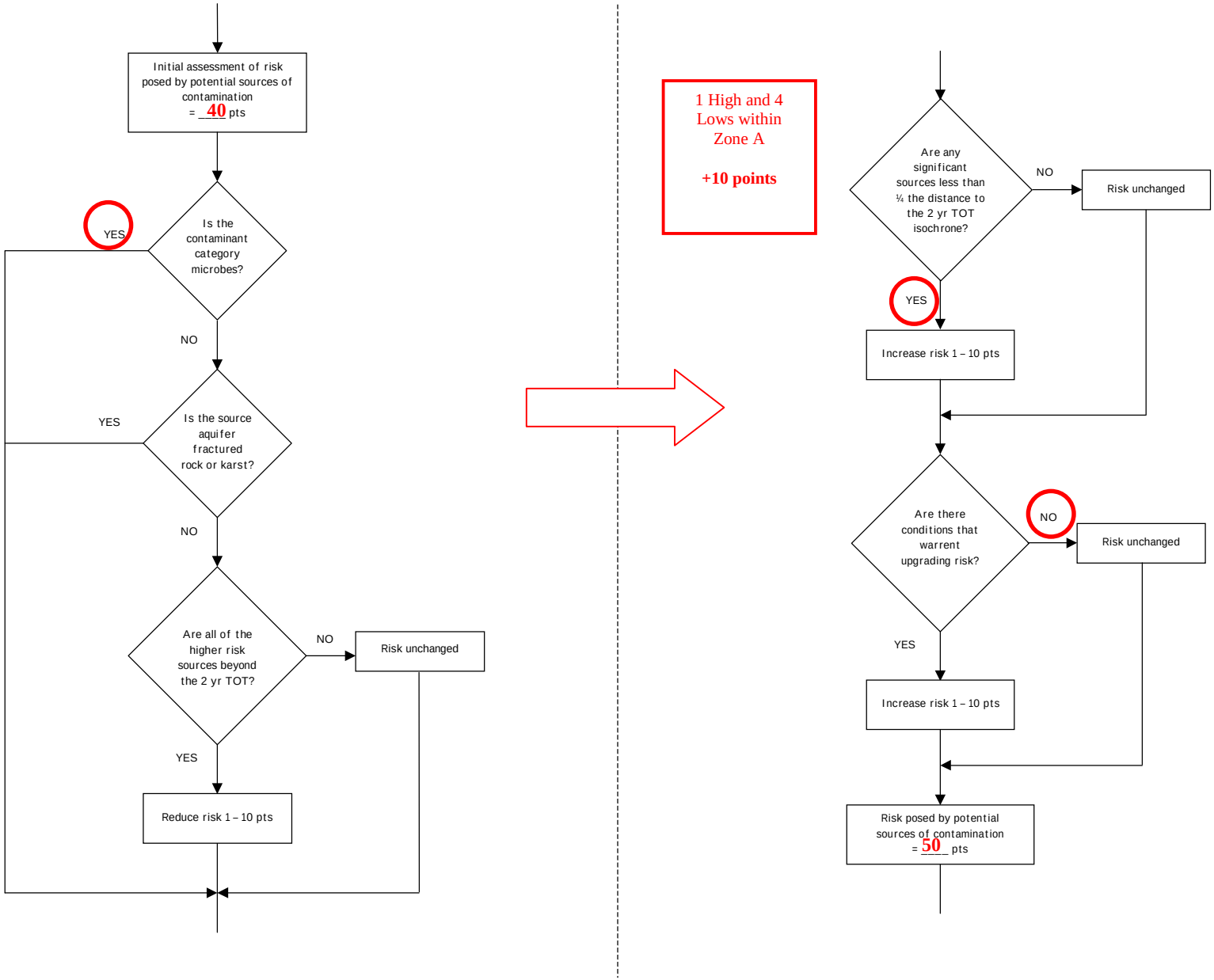
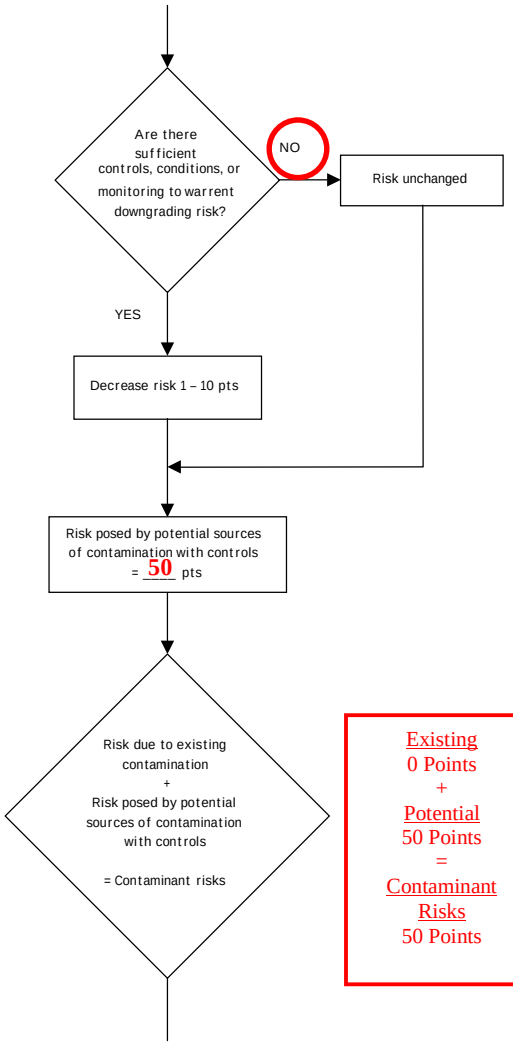


Chart 3. Contaminant risks for Alaska R&R Laundry and RV Park – Bacteria & Viruses (Continued)



Existing
0 Points
+
Potential
50 Points
=
Contaminant Risks
50 Points

* *Truncate risk at 50 pts*

Contaminant risks*
= 50 pts

Very High

3. Level of Background Contamination

> MCL	21 - 50 pts
0.5 MCL to < MCL	11 - 20 pts
0.2 MCL to < 0.5 MCL	6 - 10 pts
'detect' to < 0.2 MCL	0 - 5 pts

Contaminant Risk Ratings

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

Sample Date	Result
6/27/01	Not Detected (ND)
3/21/01	ND
12/19/00	ND
8/02/00	ND
3/21/00	ND

Table 1. Risk Matrix for Contaminant Sources for Alaska R&R Laundry and RV Park– Bacteria & Viruses

Level of Risk Associated with the Highest Risk Sources

Next Highest Risk Source(s)

3 Highs and 7 Lows	**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

Chart 4. Vulnerability analysis for Alaska R&R Laundry and RV Park – Bacteria & Viruses

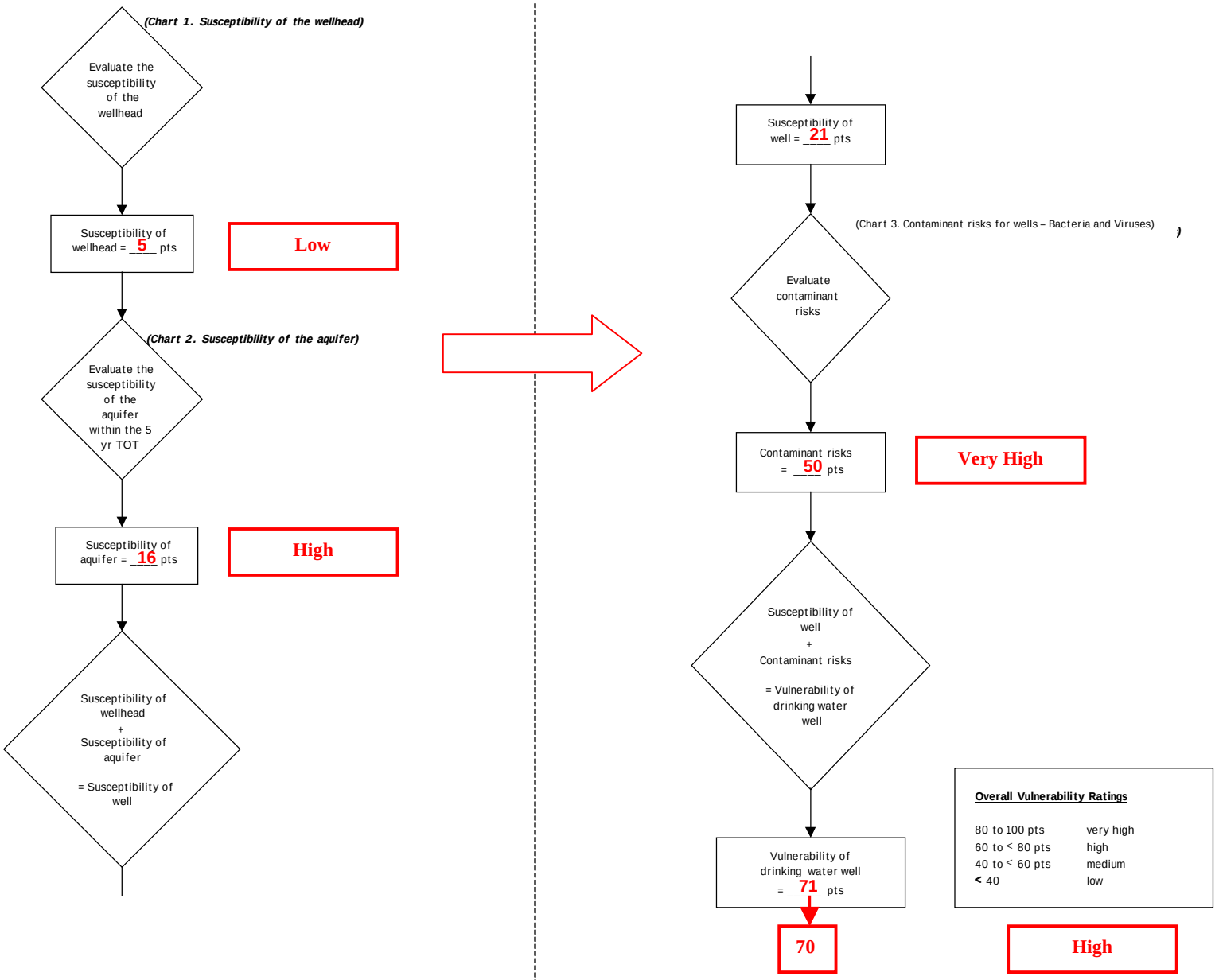


Chart 5. Contaminant Risks for Alaska R&R Laundry and RV Park – Nitrates and Nitrites

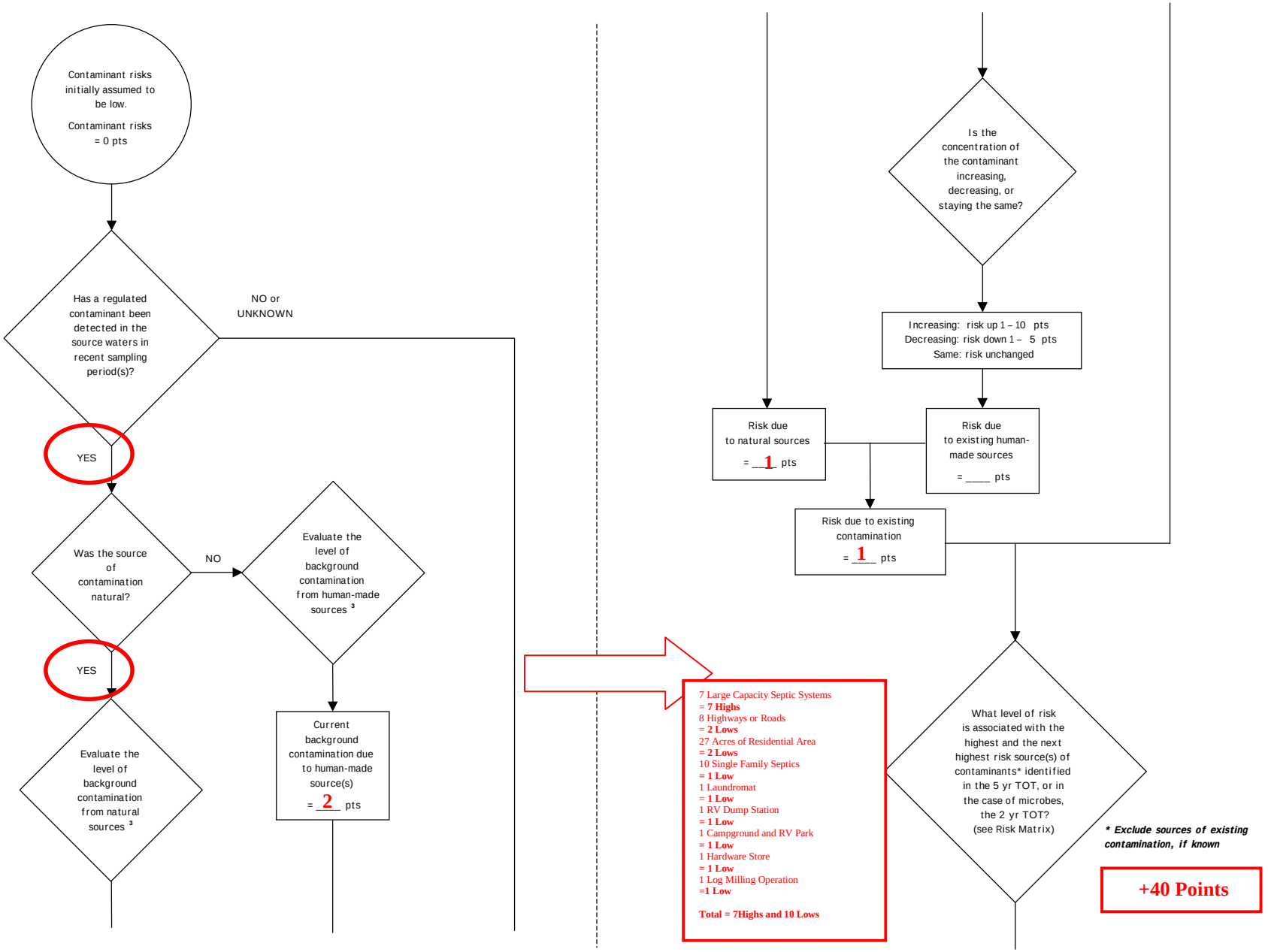


Chart 5. Contaminant risks for Alaska R&R Laundry and RV Park– Nitrates and Nitrites (Continued)

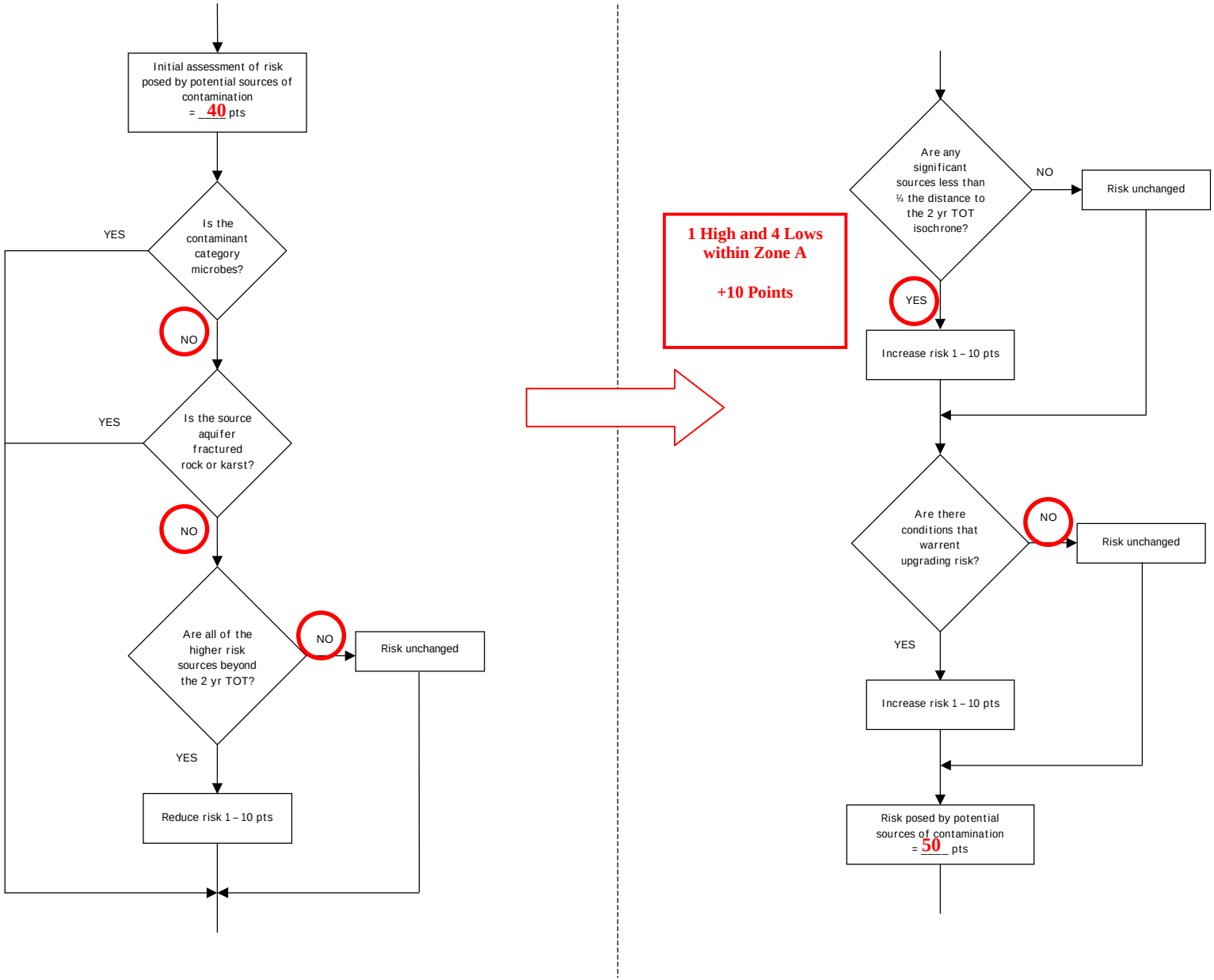
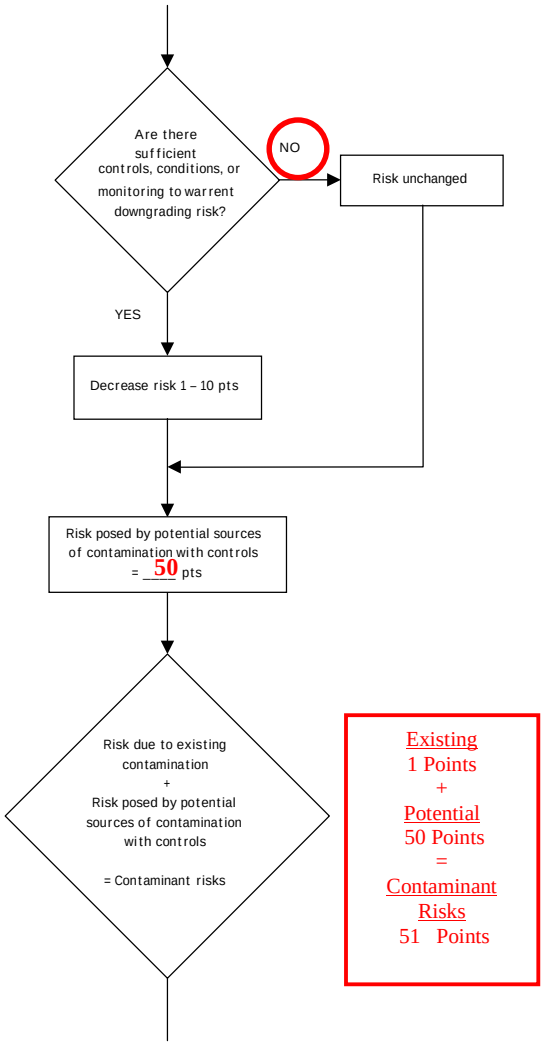


Chart 5. Contaminant risks for Alaska R&R Laundry and RV Park– Nitrates and Nitrites (Continued)



Existing
1 Points
+
Potential
50 Points
=
Contaminant Risks
51 Points

* Truncate risk at 50 pts

Contaminant risks*
= 50 pts

Very High

3. Level of Background Contamination

> MCL	21 - 50 pts
0.5 MCL to < MCL	11 - 20 pts
0.2 MCL to < 0.5 MCL	6 - 10 pts
'detect' to < 0.2 MCL	0 - 5 pts

Contaminant Risk Ratings

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

Sample Date	Result
12/19/00	Non Detect (ND)
9/29/99	ND
9/28/98	ND
8/12/97	ND
6/17/96	0.34 mg/L

Maximum Contaminant Level (MCL)= 10mg/L
(0.34 mg/L)/(10 mg/L) = 0.034 of MCL

Interpolated Linearly = **1 Point**

Table 2. Risk Matrix for Contaminant Sources for Alaska R&R Laundry and RV Park– Nitrates and Nitrites

Level of Risk Associated with the Highest Risk Sources

7 Highs and 10 Lows	**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

Chart 6. Vulnerability analysis for Alaska R&R Laundry and RV Park – Nitrates and Nitrites

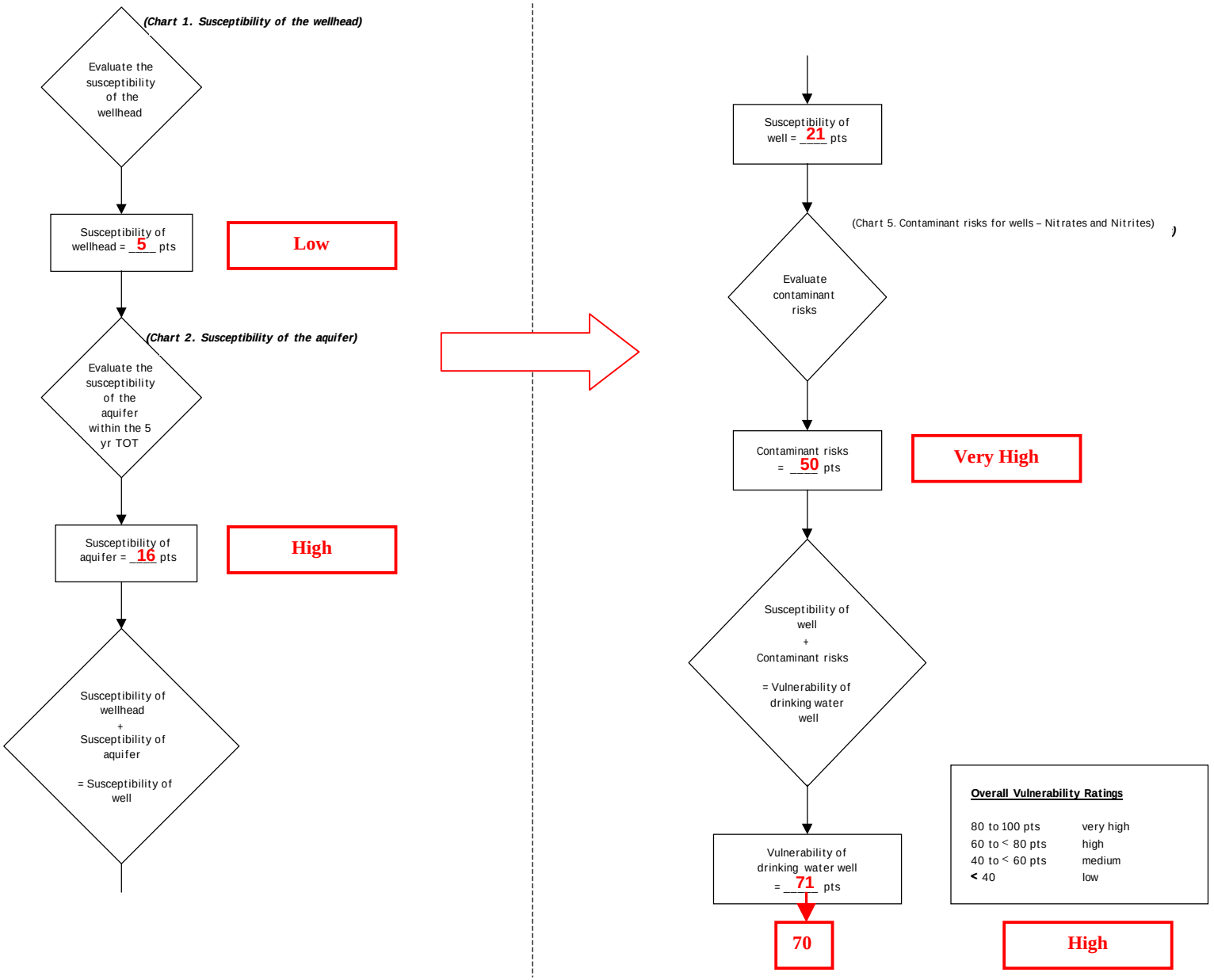


Chart 7. Contaminant Risks for Alaska R&R Laundry and RV Park – Volatile Organic Chemicals

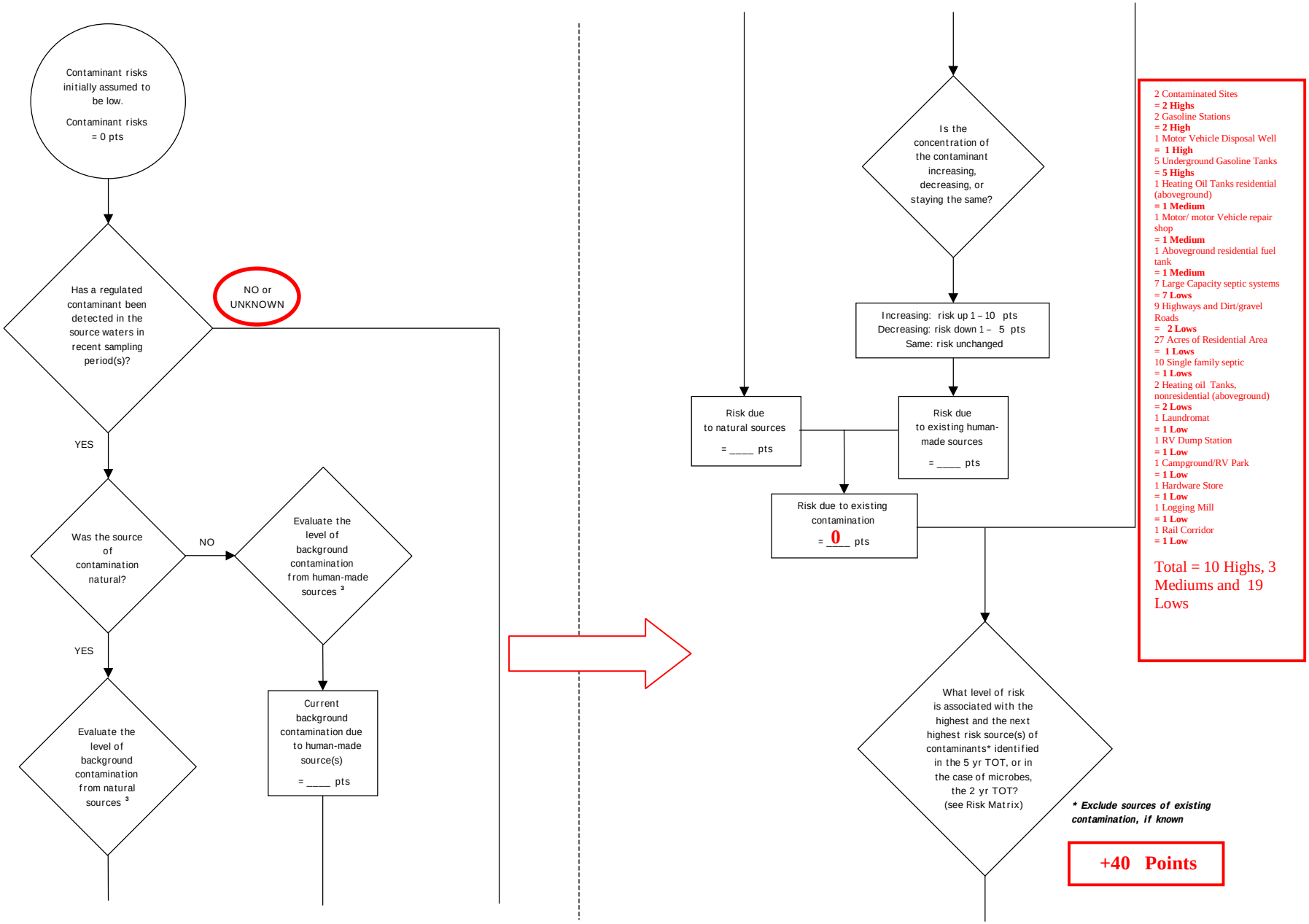


Chart 7. Contaminant Risks for Alaska R&R Laundry and RV Park – Volatile Organic Chemicals (Continued)

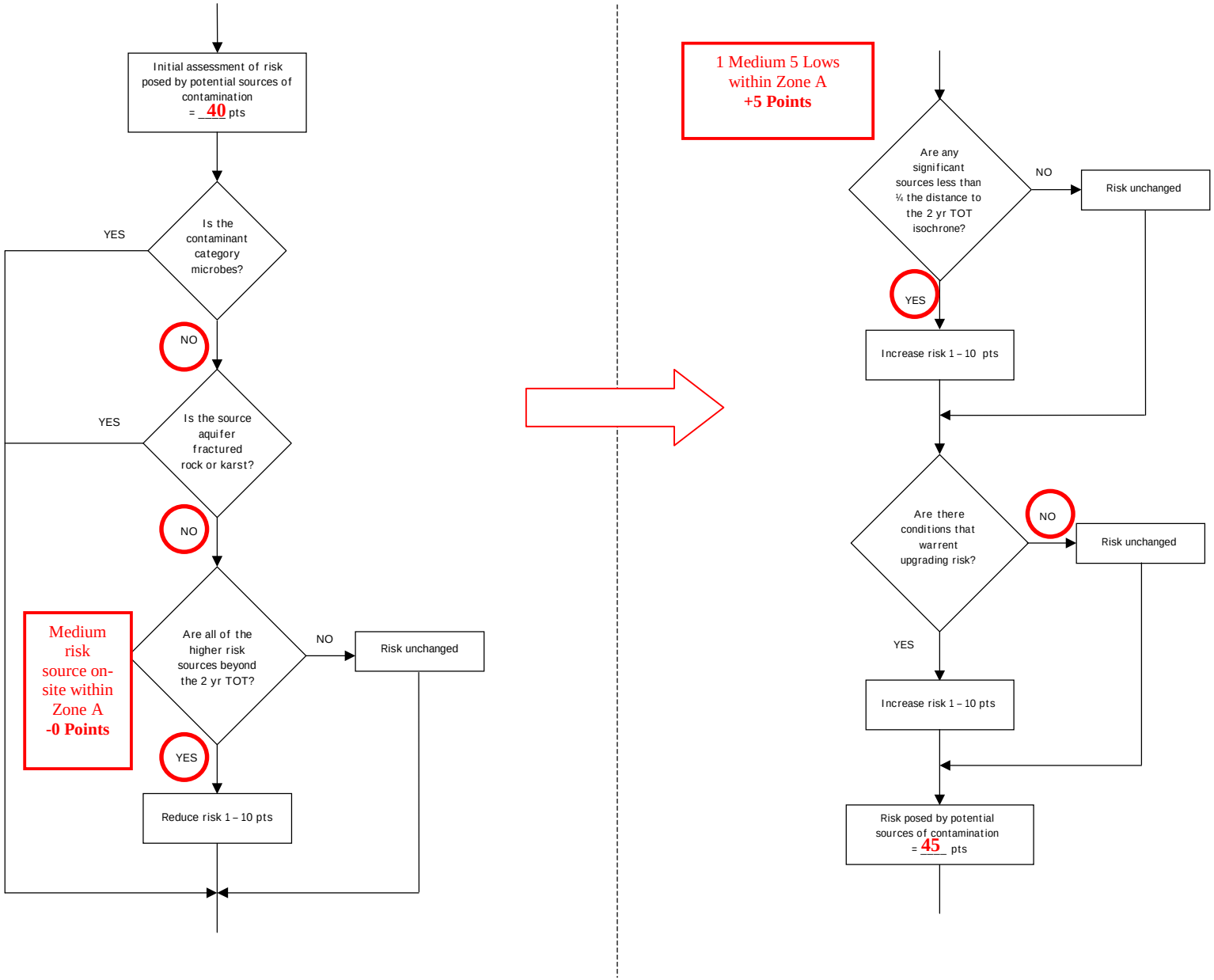
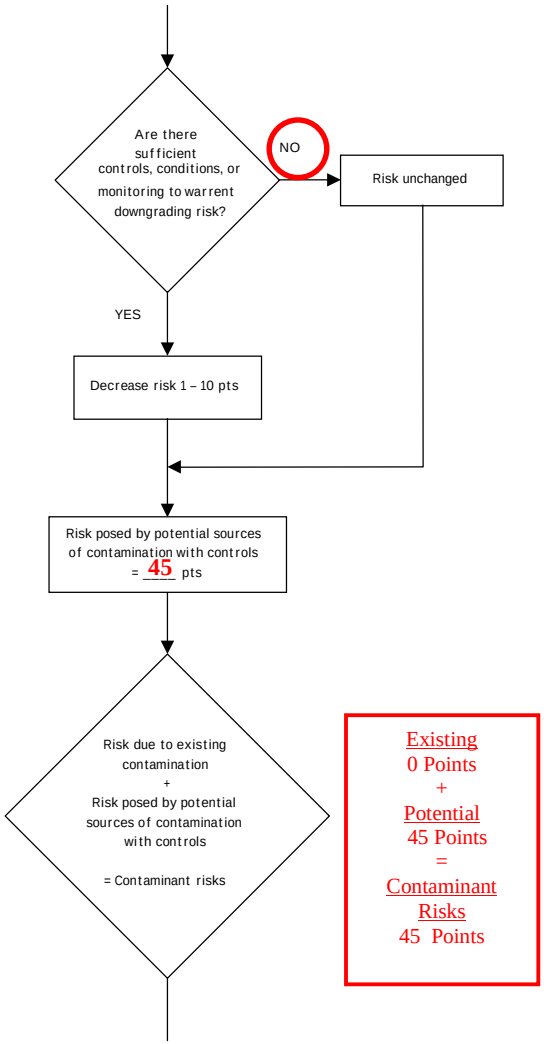


Chart 7. Contaminant Risks for Alaska R&R Laundry and RV Park– Volatile Organic Chemicals (Continued)



Existing
0 Points
+
Potential
45 Points
=
Contaminant Risks
45 Points

Contaminant risks*
= 45 pts

** Truncate risk at 50 pts*

Very High

3. Level of Background Contamination

> MCL	21 - 50 pts
0.5 MCL to < MCL	11 - 20 pts
0.2 MCL to < 0.5 MCL	6 - 10 pts
'detect' to < 0.2 MCL	0 - 5 pts

Contaminant Risk Ratings

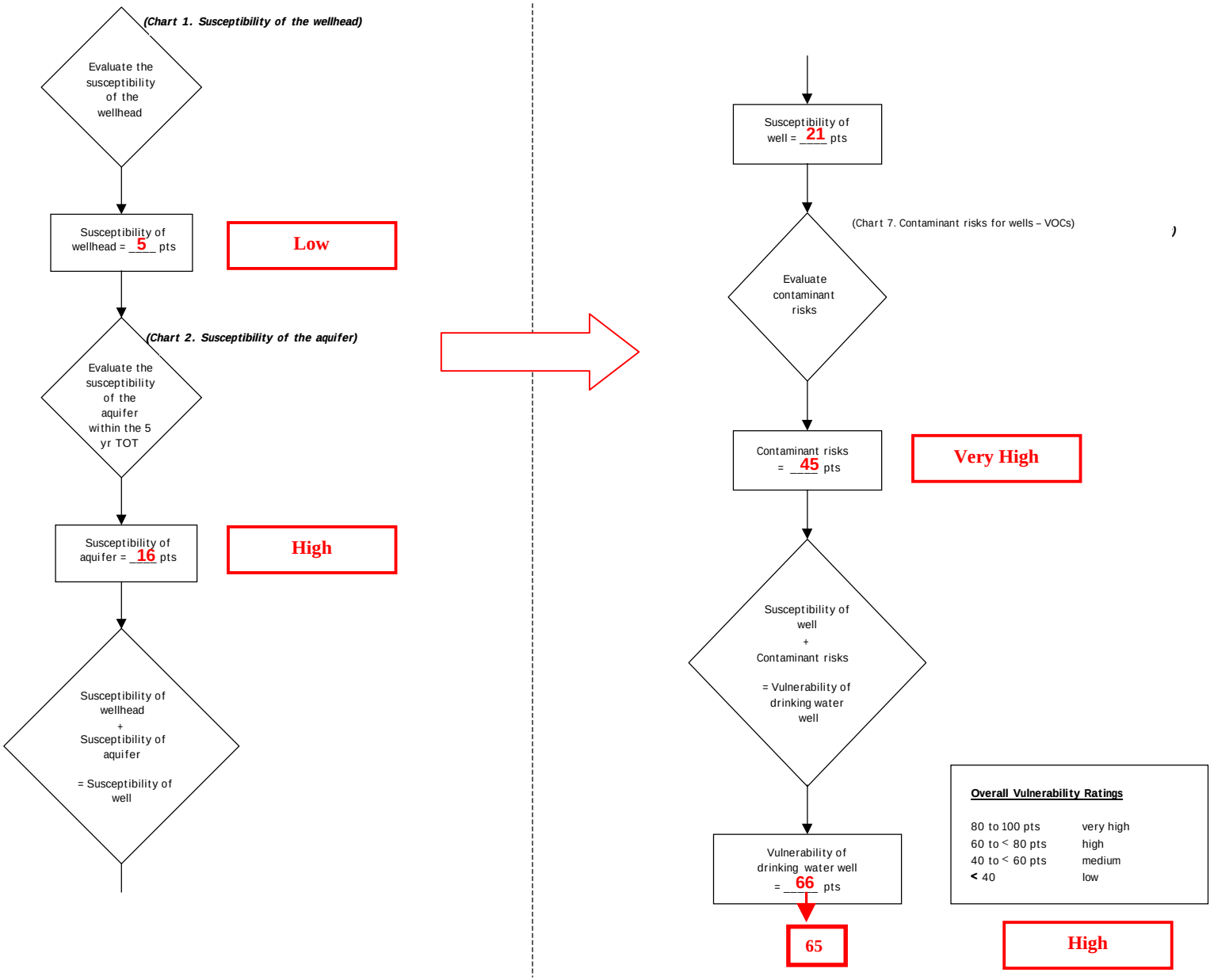
40 to 50 pts	very high
30 to < 40 pts	high
20 to < 30 pts	medium
< 20	low

Table 1. Risk Matrix for Contaminant Sources for Alaska R&R Laundry and RV Park – Volatile Organic Chemicals

Level of Risk Associated with the Highest Risk Sources

10 Highs, 3 Mediums and 19 Lows	**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

Chart 8. Vulnerability Analysis for Alaska R&R Laundry and RV Park – Volatile Organic Chemicals



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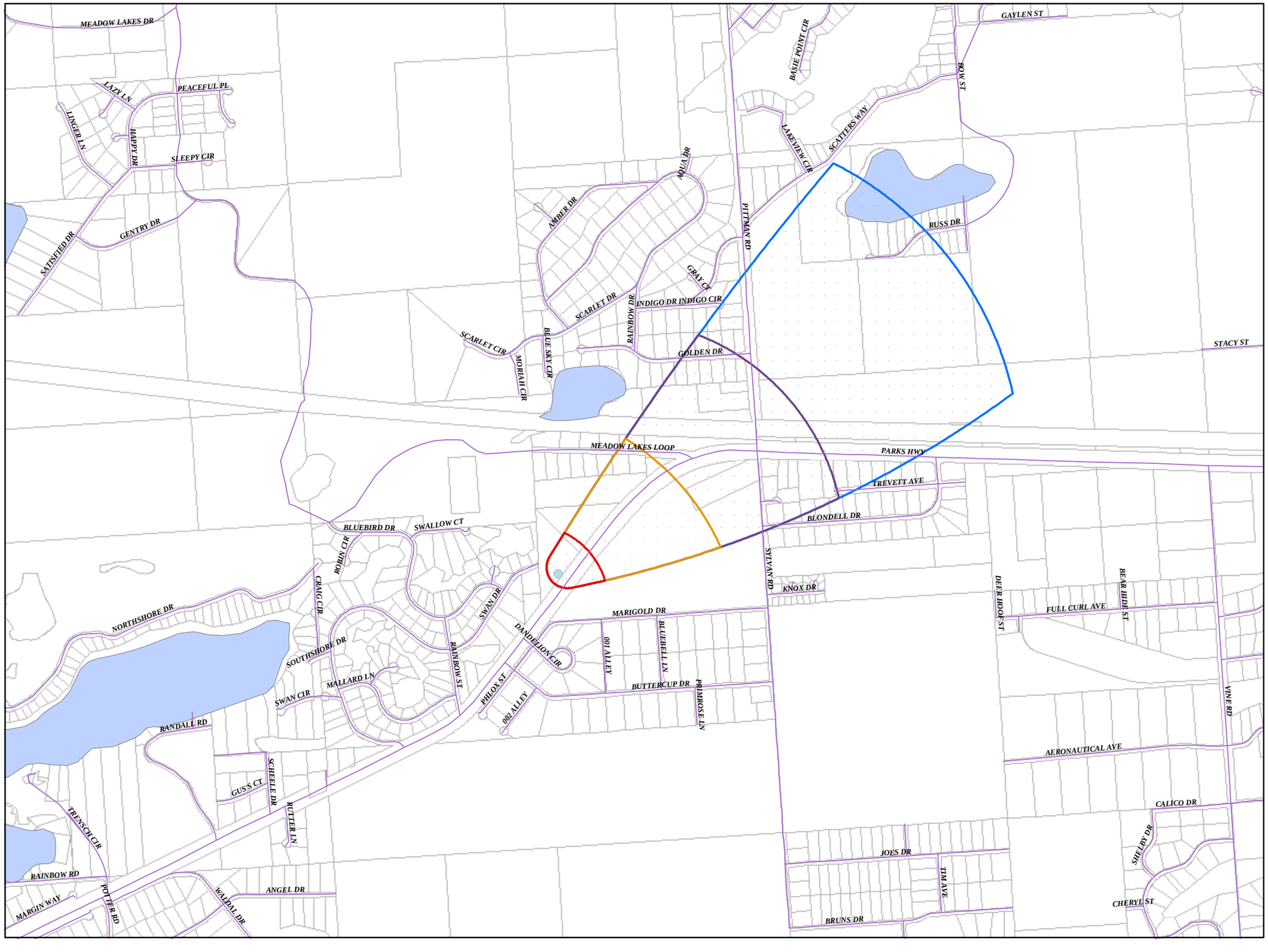
Drinking Water Protection Areas for Alaska R&R Laundry & RV Park



1,500 0 1,500 Feet

Alaska R&R Laundry and RV Park Well
MSB roads
Lakes
MSB parcel core
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

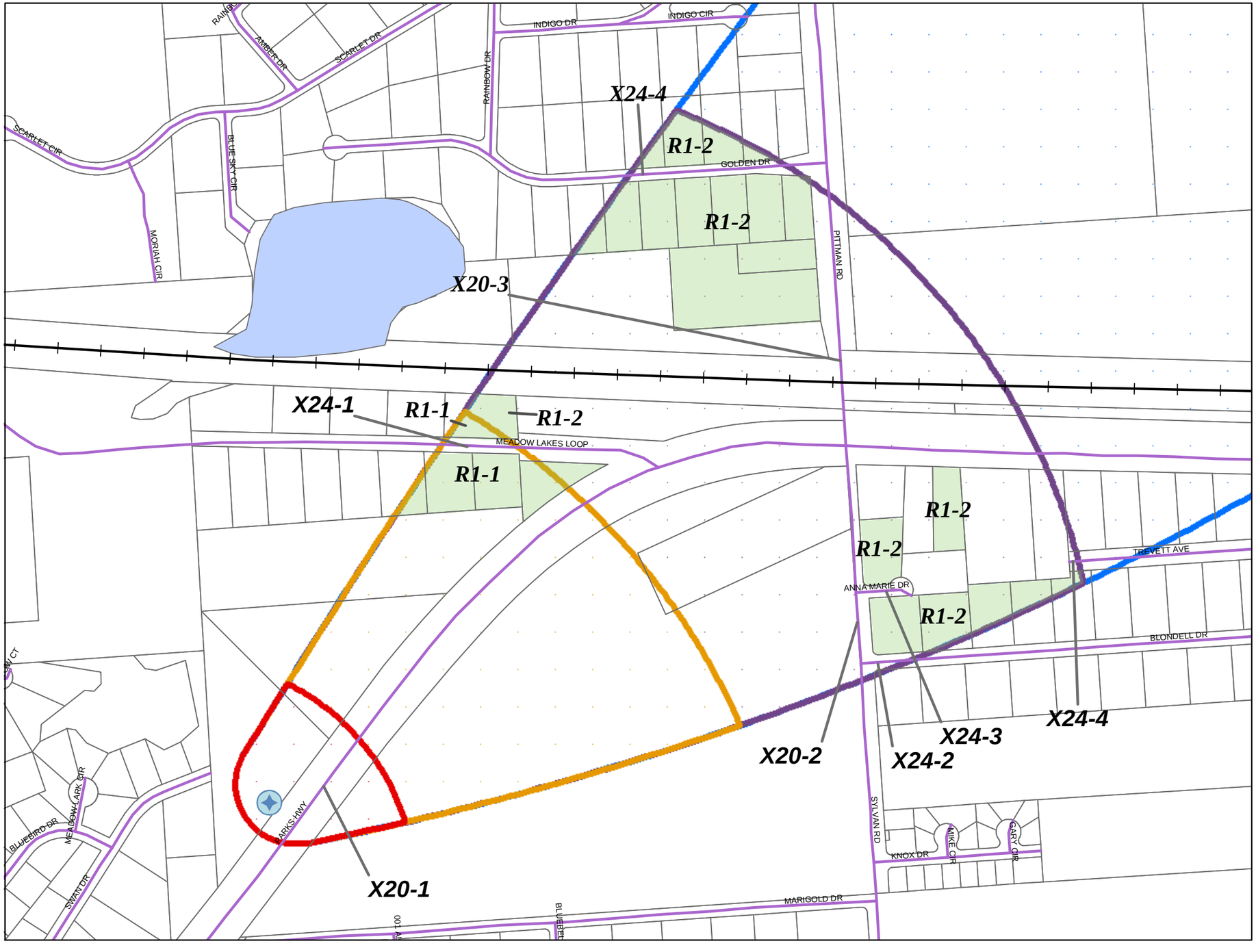
Location of Map

N
W E
S

PWSID 224395.001

Map 1

Drinking Water Protection Areas for Alaska R&R Laundry & RV Park and Potential and Existing Sources of Contamination



- Alaska R&R Laundry and RV Park Well
- Railroad
- MSB roads
- MSB parcel core
- Residential Area
- Lakes

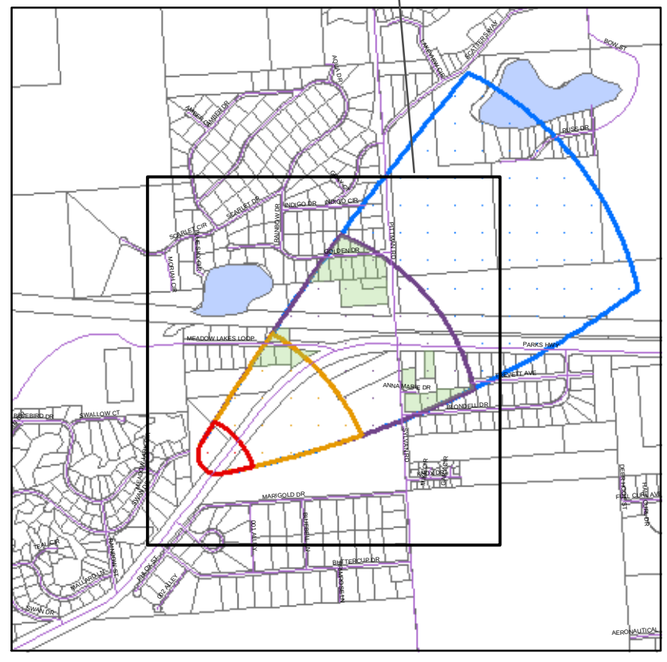
Zone A Protection Area
Several Months Travel Time

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

Location of Map



270 0 270 Feet

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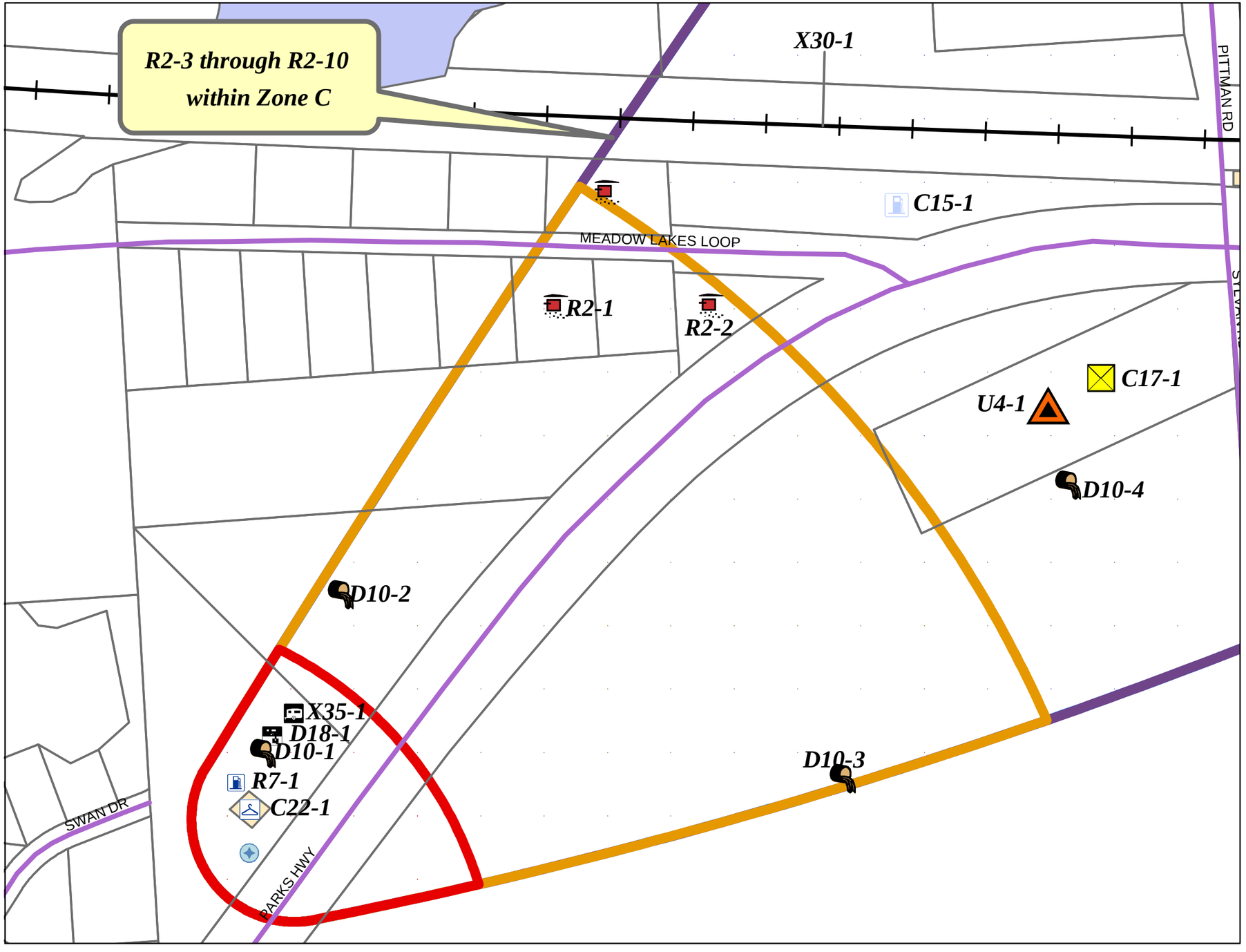
Map 2

Drinking Water Protection Areas for Alaska R&R Laundry & RV Park and Potential and Existing Sources of Contamination



- Alaska R&R Laundry and RV Park Well
- Hardware Store (C17)
- Laundromat (C22)
- RV Dump Station (D18)
- Aboveground Fuel Tank w/dispenser (R7)
- Contaminated Site (U4)
- Campground And RV Park (X35)
- Gasoline Station (under const.) (C15)
- Large Capacity Septic System (D10)
- Single Family Septic System (R2)
- Railroad
- MSB roads
- MSB parcel core
- Buildings
- Lakes

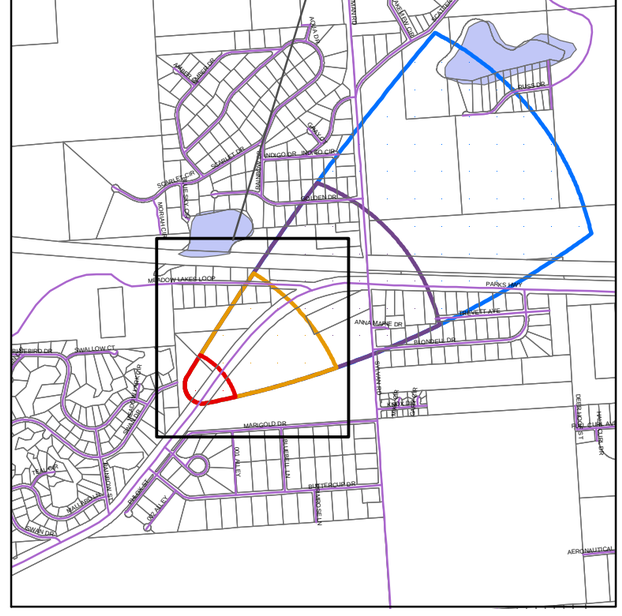
Zone A Protection Area
Several Months Travel Time

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

Location of Map



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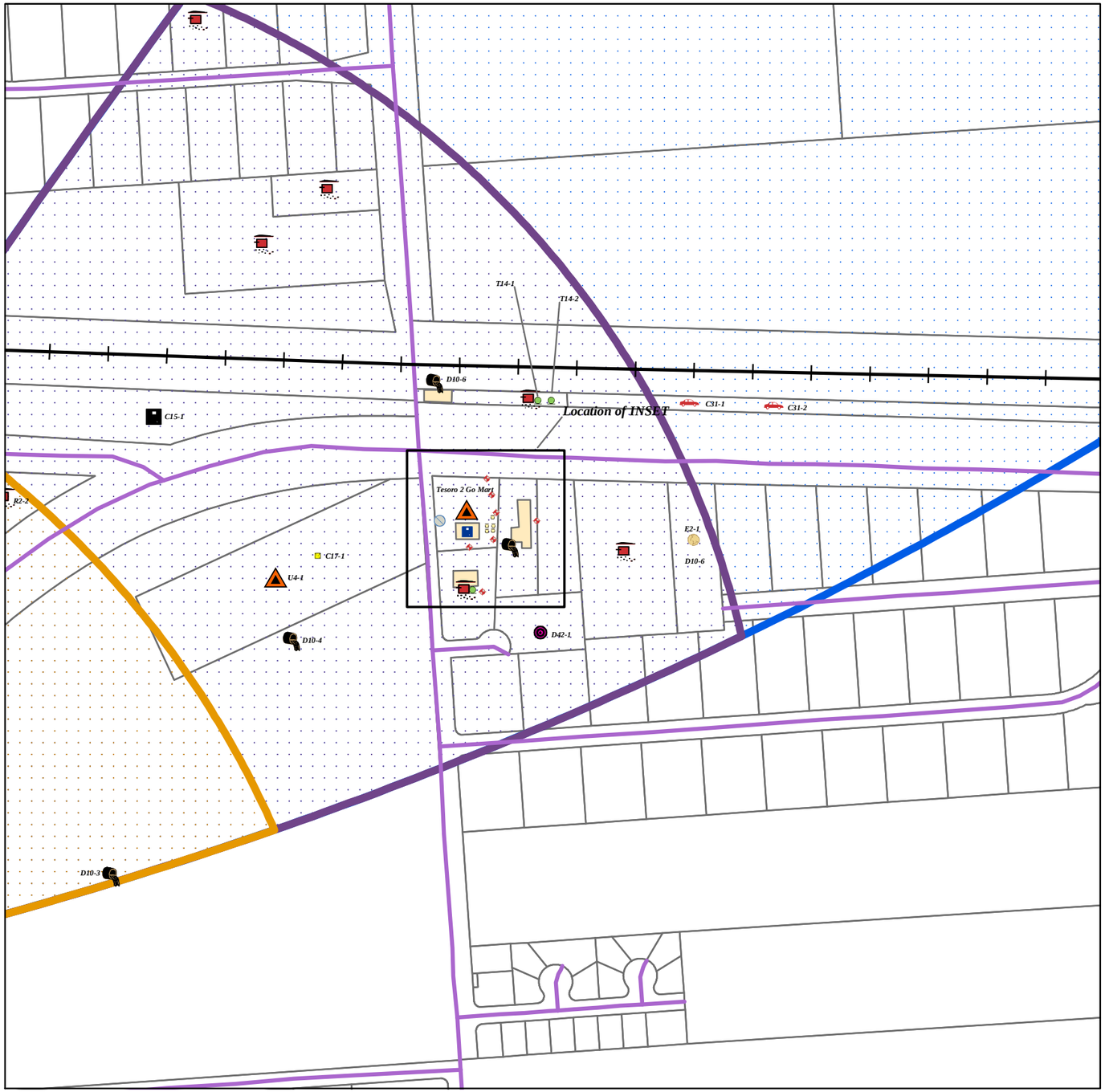
Map 3

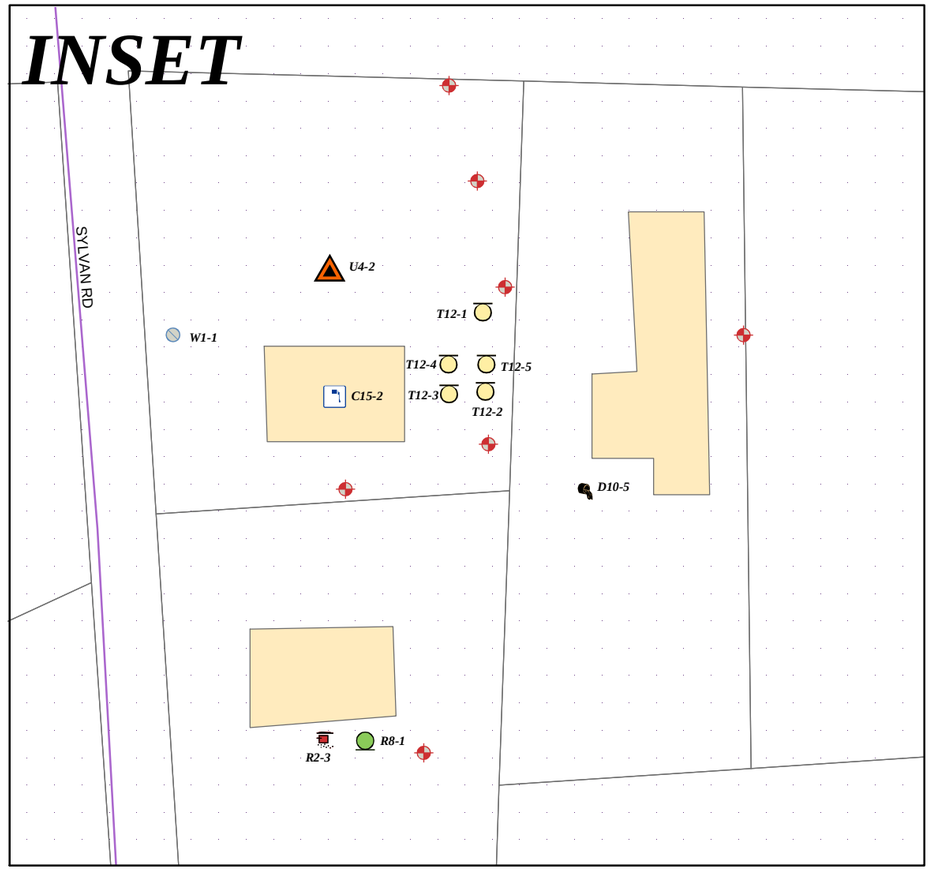
Drinking Water Protection Areas for Alaska R&R Laundry & RV Park and Potential and Existing Sources of Contamination



330 0 330 Feet

Alaska R&R Laundry and RV Park Well
Large Capacity Septic System (D10)
Motor Vehicle Waste Disposal System (D42)
Single Family Septic System (R2)
Railroad
MSB roads
Buildings
Lakes
MSB parcel core
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

Gasoline Station (C15)
Hardware Store (C17)
Laundromat (C22)
Motor/ Motor Vehicle Repair Shops (C31)
RV Dump Station (D18)
Logging Activites (E2)
Gasoline Station (under constr.) (C15)
Residential Heating Oil AST (R8)
Underground Gasoline Storage Tank (T12)
Nonresidential Heating Oil AST (T14)
ADEC Recognized "Contaminated Site" (U4)
Abandoned Well (W1)
Monitoring Wells (W6)
Campground And RV Park (X35)



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Map 4