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# Source Water Assessment

A Hydrogeologic Susceptibility and  
Vulnerability Assessment for  
Caribou Cafe & Motel,  
Glennallen, Alaska  
PWSID #291300

DRINKING WATER PROTECTION PROGRAM REPORT NO. 868

Alaska Department of Environmental Conservation

# Source Water Assessment for Caribou Cafe & Motel, Glennallen, Alaska PWSID #291300

DRINKING WATER PROTECTION PROGRAM REPORT NO. 868

The Drinking Water Protection Program (DWPP) 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. It is anticipated this assessment will be updated every five years to reflect any changes in the vulnerability and/or susceptibility of public drinking water source. If you have any additional information that may affect the results of this assessment, please contact the Program Coordinator of DWPP, (907) 269-7521.

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# Source Water Assessment for Caribou Cafe & Motel, Glennallen, Alaska

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## Drinking Water Protection Program Alaska Department of Environmental Conservation

### EXECUTIVE SUMMARY

The public water system for Caribou Cafe & Motel is a Class B (transient/non-community) water system consisting of one well. The Caribou Cafe & Motel is located at Mile 189.6 of the Glenn Highway, north of Glennallen, Alaska. The wellhead received a susceptibility rating of **Low** and the aquifer received a susceptibility rating of **Very High**. Combining these two ratings produces a **High** rating for the natural susceptibility of the well. Identified potential and current sources of contaminants for Caribou Cafe & Motel public drinking water source include large-capacity septic systems; aboveground heating oil tanks; and paved highways and roads. These identified potential and existing sources of contamination are considered sources of bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals. Overall, the public water sources for Caribou Cafe & Motel received a vulnerability rating of **High** for bacteria and viruses and nitrates and nitrites, and **Medium** for volatile organic chemicals.

### CARIBOU CAFE & MOTEL PUBLIC DRINKING WATER SYSTEM

Caribou Cafe & Motel public water system is a Class B (transient/non-community) water system. The system consists of one well at Mile 189.6 of the Glenn Highway, north of Glennallen, Alaska (See Map 1 of Appendix A). Glennallen lies at the western edge of the Wrangell-St. Elias National Park and Preserve and is the gateway to the Wrangell Mountains and the service center for the Copper River basin. The population of Glennallen is approximately 520.

Glennallen averages about 15 inches of precipitation per year, and an annual average of approximately 39 inches of snow. Although the quality of the groundwater can vary significantly in a short distance, groundwater supplies are generally abundant in the area. Static water levels in many of these wells are less than 15 feet below the surface. The coarse, alluvial, sandy gravel in the floodplains of the areas' streams and rivers provides a large aquifer, even in the winter when infiltration is low.

The Glennallen area topography varies from about 3,000 feet at Tahnetta Pass (separating the Matanuska and Copper river drainage basins) to 2,000 feet at Tolsona Creek, due west of Glennallen. Drainages

along the Glenn Highway in this area generally flow south into the Tazlina Lake or river and then on into the Copper River.

According to a Sanitary Survey dated June 25, 1999, the existing well was installed in 1973 with 6-inch diameter casing to a depth of 140 feet below the ground surface. The length of the well screen is assumed to be 10 feet.

The Survey indicates the land surface is sloped away from the well, providing adequate surface water drainage. It is assumed because the well was installed prior to 1992 that it is not grouted according to ADEC standards. Proper grouting provides added protection against contaminants traveling along the well casing and into source waters.

This system operates year round and serves approximately 25 non-residents through one service connection.

### CARIBOU CAFE & MOTEL DRINKING WATER PROTECTION AREA

In order to evaluate whether a drinking water source is at risk, we must first evaluate what are the most likely pathways for surface contamination to reach the groundwater. These areas are determined by looking at the characteristics of the soil, groundwater, aquifer, and well.

The most probable area for contamination to reach the drinking water well is the area that contributes water to the well, the groundwater recharge area. This area is designated as the Drinking Water Protection Area (DWPA). Because releases of contaminants within the DWPA are most likely to impact the drinking water well, this area will serve as the focus for voluntary protection efforts.

An analytical calculation was used to determine the size and shape of the DWPA. The input parameters describing the attributes of the aquifer in this calculation were estimated from information contained in the well logs and/or the Sanitary Survey. Additional methods were also used to take into account any uncertainties in groundwater flow and aquifer characteristics to arrive at a meaningful DWPA (Please refer to the Guidance Manual for Class B Public Water Systems for additional information).

The DWPA's established for wells by the ADEC are usually separated into four zones. These zones correspond to differences in the time-of-travel (TOT) of the water moving through the aquifer to the well.

The TOT for contaminants within the water varies and is dependent on the physical and chemical characteristics of each contaminant. The following is a summary of the four protection area zones for wells and the calculated time-of-travel for each:

**Table 1. Definition of Zones**

<b>Zone</b>	<b>Definition</b>
A	¼ the distance for the 2-yr. time-of-travel
B	Less than the 2 year time-of-travel
C	Less Than the 5 year time-of-travel
D	Less than the 10 year time-of-travel

The DWPA for Caribou Cafe & Motel extends over one mile northwest of the well. Development in the vicinity of the well is limited to only Zone A (See Map 1 of Appendix A).

**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 Caribou Cafe & Motel DWPA. This inventory was completed through a search of agency records and other publicly-available information. Potential sources of contamination to the drinking water aquifer include 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 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

The sources are displayed on Map 2 of Appendix C and summarized in Table 1 of Appendix B.

**RANKING OF CONTAMINANT RISKS**

Once the potential and existing sources of contamination have been identified, they are assigned a ranking 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. Rankings include:

- Low;
- Medium;
- High; and
- Very High.

The TOT for contaminants within the water varies and is dependent on the physical and chemical characteristics of each contaminant. Bacteria and Viruses are only inventoried in Zones A and B because of their short life span. Only “Very High” and “High” rankings are inventoried within the outer Zone D due to the probability of contaminant dilution by the time the contaminants get to the well.

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.

**VULNERABILITY OF CARIBOU CAFE & MOTEL DRINKING WATER SYSTEM**

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

- Natural susceptibility; and
- Contaminant risks.

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 Analyses for nitrates and nitrites and volatile organic chemicals, respectively.

A score for the Natural Susceptibility is reached by considering the properties of the well and the aquifer.

Susceptibility of the Wellhead (0 – 25 Points)  
(Chart 1 of Appendix D)

+

Susceptibility of the Aquifer (0 – 25 Points)  
Chart 2 of Appendix D)

=

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

A ranking is assigned for the Natural Susceptibility according to the point score:

**Natural Susceptibility Ratings**

40 to 50 pts	Very High
30 to < 40 pts	High
20 to < 30 pts	Medium
< 20 pts	Low

We assume the well for the Caribou Cafe & Motel is completed in an unconfined aquifer. Because unconfined aquifers are recharged by surface water and precipitation that migrates downward from the surface, contaminants at the surface have the potential to adversely impact this aquifer. Table 2 shows the Susceptibility scores and ratings for the Caribou Cafe & Motel.

**Table 2. Susceptibility**

	Score	Rating
Susceptibility of the Wellhead	5	Low
Susceptibility of the Aquifer	25	Very High
Natural Susceptibility	30	High

Contaminant risks to a drinking water source depend on the type, number or density, and distribution of contaminant sources. This score has been derived from an examination of existing and historical contamination that has been detected at the drinking water source through routine sampling. It also evaluates potential sources of contamination. Flow charts are used to assign a point score, and ratings are assigned in the same way as for the natural susceptibility:

**Contaminant Risk Ratings**

40 to 50 pts	Very High
30 to < 40 pts	High
20 to < 30 pts	Medium
< 20 pts	Low

Table 3 summarizes the Contaminant Risks for each category of drinking water contaminants.

**Table 3. Contaminant Risks**

Category	Score	Rating
Bacteria and Viruses	40	Very High
Nitrates and/or Nitrites	42	Very High
Volatile Organic Chemicals	12	Low

Finally, an overall vulnerability score is assigned for each water system by combining each of the contaminant risk scores with the natural susceptibility score:

Natural Susceptibility (0 – 50 points)

+

Contaminant Risks (0 – 50 points)

=

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

Again, rankings are assigned according to a point score:

**Overall Vulnerability Ratings**

80 to 100 pts	Very High
60 to < 80 pts	High
40 to < 60 pts	Medium
< 40 pts	Low

Table 4 contains the overall vulnerability scores (0 - 100) and ratings for each of the three categories of drinking water contaminants. Note: scores are rounded off to the nearest five.

**Table 4. Overall Vulnerability**

Category	Score	Rating
Bacteria and Viruses	70	High
Nitrates and Nitrites	70	High
Volatile Organic Chemicals	40	Medium

**Bacteria and Viruses**

The contaminant risk for bacteria and viruses is **Very High** with large-capacity septic systems and paved highways and roads located within Zone A representing the risk to the drinking water well (See Chart 3 – Contaminant Risks for Bacteria and Viruses in Appendix D).

Only a small amount of bacteria and viruses are required to endanger public health. Recent sampling events indicated no positive results were detected for bacteria and viruses. However, after combining the contaminant risks with the overall natural susceptibility of the well, the vulnerability of the well to contamination by bacteria and viruses is **High**.

#### **Nitrates and Nitrites**

The contaminant risk for nitrates and nitrites is **Very High** with large-capacity septic systems and paved highways and roads representing the risk to this source of public drinking water (See Chart 5 - Contaminant Risks for Nitrates and/or Nitrites in Appendix D).

Sampling history for The Caribou Cafe & Motel indicates that nitrates have been detected in the water, but only in very low concentrations (at 0.650 mg/L on 12/11/96) or 7% of the Maximum Contaminant Level (MCL). The MCL is the maximum level of contaminant that is allowed to exist in drinking water and still be consumed by humans without harmful health effects. Due to the high solubility and weak retention by soil, nitrates are very mobile, moving at approximately the same rate as water.

After combining the contaminant risk for nitrates and nitrites with the natural susceptibility of the well, the overall vulnerability of the well to contamination by nitrates and nitrites is **High**.

#### **Volatile Organic Chemicals**

The contaminant risk for volatile organic chemicals is **Low** with large-capacity septic systems and paved highways and roads creating the only known risk for volatile organic chemicals (See Chart 7 – Contaminant Risks for Volatile Organic Chemicals in Appendix D).

There are no recent sample data available for the drinking water at Caribou Cafe & Motel for volatile organic chemicals. However, after combining the contaminant risk for volatile organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination by volatile organic chemicals is **Medium**.

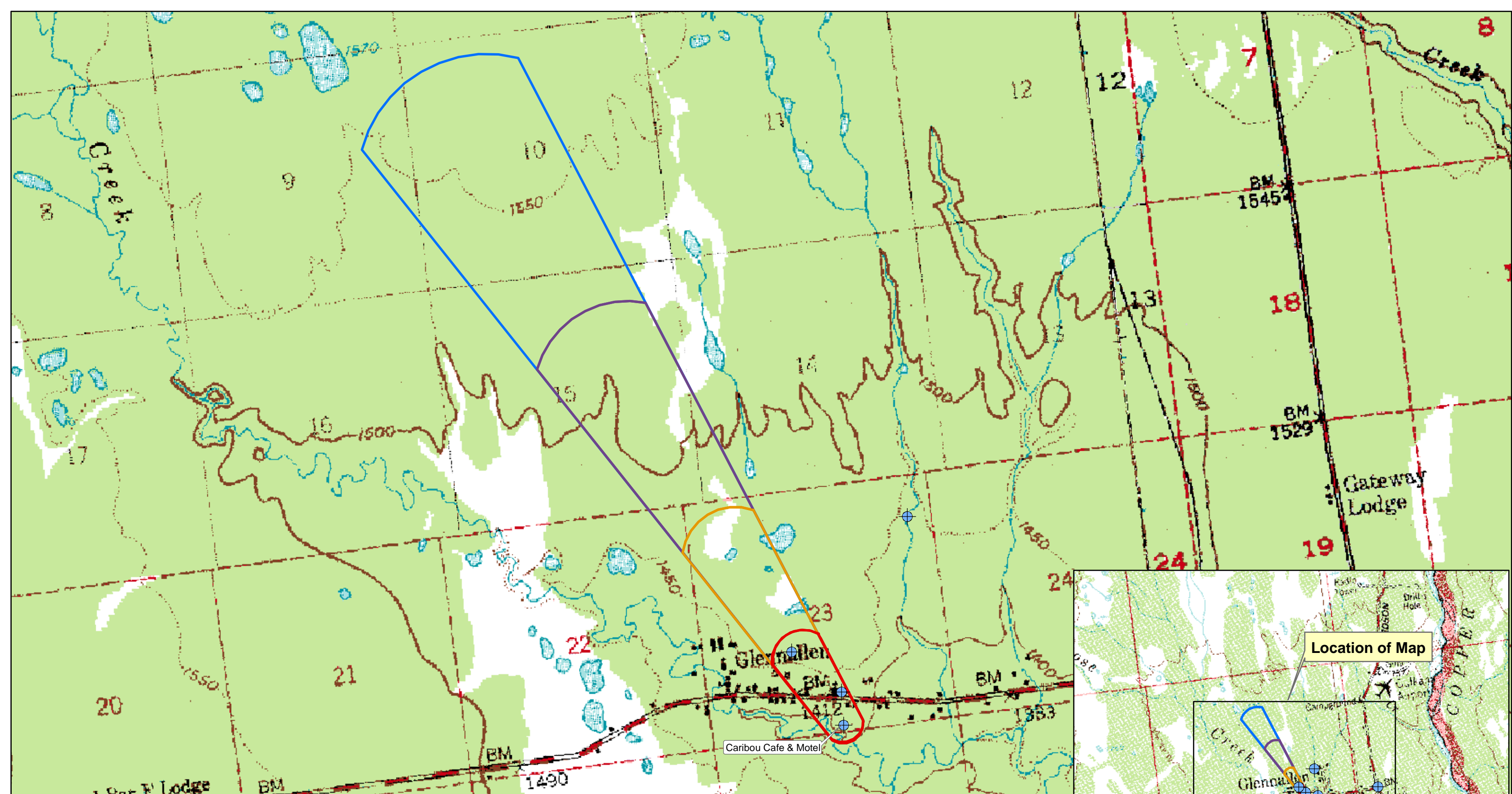
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- King, P.B., compiler, 1969, Tectonic map of North America: US Geological Survey Map (Scale 1:5,000,000) 2 sheets.
- United States Environmental Protection Agency (2002). <<http://www.epa.gov/safewater/mcl.html#mcls>> (2003, September 1)



## **APPENDIX A**

### **Caribou Cafe & Motel Drinking Water Protection Area Location Map (Map 1)**



Map 1: Caribou Cafe & Motel Drinking Water Protection Areas

PWSID: 291300.001



1:23,120

Data Sources:

Background image - USGS 1:63,000 mapping

Legend

Public Drinking Water Systems

DWPA Zone A

Several Months Travel Time

DWPA Zone B

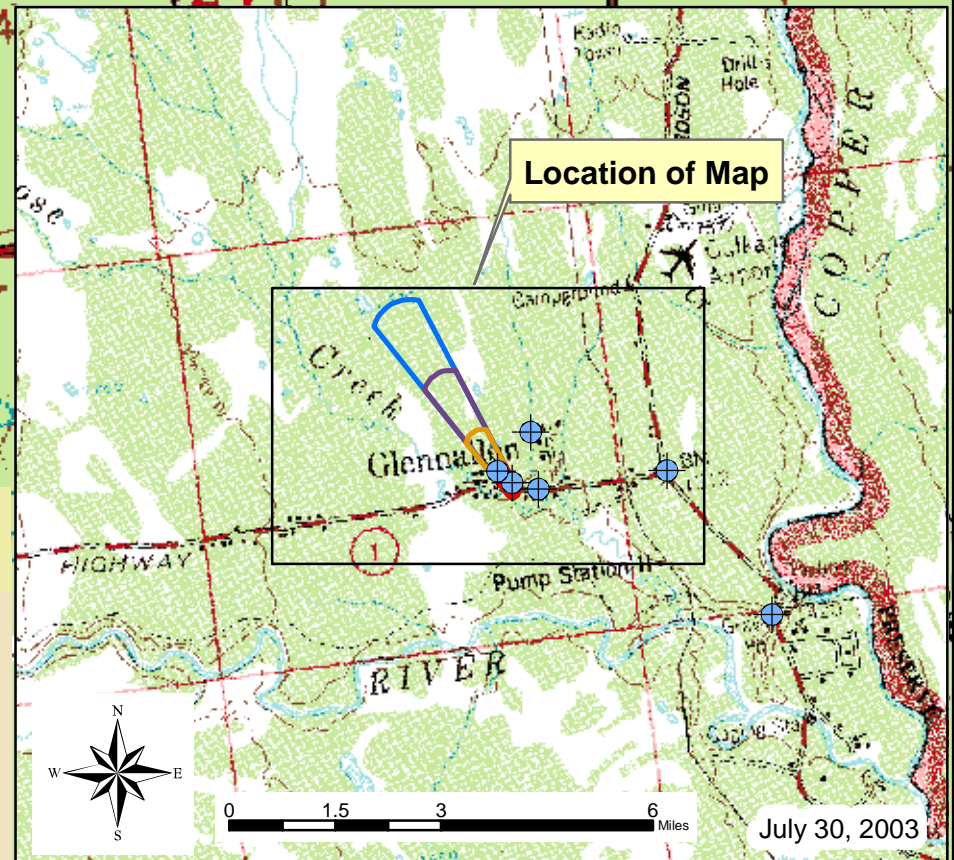
Less than 2 Years Travel Time

DWPA Zone C

Less than 5 Years Travel Time

DWPA Zone D

Less than 10 Years Travel Time



July 30, 2003

## **APPENDIX B**

### **Contaminant Source Inventory and Risk Ranking for Caribou Cafe & Motel (Tables 1-4)**

**Table 1****Contaminant Source Inventory for  
Caribou Café & Motel Well****PWSID 291300.001**

<b>Contaminant Source Type</b>	<b>Contaminant Source ID</b>	<b>CS ID tag</b>	<b>Zone</b>	<b>Map Number</b>	<b>Comments</b>
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-1	A	2	Septic System for Caribou Café
Tanks, heating oil, nonresidential (aboveground)	T14	T14-1	A	2	Heating Oil for Caribou Café
Tanks, heating oil, nonresidential (aboveground)	T14	T14-2	A	2	Heating Oil for Cross Road Medical Center
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	2	Road to Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	2	Road West of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	2	Glenn Highway
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	2	Road North of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	2	Road Northwest of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	2	Road Northwest of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	2	Road Northwest of Caribou Café & Motel

**Contaminant Source Inventory and Risk Ranking for  
Caribou Café & Motel Well  
Sources of Bacteria and Viruses**

**PWSID 291300.001**

**Table 2**

<b>Contaminant Source Type</b>	<b>Contaminant Source ID</b>	<b>CS ID tag</b>	<b>Zone</b>	<b>Risk Ranking for Analysis</b>	<b>Map Number</b>	<b>Comments</b>
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-1	A	High	2	Septic System for Caribou Café
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Low	2	Road to Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Low	2	Road West of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Low	2	Glenn Highway
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Low	2	Road North of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Low	2	Road Northwest of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Low	2	Road Northwest of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Low	2	Road Northwest of Caribou Café & Motel

**Contaminant Source Inventory and Risk Ranking for  
Caribou Café & Motel Well  
Sources of Nitrates/Nitrites**

**PWSID 291300.001**

**Table 3**

<b>Contaminant Source Type</b>	<b>Contaminant Source ID</b>	<b>CS ID tag</b>	<b>Zone</b>	<b>Risk Ranking for Analysis</b>	<b>Map Number</b>	<b>Comments</b>
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-1	A	High	2	Septic System for Caribou Café
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Low	2	Road to Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Low	2	Road West of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Low	2	Glenn Highway
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Low	2	Road North of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Low	2	Road Northwest of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Low	2	Road Northwest of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Low	2	Road Northwest of Caribou Café & Motel

**Contaminant Source Inventory and Risk Ranking for  
Caribou Café & Motel Well  
Sources of Volatile Organic Chemicals**

**PWSID 291300.001**

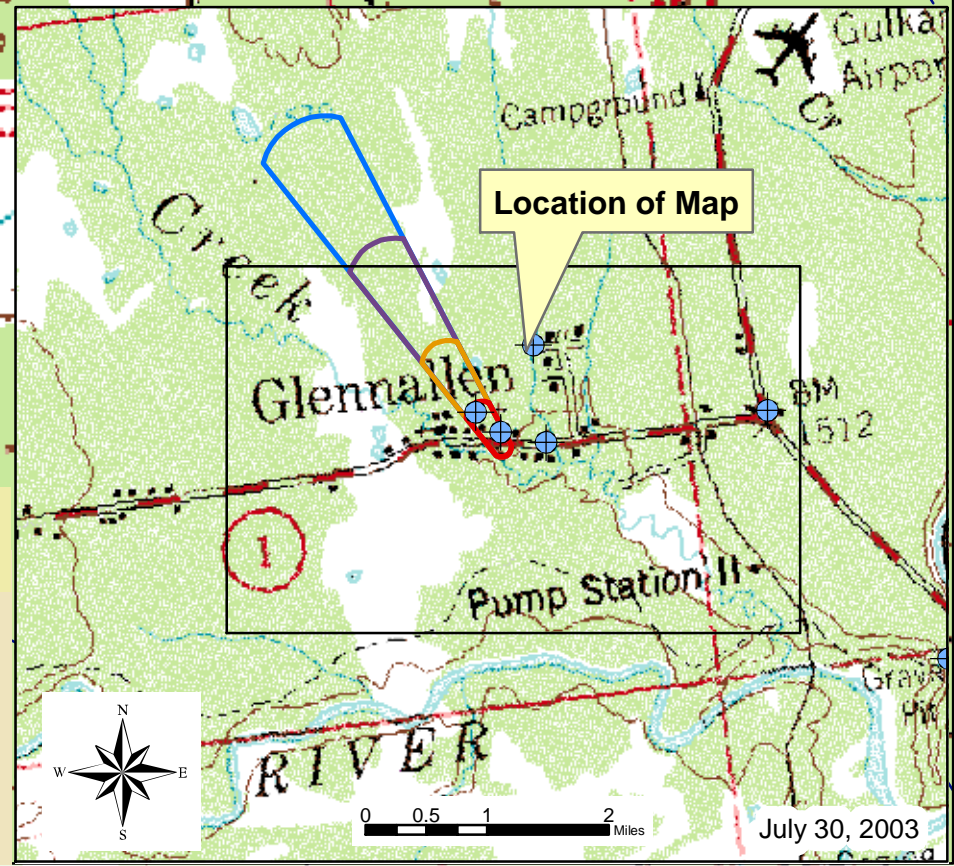
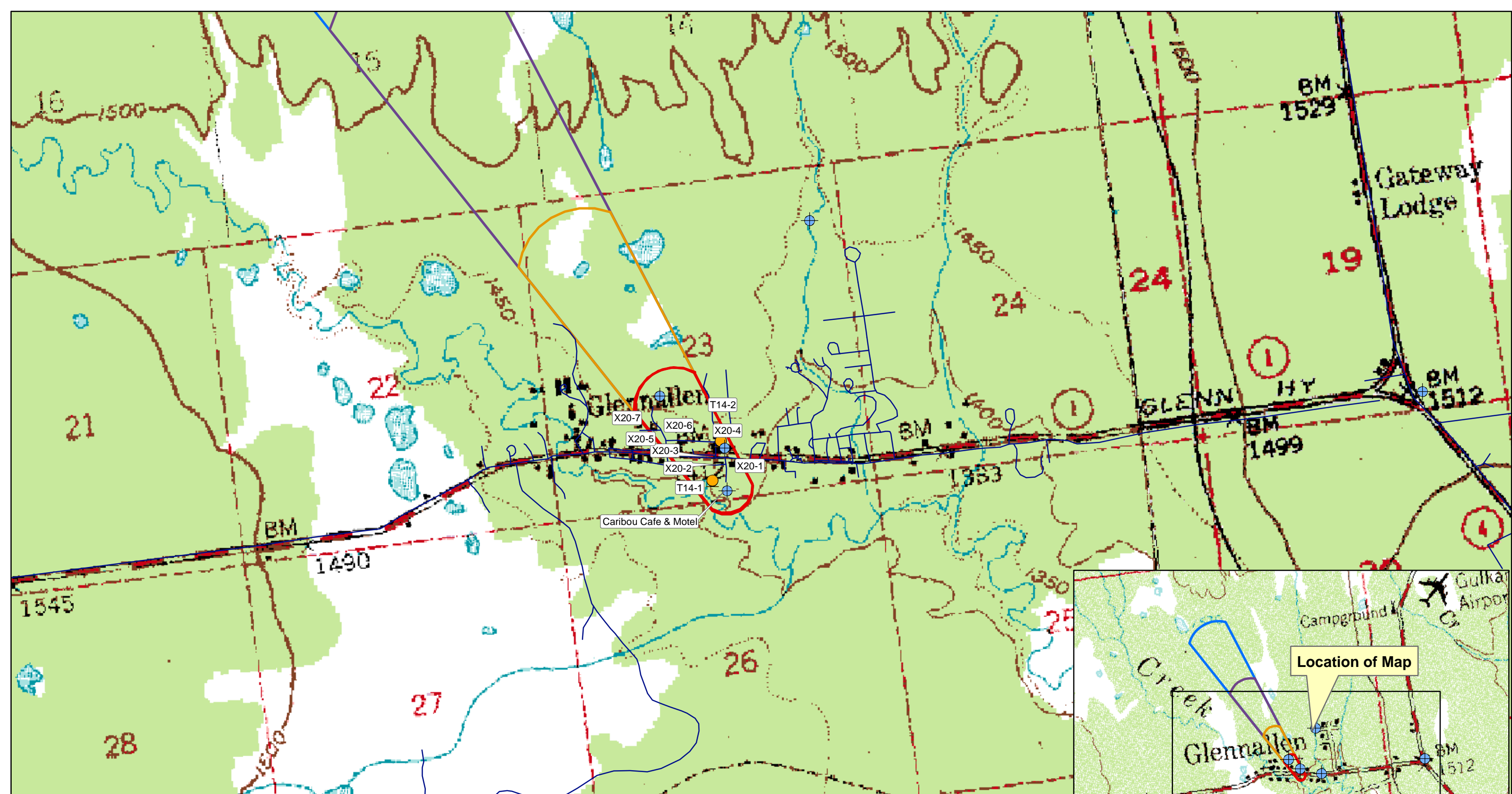
**Table 4**

<b>Contaminant Source Type</b>	<b>Contaminant Source ID</b>	<b>CS ID tag</b>	<b>Zone</b>	<b>Risk Ranking for Analysis</b>	<b>Map Number</b>	<b>Comments</b>
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-1	A	Low	2	Septic System for Caribou Café
Tanks, heating oil, nonresidential (aboveground)	T14	T14-1	A	Low	2	Heating Oil for Caribou Café
Tanks, heating oil, nonresidential (aboveground)	T14	T14-2	A	Low	2	Heating Oil for Cross Road Medical Center
Highways and roads, paved (cement or asphalt)	X20	X20-1	A	Low	2	Road to Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-2	A	Low	2	Road West of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-3	A	Low	2	Glenn Highway
Highways and roads, paved (cement or asphalt)	X20	X20-4	A	Low	2	Road North of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-5	A	Low	2	Road Northwest of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-6	A	Low	2	Road Northwest of Caribou Café & Motel
Highways and roads, paved (cement or asphalt)	X20	X20-7	A	Low	2	Road Northwest of Caribou Café & Motel

## **APPENDIX C**

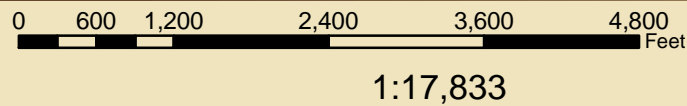
### **Caribou Cafe & Motel Drinking Water Protection Area and Potential and Existing Contaminant Sources (Map 2)**





**Map 2: Drinking Water Protection Areas for Caribou Cafe & Motel and Potential and Existing Sources of Contamination**

PWSID: 291300.001



Data Sources:  
Background image - USGS 1:63,000 mapping

- Legend**
- Public Drinking Water Systems
  - Large Capacity Septic System (D10)
  - Nonresidential Heating Oil AST (T14)
  - Roads (X20)
  - DWPA Zone A**  
 Several Months Travel Time
  - DWPA Zone B**  
 Less than 2 Years Travel Time
  - DWPA Zone C**  
 Less than 5 Years Travel Time
  - DWPA Zone D**  
 Less than 10 Years Travel Time

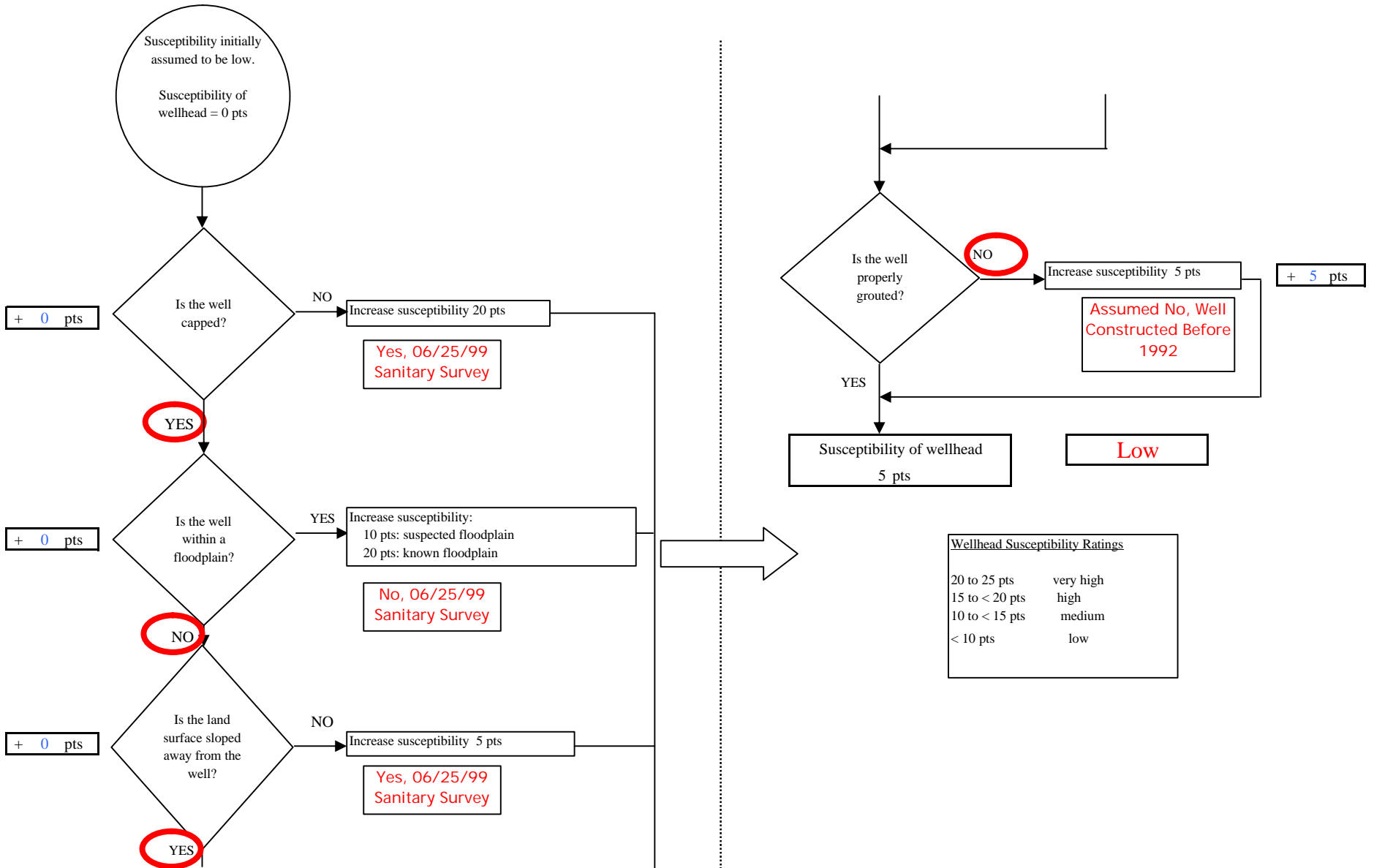


July 30, 2003

## **APPENDIX D**

### **Vulnerability Analysis for Caribou Cafe & Motel Public Drinking Water Source (Charts 1-8)**

**Chart 1. Susceptibility of the wellhead - Caribou Cafe & Motel**



**Chart 2. Susceptibility of the aquifer - Caribou Cafe & Motel**

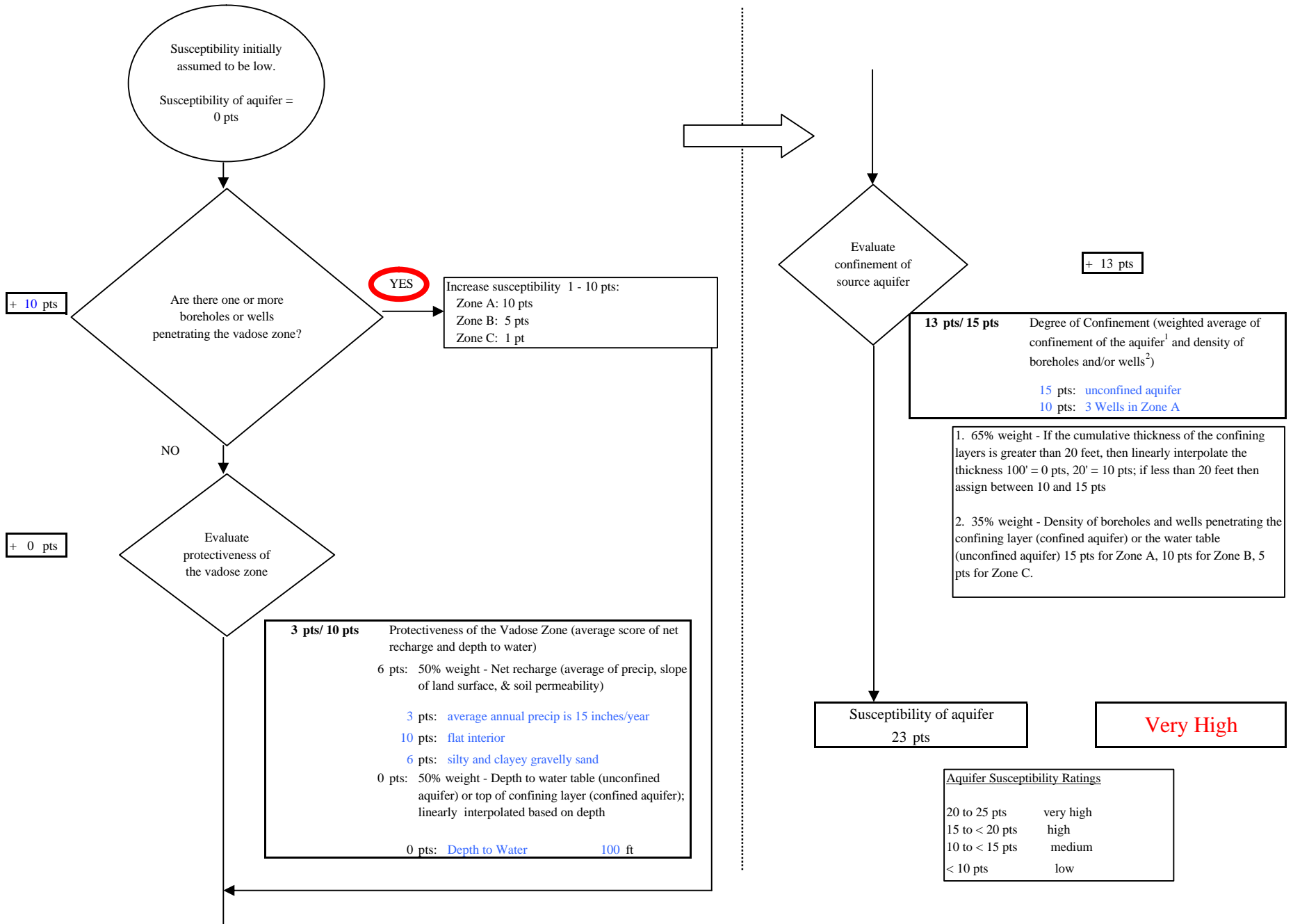
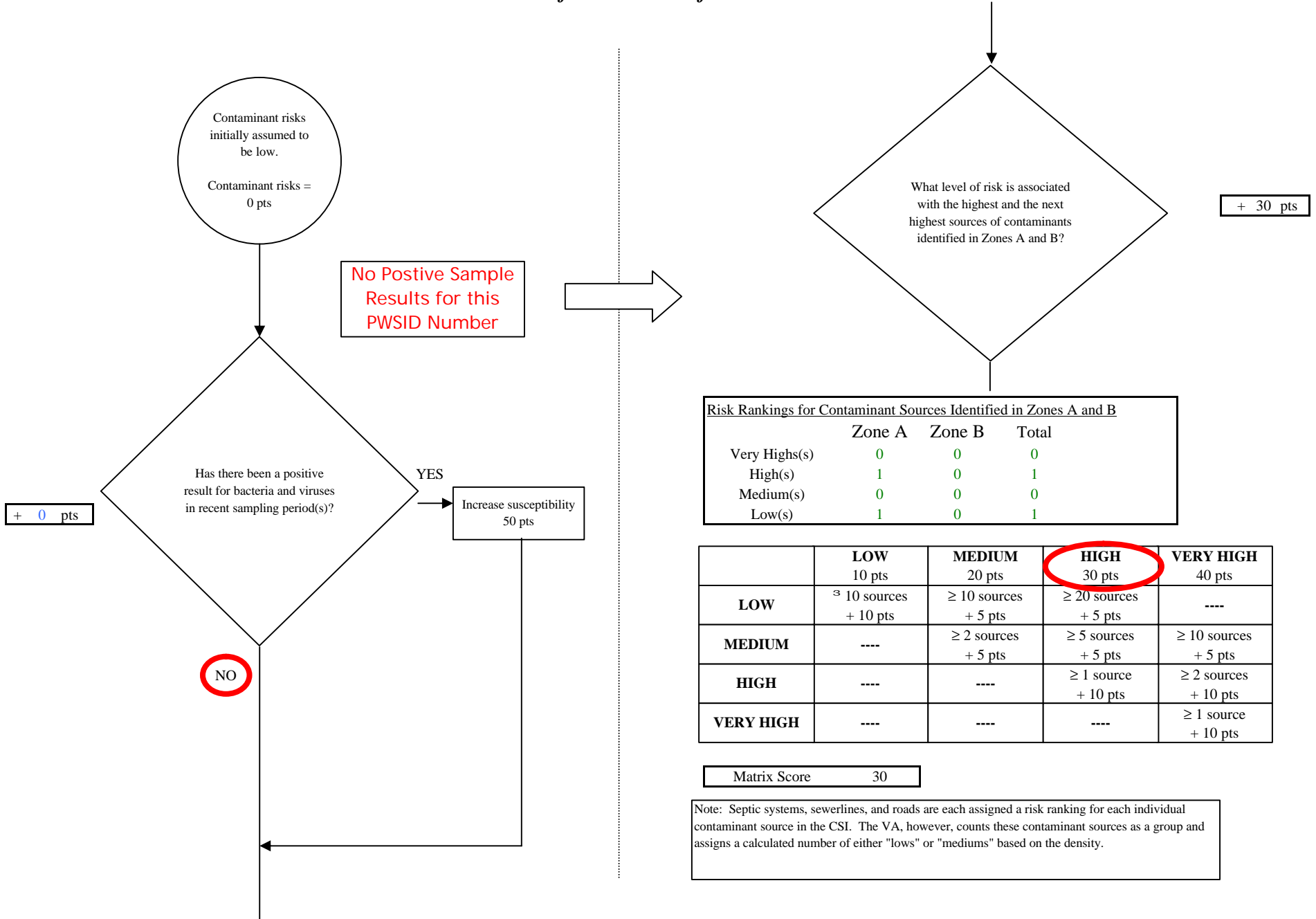
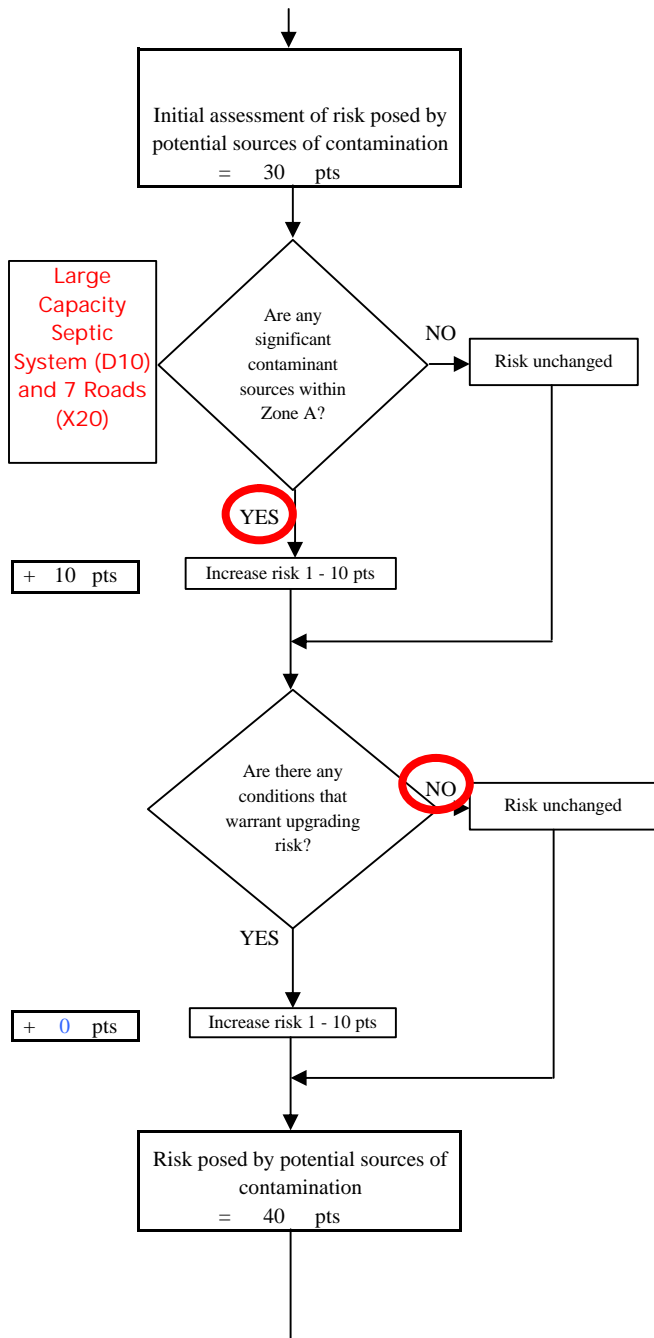


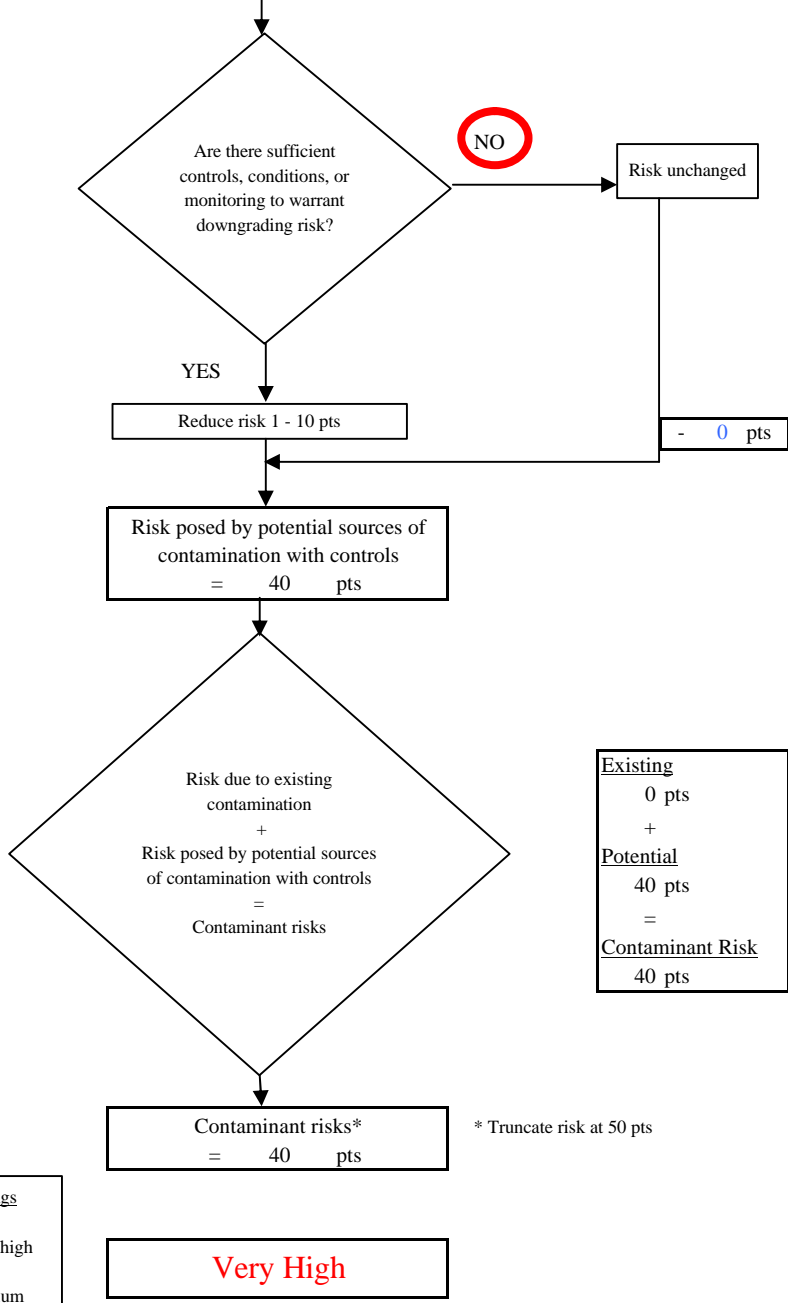
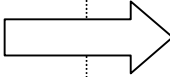
Chart 3. Contaminant risks for Caribou Cafe & Motel - Bacteria & Viruses



**Chart 3. Contaminant risks for Caribou Cafe & Motel - Bacteria & Viruses**



Large Capacity Septic System (D10) and 7 Roads (X20)

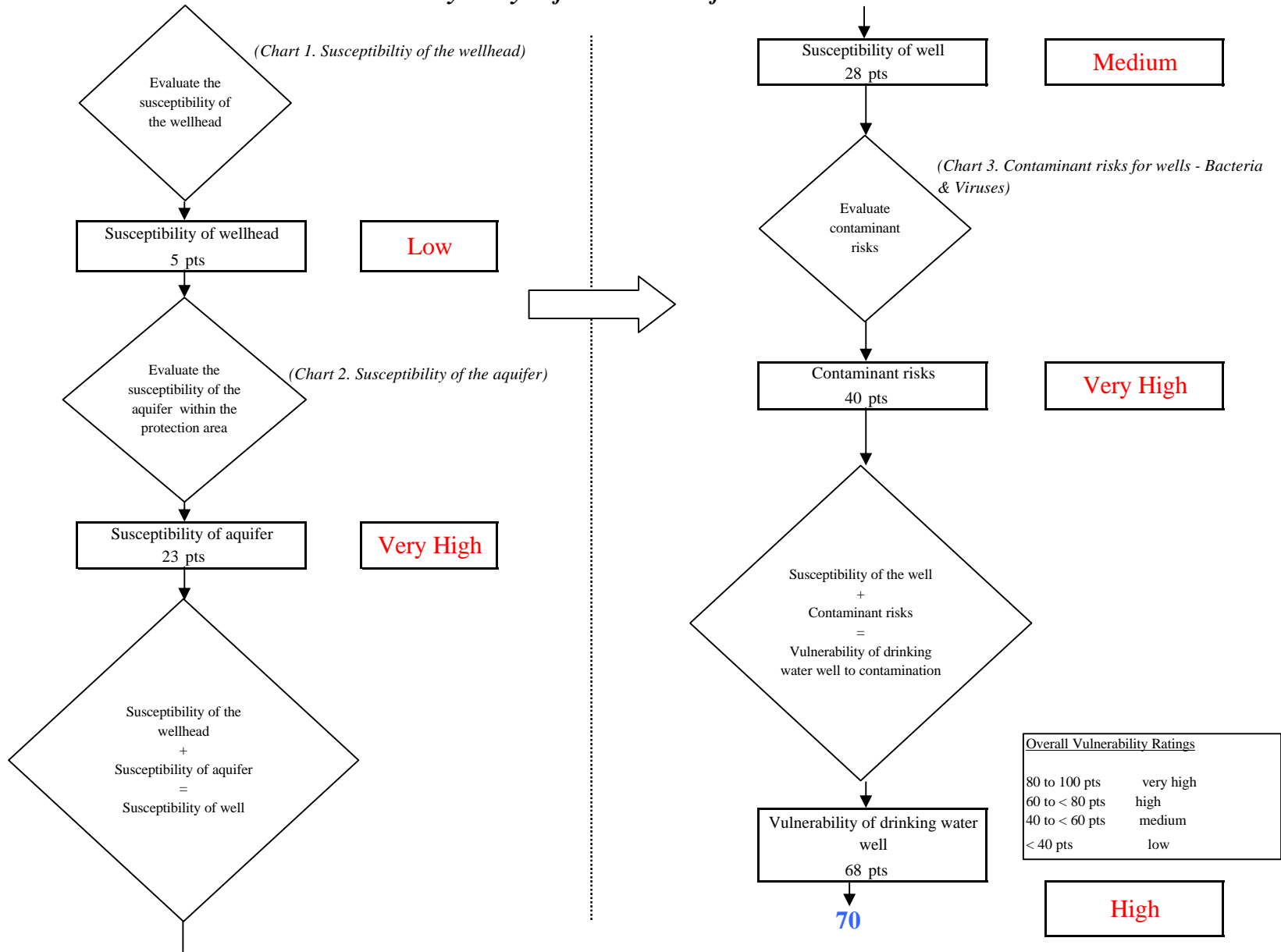


Existing  
0 pts  
+  
Potential  
40 pts  
=  
Contaminant Risk  
40 pts

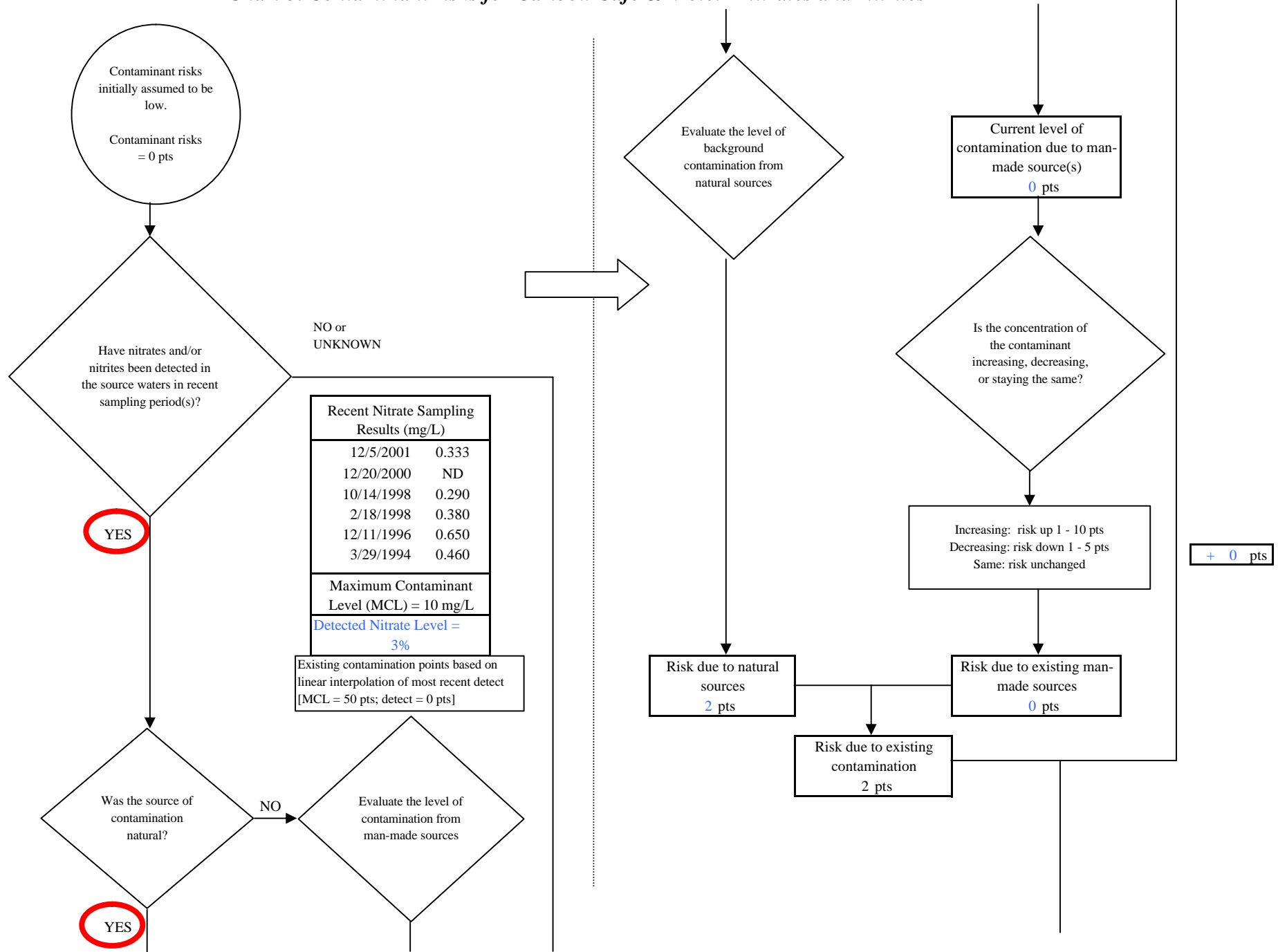
Contaminant Risk Ratings	
40 to 50 pts	very high
30 to < 40 pts	high
20 to < 30 pts	medium
< 20 pts	low

\* Truncate risk at 50 pts

**Chart 4. Vulnerability analysis for Caribou Cafe & Motel - Bacteria & Viruses**



**Chart 5. Contaminant risks for Caribou Cafe & Motel - Nitrates and Nitrites**





**Chart 5. Contaminant risks for Caribou Cafe & Motel - Nitrates and Nitrites**

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?

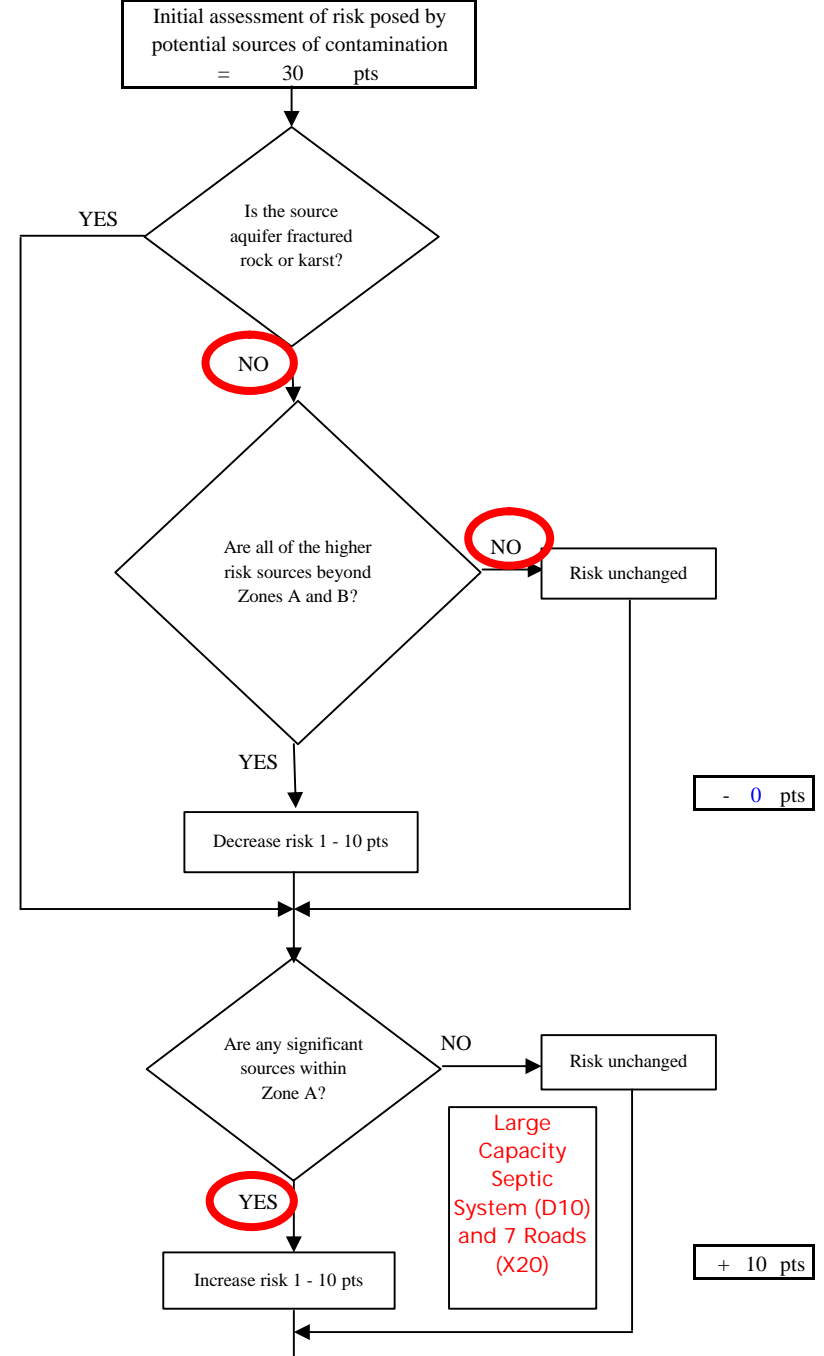
+ 30 pts

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

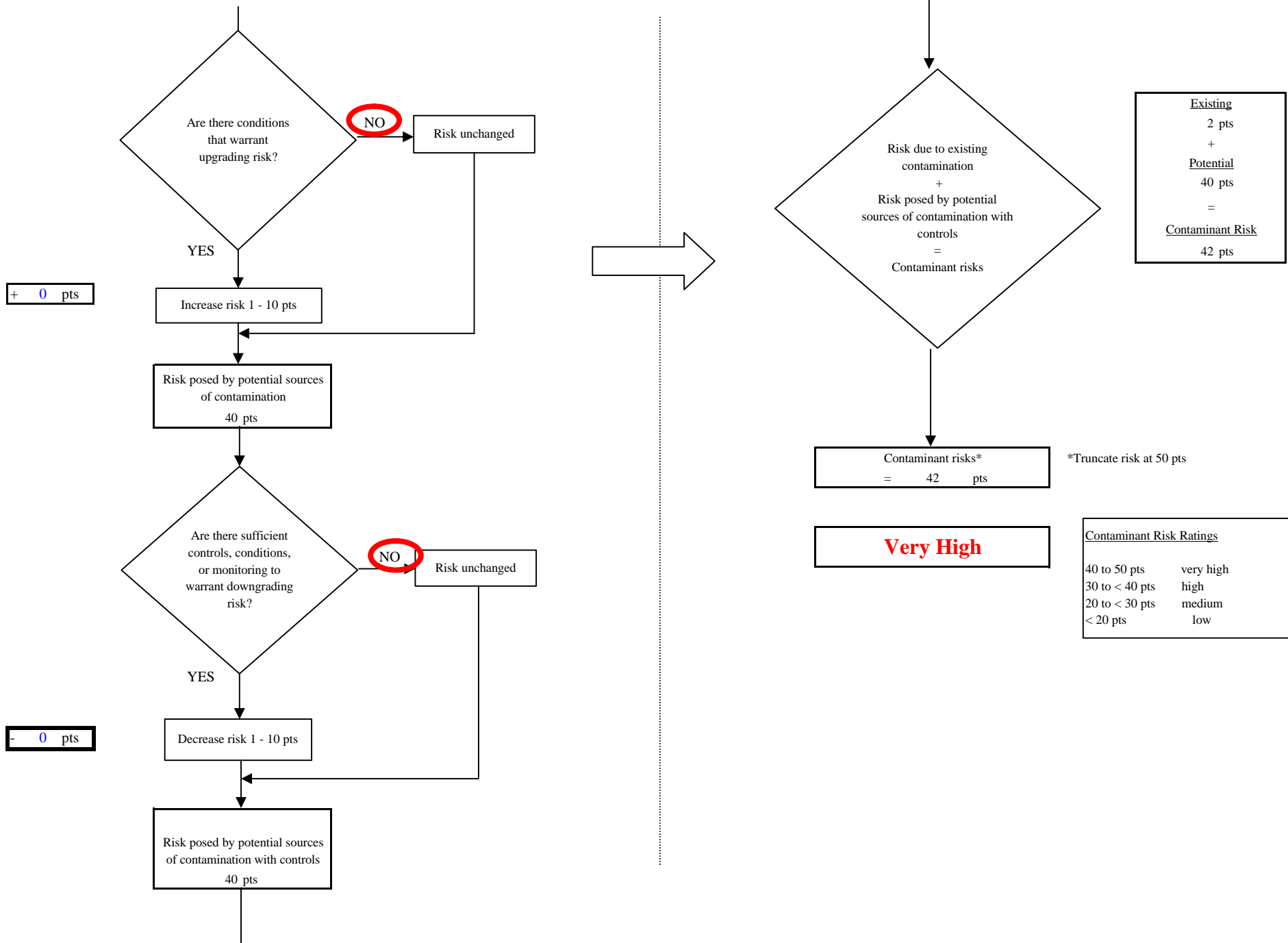
	LOW 10 pts	MEDIUM 20 pts	<b>HIGH 30 pts</b>	VERY HIGH 40 pts
<b>LOW</b>	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
<b>MEDIUM</b>	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
<b>HIGH</b>	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
<b>VERY HIGH</b>	----	----	----	≥ 1 source + 10 pts

Matrix Score      30

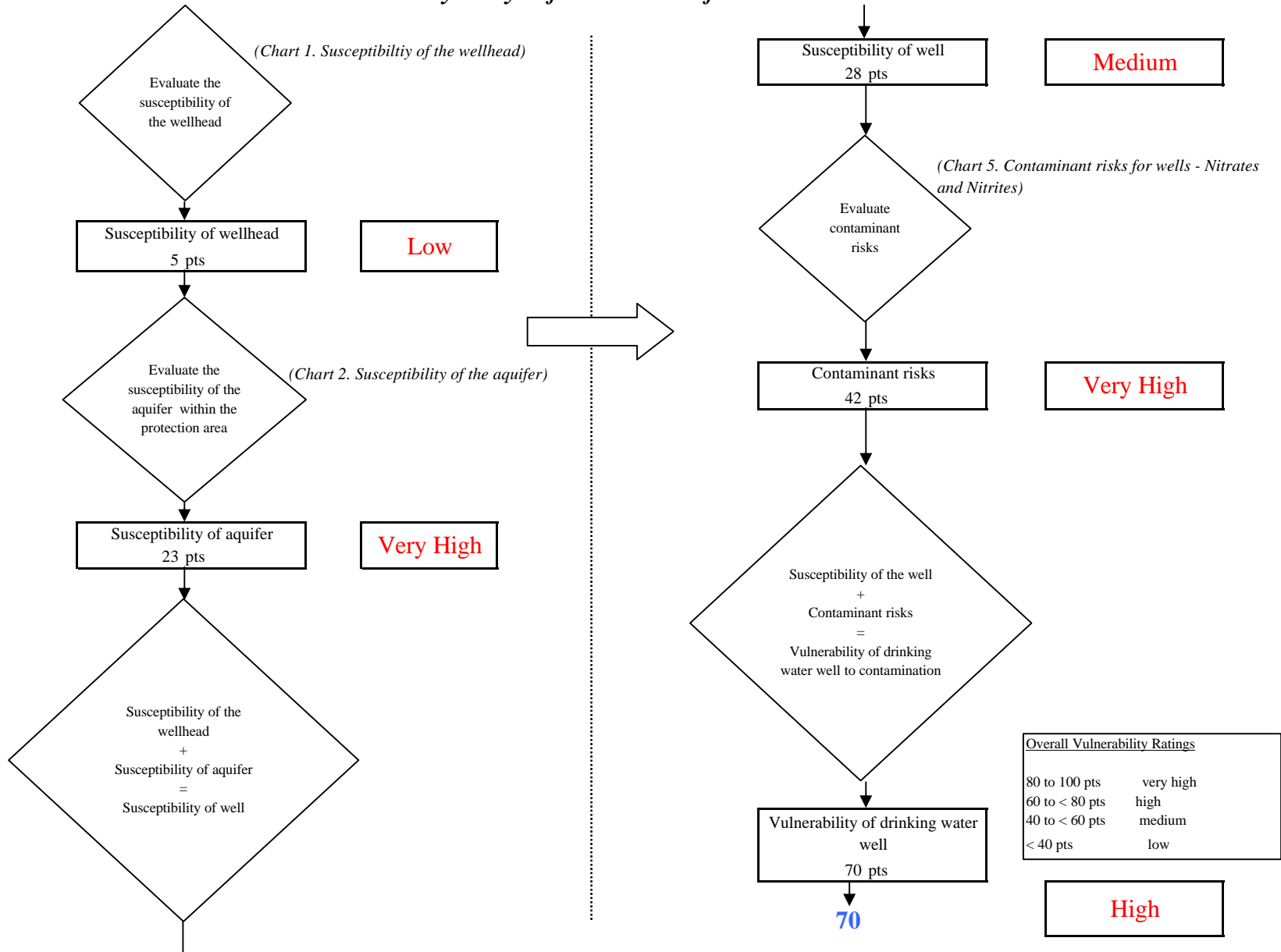
Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.



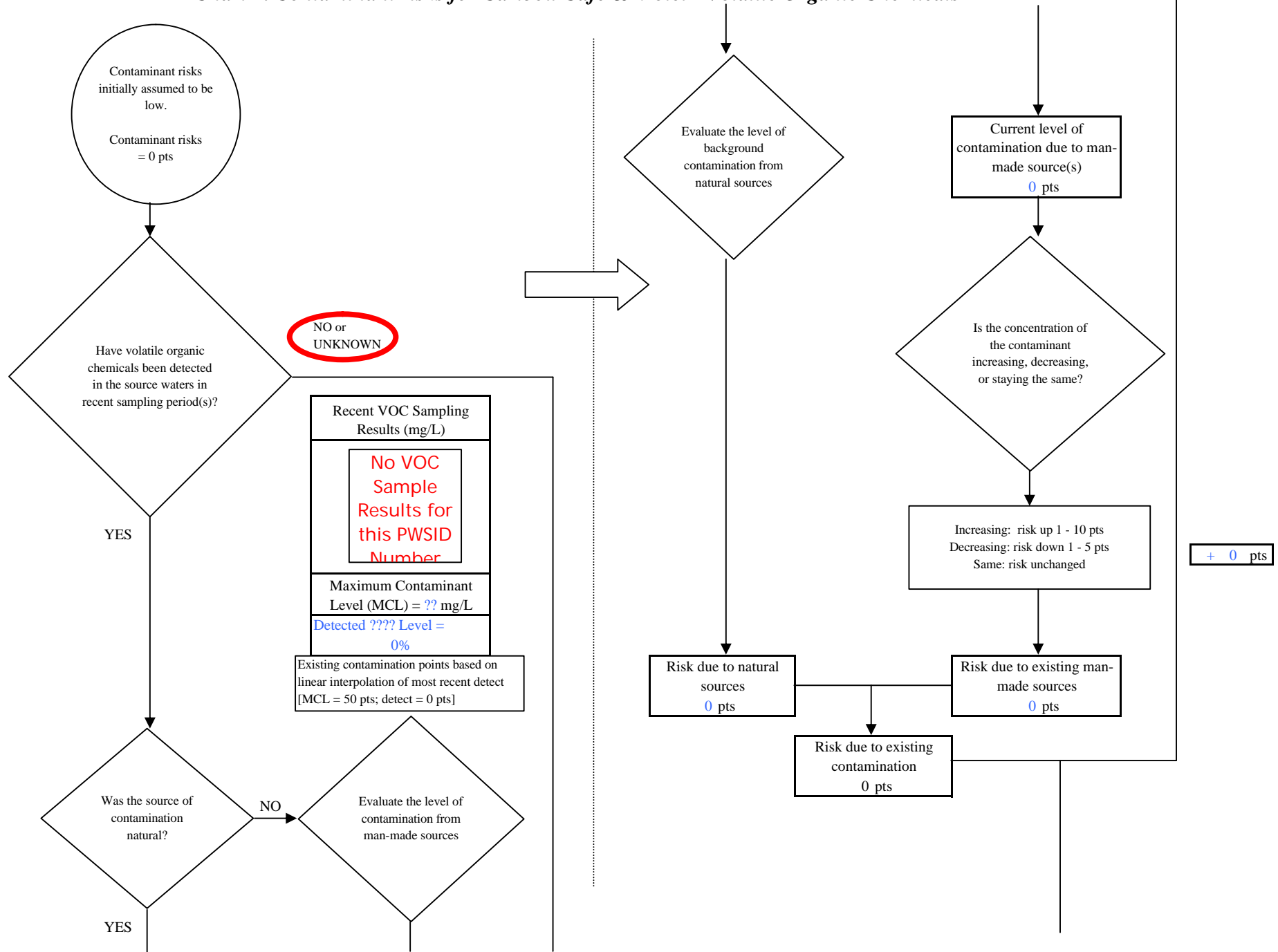
**Chart 5. Contaminant risks for Caribou Cafe & Motel - Nitrates and Nitrites**



**Chart 6. Vulnerability analysis for Caribou Cafe & Motel - Nitrates and Nitrites**



**Chart 7. Contaminant risks for Caribou Cafe & Motel - Volatile Organic Chemicals**



**Chart 7. Contaminant risks for Caribou Cafe & Motel - Volatile Organic Chemicals**

+ 10 pts

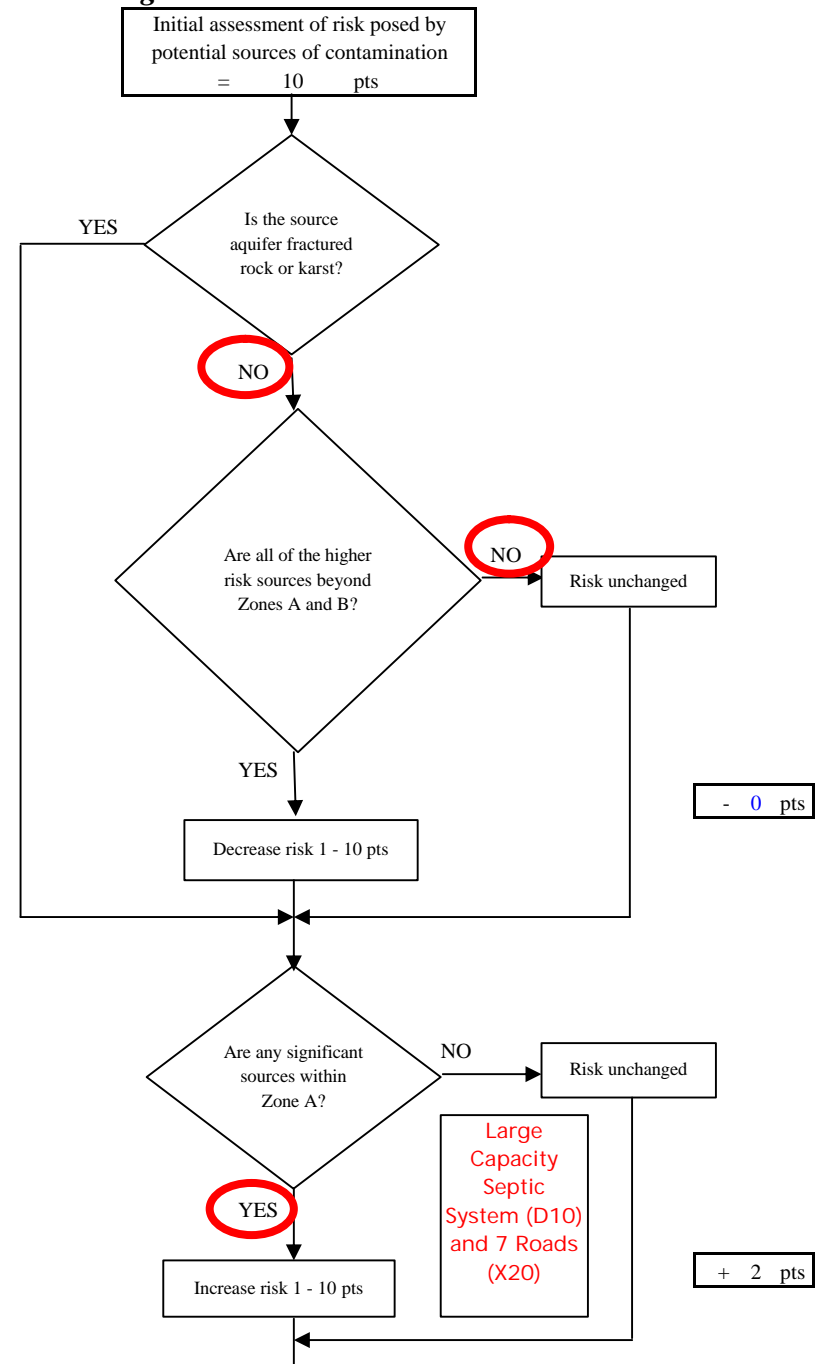
What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A, B and C?

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	0	0
Medium(s)	0	0	0
Low(s)	4	0	4

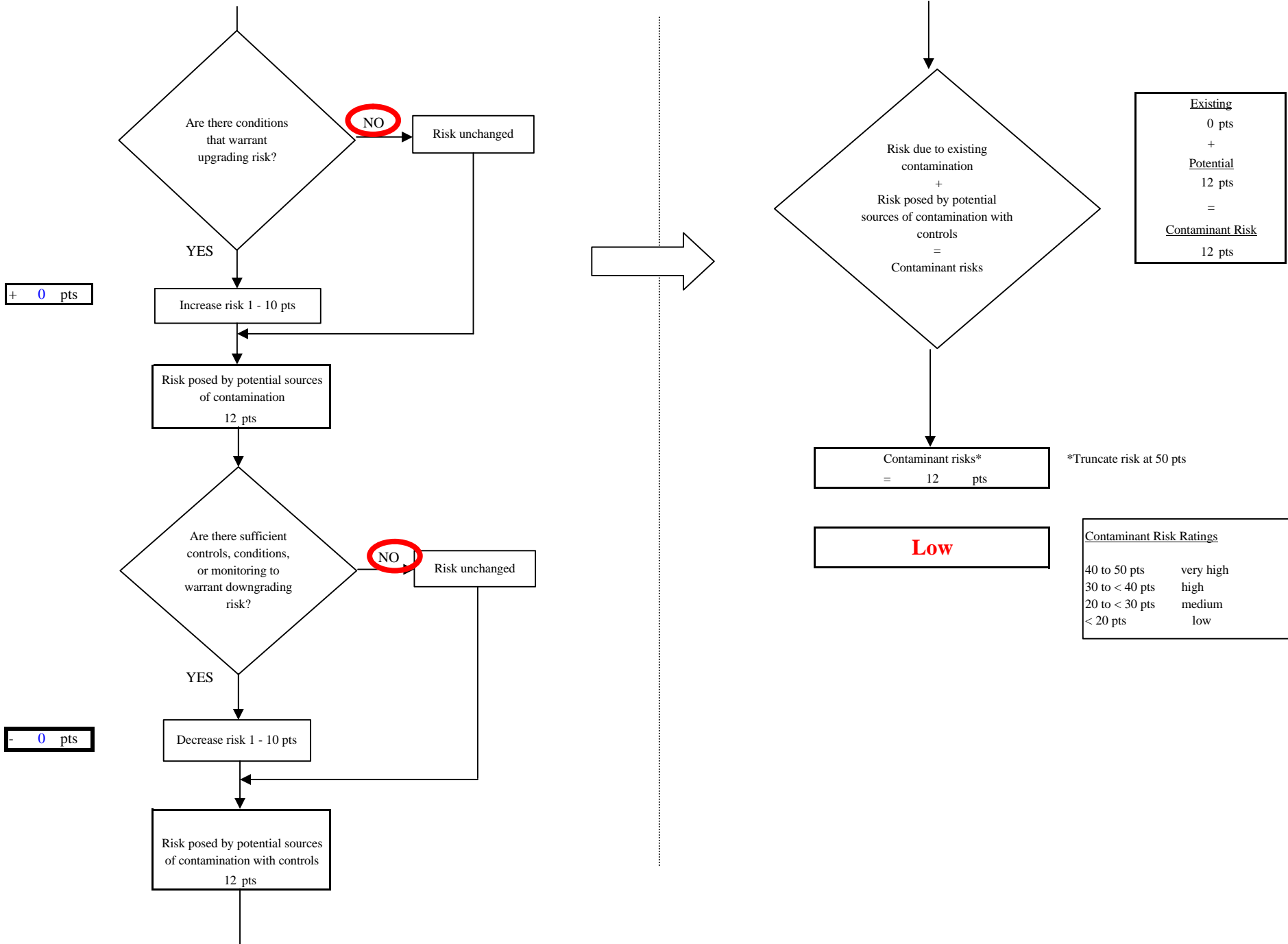
	LOW 10 pts	MEDIUM 20 pts	HIGH 30 pts	VERY HIGH 40 pts
<b>LOW</b>	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
<b>MEDIUM</b>	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
<b>HIGH</b>	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
<b>VERY HIGH</b>	----	----	----	≥ 1 source + 10 pts

Matrix Score 10

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 7. Contaminant risks for Caribou Cafe & Motel - Volatile Organic Chemicals**



**Chart 8. Vulnerability analysis for Caribou Cafe & Motel - Volatile Organic Chemicals**

