

---

# Source Water Assessment

A Hydrogeologic Susceptibility and  
Vulnerability Assessment for  
Wildwood Mobile Home Park Drinking  
Water System,  
Fairbanks area, Alaska  
PWSID # 310853

DECEMBER 2002

DRINKING WATER PROTECTION PROGRAM REPORT Report 800  
Alaska Department of Environmental Conservation

Source Water Assessment for Wildwood  
Mobile Home Park Drinking Water  
System  
Fairbanks area, Alaska  
PWSID# 310853

DECEMBER 2002

DRINKING WATER PROTECTION PROGRAM REPORT Report 800

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.

## CONTENTS

	Page		Page
Executive Summary	1	Inventory of Potential and Existing Contaminant Sources	2
Wildwood Mobile Home Park Public Drinking Water System	1	Ranking of Contaminant Risks	2
Wildwood Mobile Home Park Protection Area	1	Vulnerability of Wildwood Mobile Home Park Drinking Water System	3
	1	References	2

## TABLES

TABLE	1. Definition of Zones	2
	2. Susceptibility	3
	3. Contaminant Risks	3
	3. Overall Vulnerability	4

## APPENDICES

APPENDIX	<p>A. Wildwood Mobile Home Park Drinking Water Protection Area (Map 1)</p> <p>B. Contaminant Source Inventory for Wildwood Mobile Home Park (Table 1)            Contaminant Source Inventory and Risk Ranking for Wildwood Mobile Home Park – Bacteria and Viruses (Table 2)            Contaminant Source Inventory and Risk Ranking for Wildwood Mobile Home Park – Nitrates/Nitrites (Table 3)            Contaminant Source Inventory and Risk Ranking for Wildwood Mobile Home Park – Volatile Organic Chemicals (Table 4)            Contaminant Source Inventory and Risk Ranking for Wildwood Mobile Home Park – Heavy Metals, Cyanide, and Other Inorganic Chemicals (Table 5)            Contaminant Source Inventory and Risk Ranking for Wildwood Mobile Home Park – Synthetic Organic Chemicals (Table 6)            Contaminant Source Inventory and Risk Ranking for Wildwood Mobile Home Park – Other Organic Chemicals (Table 7)</p> <p>C. Wildwood Mobile Home Park Drinking Water Protection Area and Potential and Existing Contaminant Sources (Map 2)</p> <p>D. Vulnerability Analysis for Contaminant Source Inventory and Risk Ranking for Wildwood Mobile Home Park Public Drinking Water Source (Charts 1 – 14)</p>
----------	--

# Source Water Assessment for Wildwood Mobile Home Park Source of Public Drinking Water, Fairbanks Area, Alaska

---

## Drinking Water Protection Program Alaska Department of Environmental Conservation

### EXECUTIVE SUMMARY

The public water system for Wildwood Mobile Home Park is a Class A (community) water system consisting of one well along Rambling Road approximately 3 miles north of Fairbanks, Alaska. The wellhead received a susceptibility rating of **Low** and the aquifer received a susceptibility rating of **High**. Combining these two ratings produces a **Low** risk rating for the natural susceptibility of the well. Identified potential and current sources of contaminants for Wildwood Mobile Home Park public drinking water source include: residential septic systems, a large capacity septic system, roads, and residential area. These identified potential and existing sources of contamination are considered as sources of bacteria and viruses, nitrates and/or nitrites, volatile organic chemicals, heavy metals, cyanide, and other inorganic chemicals, synthetic organic chemicals, and other organic chemicals. Combining the natural susceptibility of the well with the contaminant risk, the public water source for Wildwood Mobile Home Park received a vulnerability rating of **High** for nitrates and/or nitrites, a **Medium** for bacteria and viruses, and volatile organic chemicals, and a **Low** for heavy metals, synthetic organic chemicals and other organic chemicals.

### WILDWOOD MOBILE HOME PARK PUBLIC DRINKING WATER SYSTEM

Wildwood Mobile Home Park public water system is a Class A (community) water system. The system consists of one well along Rambling Road between McGrath and Lowell Roads approximately 3 miles north of Fairbanks, Alaska (T1N, R1W, Section 24) (See Map 1 of Appendix A). Fairbanks and its surrounding communities are located in the Fairbanks North Star Borough which is near the center of Alaska (Please see the inset of Map 1 in Appendix A for location). The Borough's current population is 82,840 making it the second-largest population center in the state (ADCED, 2002). Communities located within the Borough include: College, Eielson Air Force Base, Ester, Fairbanks, Fox, Harding Lake, Moose Creek, North Pole, Pleasant Valley, Salcha, and Two Rivers.

The majority of residents in the Fairbanks area use individual wells or hauled water, and septic systems (ADCED, 2002). Heating oil (commonly stored in both above and below ground 275 to 500-gallon tanks) is most commonly used for heating homes and buildings (ADCED, 2002). Refuse is transported to the Fairbanks North Star Borough landfill.

The Fairbanks area includes two distinct topographic areas: the floodplain of the Tanana River and the Chena River, and the uplands north of this floodplain. The well for Wildwood Mobile Home Park is located in the uplands at an elevation of approximately 725 feet above sea level.

According to the most recent Sanitary Survey (7/19/01), the depth of the well is 220 feet. Well logs in the area show this aquifer as bedrock. Bedrock in this area is predominantly a metamorphosed marine mud deposit, called a pelitic schist. The schist is locally intruded by granitic rocks – granite and quartz diorite. Groundwater in the bedrock is principally contained in fractures. The water wells in this area with the greatest well recharge appear to be in quartz veins, quartzite, and siliceous schist (Nelson, 1978).

Groundwater in the uplands is recharged by local precipitation. Outflow of ground water in the uplands primarily occurs two ways. In areas under artesian pressure (pressure caused by overlying permafrost), water can flow to the surface through thawed conduits within the permafrost. Otherwise groundwater will flow under the permafrost (if present) and out to the groundwater beneath the adjacent flood plain or creek valley (Nelson, 1978).

The most recent Sanitary Survey (7/19/01) indicates the well was installed with a cap providing a sanitary seal. A properly installed sanitary seal may provide protection against contaminants from entering the source waters at the well casing. The land surface is also appropriately sloped away from the well providing adequate surface water drainage. The well is grouted according to ADEC regulations. Proper grouting provides added protection against contaminants travelling along the well casing and into source waters. The well is not located in a known floodplain.

This system operates year-round and serves approximately 120 residents through 49 service connections.

### DRINKING WATER PROTECTION AREA

The pathways most likely for surface contamination to reach the groundwater are identified as the first step in determining a drinking water system’s risk. 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, and will serve as the focus for voluntary protection efforts.

An outline of the immediate watershed was used to determine the size and shape of the protection area for Wildwood Mobile Home Park. Available geology was also considered to take into account any uncertainties in groundwater flow and aquifer characteristics to arrive at a meaningful protection area (Please refer to the Guidance Manual for Class A Public Water Systems for additional information).

The protection areas established for wells by the ADEC are usually separated into four zones, limited by the watershed. These zones correspond to differences in the time-of-travel (TOT) of the water moving through the aquifer to the well. The protection area for Wildwood Mobile Home Park is limited by its immediate watershed and includes only Zone A (See Map 1 of Appendix A). 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*), and State of Alaska Department of Water Resources (*Jokela et al., 1991*).

The time of travel 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**

Zone	Definition
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

### 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 Wildwood Mobile Home Park protection area. 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 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.

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 time-of-travel 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 7 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 WILDWOOD MOBILE HOME PARK 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 fourteen 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 14 contain the Contaminant Risks and Vulnerability Analyses for nitrates and nitrites, volatile organic chemicals, heavy metals, synthetic organic chemicals, and other 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

The well for the Wildwood Mobile Home Park is completed in a confined fractured bedrock aquifer. The nearly impermeable confining layers above the aquifer create a barrier to contaminants traveling downward from the surface with the precipitation and surface water runoff. Although the aquifer is relatively protected in the area of the well, the water supply wells upgradient of the well offer an easy pathway for contaminants to travel down into the confined aquifer and towards the well. Table 2 shows the Susceptibility scores and ratings for Wildwood Mobile Home Park.

**Table 2. Susceptibility**

	Score	Rating
Susceptibility of the Wellhead	0	Low
Susceptibility of the Aquifer	19	High
Natural Susceptibility	19	Low

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	37	High
Nitrates and/or Nitrites	50	Very High
Volatile Organic Chemicals	30	High
Heavy Metals, Cyanide and Other Inorganic Chemicals	10	Low
Synthetic Organic Chemicals	10	Low

Other Organic Chemicals      10      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:

$$\begin{array}{r}
 \text{Natural Susceptibility (0 – 50 points)} \\
 + \\
 \text{Contaminant Risks (0 – 50 points)} \\
 = \\
 \text{Vulnerability of the} \\
 \text{Drinking Water Source to Contamination (0 – 100).}
 \end{array}$$

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	55	Medium
Nitrates and Nitrites	70	High
Volatile Organic Chemicals	50	Medium
Heavy Metals, Cyanide, and Other Inorganic Chemicals	30	Low
Synthetic Organic Chemicals	30	Low
Other Organic Chemicals	30	Low

**Bacteria and Viruses**

The contaminant risk for bacteria and viruses is high with the large capacity septic system and the density of residential septic systems nearest to the well representing the greatest 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. Bacteria and viruses have not been detected during recent sampling of this water system. After combining the contaminant risk for bacteria and viruses with the natural susceptibility of the well, the overall vulnerability of the well to contamination is medium.

**Nitrates and Nitrites**

The contaminant risk for nitrates and nitrites is very high with the septic system nearest the well representing the greatest risk to this source of public drinking water (See Chart 5 - Contaminant Risks for Nitrates and/or Nitrites in Appendix D). Nitrates are very mobile, moving at approximately the same rate as water.

Sampling history for the Wildwood Mobile Home Park well indicates that concentrations of nitrate just below the Maximum Contaminant Level (MCL) have consistently been detected in the drinking water. The MCL is the maximum level of contaminant that is allowed to exist in drinking water by the Environmental Protection Agency (EPA). Recent nitrate concentrations have ranged from 7.90 mg/L to 9.120 mg/L or about 80 to 90% of the Maximum Contaminant Level (MCL) of 10 mg/L.

High concentrations of nitrates in drinking water pose the greatest risk to infants. Excessive levels of nitrates in the water can reduce the ability of the infant’s blood to absorb oxygen, the cause of “blue baby syndrome” (EPA, 2002). Blue baby syndrome is a serious medical condition requiring immediate medical treatment.

The EPA also lists the long term effects of high nitrate concentrations as diuresis, increased starchy deposits and hemorrhaging of the spleen (EPA, 2002).

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

**Volatile Organic Chemicals**

The contaminant risk for volatile organic chemicals is high with the density of heating oil storage tanks creating the greatest risk for volatile organic chemicals (See Chart 7 – Contaminant Risks for Volatile Organic Chemicals in Appendix D).

Both underground and above ground heating oil storage tanks are the standard way of heating homes and businesses in the area surrounding Fairbanks. The most common causes of fuel leaks of these heating oil systems are overfilling the tank, ruptured fuel lines, leaking storage tanks, damaged or faulty valves and vandalism. Regular system maintenance can help prevent many of these harmful fuel leaks.

Volatile Organic Chemicals were not detected during the most recent sampling on 3/22/99. After combining the contaminant risk for volatile organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is medium.

#### **Heavy Metals, Cyanide, and Other Inorganic Chemicals**

The contaminant risk for heavy metals is low with the density of septic systems and residential area in the protection area creating risk (See Chart 9 – Contaminant Risks for Heavy Metals, Cyanide, and Other Inorganic Chemicals in Appendix D).

Heavy metals were not detected in significant concentrations in their most recent samples (6/26/01 and 8/25/93). After combining the contaminant risk for heavy metals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is low.

#### **Synthetic Organic Chemicals**

The contaminant risk for synthetic organic chemicals is low with the residential activities creating risk. Synthetic Organic Chemicals have never been sampled for in this water system. After combining the contaminant risk with the natural susceptibility of the well, the overall vulnerability to synthetic organic chemicals of the well is low (See Chart 11 – Contaminant Risks for Synthetic Organic Chemicals in Appendix D).

#### **Other Organic Chemicals**

The contaminant risk for other organic chemicals is low with the residential activities within the protection area creating the risk. After combining the contaminant risk with the natural susceptibility of the well, the overall vulnerability to other organic chemicals of the well is low (See Chart 13 – Contaminant Risks for Other Organic Chemicals in Appendix D). Other organic chemicals have not been sampled for in Wildwood Mobile Home Park's drinking water system.



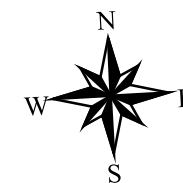
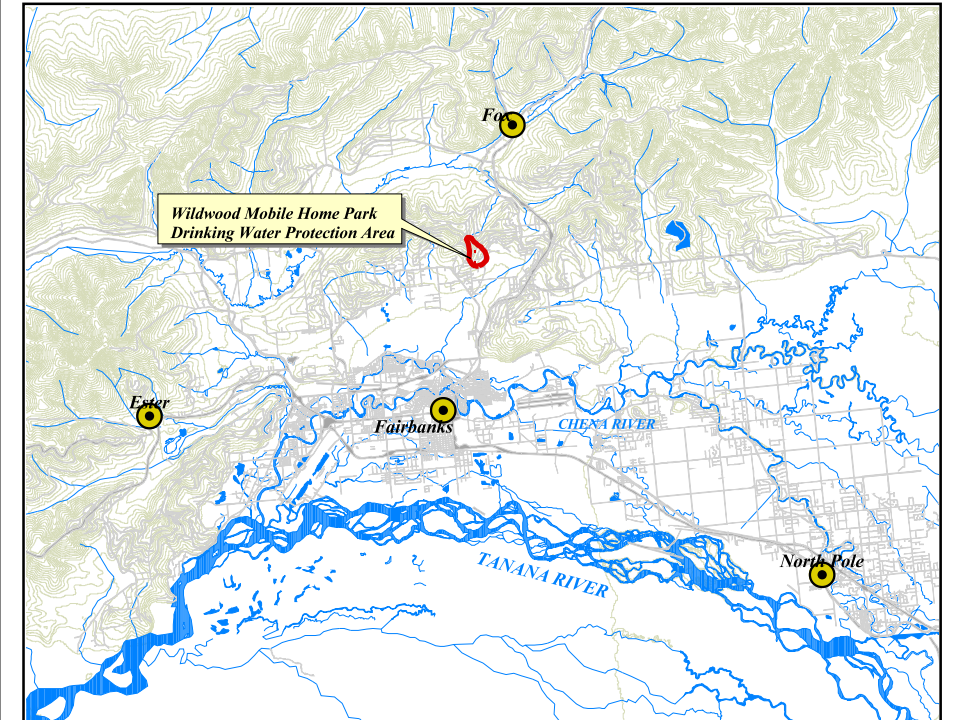
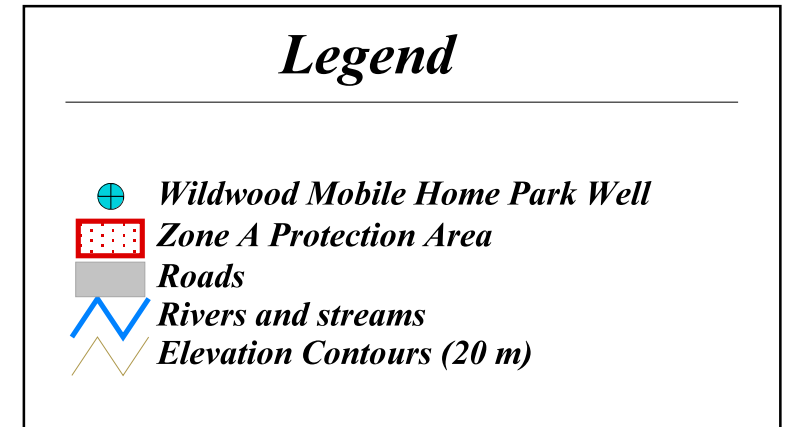
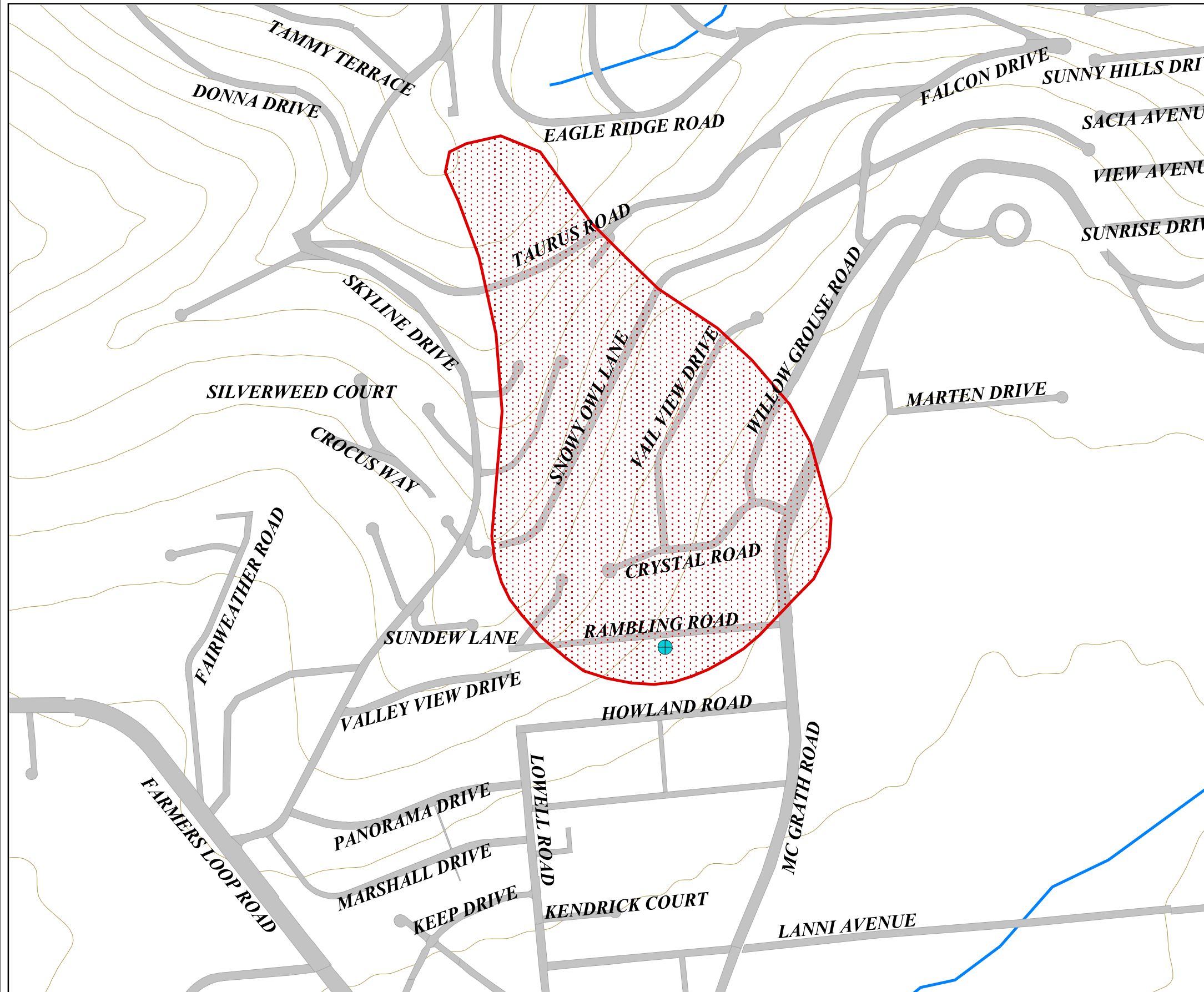
## REFERENCES

- Alaska Department of Community and Economic Development (ADCED), 2002 [WWW document]. URL [http://www.dced.state.ak.us/mra/CF\\_BLOCK.cfm](http://www.dced.state.ak.us/mra/CF_BLOCK.cfm).
- Forbes, R.B. and Weber, F.R., 1981. Bedrock Geologic Map of the Fairbanks Mining District, Alaska. Funded by the State of Alaska, US Geological Survey, and The National Science Foundation.
- Freeze, R.A. and Cherry, J.A., 1979. Groundwater. Prentice-Hall, Englewood Cliffs, NJ.
- Jokela, J.B., Munter, J.A., and Evans, J.G., 1991, Ground-water resources of the Palmer-Big Lake area, Alaska: a conceptual model. Division of Geological & Geophysical Surveys Reports of Investigations 90-4, State of Alaska Department of Natural Resources, Fairbanks, AK.
- King, P.B., compiler, 1969, Tectonic map of North America: US Geological Survey Map, (scale 1:5,000,000) 2 sheets.
- Nelson, Gordon L., 1978, Hydrologic Information for Land-Use Planning, Fairbanks Vicinity, Alaska. US Department of the Interior Geological Survey Open File Report 78-959, 47p.
- Patrick, L.D., Brabets, T.P., and Glass, R.L., 1989, Simulation of ground-water flow at Anchorage, Alaska: US Geological Survey Water-Resources Investigations Report 88-4139, 41p.
- United States Environmental Protection Agency (EPA), 2002 [WWW document]. URL <http://www.epa.gov/safewater/mcl.html>.

## **APPENDIX A**

### **Wildwood Mobile Home Park Drinking Water Protection Area Location Map (Map 1)**

# Wildwood Mobile Home Park Drinking Water Protection Area



**Map 1**



PWSID 310853

## **APPENDIX B**

### **Contaminant Source Inventory and Risk Ranking for Wildwood Mobile Home Park (Tables 1-7)**

**Table 1**

**Contaminant Source Inventory for  
FNSB - Weller Elementary**

**PWSID 310251.001**

<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>
Construction trade areas and materials	C09	C09-1	A	2	935 Highland Street
Residential Areas	R01		A	2	Approximately 400 acres of residential area
Septic systems (serves one single-family home)	R02		A	2	Approximately 137 septic systems (approximated by number of parcels designated as residential)
Tanks, heating oil, residential (above ground)	R08		A	2	Approximately 137 heating oil tanks (approximated by number of parcels designated as residential)
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-1	A	2	Waste oil tank at the Firehouse
Highways and roads, dirt/gravel	X24		A	2	Approximately 11 roads located within the protection area
Firehouses	X38	X38-1	A	2	585 Steele Creek Road

**Table 2**

*Contaminant Source Inventory and Risk Ranking for  
FNSB - Weller Elementary  
Sources of Bacteria and Viruses*

**PWSID 310251.001**

<i>Contaminant Source Type</i>	<i>Contaminant Source ID</i>	<i>CS ID tag</i>	<i>Zone</i>	<i>Risk Ranking for Analysis</i>	<i>Map Number</i>	<i>Comments</i>
Septic systems (serves one single-family home)	R02		A	Low	2	Approximately 137 septic systems (approximated by number of parcels designated as residential)
Highways and roads, dirt/gravel	X24		A	Low	2	Approximately 11 roads located within the protection area
Residential Areas	R01		A	Low	2	Approximately 400 acres of residential area

**Table 3**

*Contaminant Source Inventory and Risk Ranking for  
FNSB - Weller Elementary  
Sources of Nitrates/Nitrites*

**PWSID 310251.001**

<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>
Septic systems (serves one single-family home)	R02		A	Low	2	Approximately 137 septic systems (approximated by number of parcels designated as residential)
Highways and roads, dirt/gravel	X24		A	Low	2	Approximately 11 roads located within the protection area
Residential Areas	R01		A	Low	2	Approximately 400 acres of residential area

Table 4

*Contaminant Source Inventory and Risk Ranking for  
FNSB - Weller Elementary  
Sources of Volatile Organic Chemicals*

*PWSID 310251.001*

<i>Contaminant Source Type</i>	<i>Contaminant Source ID</i>	<i>CS ID tag</i>	<i>Zone</i>	<i>Risk Ranking for Analysis</i>	<i>Map Number</i>	<i>Comments</i>
Highways and roads, dirt/gravel	X24		A	Low	2	Approximately 11 roads located within the protection area
Septic systems (serves one single-family home)	R02		A	Low	2	Approximately 137 septic systems (approximated by number of parcels designated as residential)
Residential Areas	R01		A	Low	2	Approximately 400 acres of residential area
Tanks, heating oil, residential (above ground)	R08		A	Medium	2	Approximately 137 heating oil tanks (approximated by number of parcels designated as residential)
Construction trade areas and materials	C09	C09-1	A	Low	2	935 Highland Street
Open Leaking Underground Fuel Storage Tank (LUST) Sites	U07	U07-1	A	Low	2	Waste oil tank at the Firehouse
Firehouses	X38	X38-1	A	Low	2	585 Steele Creek Road



**Table 5**

*Contaminant Source Inventory and Risk Ranking for  
FNSB - Weller Elementary  
Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals*

**PWSID 310251.001**

<i>Contaminant Source Type</i>	<i>Contaminant Source ID</i>	<i>CS ID tag</i>	<i>Zone</i>	<i>Risk Ranking for Analysis</i>	<i>Map Number</i>	<i>Comments</i>
Septic systems (serves one single-family home)	R02		A	Low	2	Approximately 137 septic systems (approximated by number of parcels designated as residential)
Highways and roads, dirt/gravel	X24		A	Low	2	Approximately 11 roads located within the protection area
Residential Areas	R01		A	Low	2	Approximately 400 acres of residential area
Construction trade areas and materials	C09	C09-1	A	Low	2	935 Highland Street
Firehouses	X38	X38-1	A	Low	2	585 Steele Creek Road

**Table 6**

*Contaminant Source Inventory and Risk Ranking for  
FNSB - Weller Elementary  
Sources of Synthetic Organic Chemicals*

**PWSID 310251.001**

<i>Contaminant Source Type</i>	<i>Contaminant Source ID</i>	<i>CS ID tag</i>	<i>Zone</i>	<i>Risk Ranking for Analysis</i>	<i>Map Number</i>	<i>Comments</i>
Residential Areas	R01		A	Low	2	Approximately 400 acres of residential area
Septic systems (serves one single-family home)	R02		A	Low	2	Approximately 137 septic systems (approximated by number of parcels designated as residential)

**Table 7**

*Contaminant Source Inventory and Risk Ranking for  
FNSB - Weller Elementary  
Sources of Other Organic Chemicals*

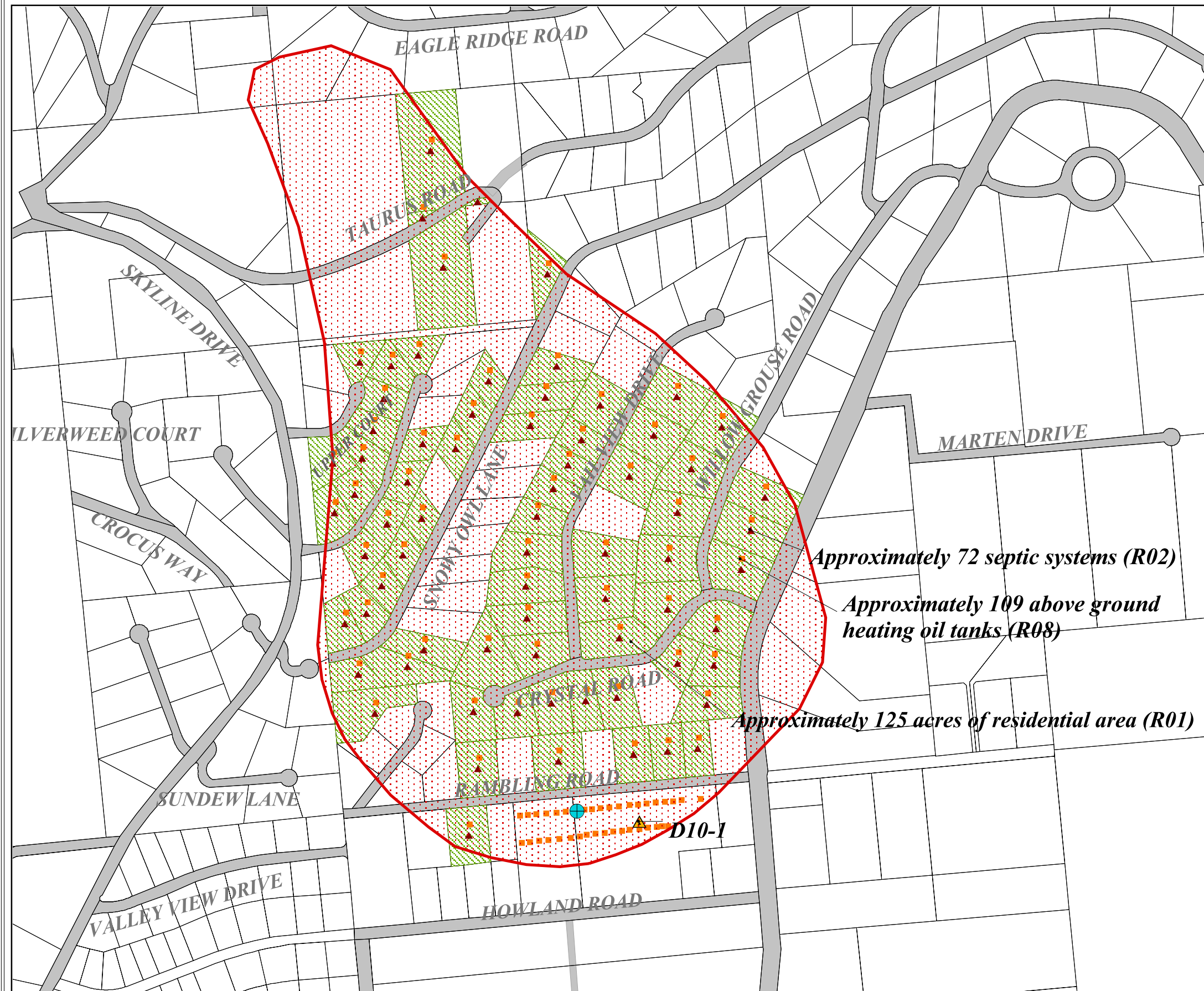
**PWSID 310251.001**

<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>
Highways and roads, dirt/gravel	X24		A	Low	2	Approximately 11 roads located within the protection area
Septic systems (serves one single-family home)	R02		A	Low	2	Approximately 137 septic systems (approximated by number of parcels designated as residential)
Residential Areas	R01		A	Low	2	Approximately 400 acres of residential area
Construction trade areas and materials	C09	C09-1	A	Low	2	935 Highland Street

## **APPENDIX C**

### **Wildwood Mobile Home Park Drinking Water Protection Area and Potential and Existing Contaminant Sources (Map 2)**

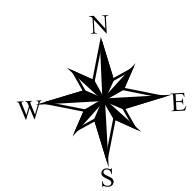
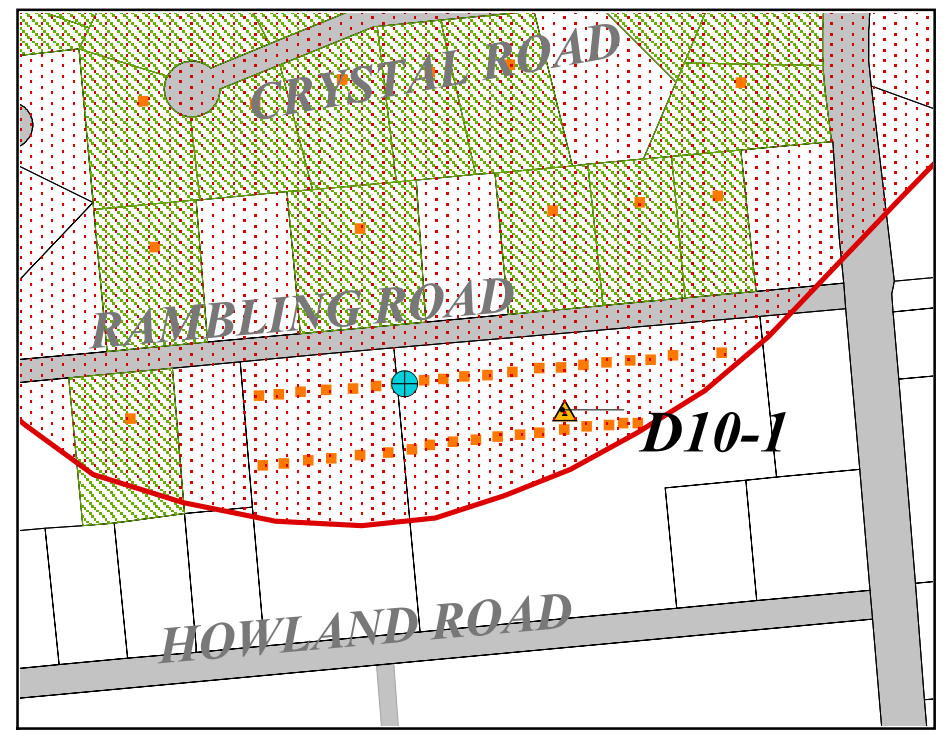
# Wildwood Mobile Home Park Drinking Water Protection Area with Potential and Existing Contaminant Sources



Approximately 72 septic systems (R02)  
 Approximately 109 above ground heating oil tanks (R08)  
 Approximately 125 acres of residential area (R01)

### Legend

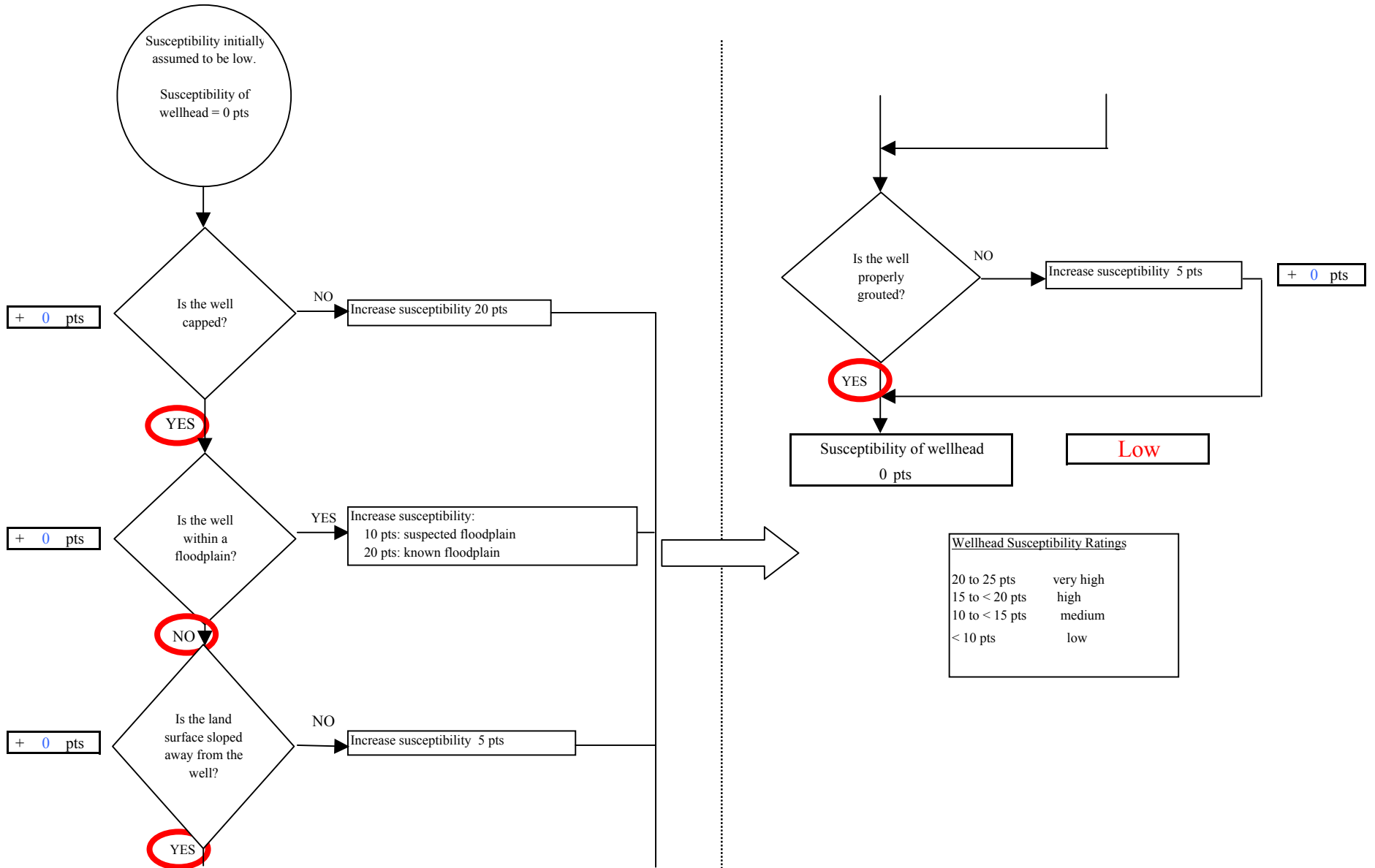
- Wildwood Mobile Home Park Well
- Zone A Protection Area
- Contaminant Sources**
- Large Capacity Septic Systems (D10)
- Residential septic systems (R02)
- Residential above ground heating oil tanks (R08)
- Residential Area (R01)
- Parcels
- Roads



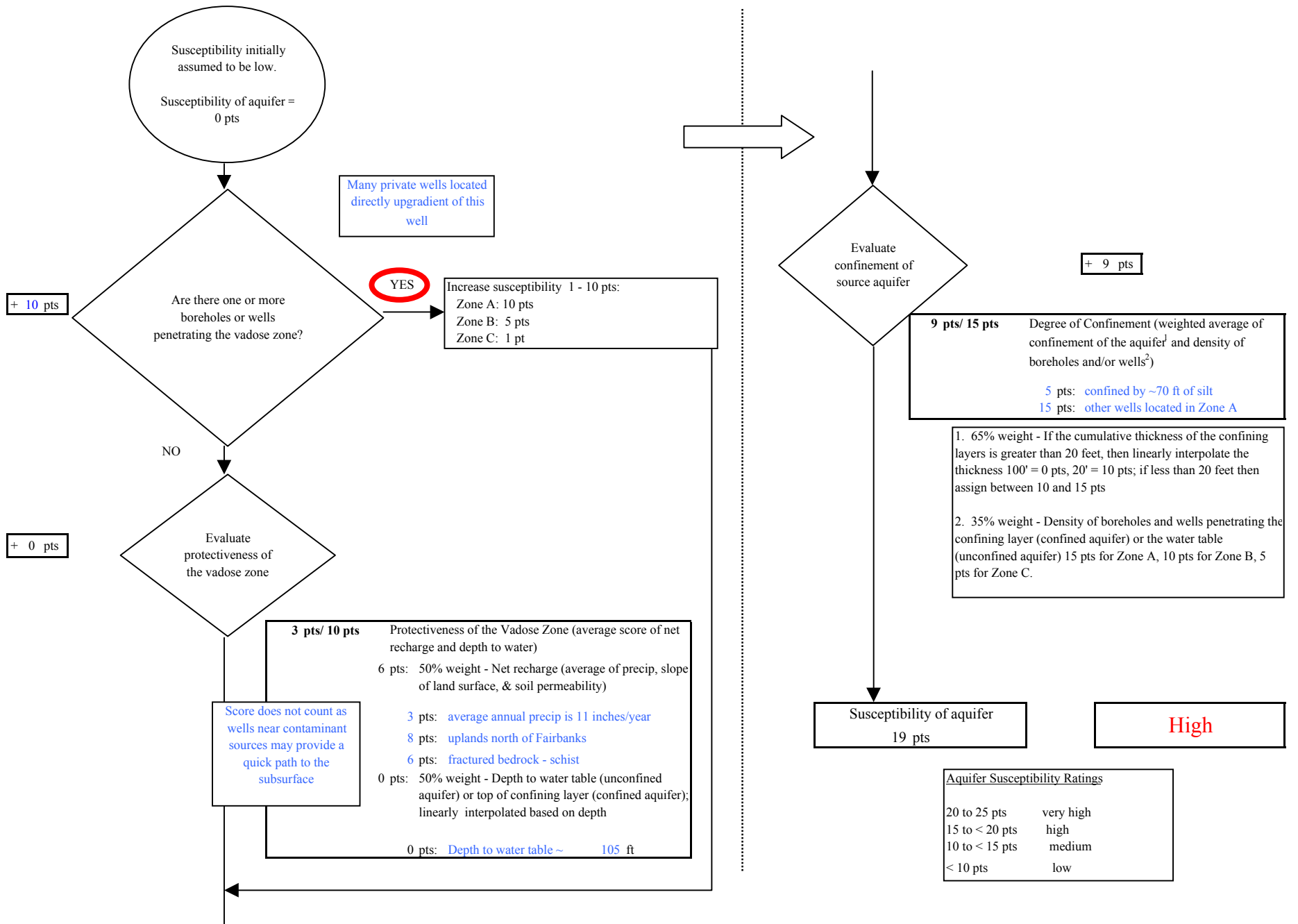
## **APPENDIX D**

### **Vulnerability Analysis for Wildwood Mobile Home Park Public Drinking Water Source (Charts 1-14)**

**Chart 1. Susceptibility of the wellhead - Wildwood Mobile Home Park**

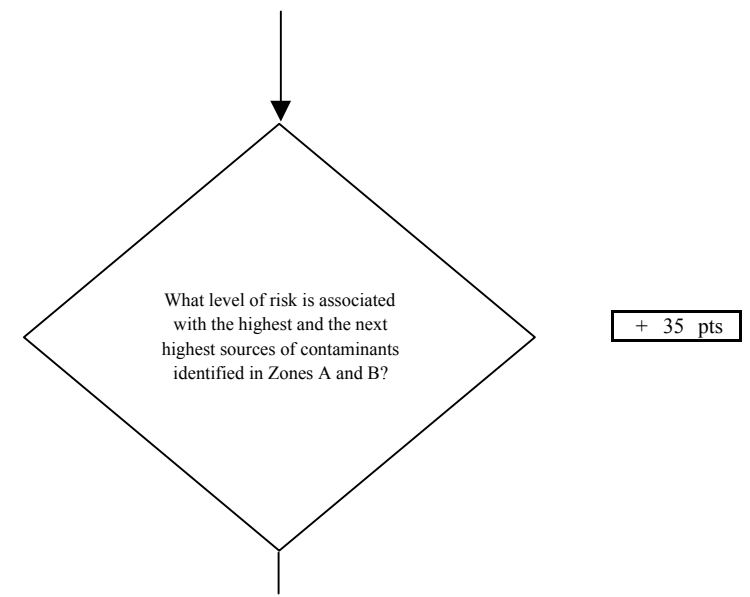
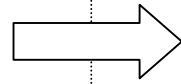
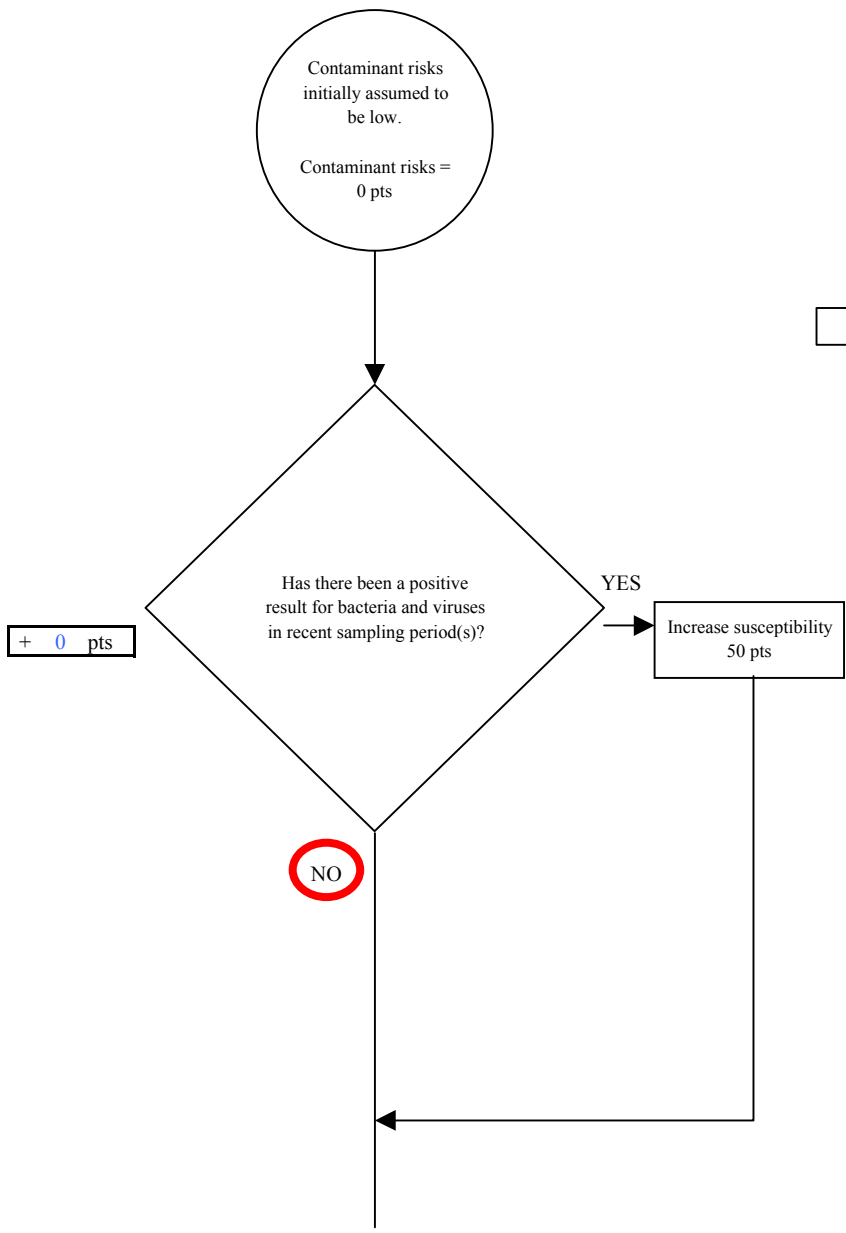


**Chart 2. Susceptibility of the aquifer - Wildwood Mobile Home Park**





**Chart 3. Contaminant risks for Wildwood Mobile Home Park - Bacteria & Viruses**



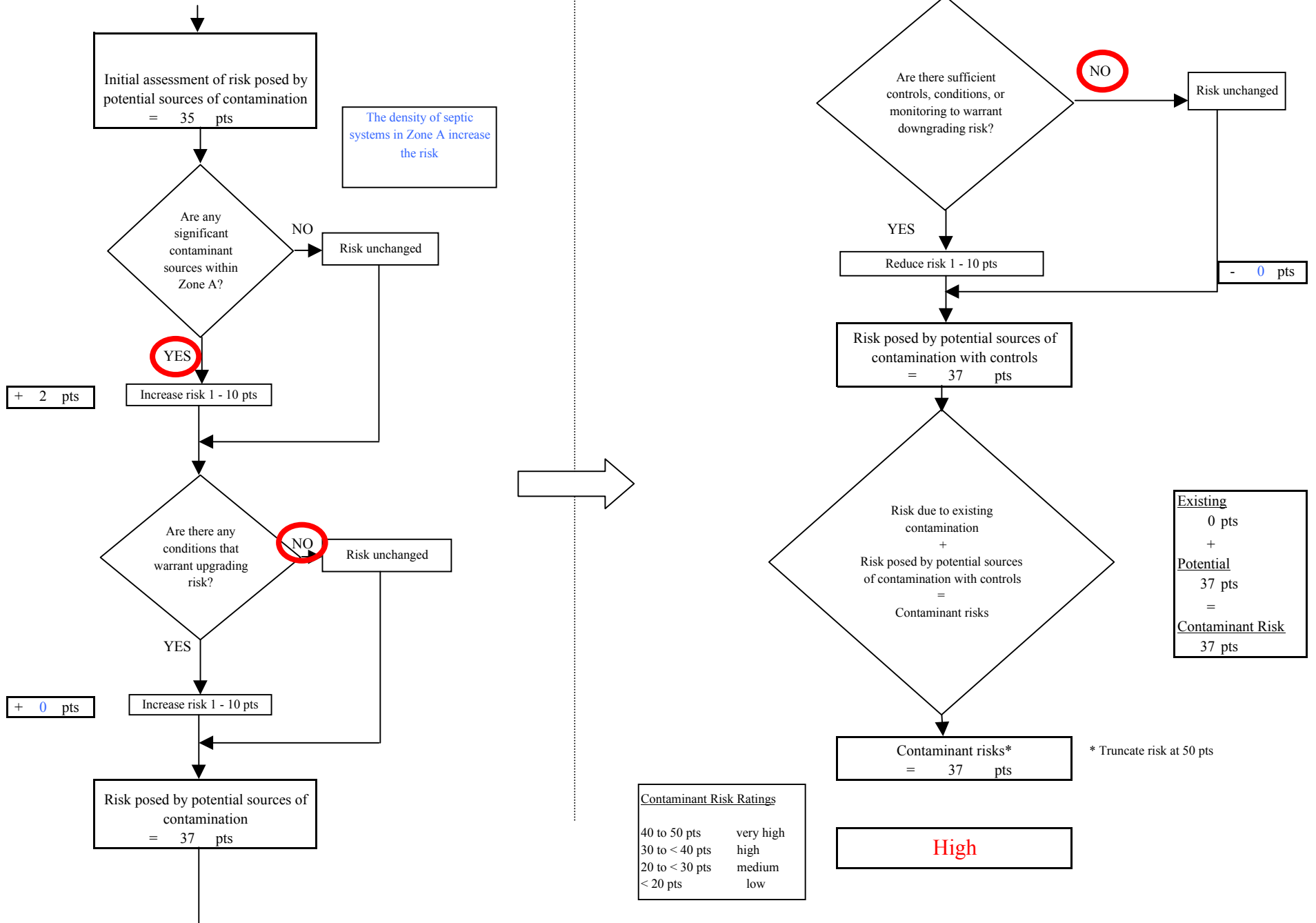
Risk Rankings for Contaminant Sources Identified in Zones A and B			
	Zone A	Zone B	Total
Very High(s)	0	0	0
High(s)	1	0	1
Medium(s)	0	0	0
Low(s)	76	0	76

	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	≥ 3 sources + 5 pts	≥ 10 sources + 5 pts
HIGH	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
VERY HIGH	----	----	----	≥ 1 source + 10 pts

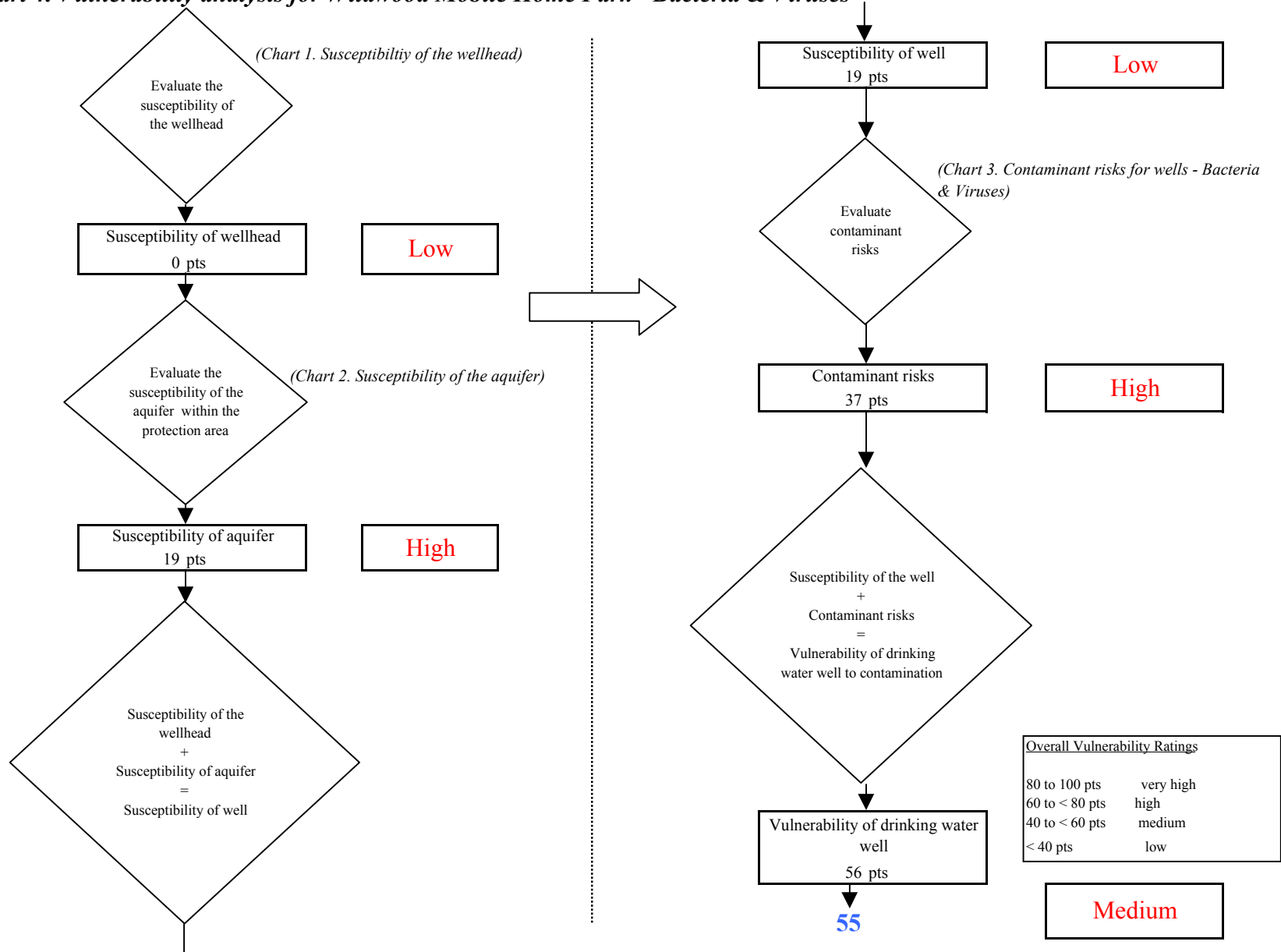
Matrix Score 35

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.

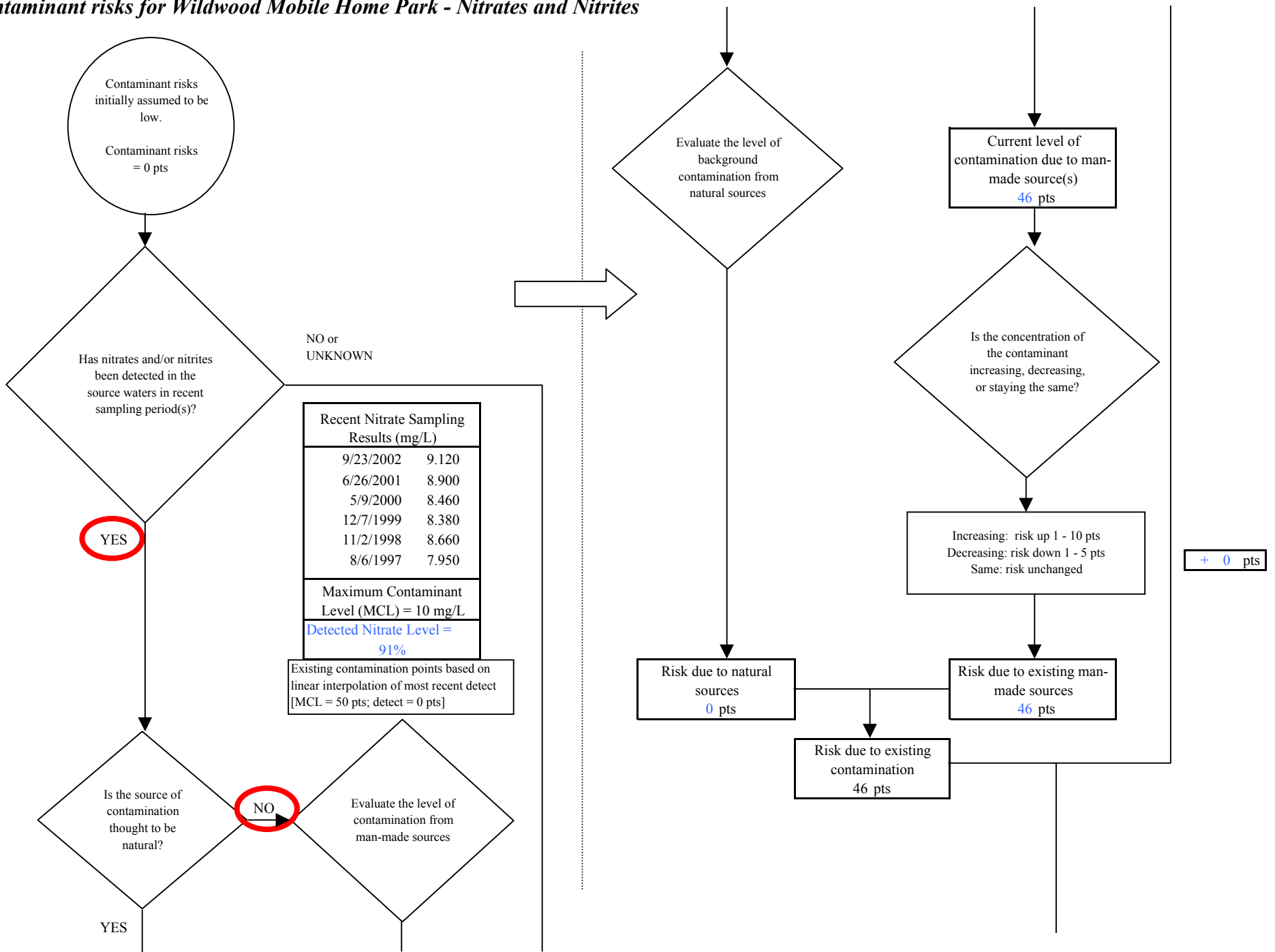
**Chart 3. Contaminant risks for Wildwood Mobile Home Park - Bacteria & Viruses**



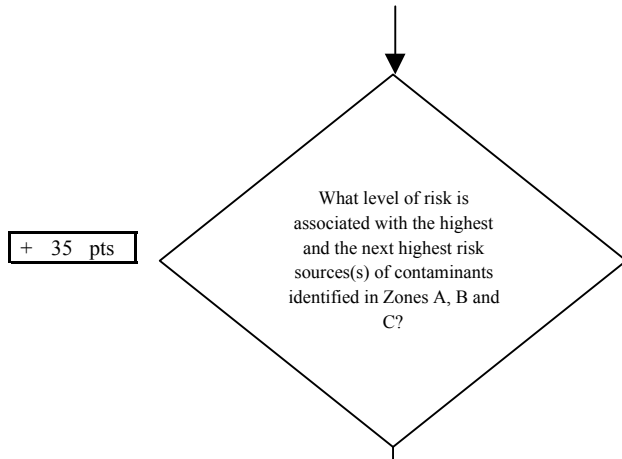
**Chart 4. Vulnerability analysis for Wildwood Mobile Home Park - Bacteria & Viruses**



**Chart 5. Contaminant risks for Wildwood Mobile Home Park - Nitrates and Nitrites**



**Chart 5. Contaminant risks for Wildwood Mobile Home Park - Nitrates and Nitrites**



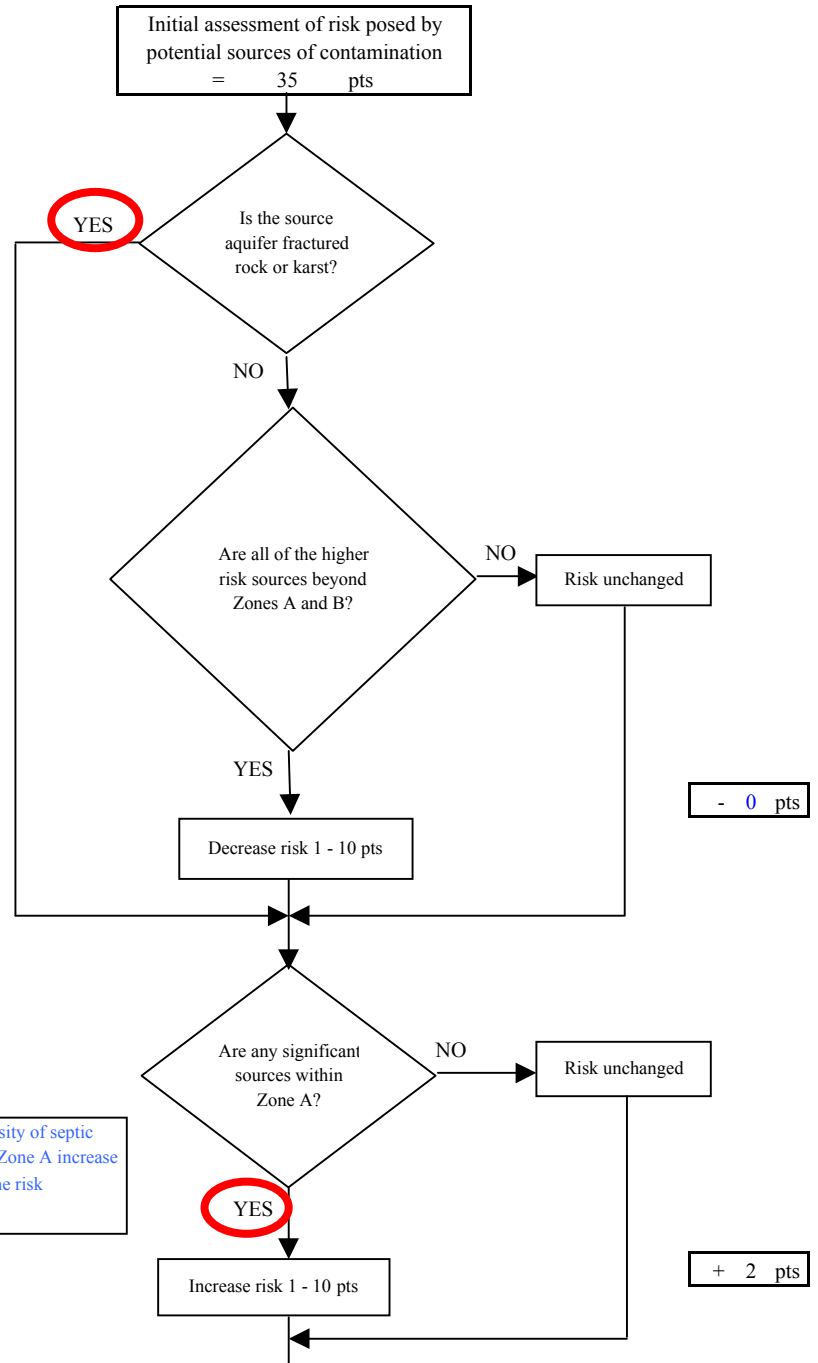
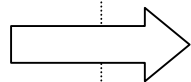
+ 35 pts

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)	1	0	1
Medium(s)	0	0	0
Low(s)	76	0	76

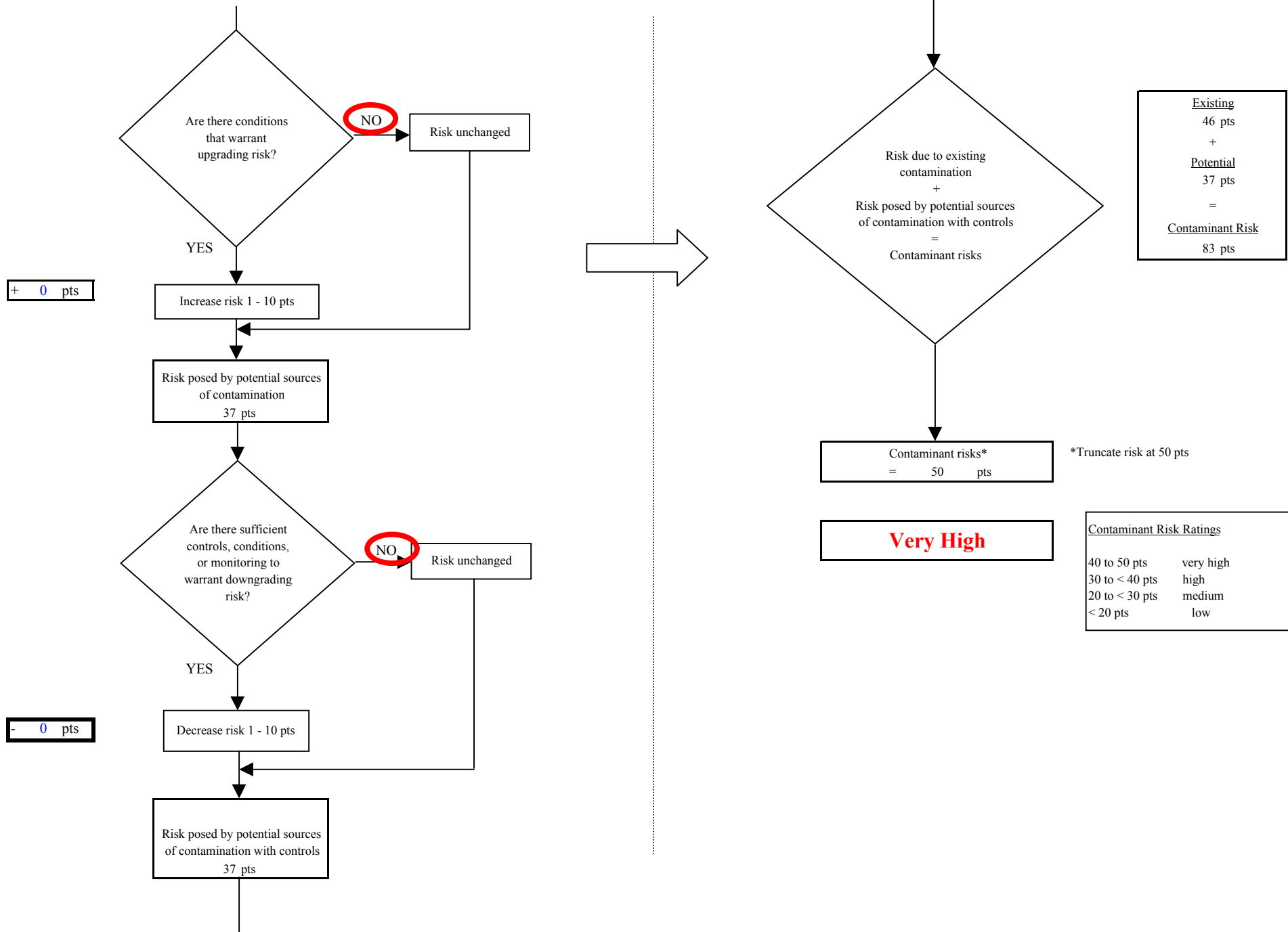
	LOW 10 pts	MEDIUM 20 pts	HIGH 30 pts	VERY HIGH 40 pts
<b>LOW</b>	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
<b>MEDIUM</b>	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
<b>HIGH</b>	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
<b>VERY HIGH</b>	----	----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

Matrix Score 35

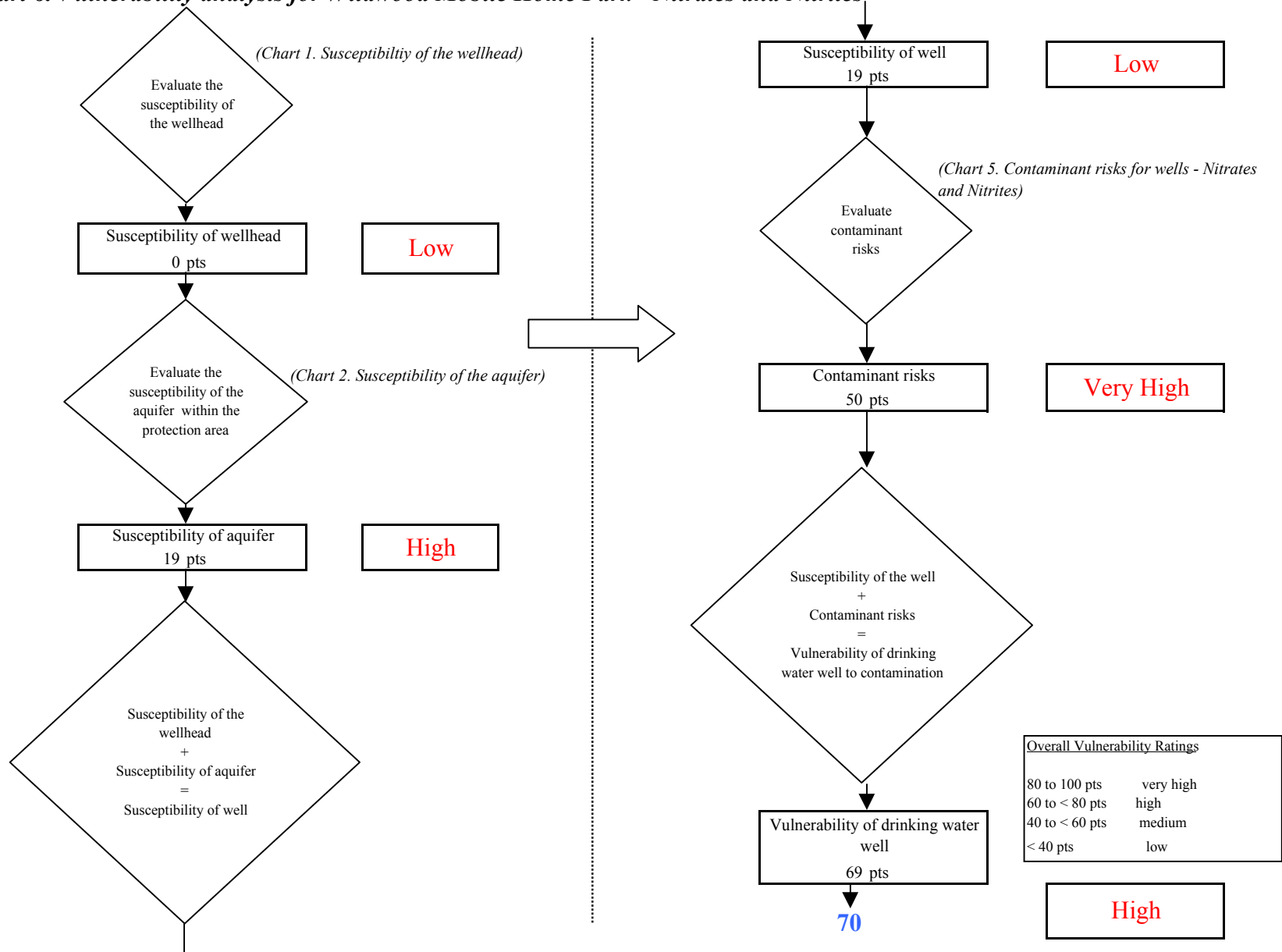
Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.



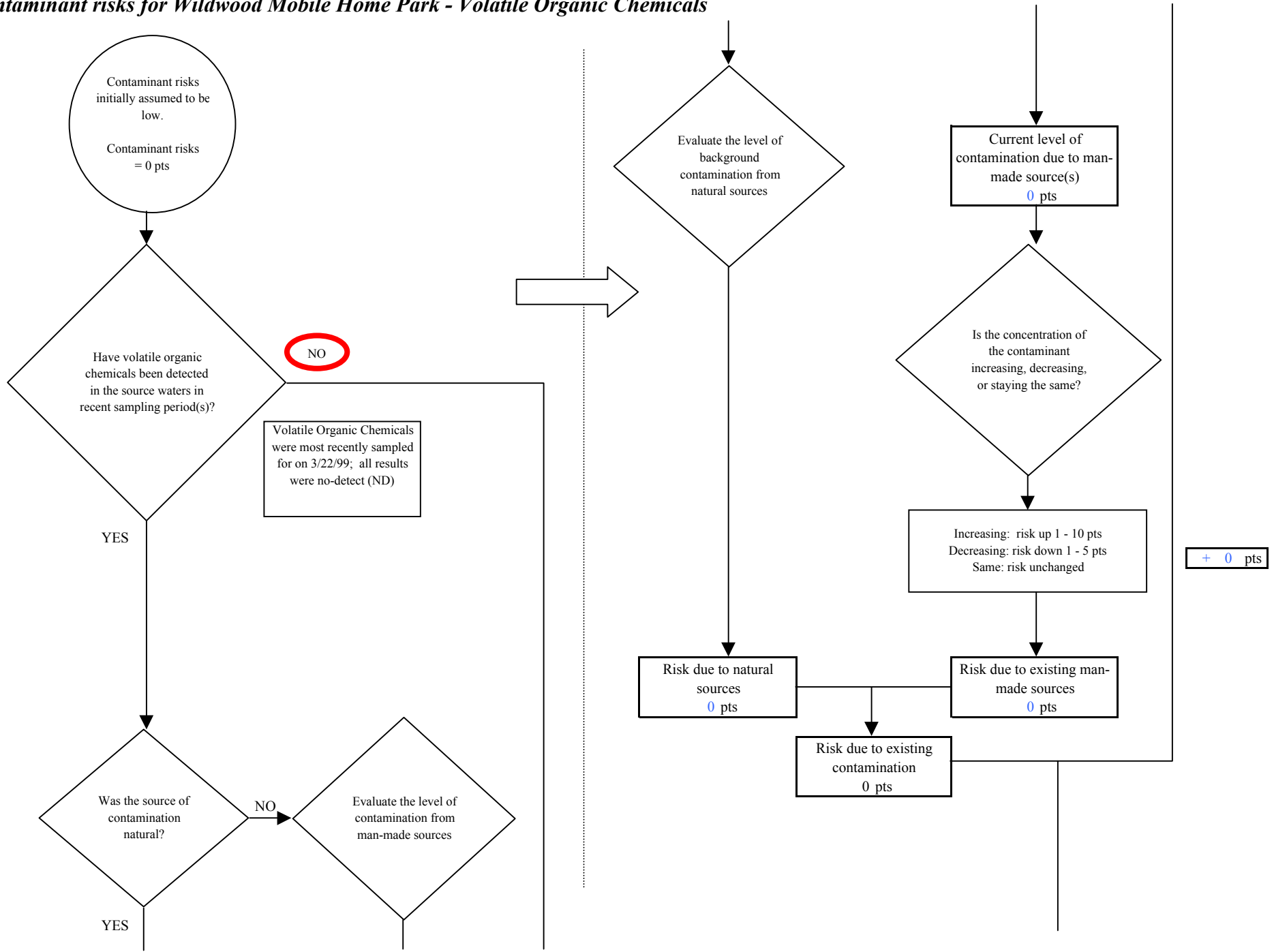
**Chart 5. Contaminant risks for Wildwood Mobile Home Park - Nitrates and Nitrites**



**Chart 6. Vulnerability analysis for Wildwood Mobile Home Park - Nitrates and Nitrites**

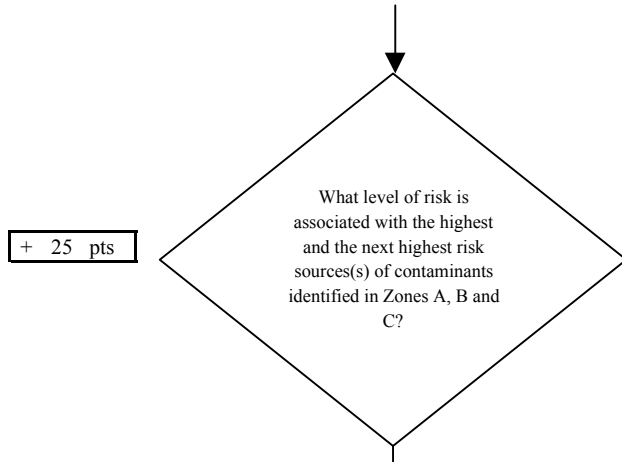


**Chart 7. Contaminant risks for Wildwood Mobile Home Park - Volatile Organic Chemicals**





**Chart 7. Contaminant risks for Wildwood Mobile Home Park - Volatile Organic Chemicals**



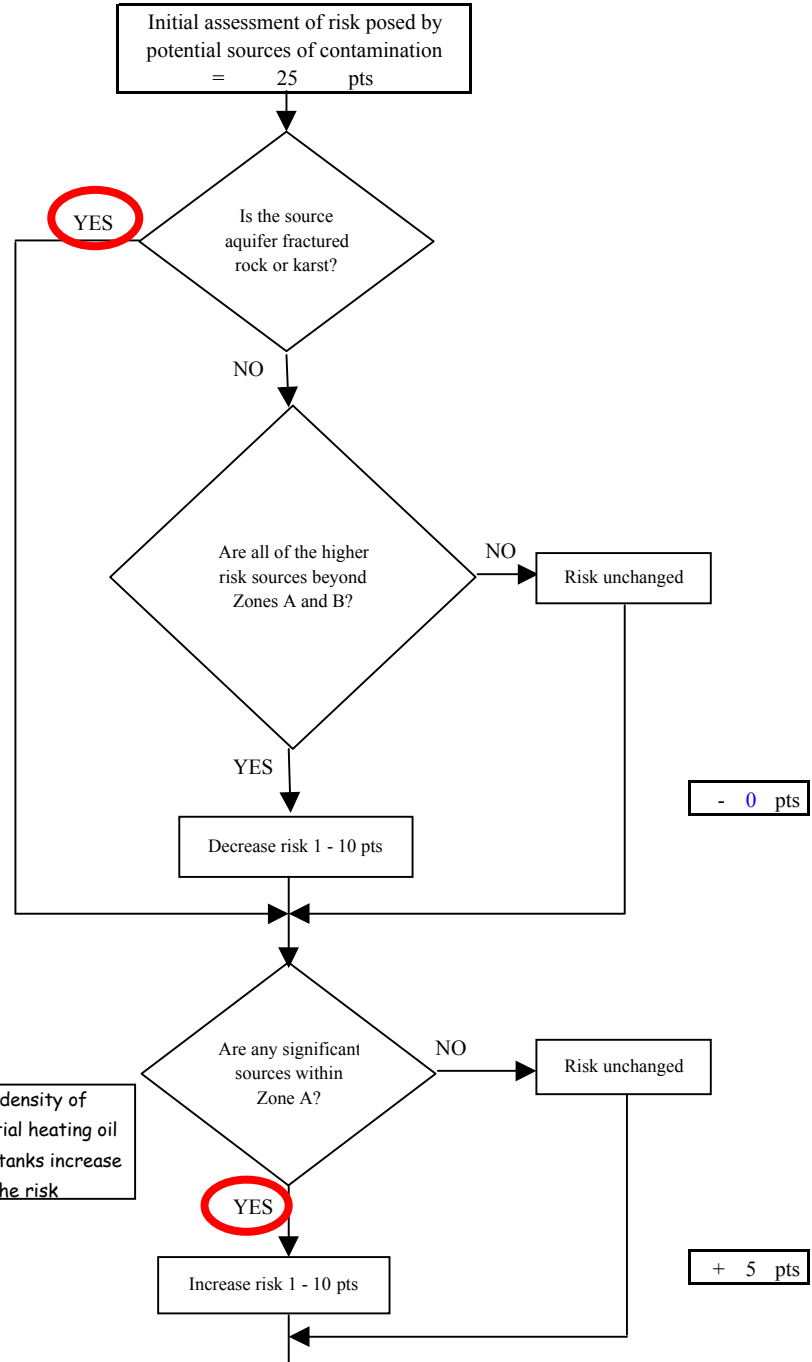
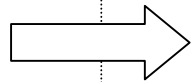
+ 25 pts

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	0	0
Medium(s)	110	0	110
Low(s)	9	0	9

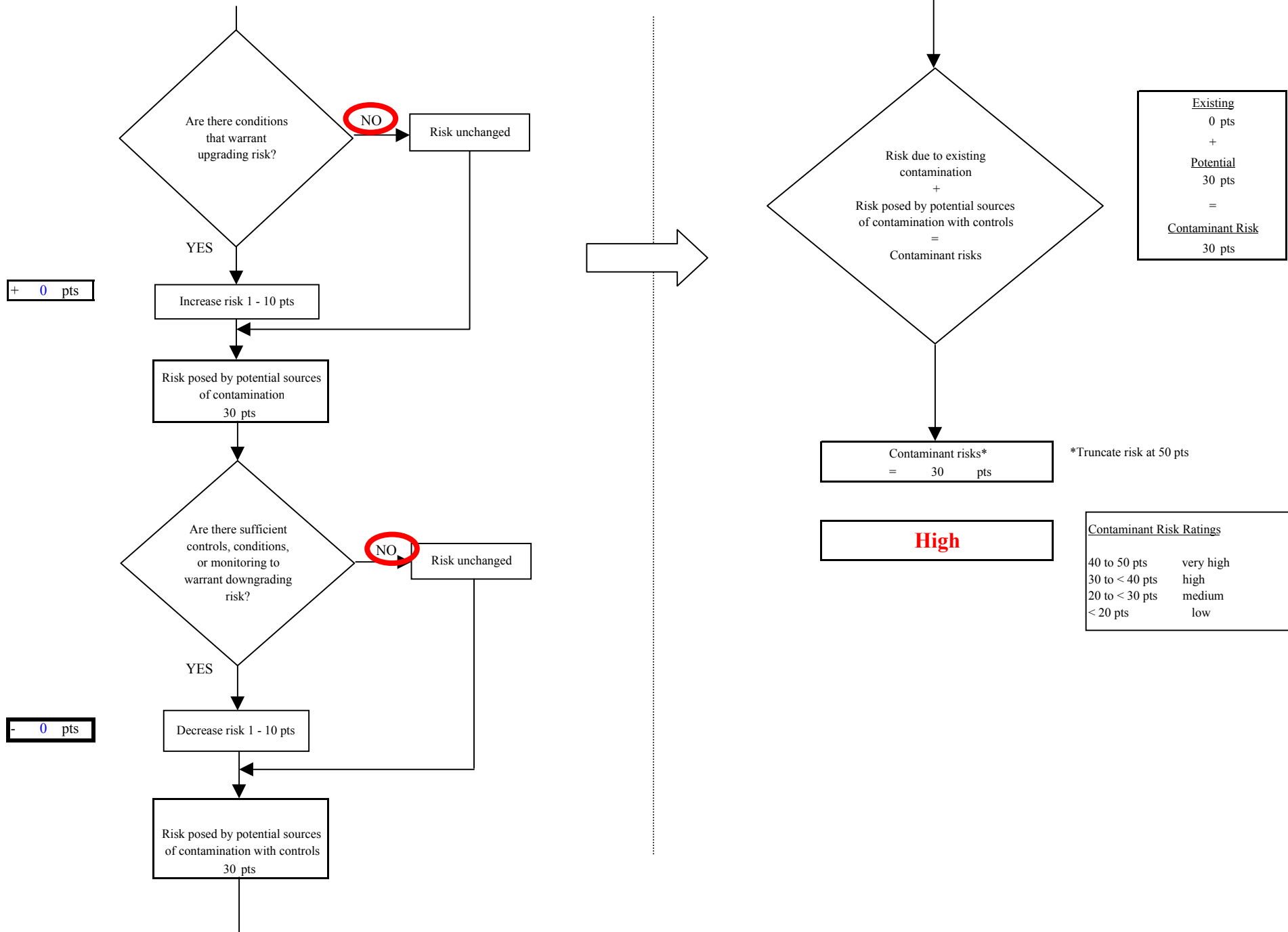
	LOW 10 pts	MEDIUM 20 pts	HIGH 30 pts	VERY HIGH 40 pts
<b>LOW</b>	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
<b>MEDIUM</b>	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
<b>HIGH</b>	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 pts
<b>VERY HIGH</b>	----	----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

Matrix Score 25

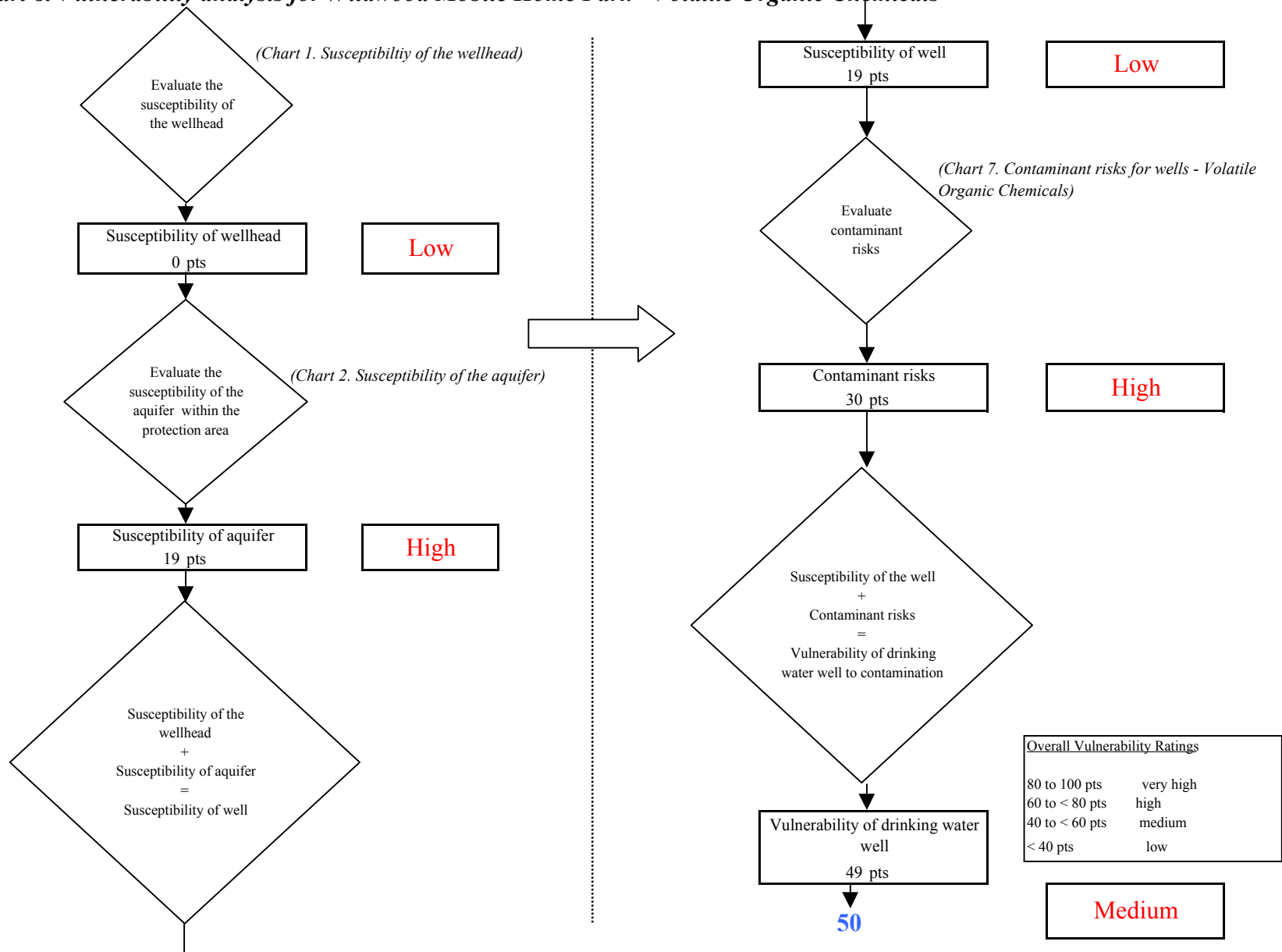
Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.



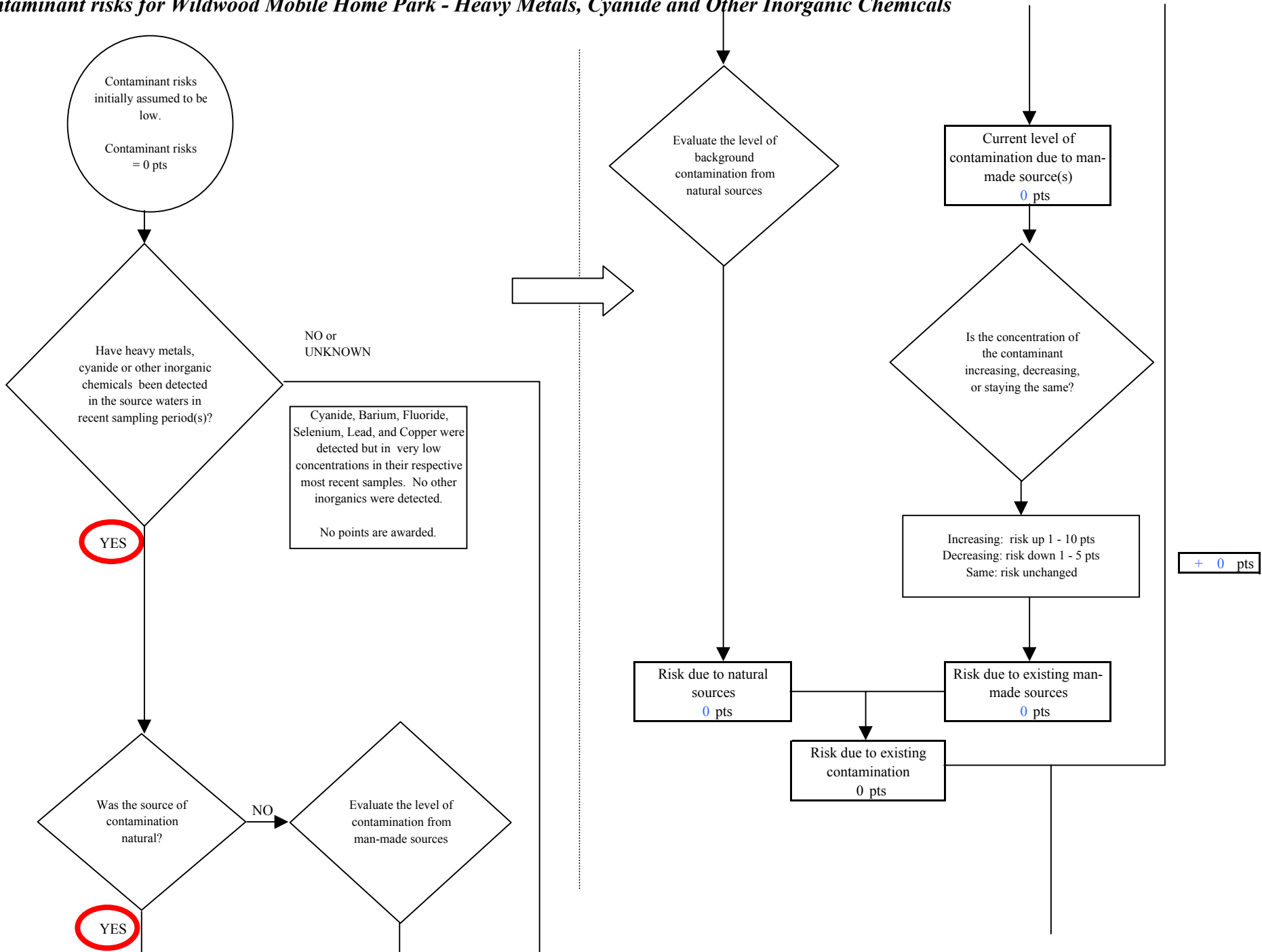
**Chart 7. Contaminant risks for Wildwood Mobile Home Park - Volatile Organic Chemicals**



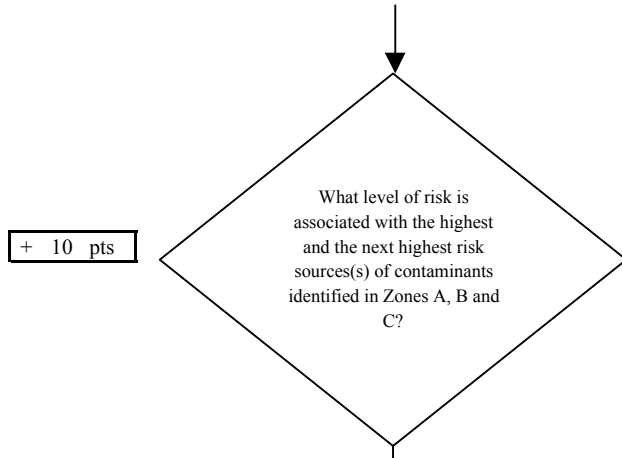
**Chart 8. Vulnerability analysis for Wildwood Mobile Home Park - Volatile Organic Chemicals**



**Chart 9. Contaminant risks for Wildwood Mobile Home Park - Heavy Metals, Cyanide and Other Inorganic Chemicals**



**Chart 9. Contaminant risks for Wildwood Mobile Home Park - Heavy Metals, Cyanide and Other Inorganic Chemicals**



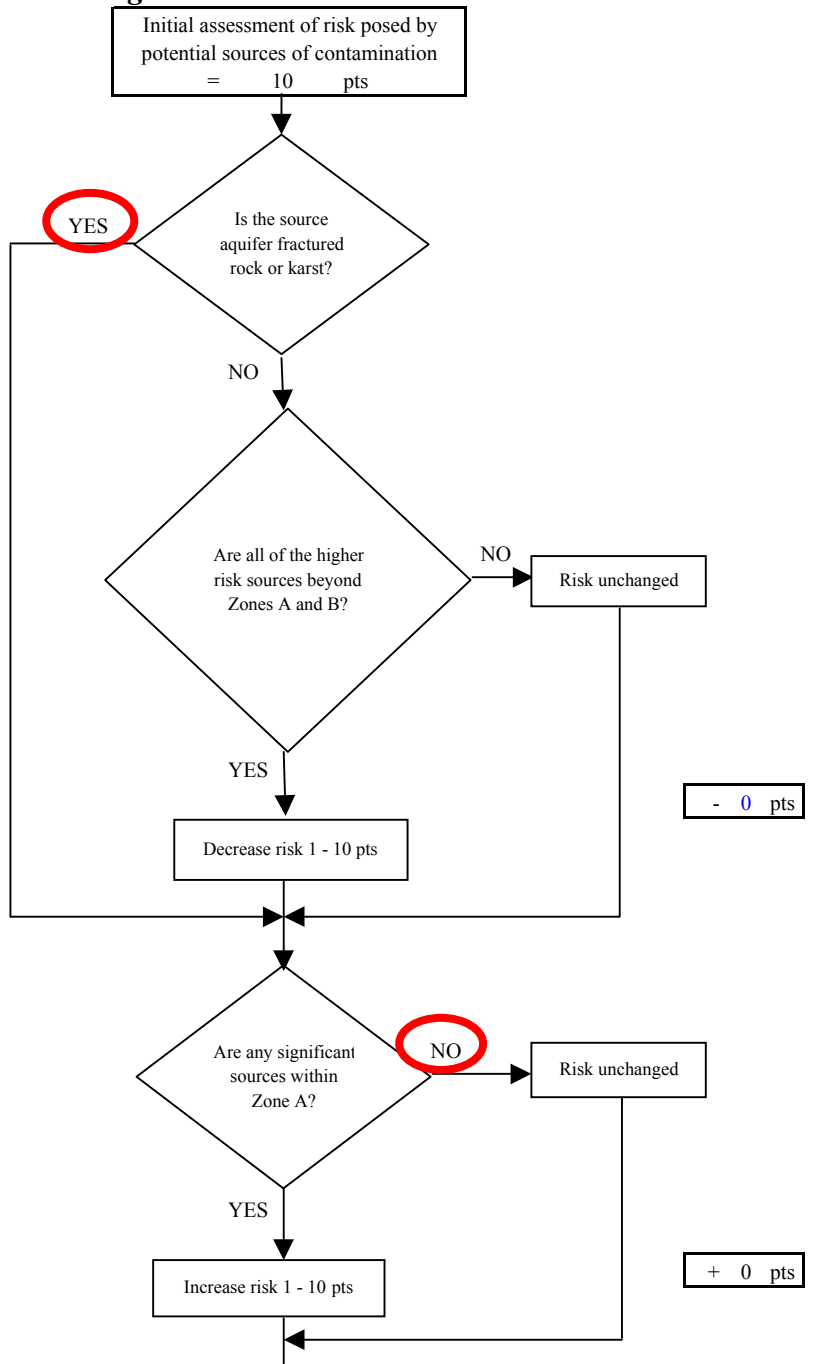
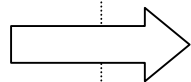
+ 10 pts

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	0	0
Medium(s)	0	0	0
Low(s)	5	0	5

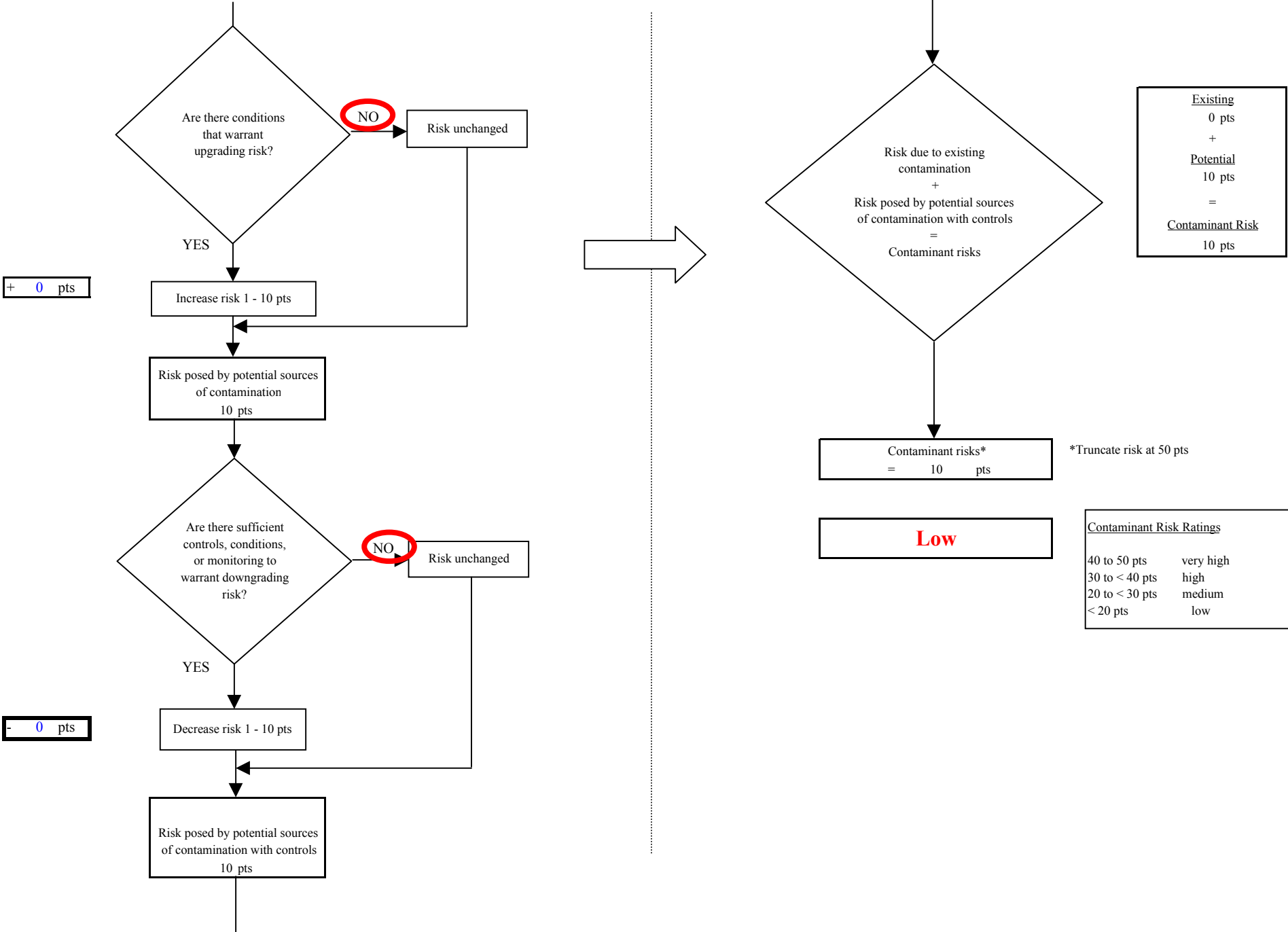
	<b>LOW</b> 10 pts	<b>MEDIUM</b> 20 pts	<b>HIGH</b> 30 pts	<b>VERY HIGH</b> 40 pts
<b>LOW</b>	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
<b>MEDIUM</b>	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
<b>HIGH</b>	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10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

Matrix Score 10

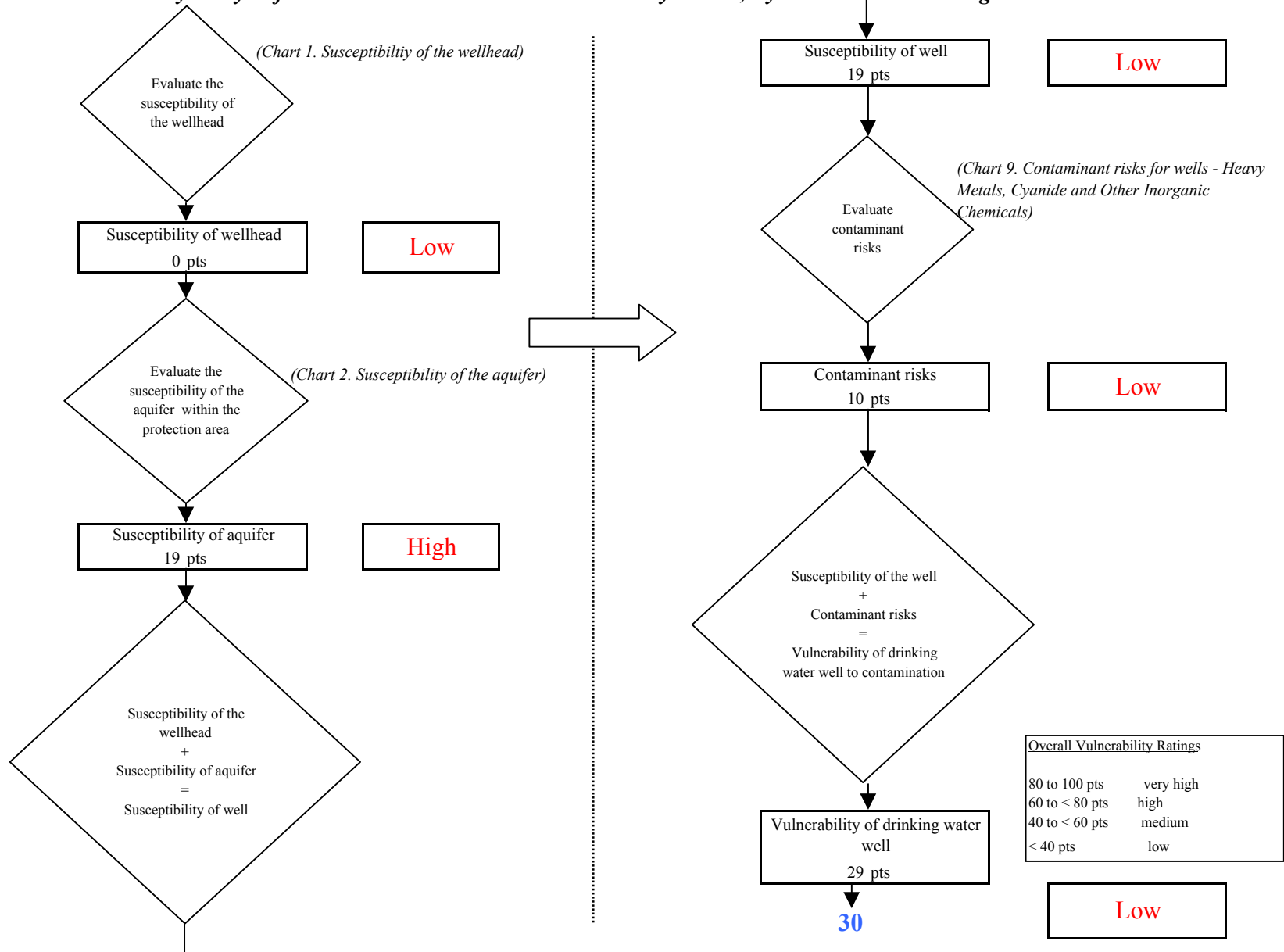
Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.



**Chart 9. Contaminant risks for Wildwood Mobile Home Park - Heavy Metals, Cyanide and Other Inorganic Chemicals**



**Chart 10. Vulnerability analysis for Wildwood Mobile Home Park - Heavy Metals, Cyanide and Other Inorganic Chemicals**



**Chart 11. Contaminant risks for Wildwood Mobile Home Park - Synthetic Organic Chemicals**

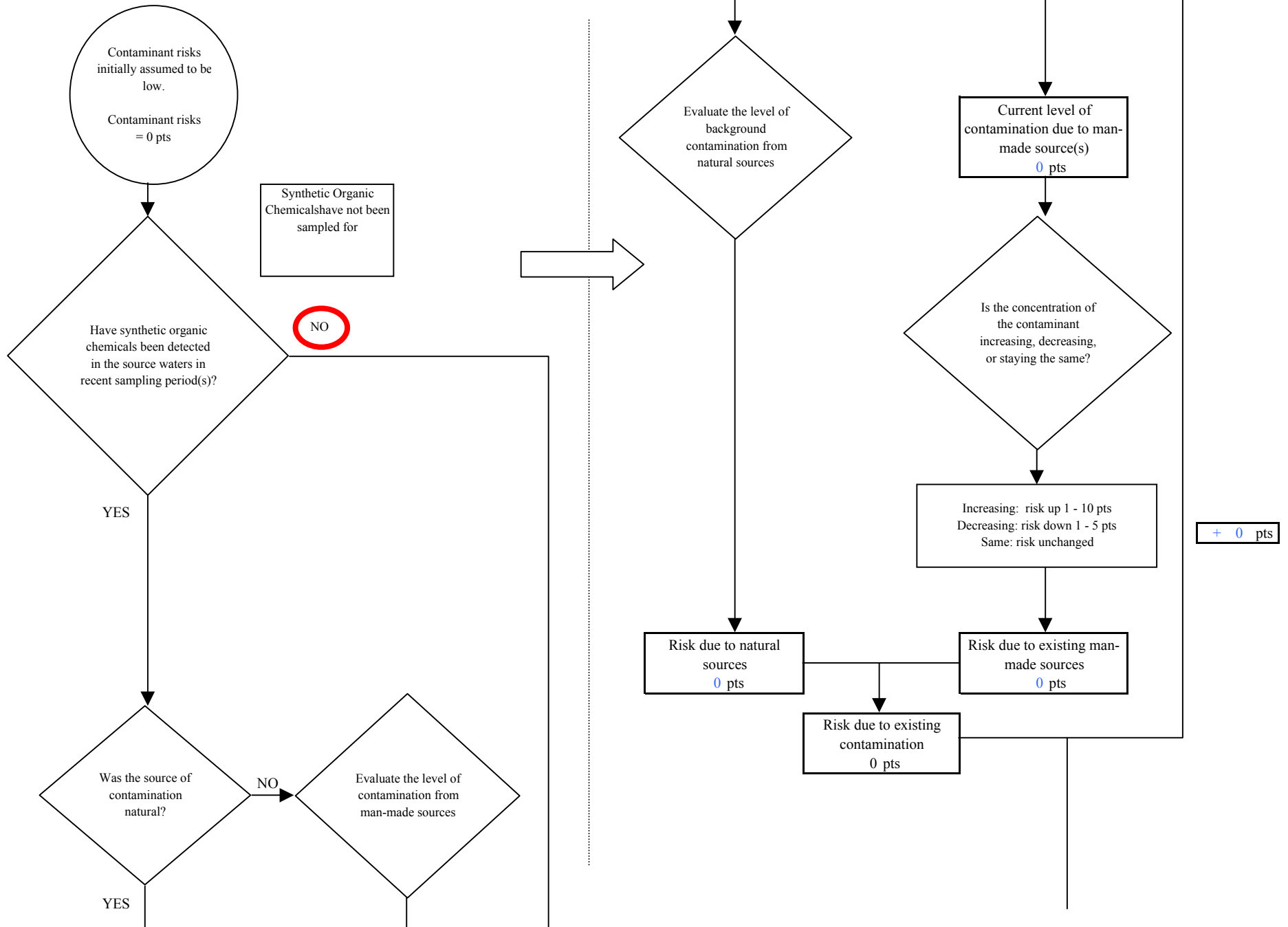
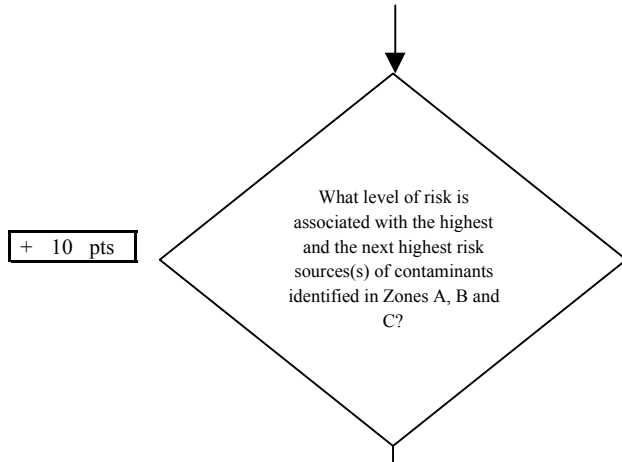




Chart 11. Contaminant risks for Wildwood Mobile Home Park - Synthetic Organic Chemicals

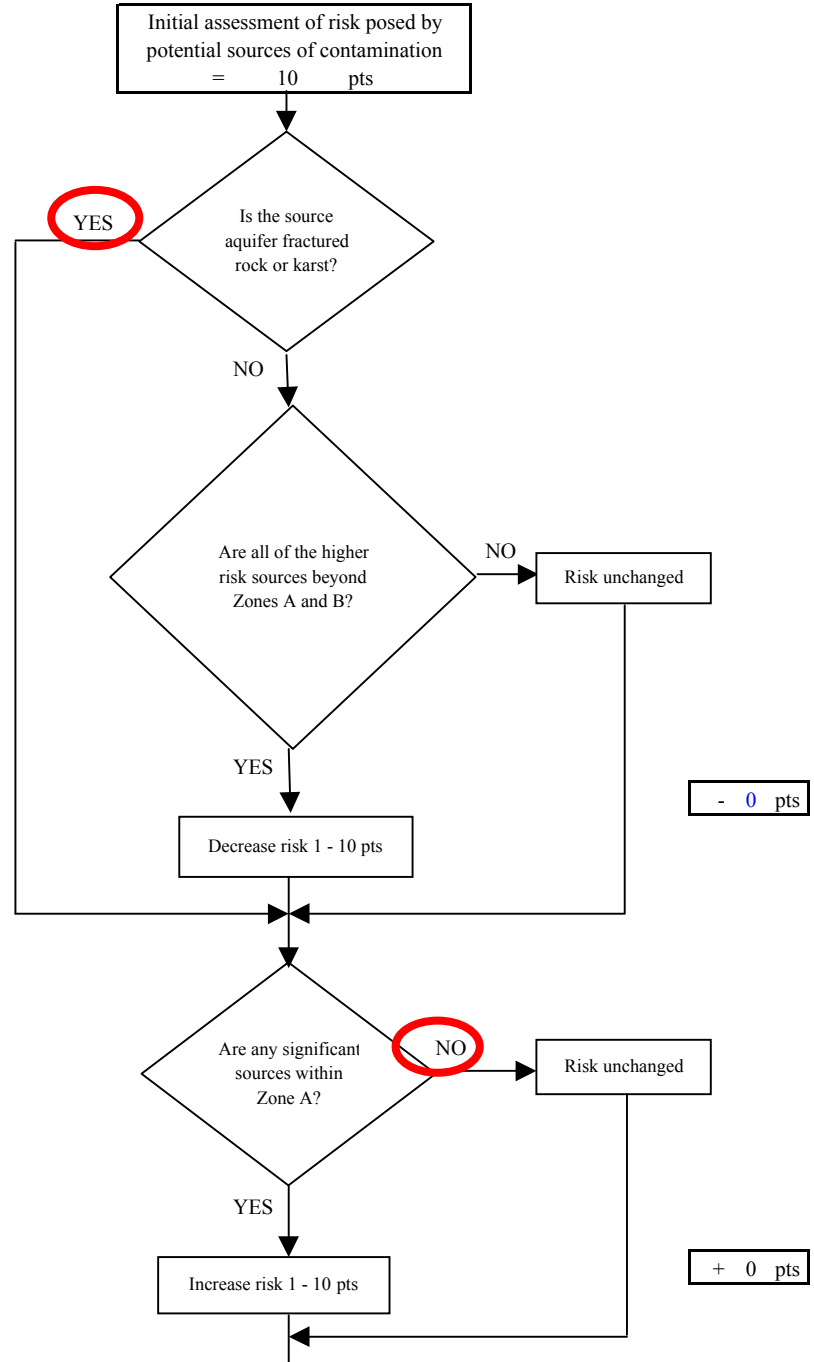
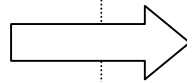


Risk Levels for Contaminant Sources identified in Zones A, B and C			
	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	0	0	0
Medium(s)	0	0	0
Low(s)	3	0	3

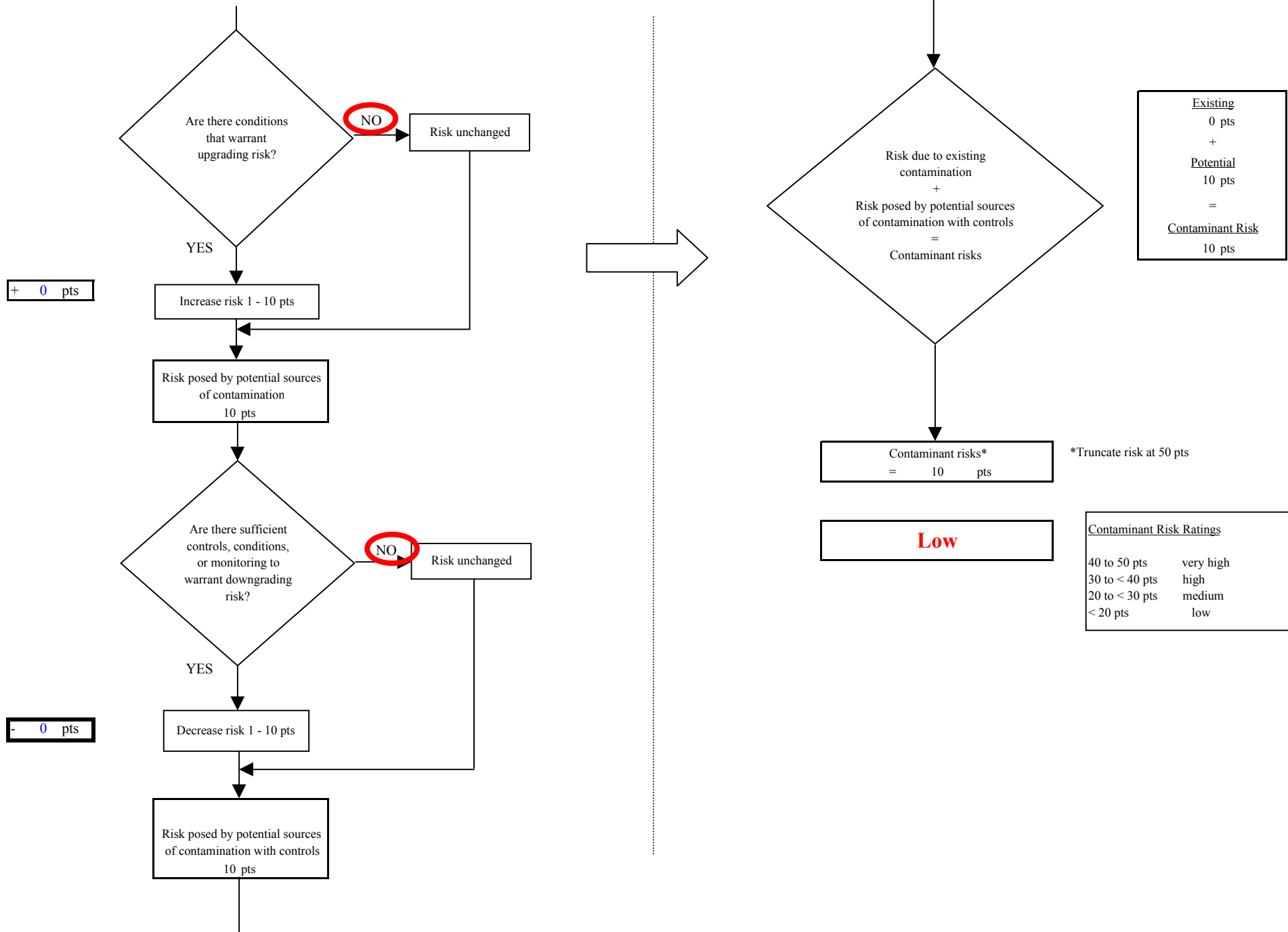
	<b>LOW</b> 10 pts	<b>MEDIUM</b> 20 pts	<b>HIGH</b> 30 pts	<b>VERY HIGH</b> 40 pts
<b>LOW</b>	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
<b>MEDIUM</b>	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
<b>HIGH</b>	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10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

Matrix Score 10

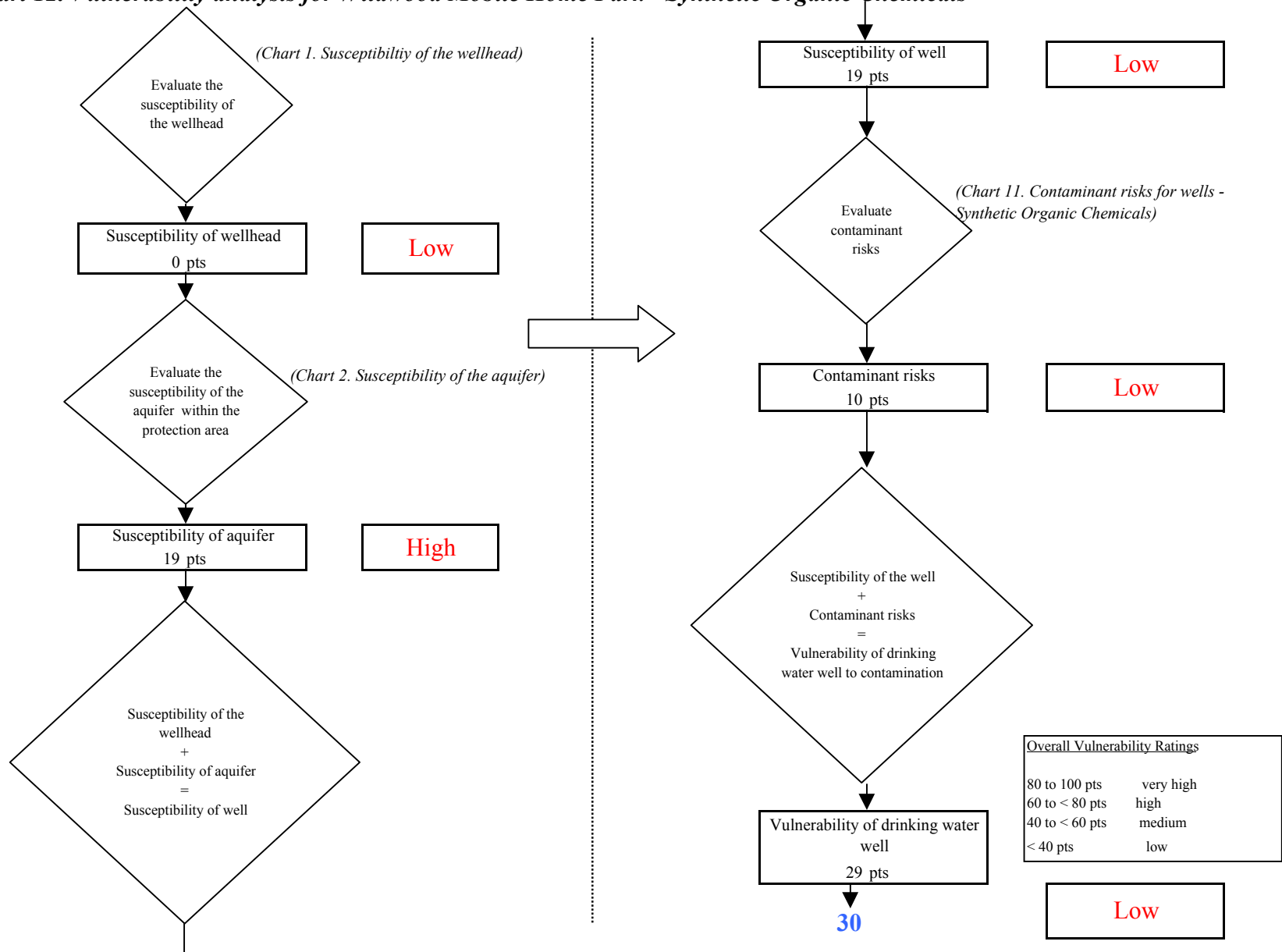
Note: Septic systems, sewerlines, and roads are each assigned a risk ranking for each individual contaminant source in the CSI. The VA, however, counts these contaminant sources as a group and assigns a calculated number of either "lows" or "mediums" based on the density.



**Chart 11. Contaminant risks for Wildwood Mobile Home Park - Synthetic Organic Chemicals**



**Chart 12. Vulnerability analysis for Wildwood Mobile Home Park - Synthetic Organic Chemicals**



**Chart 13. Contaminant risks for Wildwood Mobile Home Park - Other Organic Chemicals**

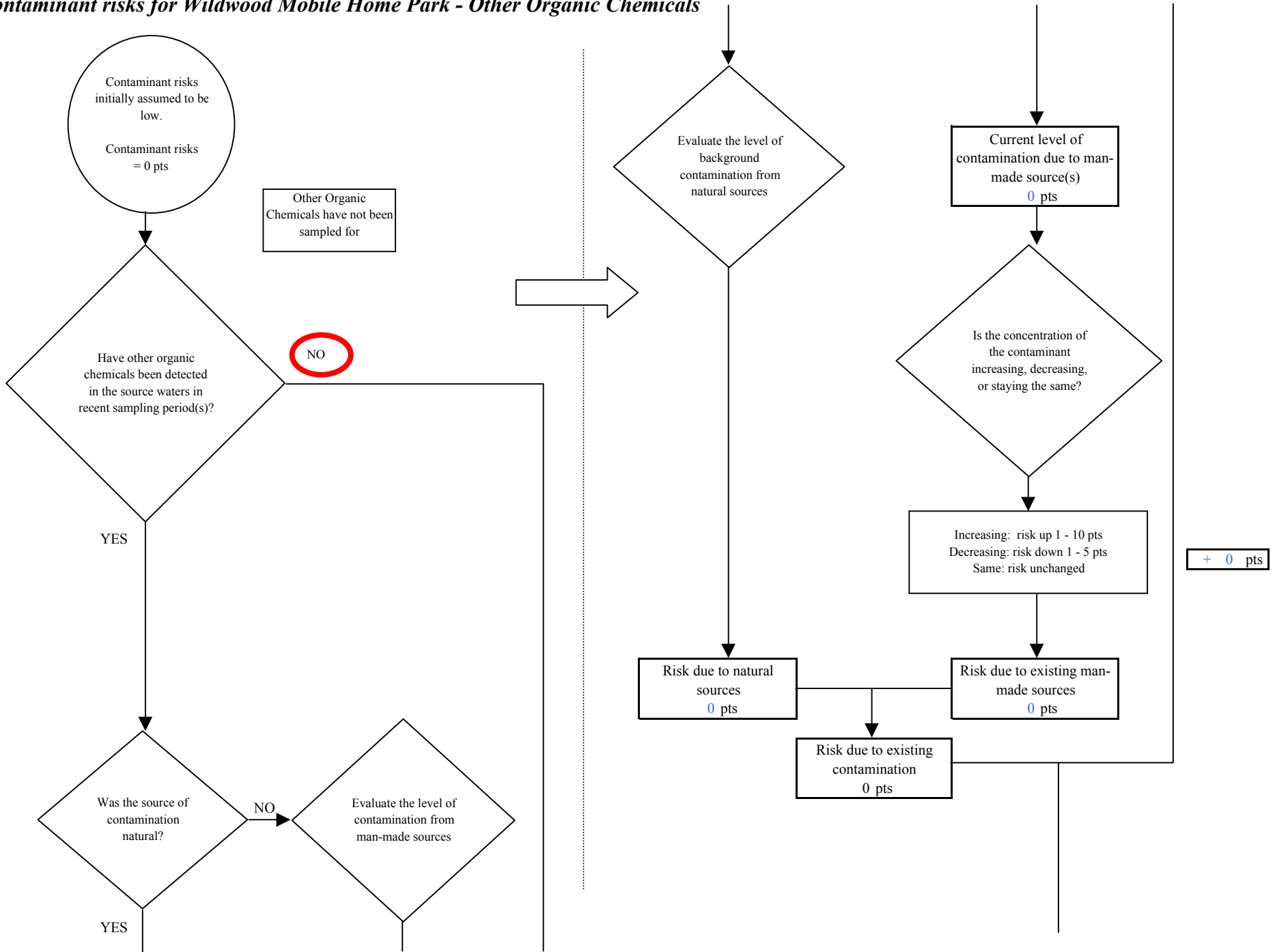
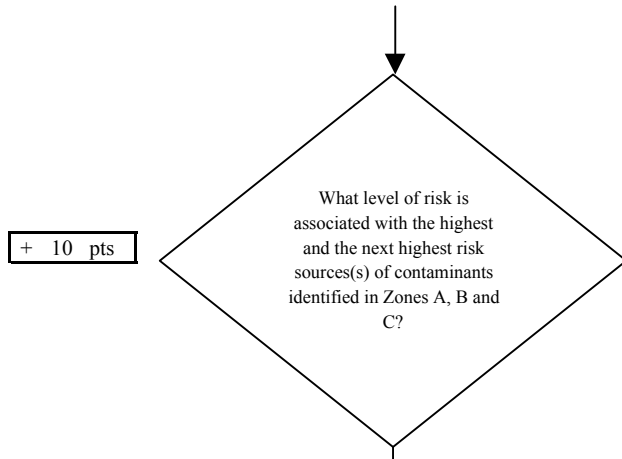


Chart 13. Contaminant risks for Wildwood Mobile Home Park - Other Organic Chemicals

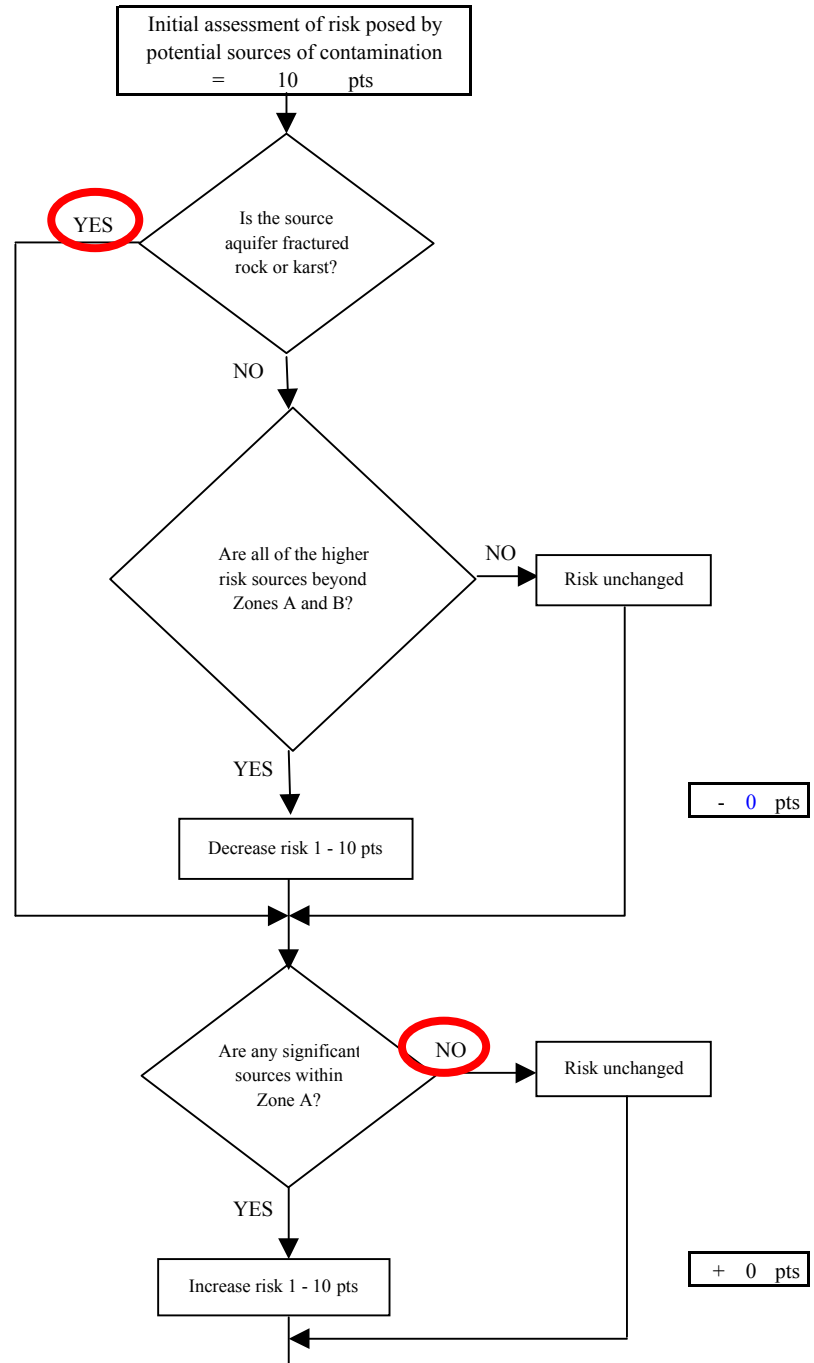
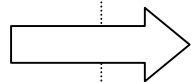


Risk Levels for Contaminant Sources identified in Zones A, B and C			
	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	0	0	0
Medium(s)	0	0	0
Low(s)	4	0	4

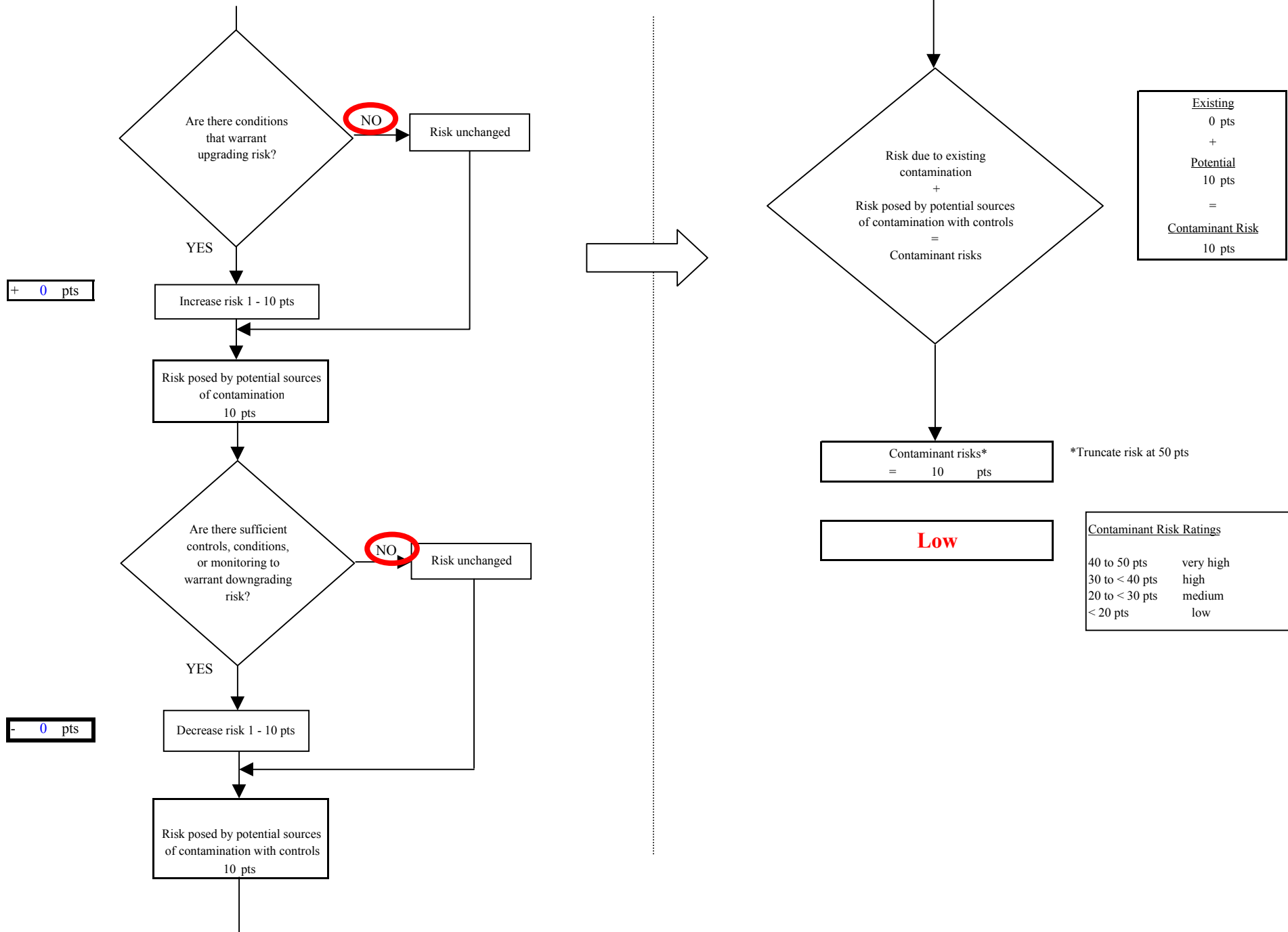
	<b>LOW</b> 10 pts	<b>MEDIUM</b> 20 pts	<b>HIGH</b> 30 pts	<b>VERY HIGH</b> 40 pts
<b>LOW</b>	≥ 10 sources + 10 pts	≥ 10 sources + 5 pts	≥ 20 sources + 5 pts	----
<b>MEDIUM</b>	----	≥ 2 sources + 5 pts	≥ 5 sources + 5 pts	≥ 10 sources + 5 pts
<b>HIGH</b>	----	----	≥ 1 source + 10 pts	≥ 2 sources + 10 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 13. Contaminant risks for Wildwood Mobile Home Park - Other Organic Chemicals**



**Chart 14. Vulnerability analysis for Wildwood Mobile Home Park - Other Organic Chemicals**

