Source Water Assessment

A Hydrogeologic Susceptibility and Vulnerability Assessment for Pelican Utilities Pelican, Alaska

PWSID # 130122.001

September 2003

Drinking Water Protection Program Report #854

Alaska Department of Environmental Conservation

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Pelican Utilities
Pelican, Alaska

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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 the Pelican Public Water System

Drinking Water Protection Program
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EXECUTIVE SUMMARY

The Pelican public water system is a Class A (community) water system that obtains water from Pelican Creek. The intake is located approximately 1000-feet upstream of where Pelican Creek drains into Lisianski Inlet. The overall protection area is approximately 13.2 square miles in size and received a susceptibility rating of "**very high**". *A rating of high to very high is typical for all systems with surface water intakes*. Potential and existing sources of the following contaminants were evaluated for the Source Water Assessment: bacteria and viruses, nitrates and/or nitrites, heavy metals, cyanide, and other inorganic chemicals, synthetic organic chemicals, volatile organic chemicals, and other organic chemicals. Beaver presence, stream erosion, and possible landslides were identified as potential sources of contaminants for the drinking water source. This evaluation included all available water sampling data submitted to ADEC by the system operator. The samples may have been collected from either raw water or post-treated water. Combining the susceptibility of the surface water source with the contaminant risks, this water system has received a vulnerability rating of **"medium"** for synthetic organic chemicals, volatile organic chemicals, heavy metals, cyanide and other inorganic chemicals, and other organic chemicals; and **"high"** for bacteria and viruses, and nitrates and/or nitrites.

DRINKING WATER SYSTEM AND AREA OVERVIEW

Pelican (Sec. 19, T045S, R057E, Copper River Meridian) is located on the northwest coast of Chichagof Island on Lisianski Inlet. It lies 80 miles north of Sitka and 70 miles west of Juneau. Most of the community is built on pilings over the tidelands. (Please see the inset of Map 1 in Appendix A for location). The current population is approximately 115 (ADCED, 2003). The Pelican water system is a Class A (community) water system that operates year round. The system's intake is located approximately 1000-feet upstream of where Pelican Creek drains into Lisianski Inlet (See Map 1 of Appendix A).

Approximately 75% of homes are connected to a piped sewage system with an ocean outfall. The City provides garbage collection services, recycling, and incinerates the refuse at the landfill. (ADCED, 2003).

According to the USDA, the geology of the Pelican area is heavily composed of carbonate rocks. The majority of them being limestone and marble. Most areas are well drained because the water percolates through the underlying carbonate bedrock. Because of this, wetlands are not typically present, except on areas of glacial hardpans or non-carbonate intrusions. Alpine areas here have significant bare areas, where soils are too thin to support vegetation. Lower elevations support forests of western hemlock and Sitka spruce (USDA, 2001).

The water system operator reports that pH levels of the source water range from 5.0-5.5 and that the watershed itself, in contrast with the USDA description (above), is composed of lightly metamorphosed intrusive igneous rock.

Pelican has a maritime climate characterized by cool summers and mild winters. Summer temperatures range from 51 to 62; winter temperatures range from 21 to 39. Temperature extremes have been recorded from -3 to 84. Annual precipitation is 127 inches, including 120 inches of snow. (ADCED, 2003).

The most recent Sanitary Survey (2002) indicates that the intake screens are maintained and are protected from ice buildup and siltation. The survey also indicates that the system has an average production rate of 650 gallons per minute. The system operator indicated that the Pelican Creek flow rates range from 10 – 7000 cfs.

PELICAN UTILITIES DRINKING WATER PROTECTION AREA

Identifying the pathways most likely for surface contamination to reach water intake areas is the first step in determining the water system's risk. These are initially determined by looking at the drainage area contributing overland water flow to a surface water source intake. The entire drainage area is also known as the "drinking water protection area". Please refer to pages 10-11of the "Guidance Manual for Class A Public Water Systems" for additional information.

The protection area established for surface water sources by the ADEC is usually separated into three

zones, limited by the watershed boundary. These zones correspond to the overland-flow distance that water travels to get to the source. The ADEC Drinking Water Protection Program's Technical Advisory Committee developed guidelines for derivation of these zones in 1998. The following is a summary of the three protection area zones:

Table 1. Definition of Zones

Zone	Definition
A	Areas within 1000-ft of lakes or streams
B	Areas within 1-mile of lakes or streams
C	The watershed boundary

The protection area for Pelican includes each of these Zones (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 Pelican Utilities protection area. This inventory was completed through a search of agency records and other publicly available information. There is a wide array of potential contamination sources to surface water. These contaminants are found within agricultural, residential, commercial, and industrial areas, but *can also occur within areas that have little or no development*.

For 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; and
- Other Organic Chemicals.

Sources identified in the Pelican Utilities protection area are displayed on Map 2 of Appendix C and summarized in Table 1 of Appendix B.

RANKING OF CONTAMINANT RISKS

Once potential and existing sources of contamination have been identified, they are assigned a ranking according to what category and level of risk they represent. Ranking of contaminant risks for "potential" or "existing" sources of contamination is a function of the toxicity and the volume of specific contaminants associated with that source. Rankings include:

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

The time-of-travel for contaminants within the water is dependent on the physical and chemical characteristics of each contaminant. Bacteria and Viruses are only inventoried in Zone A because of their short life span. Only "Very High" and "High" rankings are inventoried within Zones B and C due to the probability of contaminant dilution by the time the contaminants reach the water intake.

The remaining tables in Appendix B (if necessary) contain the ranking of potential and existing sources of contamination with respect to bacteria and viruses, nitrates and/or nitrites, volatile organic chemicals, heavy metals, cyanide, and other inorganic chemicals, synthetic organic chemicals, and other organic chemicals.

VULNERABILITY OF THE DRINKING WATER SYSTEM

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

- Surface Water Susceptibility; and
- Contaminant risks.

Appendix D contains 13 charts, which together form the 'Vulnerability Analysis' for the public drinking water Source Water Assessment. Chart 1 analyzes the 'Susceptibility of the Surface Water Source' to contamination by looking at the climate, terrain, and intake location. Chart 2 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 intake area. Chart 3 contains the 'Vulnerability Analysis for Bacteria and Viruses', which is a composite score of the Vulnerability Analysis and the overall Susceptibility. Charts 4 through 13 repeat the Contaminant Risks and Vulnerability Analyses for nitrates and nitrites, volatile organic chemicals, heavy metals, cyanide, and other inorganic chemicals, synthetic organic chemicals, and other organic chemicals, respectively.

A score for the Surface Water Susceptibility of the source is reached by considering the properties of the

water intake and the surrounding area. The derivation of this information is presented below and the data for this source is shown in Chart 1 of Appendix D.

Susceptibility of the Surface Water Source – always considered to be "high" (30 points)

+

Adequate Construction of the Intake (0 – 5 Points)

+

Runoff Potential Within Zone B (0 – 5 Points)

+

Dilution Capacity of the Surface Water (0 – 10 Points)

=

Natural Susceptibility
(0 – 50 Points)

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

Surface Water Source Susceptibility Ratings	
40 to 50 pts	Very High
30 to < 40 pts	High

Table 2. Susceptibility of the Water Source

	Score	Rating
Minimum Allowable Susceptibility	30	
Intake Construction Adequate	0	
Runoff Potential	5	
Dilution Capacity	10	
Overall Susceptibility	45	Very High

For contaminants, risks to a drinking water source depend on the type, number or density, and distribution of the contaminant sources. The Contaminant Risk score has been derived from an examination of existing, and historical contamination sources that have been detected in the protection area 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 the 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. Pelican Utilities Contaminant Risks

Category	Score	Rating
Bacteria and Viruses	30	High
Nitrates and/or Nitrites	32	High
Volatile Organic Chemicals	0	Low
Heavy Metals, Cyanide, and Other Inorganic Chemicals	0	Low
Synthetic Organic Chemicals	0	Low
Other Organic Chemicals	0	Low

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

Susceptibility of the Surface Water Source

(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 and ratings for each of the six categories of drinking water contaminants. Note: scores are rounded off to the nearest five.

Table 4. Pelican Utilities Overall Vulnerability

Category	Score	Rating
Bacteria and Viruses	75	High
Nitrates and Nitrites	75	High
Volatile Organic Chemicals	45	Medium
Heavy Metals, Cyanide, and		

Other Inorganic Chemicals	45	Medium
Synthetic Organic Chemicals	45	Medium
Other Organic Chemicals	45	Medium

Bacteria and Viruses

The contaminant risk for bacteria and viruses is "high". Typically, coliform detection in raw water samples collected from surface water sources is normal. (See Chart 2 – Contaminant Risks for Bacteria and Viruses in Appendix D).

Coliforms (a bacteria) are found naturally in the environment and although they aren't necessarily a health threat, they are an indicator of other potentially harmful bacteria in the water, more specifically, fecal coliforms and E. coli which only come from human and animal fecal waste. Harmful bacteria can cause diarrhea, cramps, nausea, headaches, or other symptoms (EPA, 2003). Positive samples increase the overall vulnerability of the drinking water source, indicating that the source is susceptible to bacteria and virus contamination.

No positive bacteria counts have been detected in sampling collected since 1999. Beaver may be a possible source of bacteria in the future should they begin to reside in the watershed.

After combining the contaminant risk for bacteria and viruses with the natural susceptibility of the source, the overall vulnerability of the source to bacteria and virus contamination remains "high".

Nitrates and Nitrites

The contaminant risk for nitrates and nitrites is "high" (See Chart 4 - 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 water source indicates that nitrates have not been detected since June 1999. The Maximum Contaminant Level (MCL) for nitrates is 10 milligrams per liter (mg/L). 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 (EPA, 2003).

Beaver may be a possible source of nitrates/nitrite in the future should they begin to reside in the watershed.

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

Volatile Organic Chemicals

The contaminant risk for volatile organic chemicals is "low" (See Chart 6 – Contaminant Risks for Volatile Organic Chemicals in Appendix D).

Chloroform and trihalomethanes were detected at levels below the MCL during sampling in 2000-2002, although both of these chemicals typically originate during the process of water treatment and not from the source waters. The MCL for chloroform is 0.2 milligrams per liter (mg/L) and the MCL for total trihalomethanes is 0.1 mg/L.

After combining the contaminant risk for volatile organic chemicals with the natural susceptibility of the source, the overall vulnerability of the source to contamination is "medium".

Heavy Metals, Cyanide, and Other Inorganic Chemicals

The contaminant risk for heavy metals is "low". Copper and lead were detected in samples collected during 1998-2001, although in levels below the MCL (See Chart 8 – Contaminant Risks for Heavy Metals, Cyanide, and Other Inorganic Chemicals in Appendix D). The MCL for copper is 1.3 mg/l. and the MCL for lead is 0.015 mg/l.

The most common source of these chemicals is the infrastructure of the distribution system following the treatment process and not from the source waters.

After combining the contaminant risk for heavy metals with the natural susceptibility of the source, the overall vulnerability of the well to contamination is "medium".

Synthetic Organic Chemicals

The contaminant risk for synthetic organic chemicals is "low". After combining the contaminant risk with the natural susceptibility of the source, the overall vulnerability to synthetic organic chemicals of the source is "medium" (See Chart 11 – Contaminant Risks for Synthetic Organic Chemicals in Appendix D).

Review of the historical sampling data indicates that test results for dibromochloropropane and ethylene dibromide in 2002 were negative.

Other Organic Chemicals

The contaminant risk for other organic chemicals is "low". After combining the contaminant risk with the natural susceptibility of the source, the overall vulnerability to other organic chemicals of the source is "medium" (See Chart 13 – Contaminant Risks for Other Organic Chemicals in Appendix D).

Review of the historical sampling data indicates that no other organic chemicals have been sampled recently.

REFERENCES

Alaska Department of Community and Economic Development (ADCED), 2003 [WWW document]. URL http://www.dced.state.ak.us/cbd/commdb/CF_COMDB.htm

United States Forest Service – Alaska Region (USDA), 2001. Technical Publication No. R10-TP-75. Ecological Subsections of Southeast Alaska and Neighboring Areas of Canada.

United States Environmental Protection Agency (EPA), 2003 [WWW document]. URL http://www.epa.gov/safewater/mcl.html.

APPENDIX A

Pelican Utilities
Drinking Water Protection Area Location Map
(Map 1)

Pelican Utilities -
Drinking Water Protection Area

Wedge Mtn.

Pelican Creek

Mineral Mtn.

Map 1: Pelican Utilities - Drinking Water Protection Area

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Alaska Department of Environmental Conservation

Alaska Drinking Water Protection Program

0 3,000 6,000 12,000 18,000 24,000 Feet

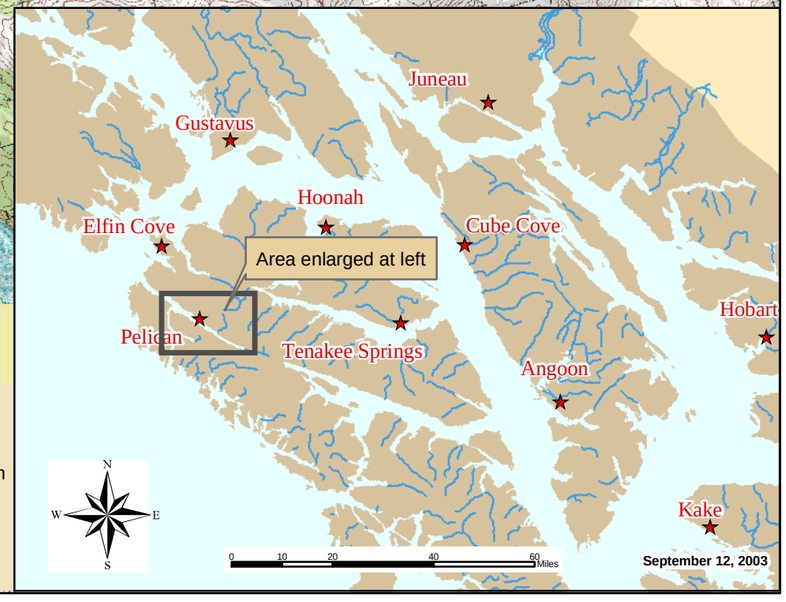
1:72,000

Data Sources:
Background image
- USGS 1:63,000 mapping
Lakes, streams, & roads
- U.S. Forest Service, Tongass

Protection zones were delineated based upon streams noted on USGS 1:63,000 mapping.

Legend

- Pelican Utilities PWS Intake
- Stream
- Zone A Protection Area
- Zone B Protection Area
- Zone C Protection Area



APPENDIX B

Contaminant Source Inventory and Risk Rankings (Tables 1 - 3)

Table 1

Contaminant Source Inventory for ***Pelican Utilities***

PWSID 130122.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Map Number*	*Comments*
Beaver/muskrat/otter habitat	B01	B01-1	A	2	From operator information
Landslides or other hillside areas subject to significant erosion	B06	B06-1	A	2	From operator information
River/stream bank erosion	B09	B09-1	A	2	From operator information

Table 2

Contaminant Source Inventory and Risk Ranking for Pelican Utilities Sources of Bacteria and Viruses

PWSID 130122.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Beaver/muskrat/otter habitat	B01	B01-1	A	High	2	From operator information

Table 3

Contaminant Source Inventory and Risk Ranking for Pelican Utilities Sources of Nitrates/Nitrites

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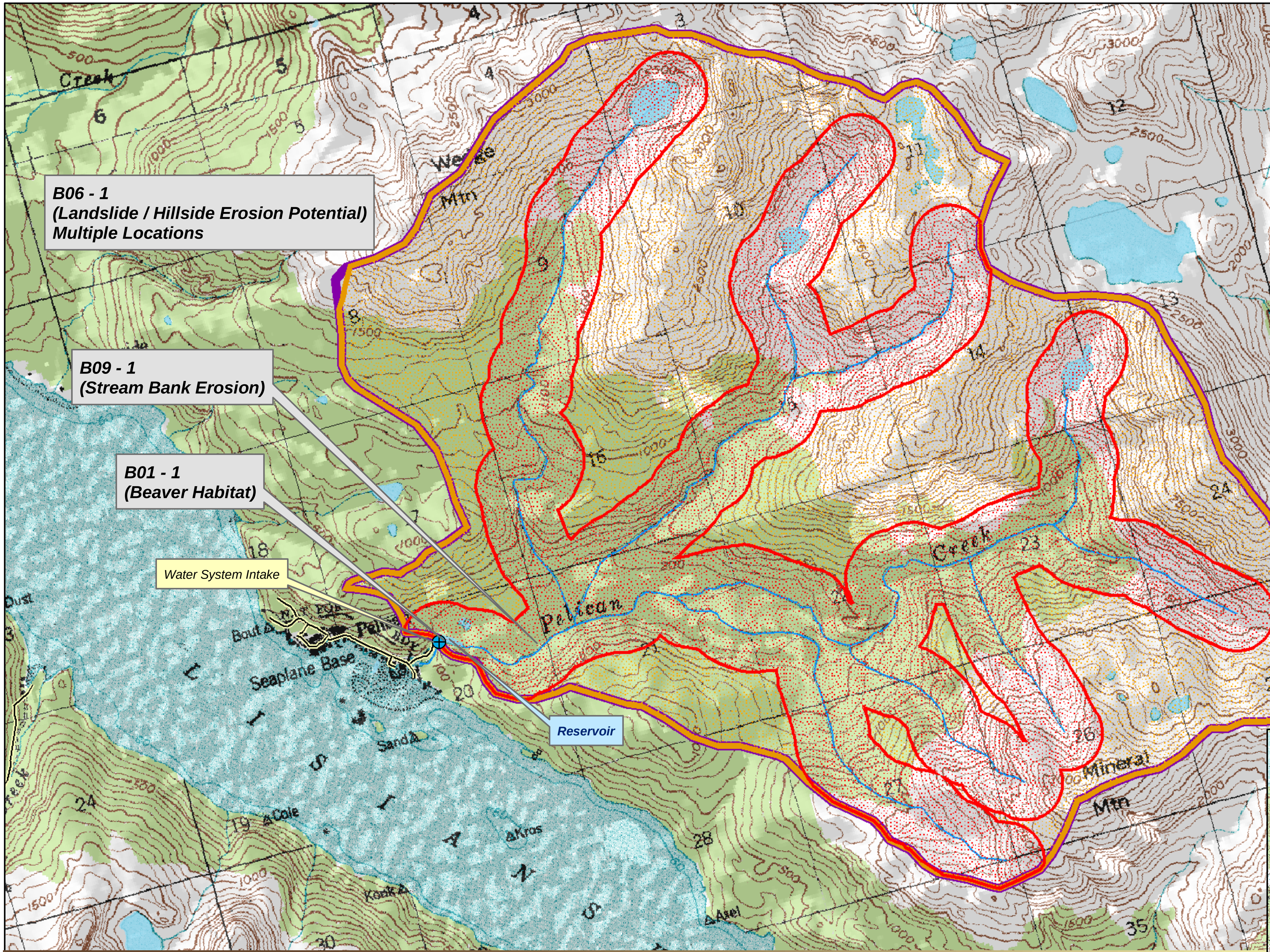
Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Map Number*	*Comments*
Beaver/muskrat/otter habitat	B01	B01-1	A	High	2	From operator information

APPENDIX C

Pelican Utilities
Drinking Water Protection Area
and Potential and Existing Contaminant Sources
(Map 2)



Map 2: Potential and Existing Contaminant Sources

PWSID: 130122.001

Alaska Department of Environmental Conservation

Alaska Drinking Water Protection Program

0 1,500 3,000 6,000 9,000 12,000 Feet

1:36,000

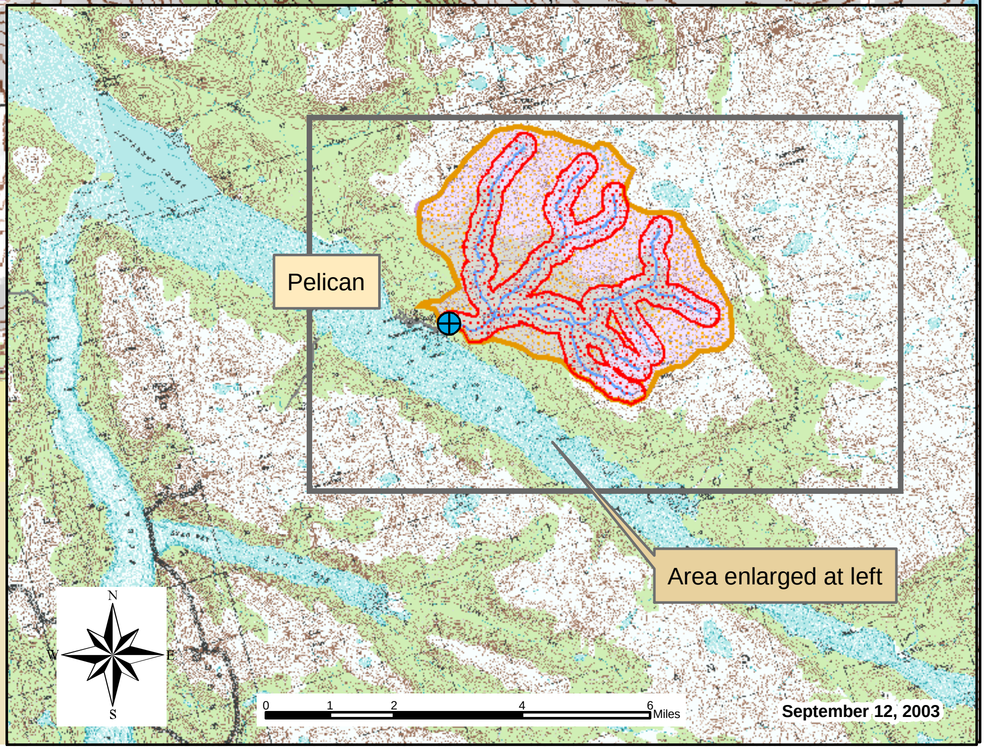
Data Sources:

Background image
- USGS 1:63,000 mapping
Lakes, streams, & roads
- U.S. Forest Service

Protection zones were delineated based upon streams noted on USGS 1:63,000 mapping.

Legend

- Pelican Utilities - PWS Intake
- Zone A Protection Area
- Zone B Protection Area
- Zone C Protection Area
- Lake
- Stream
- Roads



APPENDIX D

Vulnerability Analysis and Contaminant Risks
(Charts 1-13)

Chart 1. Susceptibility of the Surface Water Source - Pelican Utilities

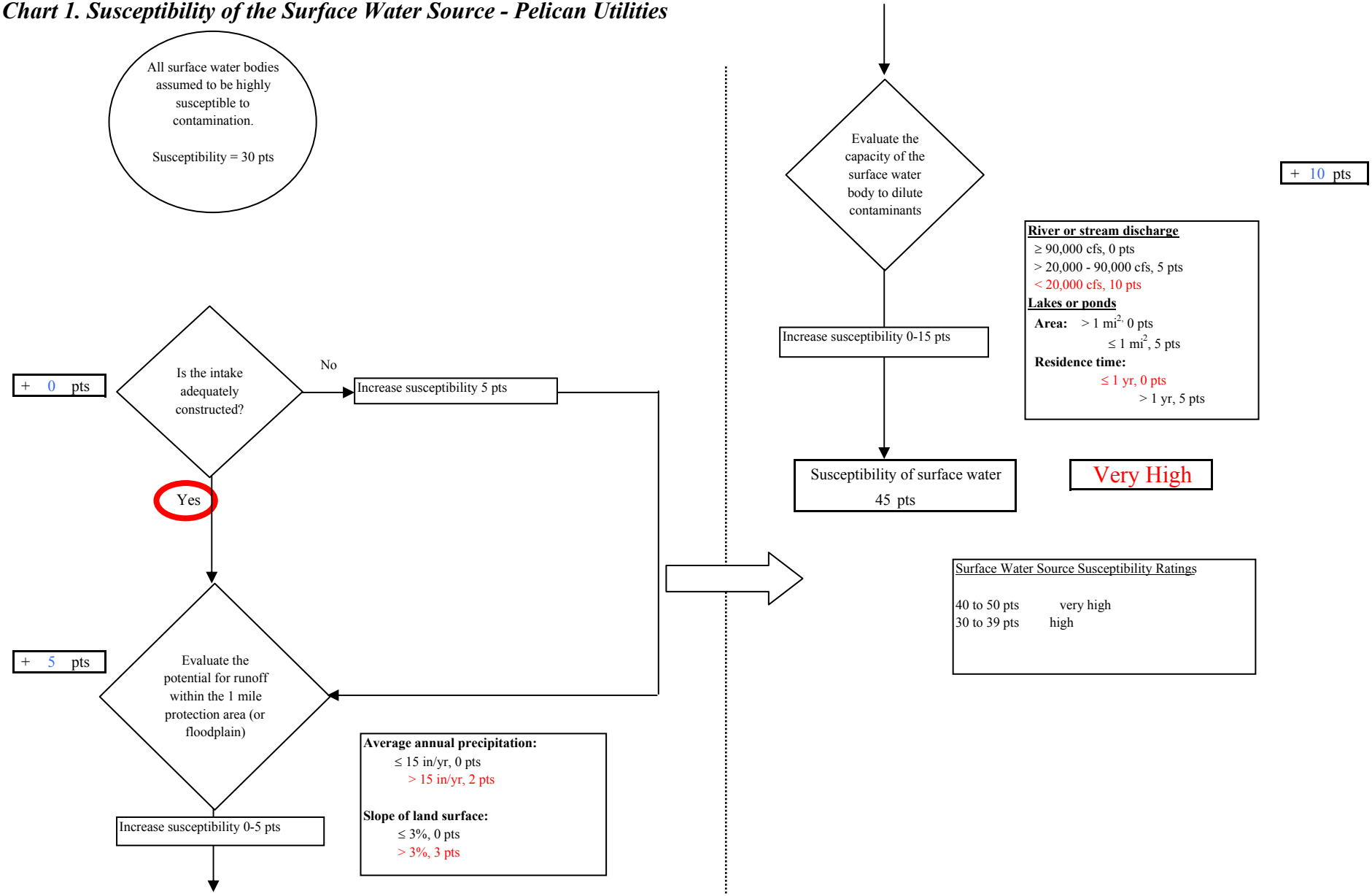
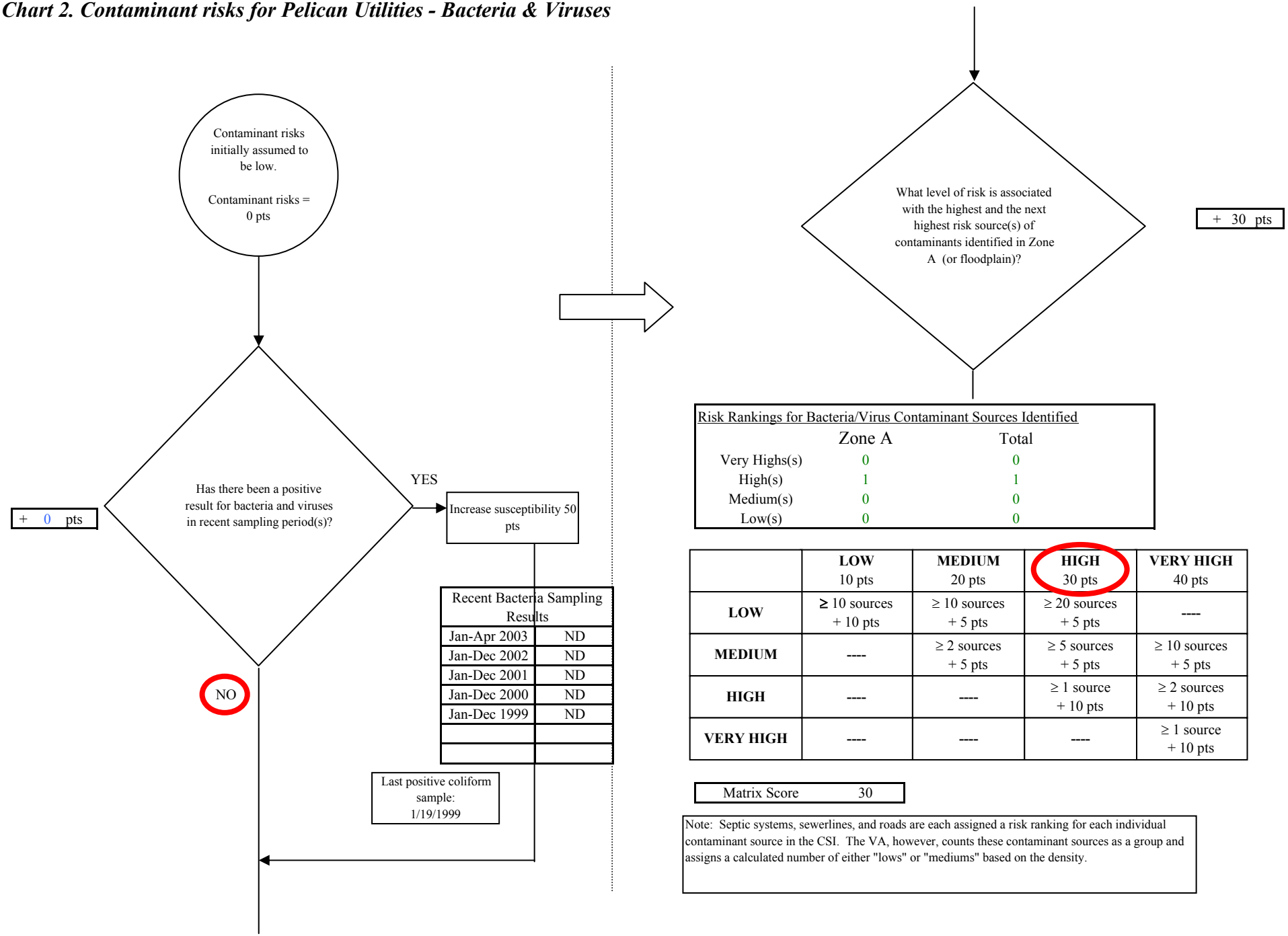


Chart 2. Contaminant risks for Pelican Utilities - Bacteria & Viruses



Risk Rankings for Bacteria/Virus Contaminant Sources Identified

	Zone A	Total
Very Highs(s)	0	0
High(s)	1	1
Medium(s)	0	0
Low(s)	0	0

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

Matrix Score 30

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

Chart 2. Contaminant risks for Pelican Utilities - Bacteria & Viruses

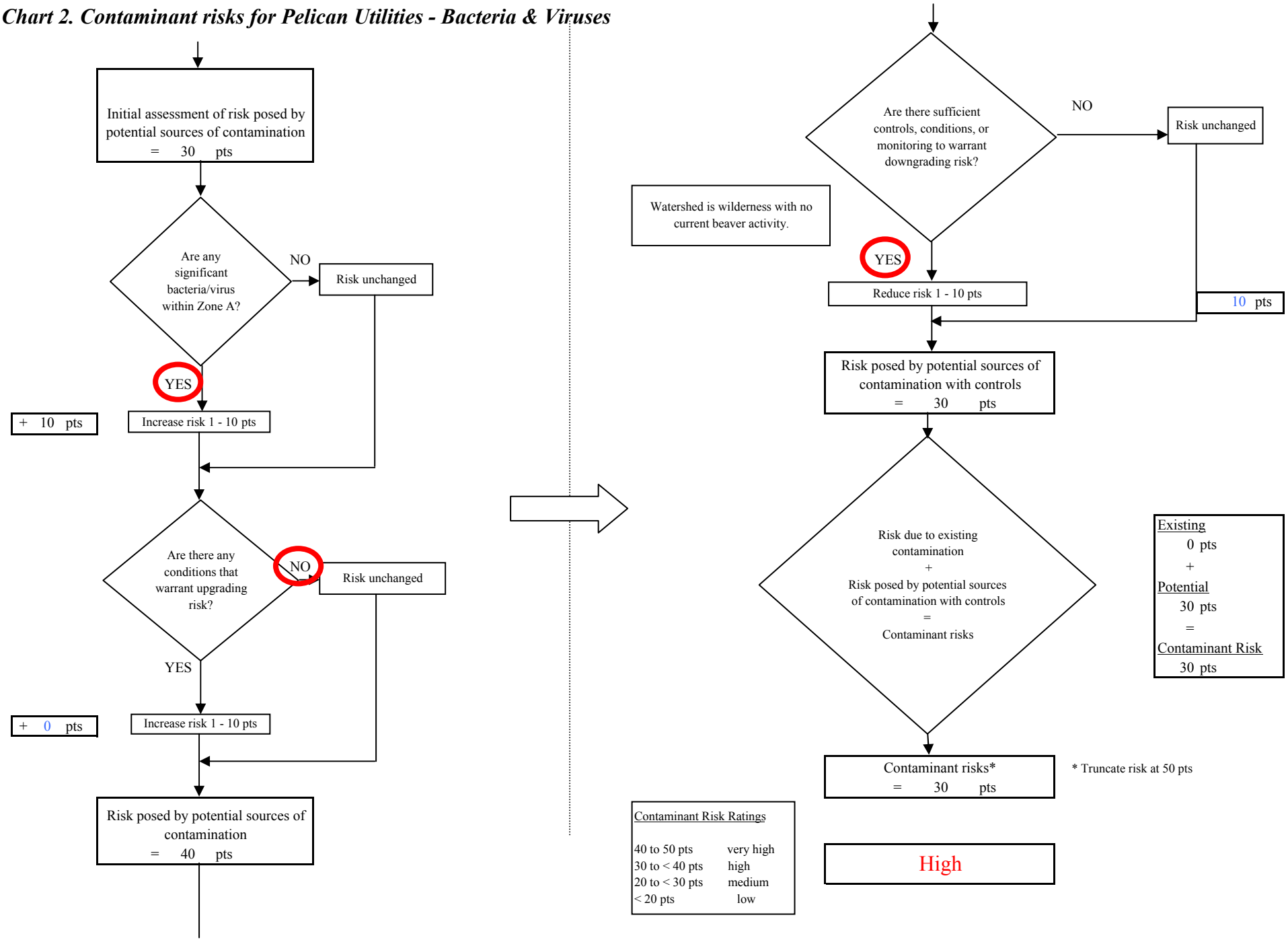


Chart 3. Vulnerability analysis for Pelican Utilities - Bacteria & Viruses

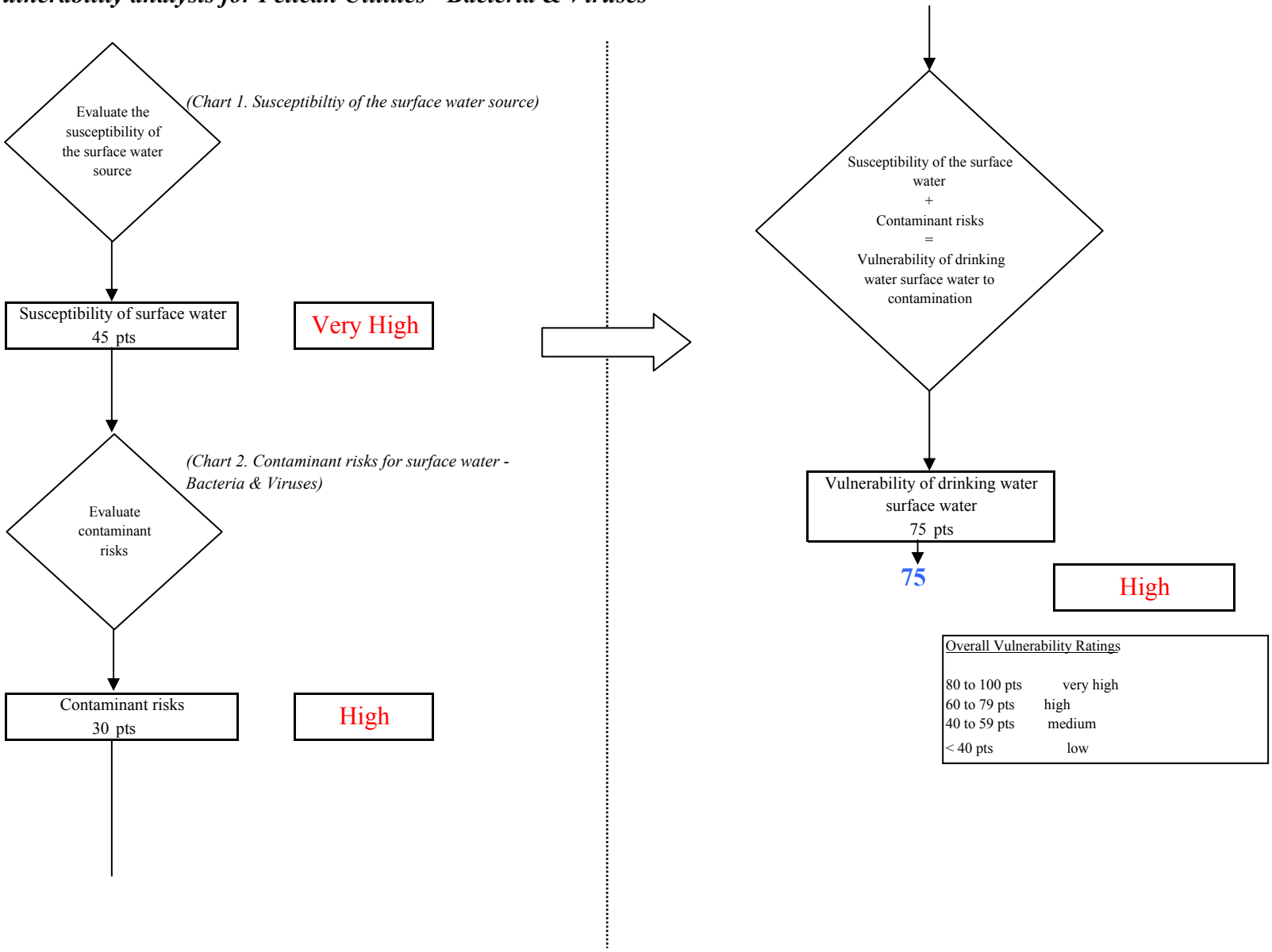


Chart 4. Contaminant risks for Pelican Utilities - Nitrates and Nitrites

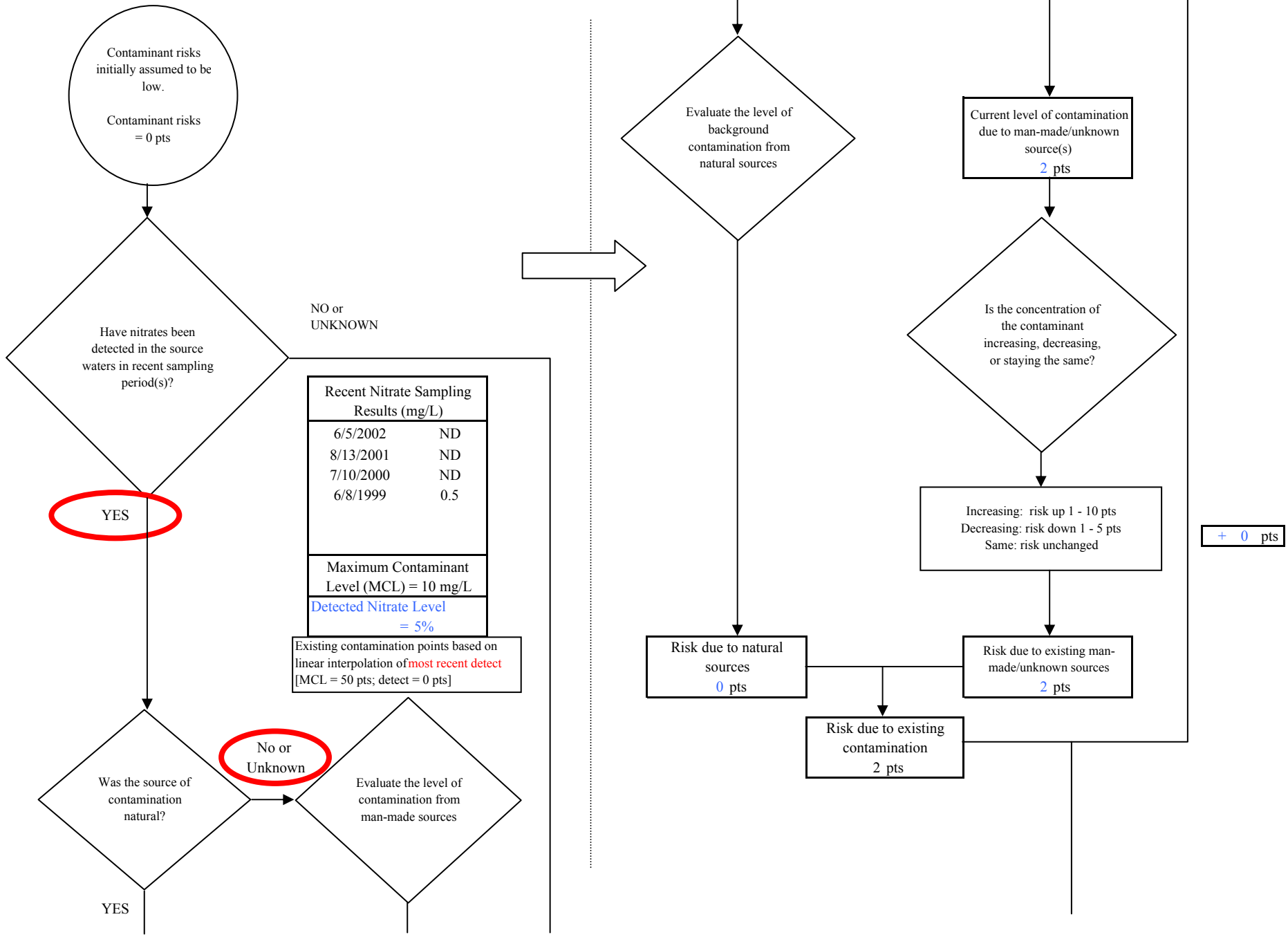
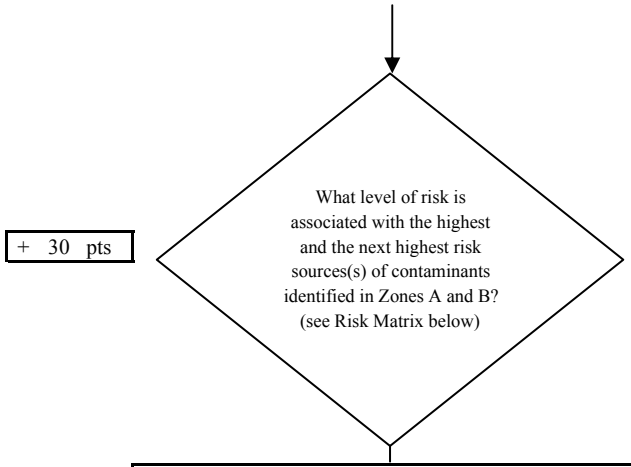


Chart 4. Contaminant risks for Pelican Utilities - Nitrates and Nitrites



+ 30 pts

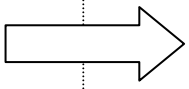
Risk Levels for Nitrate/Nitrite Sources identified in Zones A and B

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

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

Matrix Score 30

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



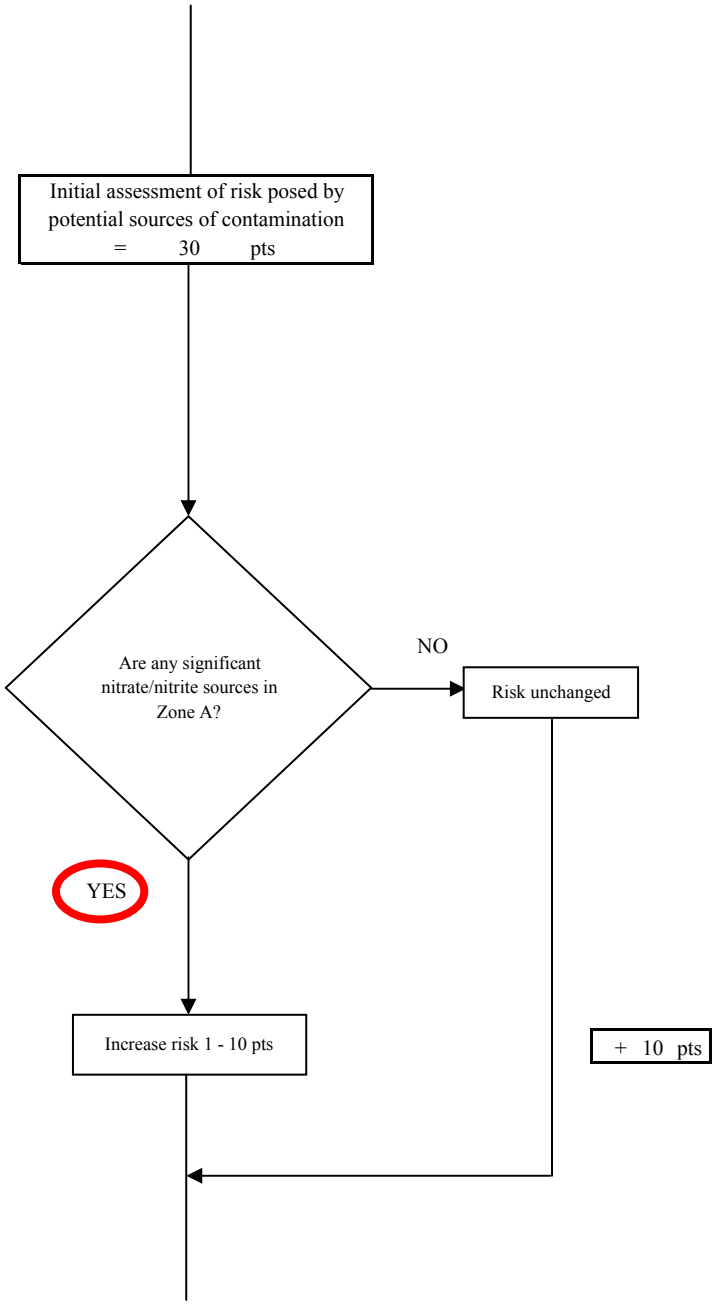


Chart 4. Contaminant risks for Pelican Utilities - Nitrates and Nitrites

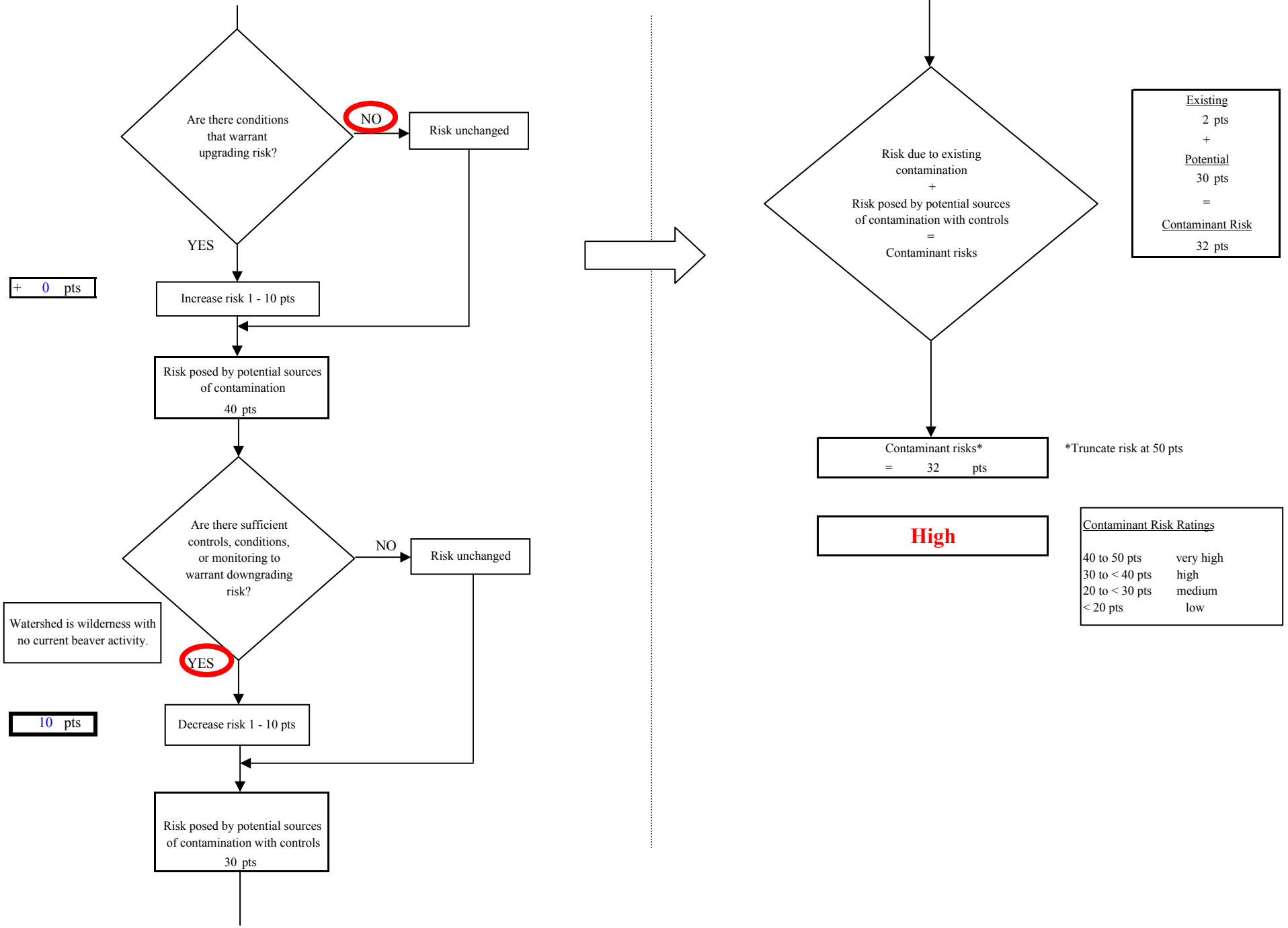


Chart 5. Vulnerability analysis for Pelican Utilities - Nitrates and Nitrites

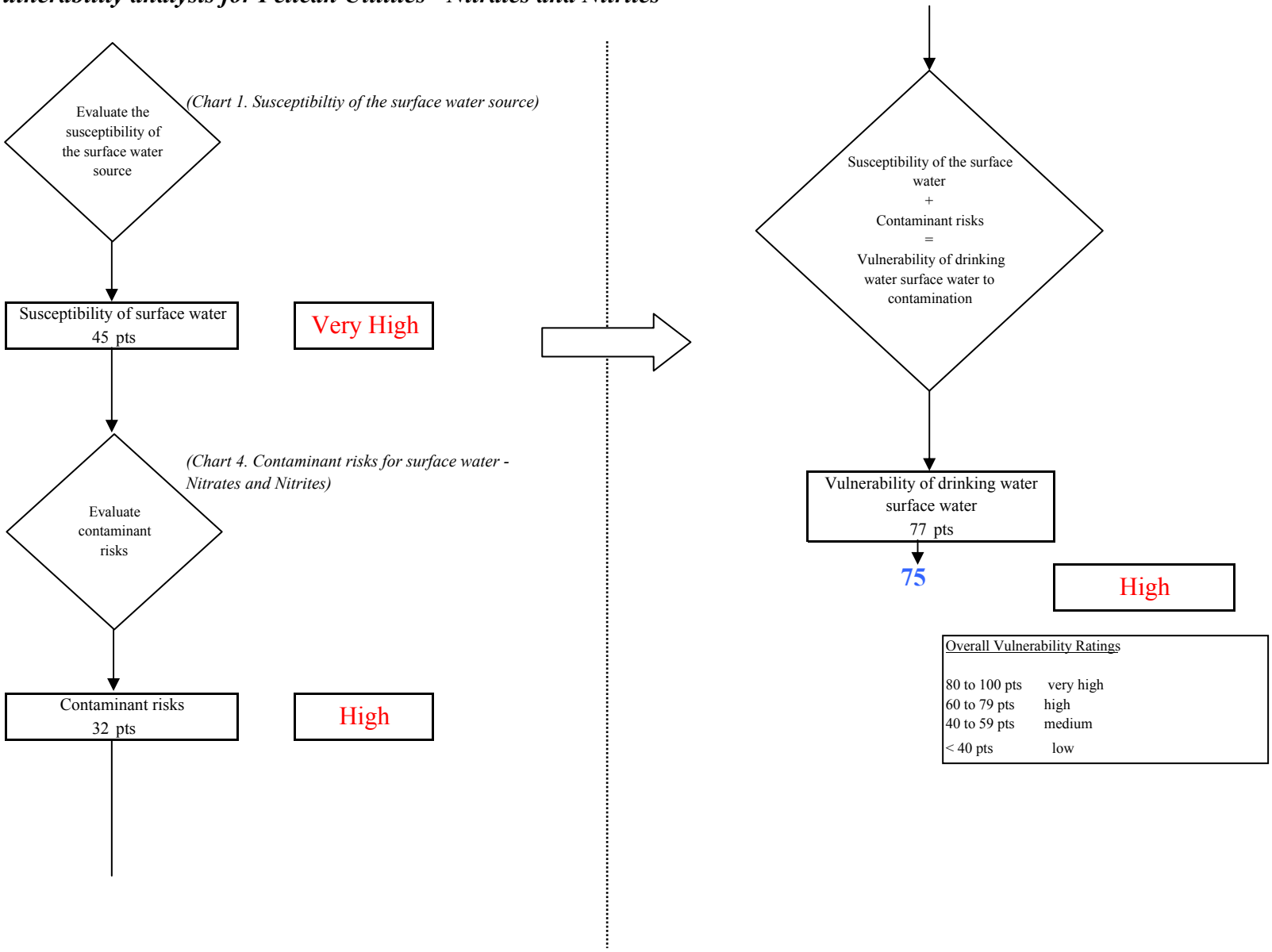


Chart 6. Contaminant risks for Pelican Utilities - Volatile Organic Chemicals

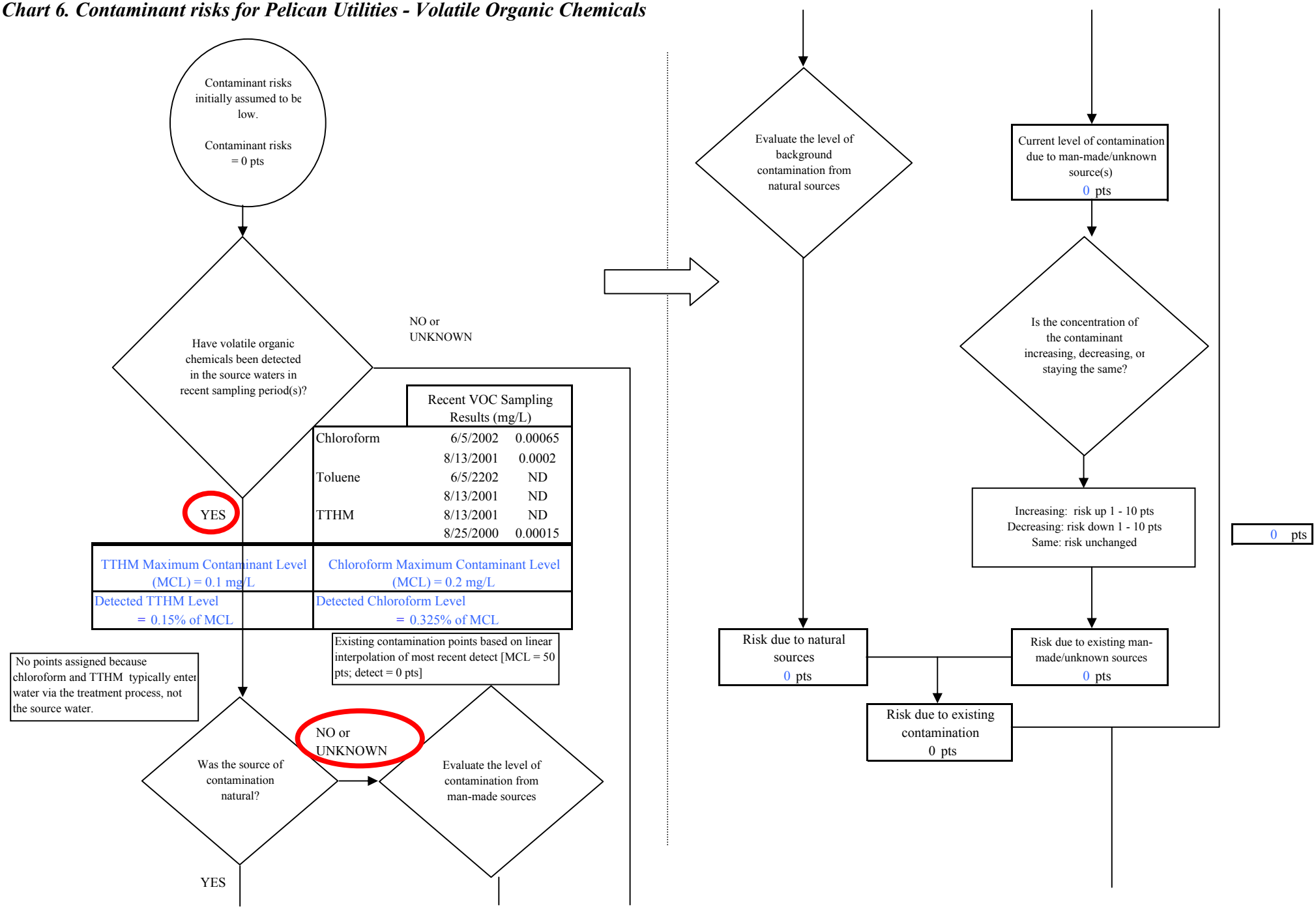


Chart 6. Contaminant risks for Pelican Utilities - Volatile Organic Chemicals

+ 0 pts

What level of risk is associated with the highest and the next highest risk sources(s) of contaminants identified in Zones A and B? (see Risk Matrix below)

Initial assessment of risk posed by potential sources of contamination = 0 pts

Are any significant VOC sources in Zone A?

NO

Risk unchanged

YES

Increase risk 1 - 10 pts

+ 0 pts

Risk Levels for VOC Sources identified in Zones A and B

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

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

Matrix Score 0

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 6. Contaminant risks for Pelican Utilities - Volatile Organic Chemicals

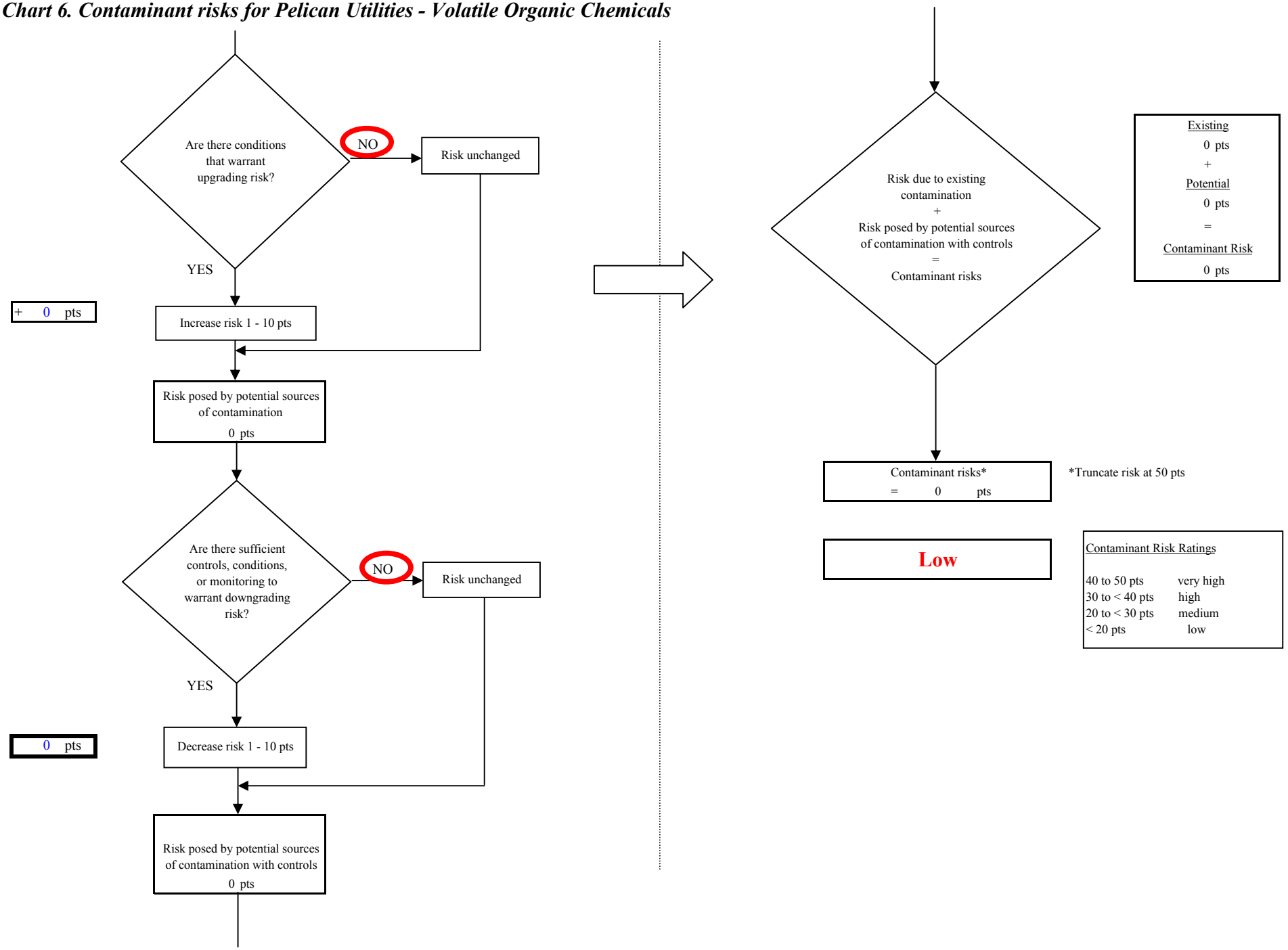


Chart 7. Vulnerability analysis for Pelican Utilities - Volatile Organic Chemicals

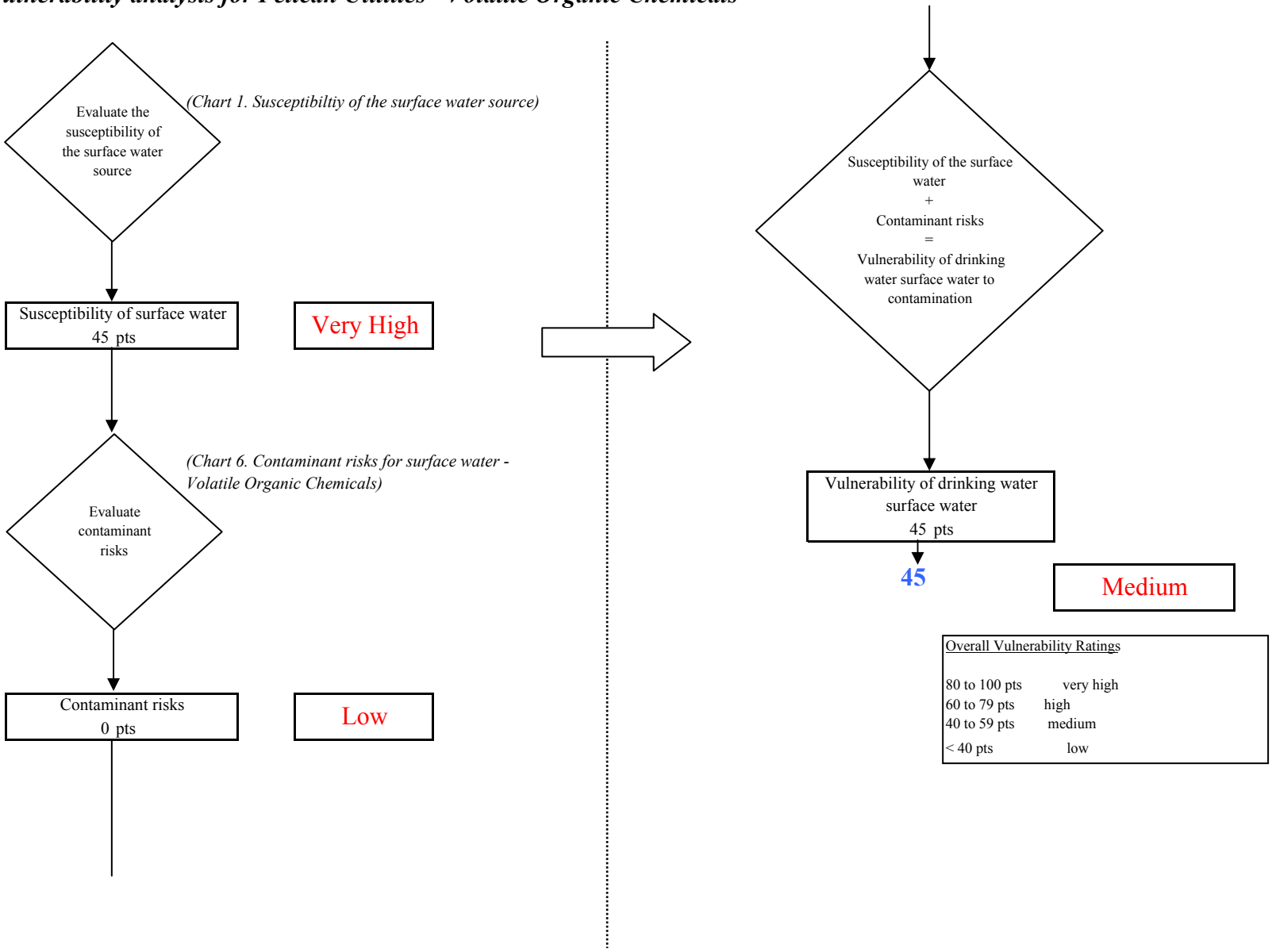


Chart 8. Contaminant risks for Pelican Utilities - Heavy Metals, Cyanide and Other Inorganic Chemicals

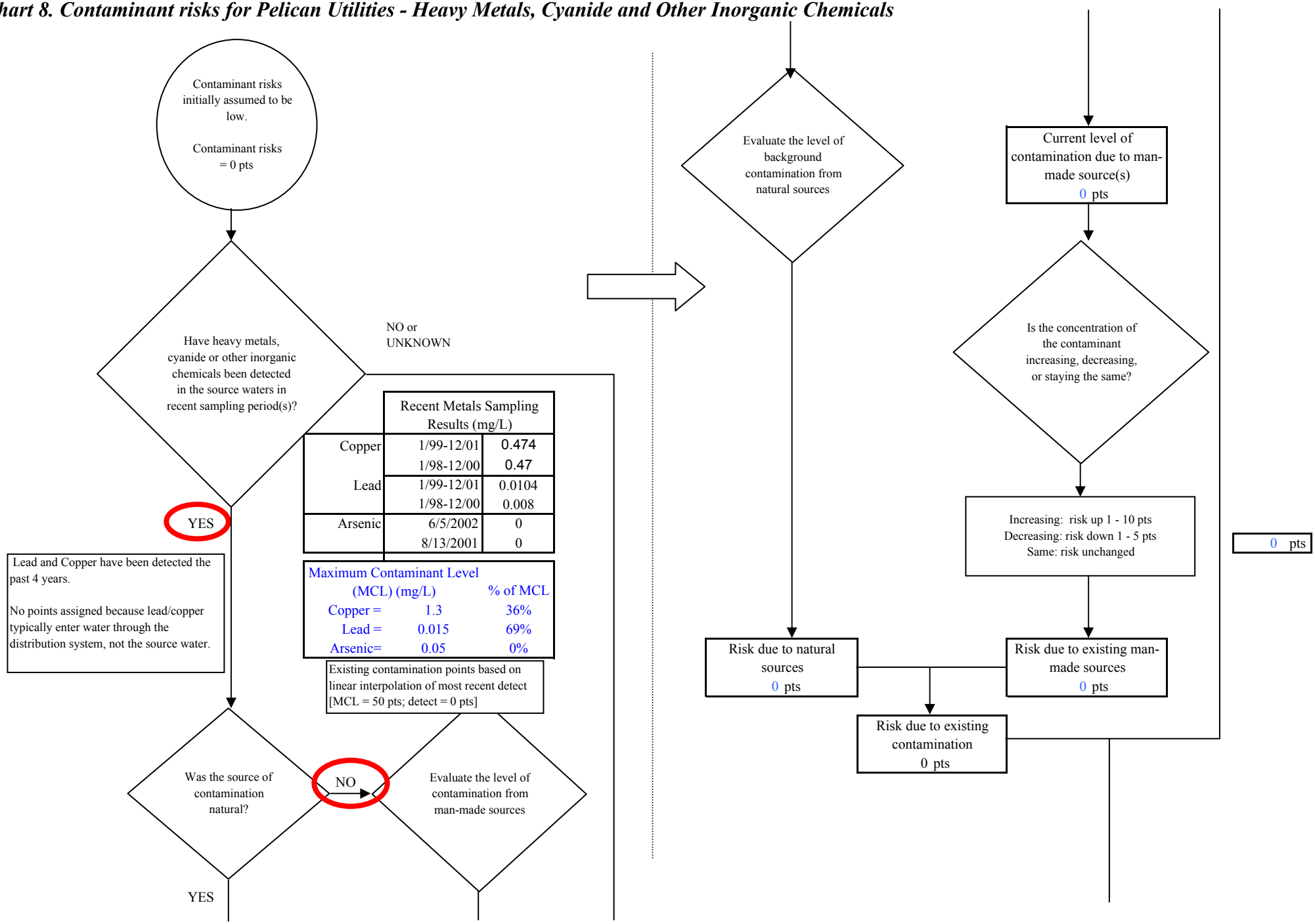
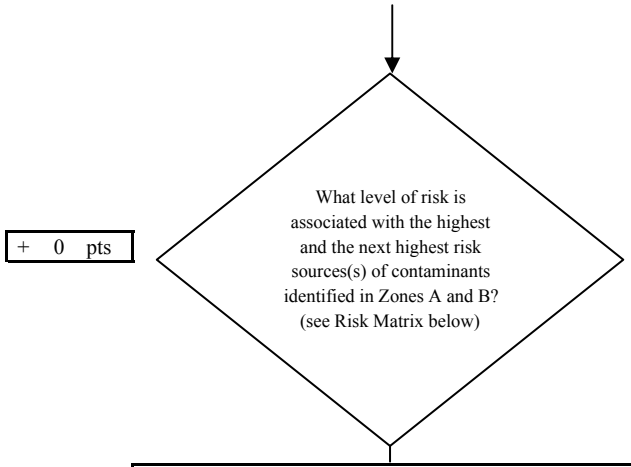


Chart 8. Contaminant risks for Pelican Utilities - Heavy Metals, Cyanide and Other Inorganic Chemicals



+ 0 pts

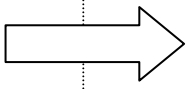
Risk Levels for HM, Cyanide, or OIC Sources identified in Zones A and B

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

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

Matrix Score 0

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.



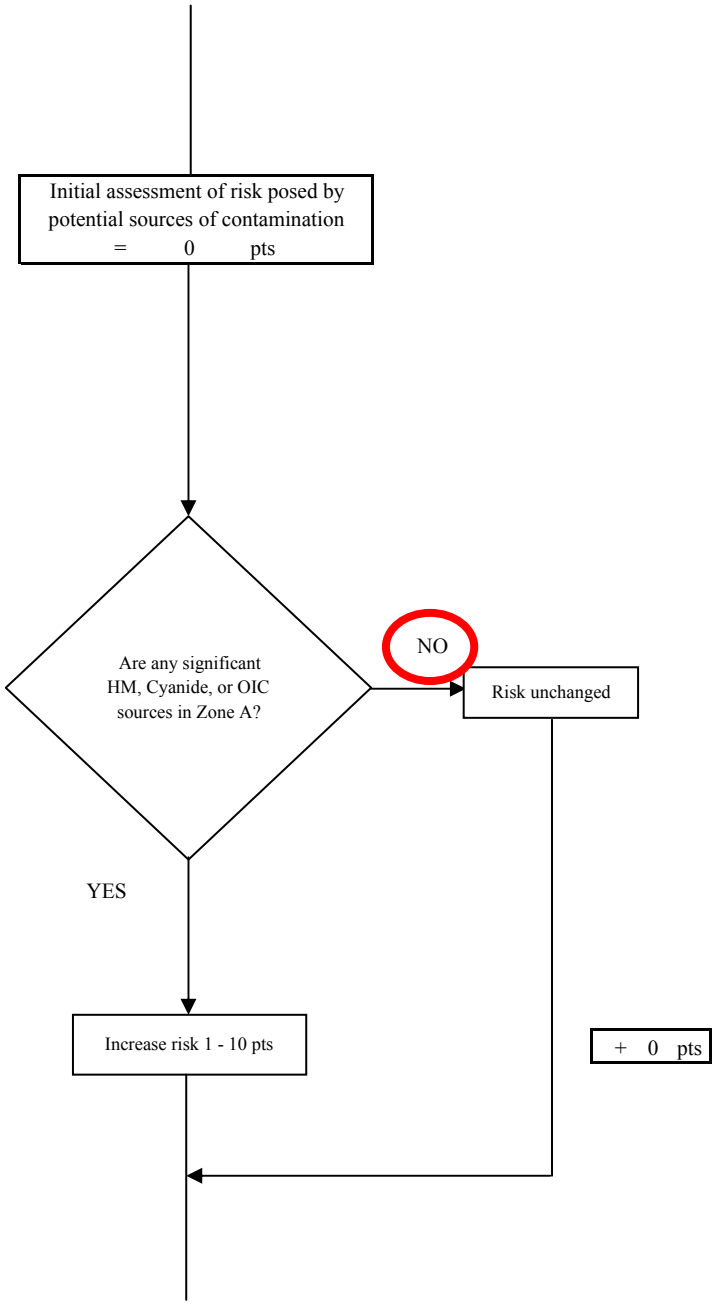


Chart 8. Contaminant risks for Pelican Utilities - Heavy Metals, Cyanide and Other Inorganic Chemicals

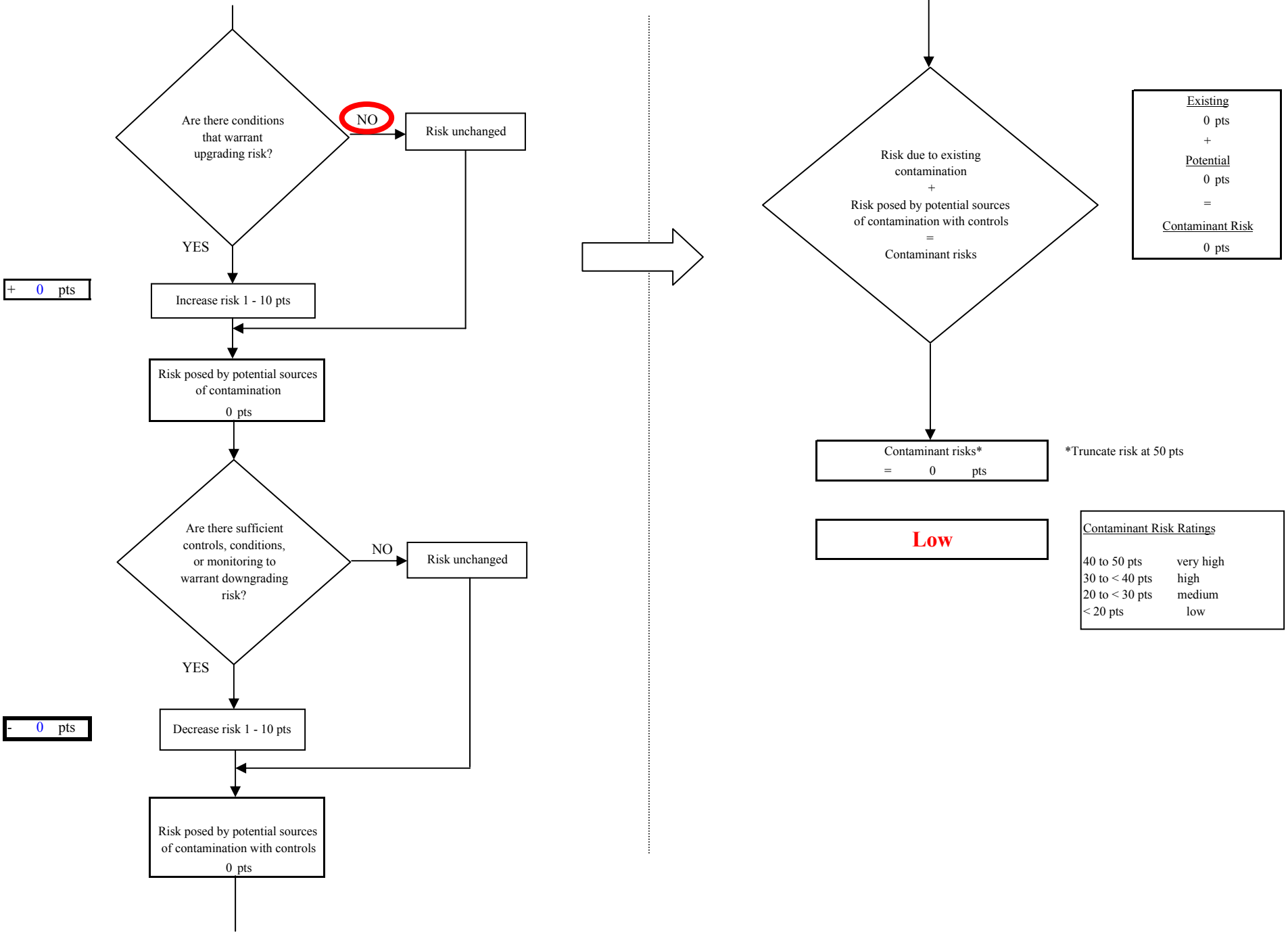


Chart 9. Vulnerability analysis for Pelican Utilities - Heavy Metals, Cyanide and Other Inorganic Chemicals

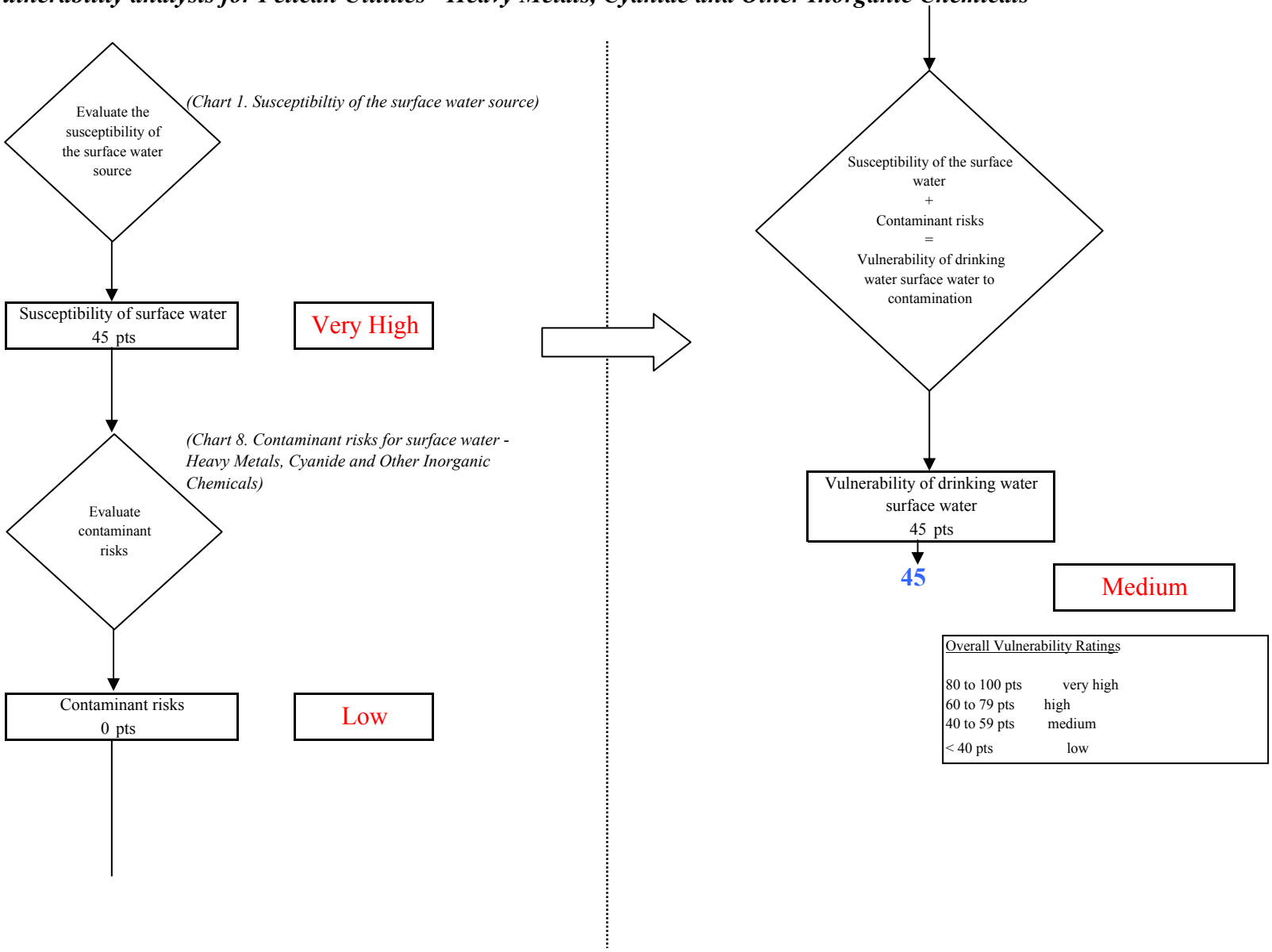


Chart 10. Contaminant risks for Pelican Utilities - Synthetic Organic Chemicals

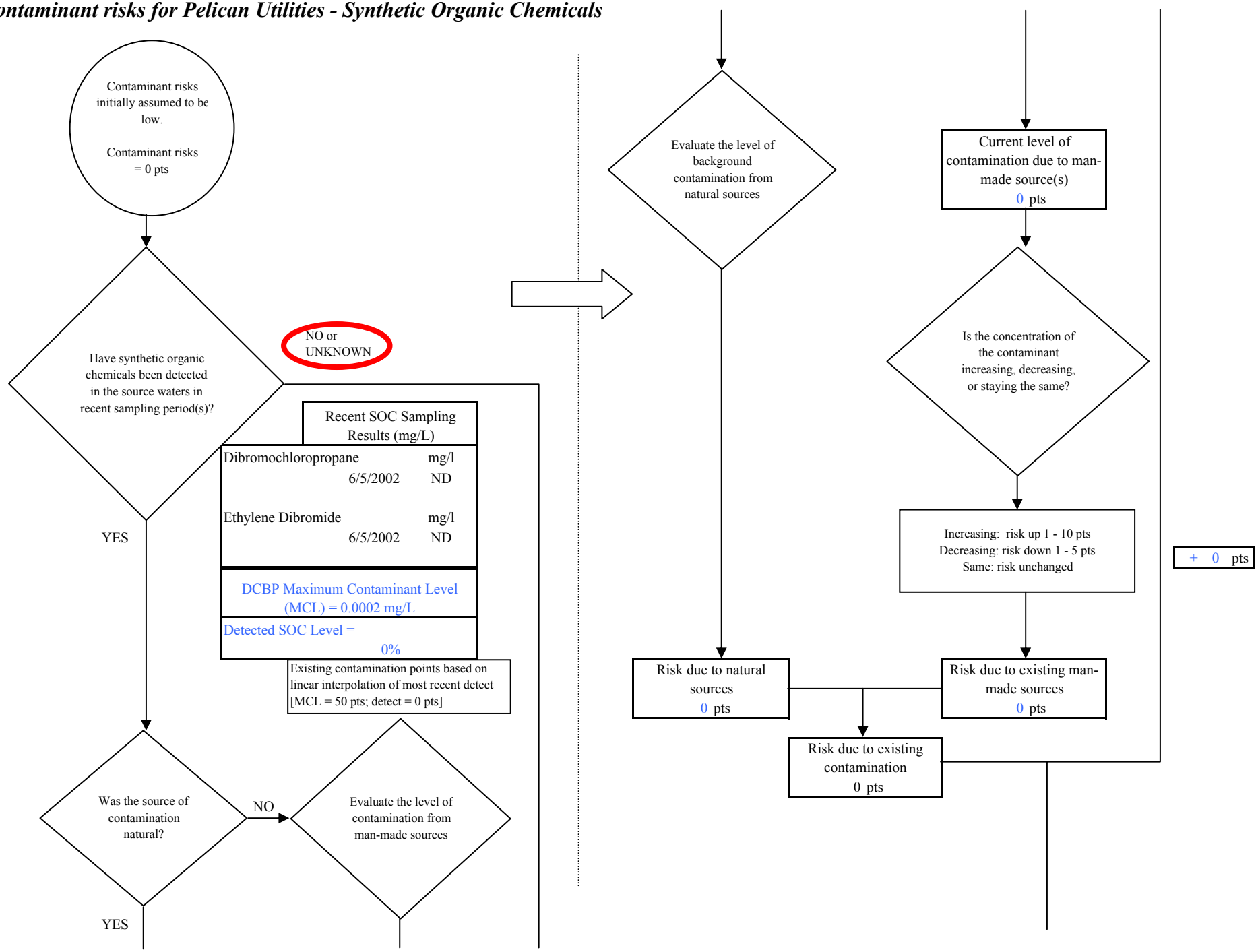
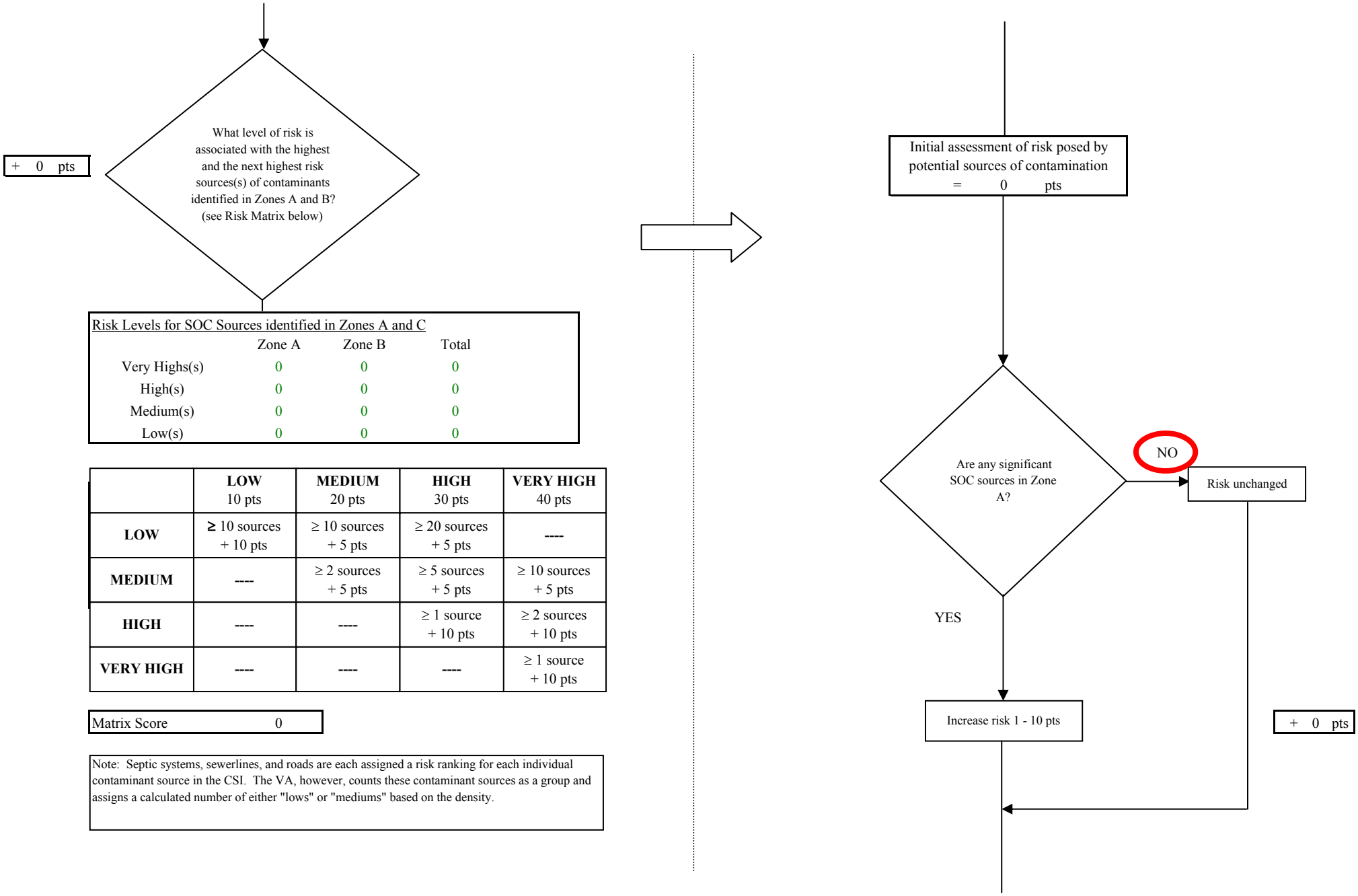


Chart 10. Contaminant risks for Pelican Utilities - Synthetic Organic Chemicals



Risk Levels for SOC Sources identified in Zones A and C

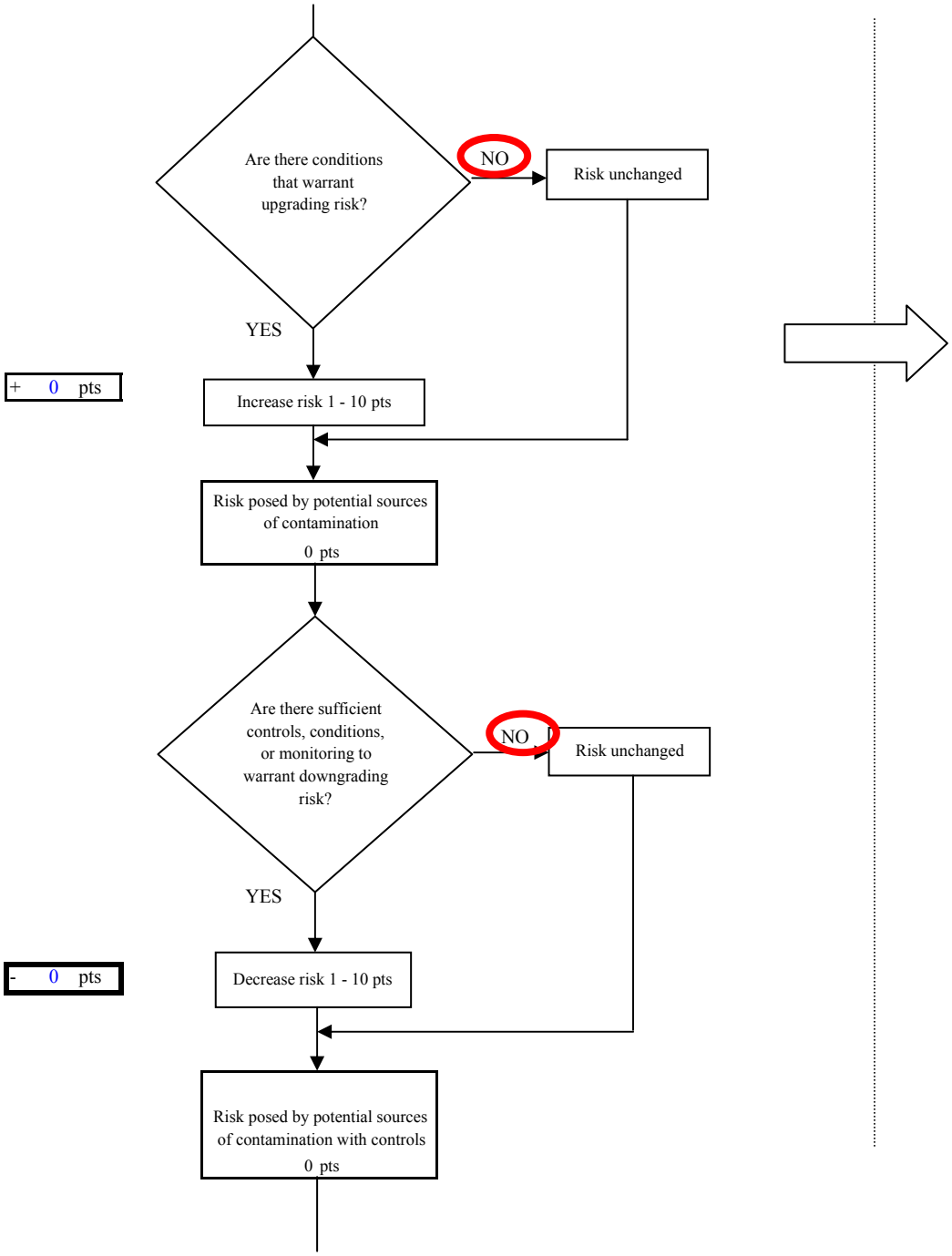
	Zone A	Zone B	Total
Very Highs(s)	0	0	0
High(s)	0	0	0
Medium(s)	0	0	0
Low(s)	0	0	0

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

Matrix Score 0

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 10. Contaminant risks for Pelican Utilities - Synthetic Organic Chemicals



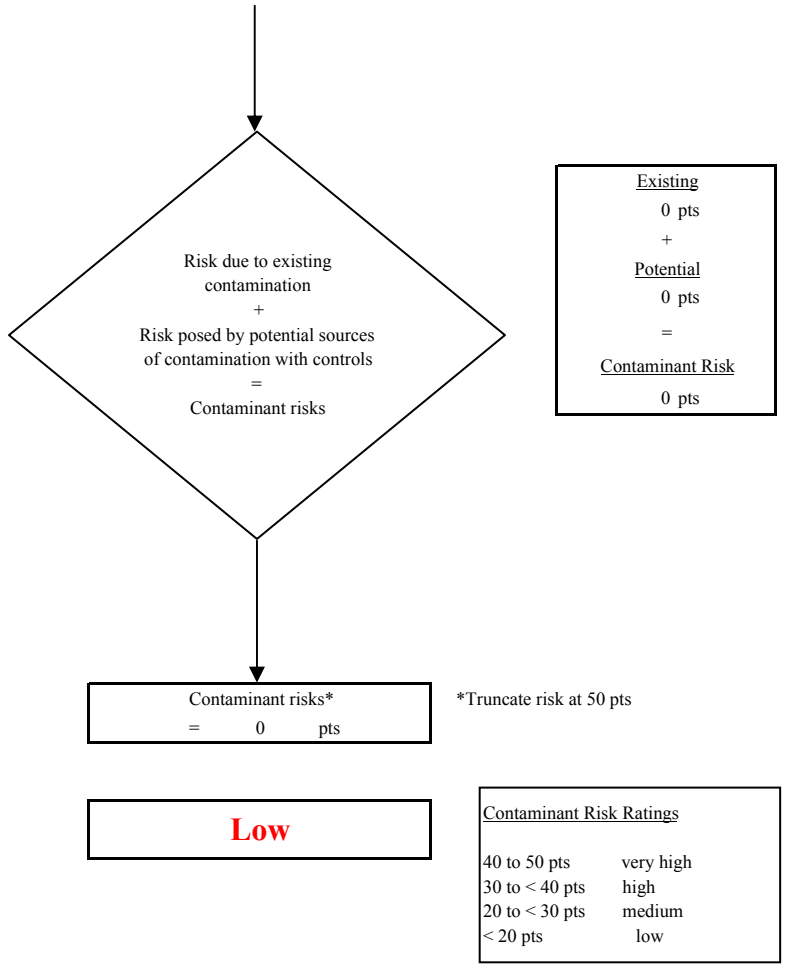


Chart 11. Vulnerability analysis for Pelican Utilities - Synthetic Organic Chemicals

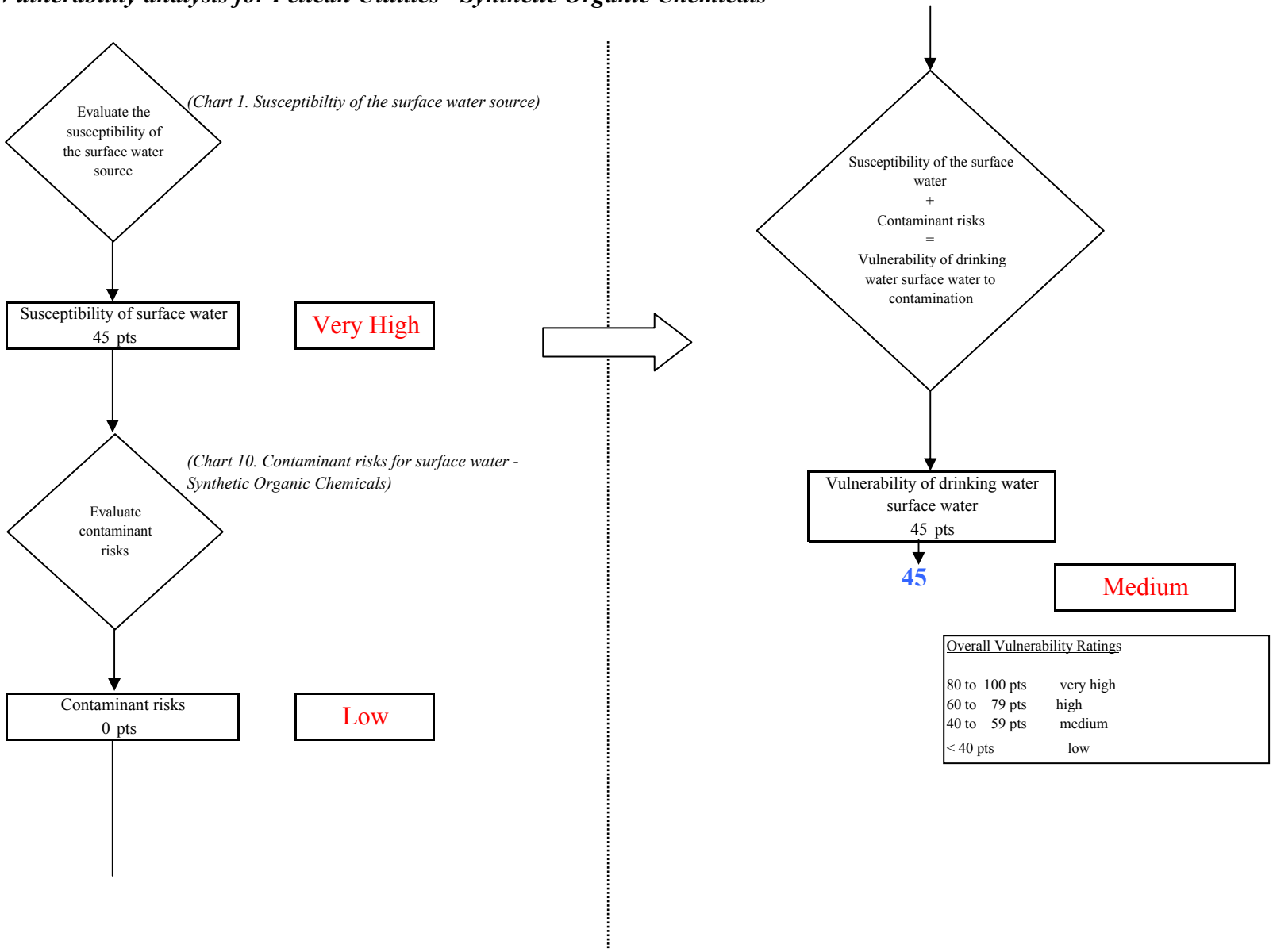


Chart 12. Contaminant risks for Pelican Utilities - Other Organic Chemicals

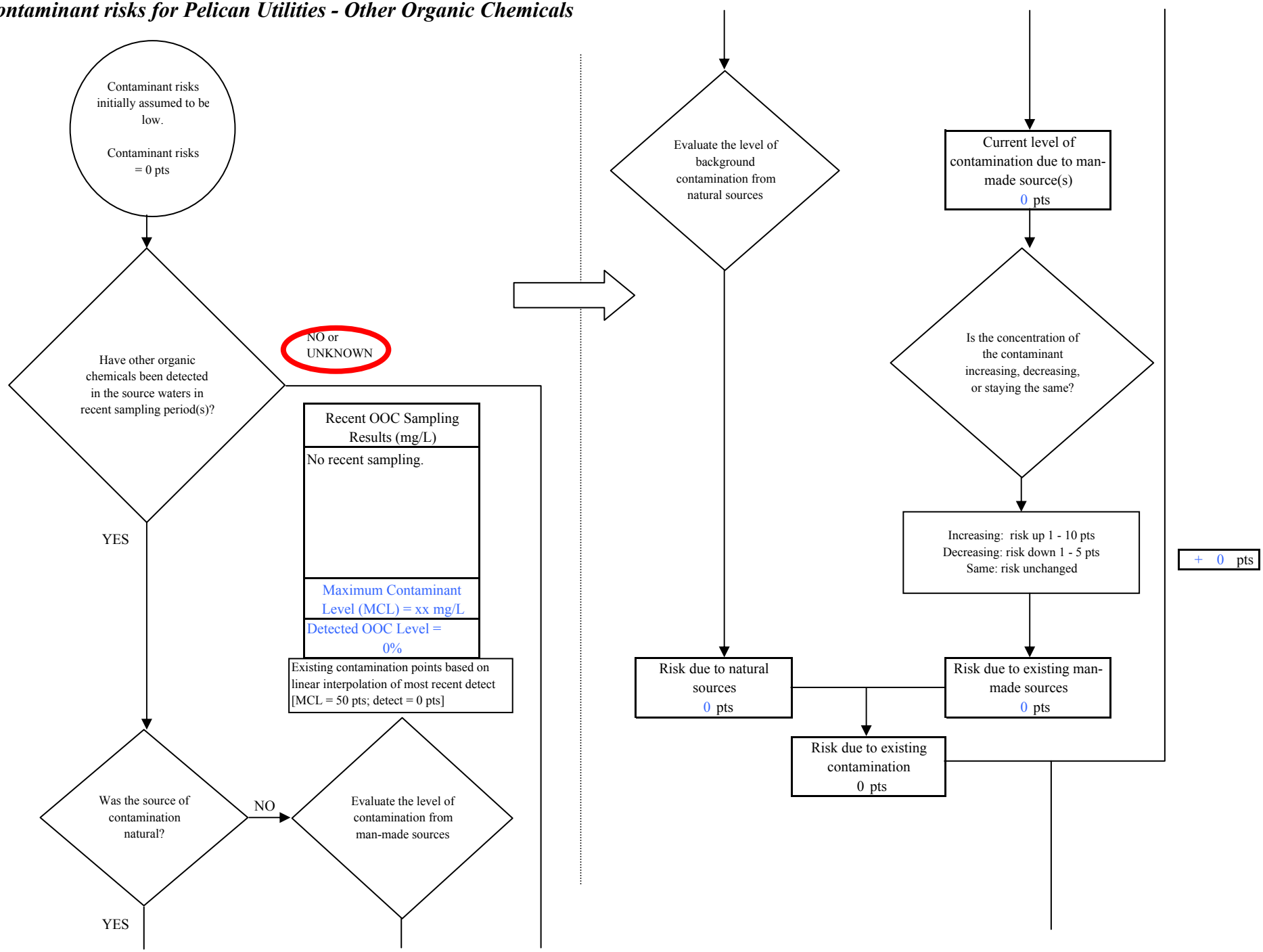
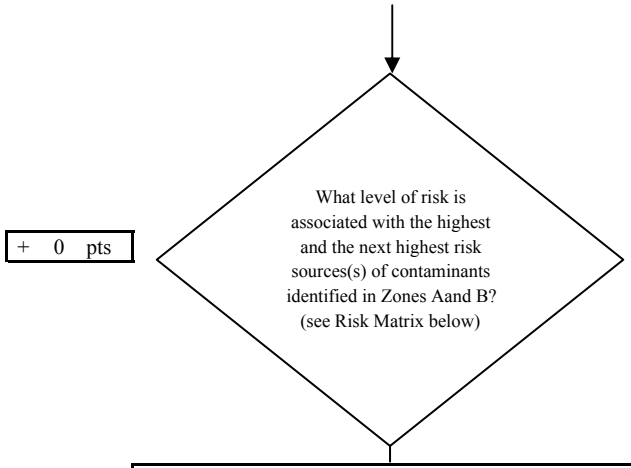


Chart 12. Contaminant risks for Pelican Utilities - Other Organic Chemicals



+ 0 pts

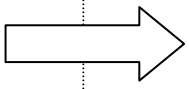
Risk Levels for OOC Sources identified in Zones A and B

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

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

Matrix Score 0

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.



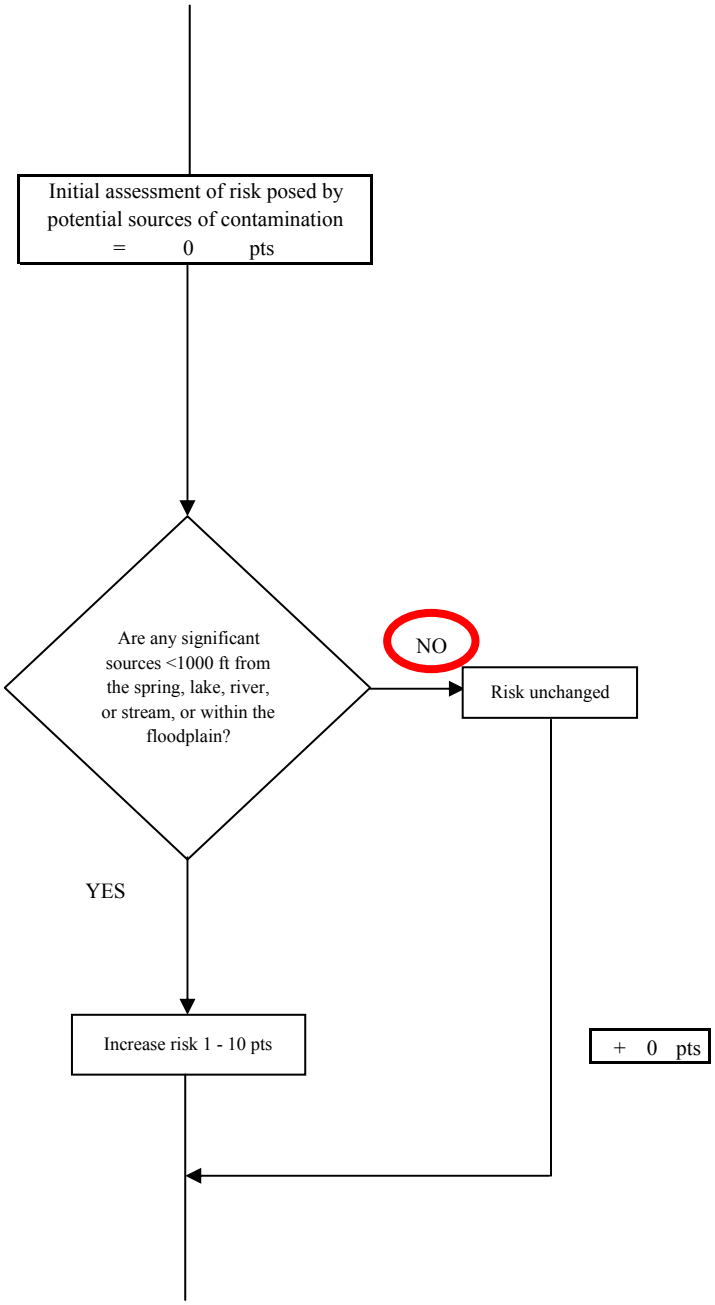
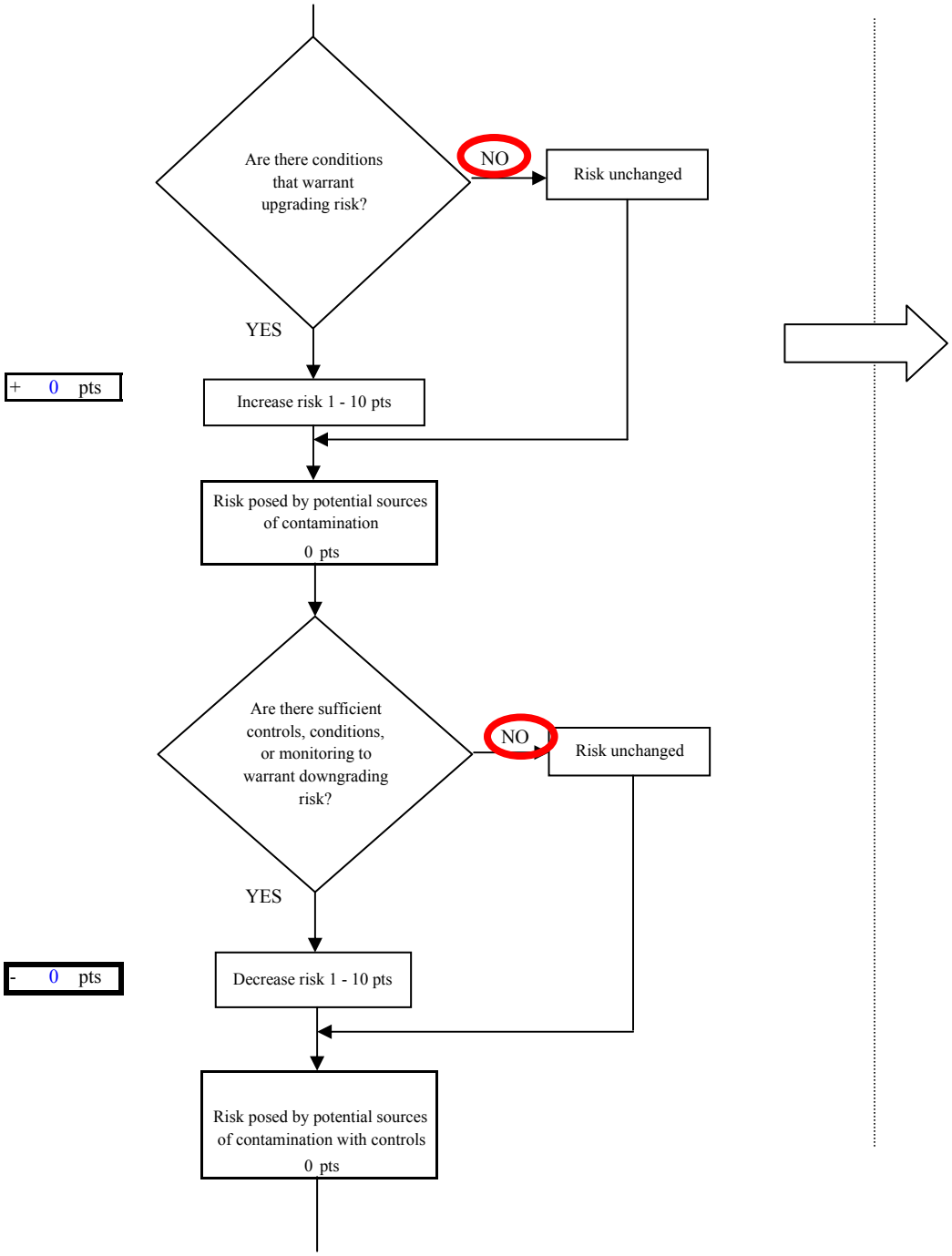


Chart 12. Contaminant risks for Pelican Utilities - Other Organic Chemicals



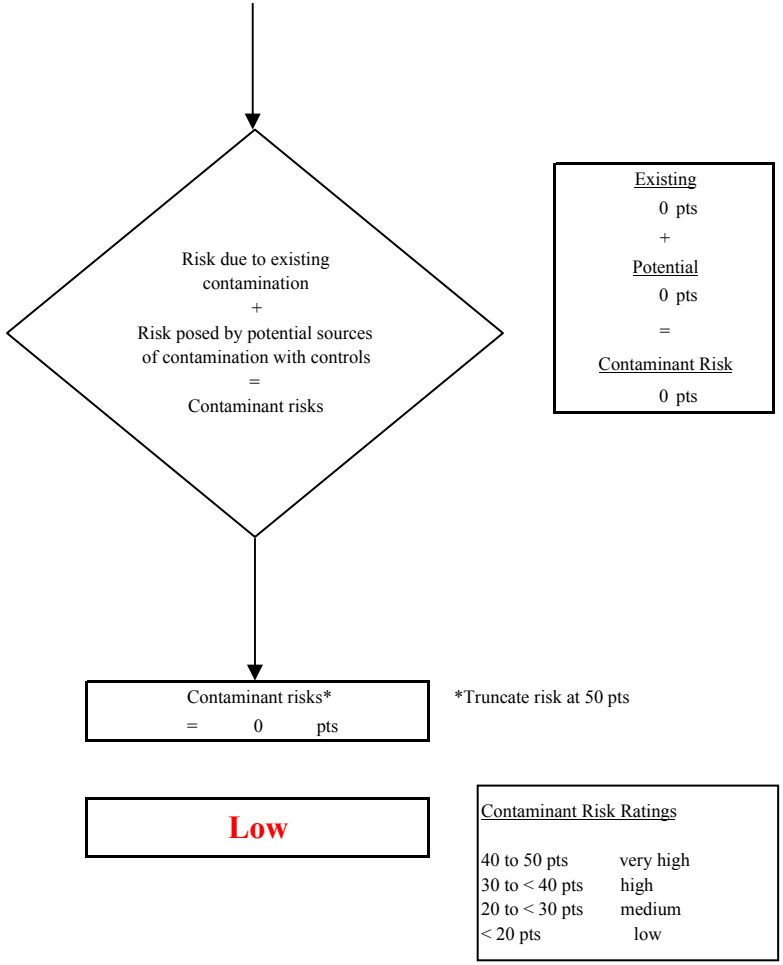


Chart 13. Vulnerability analysis for Pelican Utilities - Other Organic Chemicals