Source Water Assessment for Midtown Estates

A Hydrogeologic Susceptibility and Vulnerability Assessment

DRINKING WATER PROTECTION PROGRAM REPORT 393
PWSID 227204.001 and 227204.002

January 2002

Source Water Assessment for Midtown Estates

By ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION,

DRINKING WATER PROTECTION PROGRAM REPORT 393

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION: 2002

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By **ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

Drinking Water Protection Program
Alaska Department of Environmental Conservation

EXECUTIVE SUMMARY

Midtown Estates public water system consists of two Class A (community) wells. The potential and current sources of contaminants for Midtown Estates Well No. 1 and Well No. 2 include: paved roads, residential septic systems, large capacity septic systems, and residential area. These existing and potential sources of contamination are considered a source of bacteria and viruses, nitrates and/or nitrites, and volatile organic chemicals, synthetic organic chemicals and other organic chemicals. Overall, Midtown Estates Well No. 1 public water source received a vulnerability rating of **High** for bacteria and viruses, nitrates and/or nitrites, **Low** for volatile organic, heavy metals, synthetics organic chemicals and other organic chemicals. Midtown Estates Well No. 2 received a vulnerability rating of **High** for nitrates and or nitrites, **Medium** for bacteria and viruses, **Low** for volatile organic, heavy metals, synthetic organic and other organic chemicals.

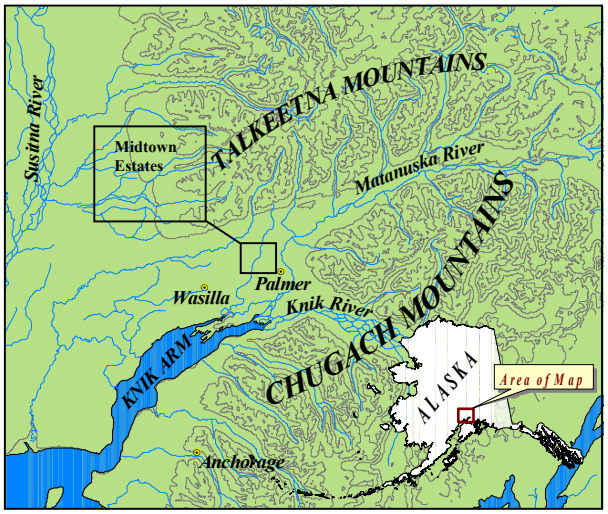


Figure 1. Index Map showing the location of the Matanuska-Susitna Valley and Midtown Estates

INTRODUCTION

The purpose of this environmental assessment is to provide public water system owners/operators, communities, and local governments with information they can use to preserve the quality of Alaska's public drinking water supplies. This assessment was completed for the Midtown Estates source of public drinking water. This source currently consists of two wells in the Palmer area (Figure 1). The system is planning to add another well in 2002. This assessment, known under the Alaska Drinking Water Protection Program as the *Source Water Assessment*, has combined a review of the natural hydrogeologic sensitivity with potential and existing contaminant risks to arrive at an overall vulnerability of the drinking water source to contamination. This assessment has been completed as a basis for local voluntary protection efforts and to assist agencies in their efforts to reduce risk to this public drinking water supply.

DESCRIPTION OF THE MATANUSKA-SUSITNA VALLEY-AREA, ALASKA

Location

The Matanuska-Susitna Valley is part of the lowland lying about 50 miles north of Anchorage in south central Alaska. The well described in this report is part of the Matanuska River Watershed. The study area is roughly bounded on the north by the Talkeetna Mountains; on the west by Wasilla Creek; on the south by the Knik River; and on the east by the Chugach Mountains. The area covers approximately 150 square miles.

Climate

The climate of the Matanuska-Susitna Valley is the result of a combination of marine and continental influences. The climate is somewhat transitional in that it does not experience large daily and annual

temperature fluctuations like those experienced in the interior of Alaska nor does it experience high amounts of precipitation typified by gulf coast regions. Mean annual precipitation is approximately 15 inches per year. On the average, the Valley receives a total snow accumulation of 58 inches per year. Precipitation generally increased inland toward the Talkeetna Mountains where annual precipitation may exceed 60 inches. Mean daily temperature ranges from 67° F during July to 5° F in January [*Western Regional Climate Center*, 2000].

Physiography and Groundwater Conditions

The Matanuska-Susitna Valley is surrounded by rugged mountains that rise abruptly above the valley floor. The Chugach Mountains at the southern edge of the valley reach altitudes greater than 6300 feet. These mountains are composed primarily of metamorphosed sedimentary marine and volcanic rocks. Along the northern edge of the valley, peaks in the Talkeetna Mountains reach altitudes of 3000 to 5000 feet. The Talkeenta Mountains are composed mainly of igneous rocks, chiefly granite intrusives and subordinate lavas and tuffs; Cretaceous and Tertiary sedimentary rocks form the south flank of the mountains. Although the altitude of the valley floor ranges from sea level at Knik Arm to 1000 feet at the base of Wishbone Hill, the local relief is commonly not more than 100 to 200 feet.

The Matanuska and Knik River's drain the area. These rivers are braided glacial outwash streams having wide floodplains. Drainage is poor in many interstream tracts resulting in large areas of swampy ground with shallow lakes occupying depressions.

The Matanuska-Susitna Valley is floored with unconsolidated deposits, chiefly glacial drift, that represents several episodes of glacial advances and retreats. The drift includes till, outwash stream deposits, and estuarine and lake deposits. Physiographic features formed by these deposits in or adjacent to the study area include end moraine, lateral moraines, eskers, crevasse fillings, and other pitted

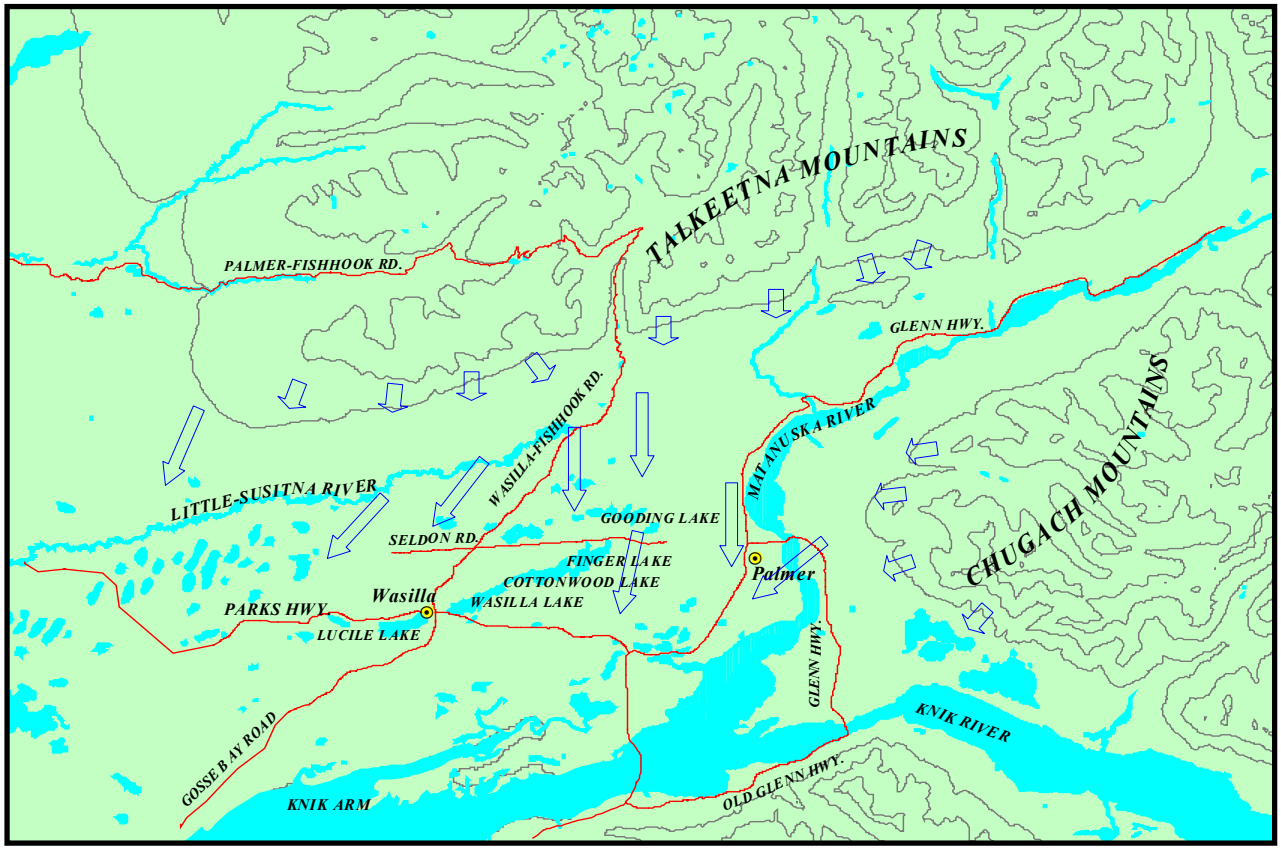


Figure 2. Map showing groundwater flow in the Matanuska-Susitna Valley (Jokela, Munter and Evans, 1991).

features, river terraces, outwash floodplains and an extensive estuarine flat (Trainer, 1960).

The glacial till and bedrock form aquifers of minor importance. The chief hydrologic significance of the till is in confining the artesian aquifer. Generally, the till is poorly permeable, although locally thin layers of sand may yield small quantities of water. Till that is present at or near the land surface in much of the area makes the acquisition of shallow groundwater difficult. The bedrock is poorly permeable. It yields water only from fractures, whose location and frequency cannot be easily predicted.

The chief aquifers are composed of outwash sand and gravel laid down by melt-water streams or in lakes. The outwash deposits are of two chief forms. The first consists of sheet-like deposits that lie just beneath the ground surface. These deposits range in thickness from a few feet to more than 100 feet. They typically rest on till or bedrock. The water in these deposits is unconfined. The other outwash deposits are buried beneath till. They are known to be as much as 50 to 60 feet thick, and probably are considerably thicker in some places. They commonly contain confined, or artesian, groundwater. Well logs and data from pumping tests suggest that outwash sand and gravel form a continuous or nearly continuous sheet in an area of more than 10 square miles north and west of Palmer (Jakola et al, 1991).

In the Mat-Su Valley, groundwater is primarily recharged by snowmelt and precipitation infiltrating both directly and also from the infiltration into the foothill slopes of the Talkeetna and Chugach Mountains. In addition,, aquifers may be recharged by streams where surface water percolates into surrounding permeable sediments (losing reaches of streams). This is the case for the water-table aquifers in the terrace south of Palmer and in the Bodenburg Butte area, which receive underground flow from the Matanuska River. Groundwater flow in the confined aquifers is generally from the north and north-northwest. The direction of groundwater flow in the upper unconfined aquifer is more variable due to the influence from surficial topography as well as its close connection with surface water bodies (Trainer,1960).

MIDTOWN ESTATES PUBLIC WATER SOURCE

Midtown Estates public water source is a Class A (community) water source, which is privately owned and operated. The source currently consists of two wells. The primary well, well no. 1, is located approximately 750 ft north of the Palmer Wasilla Highway .and 1 mile west of Trunk Road. The backup well, well no. 2, is located approximately 1900 northwest of well no.1. Both wells are at an approximate elevation of 350 feet above sea level. According to the well logs , neither Well No. 1 nor Well No. 2 are grouted. Records indicate that Well No. 1 penetrates a hard pan layer from 15 to 60 feet and sandy gravel from 60 to 115 feet. The depth of the well is 115' below the surface. The well is screened from 95 to 115 feet and had a static water level of 20 feet below the surface at the time of drilling (6/14/84). Well No.2 penetrates topsoil, sand and sandy gravel from 0 to 35 feet, hardpan from 35 to 80 feet and sand from 80 to 100 feet. The depth of the well is 100 feet below the surface and it is screened from 80 to 100 feet and has a static water level of 15 feet below the surface at the time of drilling (7/17/84).

The water from Well No. 1, the primary well, is stored in a single 5000 gallon atmospheric tank. Water from Well No.2 mixes with water from Well No. 1. The system serves 335 residents and 35 non-residents through 112 service connections.

This water source operates 365 days per year. The Midtown Estates drinking water source collectively serves approximately 200 non-residents through one service connection.

A third well, Well No. 3 is inactive due to poor water quality. (high iron, manganese and likely tannins). Per recent sanitary survey, the wellhouse needs major modifications before it can operate again.

Additional Wells are planned for this system. Records indicate that Well No. 6 and No. 7 are expected to become active in 2002.

ASSESSMENT AND PROTECTION AREA FOR MIDTOWN ESTATES DRINKING WATER SOURCE

The Drinking Water Protection and Assessment Area that has been established for the Midtown Estates wells is the area that is most sensitive to contamination. This area has served as a basis for assessing the risk of the drinking water source to contamination. This zone around the drinking water source is the most critical area for the preservation of the quality of the drinking water for this source. For simplicity, this area will be known as your Drinking Water Protection Area and will serve as the area of focus for voluntary protection efforts.
Conceptually, groundwater enters the aquifer systems along the front range of the Talkeetna Mountains and flows toward Cook Inlet. An analytical calculation was used to calculate the size and shape of the area that

contributes water to the well. The input parameters describing the attributes of the aquifer in this calculation were adopted from the well log and the recent Sanitary Survey. This analytical calculation was used as a guide in establishing the protection area for Midtown Estates. Additional methods were further employed to take into account any uncertainties in groundwater flow and aquifer characteristics to arrive at a meaningful and conservative protection area with respect to public health (Please refer to the Guidance Manual for Class A Public Water Systems for additional information).

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

INVENTORY OF POTENTIAL AND EXISTING CONTAMINANT SOURCES

The Drinking Water Protection Program has completed an inventory of potential and existing sources of contamination within the Drinking Water Protection Area for Midtown Estate Well No. 1 and Well No. 2. This survey was completed through a search of agency records and other publicly available information.

Potential sources of contamination to drinking water supplies cover a wide range of categories and types. Potential drinking water contaminants are found within agricultural, residential, commercial, and industrial areas, but can also occur within areas that have little or no development.

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

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

Table 1 in Appendix C lists the Contaminant Source Inventory for Midtown Estates. Inventoried potential sources of contamination within Zone A were attributed to residential lawns and gardens. Zones B contained roads, residential lawn & gardens and septic systems, and commercial activities. Zone C contained roads, residential septic systems and residential lawns and gardens. Zone D did not contain any significant sources. Below is a summary of the contaminant sources inventoried within the Midtown Estates protection area:

- Paved Highway
- Residential Septic Systems
- Residential Lawn and Gardens
- Injection Wells (Class V) Large Capacity Septic Systems.

These potential contaminant sources present risks for all six categories of drinking water contaminants for Midtown Estates drinking water source.

RANKING OF CONTAMINANT RISKS

Potential and existing sources of contamination have been identified, sorted, and ranked according to what type and level of risk they represent. Ranking of contaminant risks for a “potential” or “existing” source of contamination is a function of toxicity and volumes of specific contaminants associated with that source. Contaminant risks are further a function of the number and density of those types of contaminant sources as well as the proximity of those sources to the well (Appendices B & C).

VULNERABILITY OF MIDTOWN ESTATES DRINKING WATER SOURCES

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

- Natural susceptibility; and
- Contaminant risks.

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

Natural Susceptibility (0 – 50 points)

+

Contaminant Risks (0 – 50 points)

=

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

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

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

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

Midtown Estates is completed in a semi-confined aquifer setting. The well penetrates gravel and silty sand to 100 feet below the surface. This material may provide a protective barrier from the movement of contaminants in the subsurface. However, near the base of the Talkeetna Mountains, the clay and till layers tend to be discontinuous and thin toward the mountains. Therefore, contaminants that enter the subsurface near the base of the mountains may enter the confined aquifer uninhibited by any protective layer. This well appears to be properly grouted with surrounding concrete pad as indicated from drilling records. Combining the susceptibilities of the wellhead and the aquifer to contamination leads to a score (0 – 50 points) and rating of overall Susceptibility (Appendix D). Table 1 shows the overall Susceptibility score and rating for Midtown Estates.

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

Well No. 1	**Score**	**Rating**
Susceptibility of the Wellheads	5	Low
Susceptibility of the Aquifer	20	Very High
Natural Susceptibility	25	Medium
Well No. 2		
Susceptibility of the Wellheads	5	Low
Susceptibility of the Aquifer	22	Medium
Natural Susceptibility	27	Medium

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

Table 2. Contaminant Risks

Contaminant Risks	**Score**	**Rating**
Well No. 1		
Bacteria and Viruses	40	Very High
Nitrates and/or Nitrites	41	Very High
Volatile Organic Chemicals	12	Low
Heavy Metals, Cyanide, And Other Inorganic Chemicals	12	Low
Synthetic Organic Chemicals	12	Low
Other Organic Chemicals	12	Low
Well No. 2		
Bacteria and Viruses	25	Medium
Nitrates and/or Nitrites	41	Very High
Volatile Organic Chemicals	12	Low
Heavy Metals, Cyanide, And Other Inorganic Chemicals	12	Low
Synthetic Organic Chemicals	12	Low
Other Organic Chemicals	12	Low

Appendix D contains fourteen charts, which together form the 'Vulnerability Analysis' for a Class A public drinking water system. Chart 1 analyzes the 'Susceptibility of the Wellhead' to contamination by looking at the construction of the well and its surrounding area. Chart 2 analyzes the 'Susceptibility of the Aquifer' to contamination by looking at the naturally occurring attributes of the water source and

influences on the groundwater system that might lead to contamination. Chart 3 analyzes 'Contaminant Risks' for the drinking water source with respect to bacteria and viruses. The 'Contaminant Risks' portion of the analysis considers potential sources of contaminants as well as a review of contamination that has or may have occurred but has not arrived or been detected at the well. Lastly, Chart 4 contains the 'Vulnerability Analysis for Bacteria and Viruses'. Charts 5 through 14 contain the Contaminant Risks and Vulnerability Analysis for nitrates and nitrites, volatile organic chemicals, heavy metals, synthetic organic chemicals, and other organic chemicals, respectively.

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

Table 3. Overall Vulnerability of Midtown Estates Public Drinking Water Source to Contamination by Category

Category	Score	Rating
Well No. 1		
Bacteria and Viruses	65	High
Nitrates and Nitrites	65	High
Volatile Organic Chemicals	35	Low
Heavy Metals, Cyanide, and Other Inorganic Chemicals	35	Low
Synthetic Organic Chemicals	35	Low
Other Organic Chemicals	35	Low
Well No. 2		
Bacteria and Viruses	50	Medium
Nitrates and Nitrites	65	High
Volatile Organic Chemicals	12	Low
Heavy Metals, Cyanide, and Other Inorganic Chemicals	12	Low
Synthetic Organic Chemicals	12	Low
Other Organic Chemicals	12	Low

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

Overall, contaminant risks for Well No. 1 are very high for Bacteria/Viruses due to the potential risks associated with the large capacity septic system and the density of residential septic systems. Recent sampling data indicates no detection of bacteria and viruses Combining contamination risk with the natural susceptibility of the well leads to an overall vulnerability to bacteria/virus contamination of high.

The contaminant risks for Well No. 2 are medium for Bacteria/Viruses due to the potential risks associated with the density residential septic systems. Recent sampling data indicates no detection of bacteria and viruses. Combining the contamination risk with the natural susceptibility of the well leads to an overall vulnerability to bacteria/virus contamination of medium

The potential contamination risk for Well No.1 is very high for nitrate/nitrites due the large capacity septic system and the density of residential septic systems. Existing nitrate/nitrite contamination has been detected in the past. The highest concentration recently detected occurred on July 17th, 1997. The level detected was 18% of the maximum contaminant level (MCL) of 10 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 effects. (See Chart 5 – Contaminant Risks for Nitrates and/or Nitrites in Appendix D.) Combining the contamination risk with the natural susceptibility of Well No. 1 leads to an overall vulnerability to nitrate/nitrite contamination of high.

The potential contamination risks for Well No.2 is very high for nitrate/nitrites due to density of residential septic systems. Samples taken at Well No. 2 on September 11th, 2000, indicate nitrates at 17% of the MCL. Combining contamination risk with the natural susceptibility of Well No. 2 leads to an overall vulnerability to nitrate/nitrite contamination of high.

Nitrates and/or nitrites are found in natural background concentration at this site, as elsewhere in Alaska. Due to high solubility and weak retention by soil, nitrates are very mobile often moving at approximately the same rate as water. Nevertheless, the current nitrate concentrations detected in Well No. 1 and No. 2 remain at safe level with respect to human health.
The contamination risks for volatile organic chemicals, heavy metals, synthetic organic chemicals and other organic chemicals remain low and no detection of has occurred to date.

Recently two new wells have been drilled, Well No. 6 and Well No.7. These wells are currently inactive but records indicate that Well No.7 is scheduled to become active. Since the system is not currently active, a source water assessment was not completed for these new sources. Assessments will be updated every 5 years, at which time the new systems may be assessed. Also, since Well No.7 is located near Well No.1 the protection areas will be similar. The exact protection area will depend on the depth and production rate of Well No. 7.

Recent sampling events at Well No.7 on June 9, 2000 indicated arsenic levels of 0.006 mg/l which is 60% of the current MCL of 0.010 mg/l., and barium levels of 0.012 mg/l which is, less than 1% of the MCL. Both these levels are below the MCL and are considered safe levels with respect to human health.

Recent sampling events at Well No. 6 on July 23, 2000 indicated arsenic levels of 0.0308 mg/l. This exceeds the current MCL of 0.010 mg/l. Barium levels were 0.015 mg/l, or less then 1% of the MCL of 2 mg/l.

At the time of sampling the MCL for arsenic was 0.050 mg/l and the levels detected were under the MCL. However, the current MCL has been reduced to 0.010 mg/l. According to the EPA "Arsenic occurs naturally in rocks and soil, water, air, and plants and animals. It can be further released into the environment through natural activities such as volcanic action, erosion of rocks, and forest fires, or through human actions. Approximately 90 percent of industrial arsenic in the U.S. is currently used as a wood preservative, but arsenic is also used in paints, dyes, metals, drugs, soaps, and semi-conductors. Agricultural applications, mining, and smelting also contribute to arsenic releases in the environment." (EPA, 2001) Since there are no known sources of arsenic, it is likely that the arsenic detected at Midtown Estates Well No.6 is naturally occurring.

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

SUMMARY

A *Source Water Assessment* has been completed for the source of public drinking water serving Midtown Estates. Well No.1 and Well No.2. The overall vulnerability of Well No.1 is to contamination is **High** for bacteria and viruses, nitrates and nitrites, and **Low** for volatile organic chemicals, synthetic organic chemicals, other organic chemicals, and heavy metals.

The overall vulnerability of Well No.2 is to contamination is **Medium** for bacteria and viruses, **High** for nitrates and nitrites, and **Low** for volatile organic chemicals, synthetic organic chemicals, other organic chemicals, and heavy metals.

Two additional sources, Well No.6 and Well No.7 are currently inactive and did not receive source water assessments. Records indicate that Well No. 6 has detected arsenic levels greater then the current MCL of 0.010 mg/l. This should be considered in the future if this system plans on becoming an active producer of drinking water.

This assessment of contaminant risks can be used as a foundation for local voluntary protection efforts as well as a basis for the continuous efforts on the part of Midtown Estates to protect public health. It is anticipated that *Source Water Assessments* will be updated every five years to reflect any changes in the vulnerability and/or susceptibility of Midtown Estate's public drinking water source.

REFERENCES CITED

Jakola, 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 Reported of Investigations 90-4, State of Alaska Department of Natural Resources, Fairbanks, AK.

Trainer, F.W., 1960, Geology and Groundwater Resources, Matanuska Valley, Alaska, U.S. Geological Survey Water Supply Paper 1494 U.S. Printing Office, Washington, D.C.

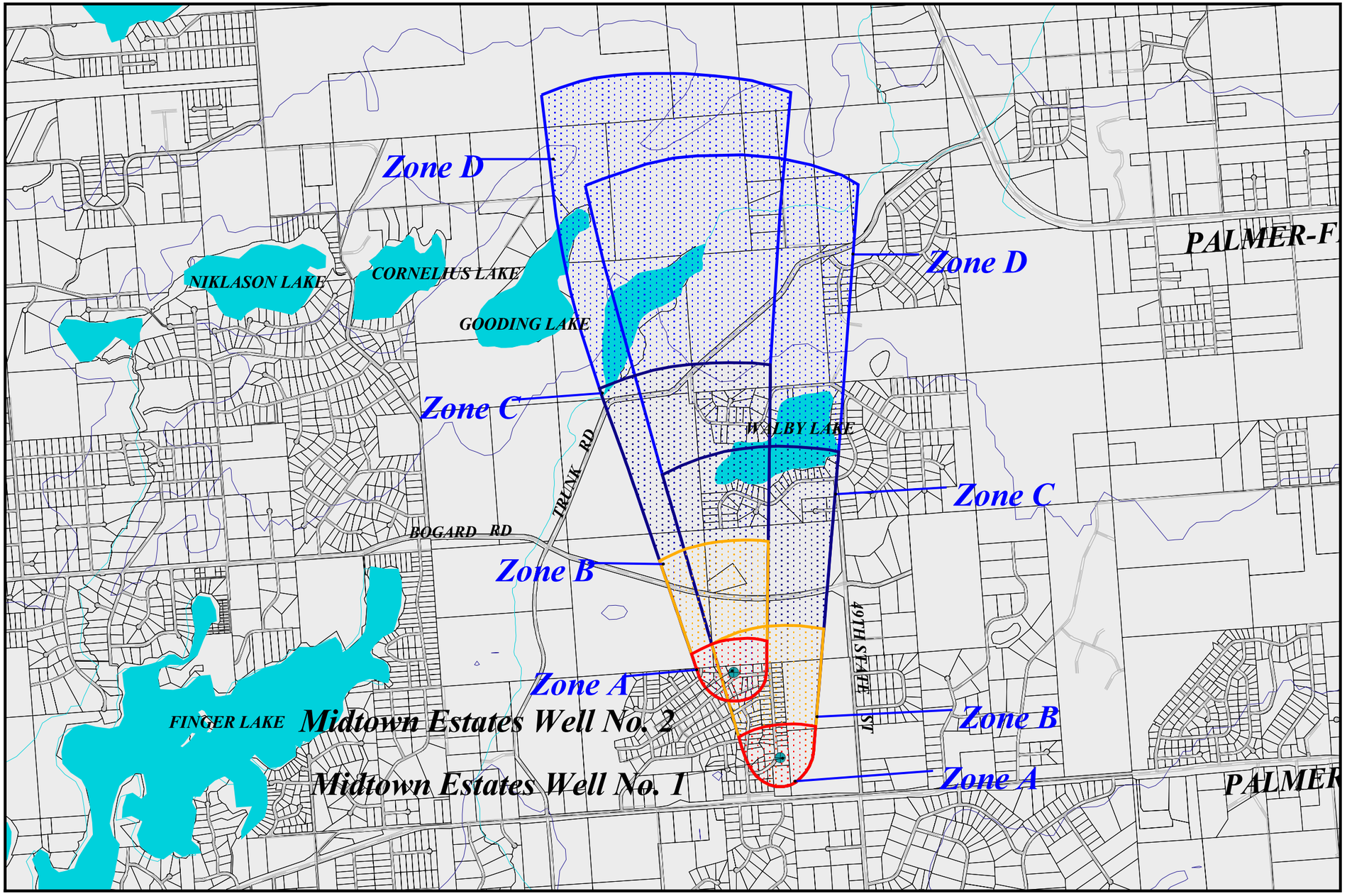
Western Regional Climate Center, 2000, August 24, Web extension to the *Western Regional Climate Center*. [WWW document]. URL http://www.uaa.alaska.edu/enri/ascc_web/ascc_home.html .

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

APPENDIX A

Midtown Estates
Drinking Water Protection Area

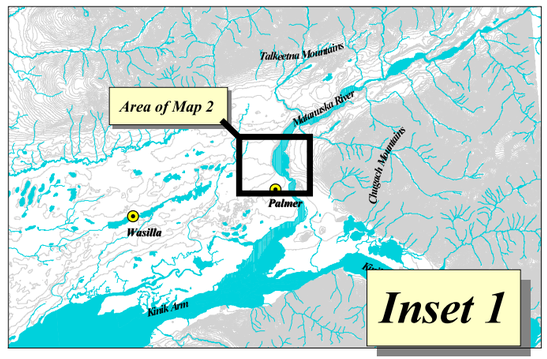
Drinking Water Protection Area for Midtown Estates Well No. 1 and Well No. 2



2000 0 2000 4000 Feet

Legend

- Midtown Estate Well No.1 and No.2
- Zone A Protection Areas
  - Several Months Travel Timel
- Zone B Protection Area
  - Less than 2 Years Travel Time
- Zone C Protection Area
  - Less than 5 years Travel Time
- Zone D Protection Area
  - Less than 10 Years Travel Time
- Cities
- Roads
- Rivers and Streams
- Lakes
- Elevation Contours
- Matanuska Susitna Borough Parcels



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PWSID 227204.001 (Well No. 1) and 227204.002 (Well No. 2)

Map 1

APPENDIX B

Contaminant Source Inventory and Risk Ranking for Midtown Estates

Table 1 *Contaminant Source Inventory for* ***PWSID 227204.001***

Midtown Estates

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Location*	*Map Number*	*Comments*
Residential Areas	R01	R01-01	A	Residential Areas in Zone B	2	
Septic systems (serves one single-family home)	R02	R02-01	A	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-02	A	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-03	A	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-04	A	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-05	A	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-06	A	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-07	A	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-08	A	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-09	A	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-10	A	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-11	A	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-62	A		3	
Highways and roads, paved (cement or asphalt)	X20	X20-01	A	Broadway Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-02	A/B	Midtown Drive	2	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Near Colony Schools Drive	3	
Septic systems (serves one single-family home)	R02	R02-12	B	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-13	B	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-14	B	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-16	B	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-17	B	Near LexingtonStreet and Midtown Drive		

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-18	B	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-19	B	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-20	B	Near Lexingtion Street	3	
Septic systems (serves one single-family home)	R02	R02-21	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-22	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-23	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-24	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-25	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-26	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-27	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-28	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-29	B	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-30	B	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-31	B	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-32	B	Near Queesnboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-33	B	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-34	B	Near Queensboro and Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-35	B	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-36	B	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-62	B	Broadway Drive	3	
Landscaping around commercial, industrial, or government buildings	X03	X03-01	B	Colony Middle and High School	2	large nicely manicured lawn
Highways and roads, paved (cement or asphalt)	X20	X20-03	B	Lexington Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-05	B	Brooklyn Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-06	B	Queensboro Avenues	2	
Highways and roads, paved (cement or asphalt)	X20	X20-07	B	Kiva Way	2	
Septic systems (serves one single-family home)	R02	R02-36-60	C	All residential septics in zone c	3	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-08	C	Colony Schools Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-09	C	Polar Lane	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	C	Caribour Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	C	Seagull Drive	2	

Table 2

Contaminant Source Inventory and Risk Ranking for Midtown Estates
Sources of Bacteria and Viruses

PWSID 227204.001

Contaminant Source Type	Contaminant Source ID	CS ID tag	Zone	Risk Ranking for Analysis	Location	Map Number	Comments
Septic systems (serves one single-family home)	R02	R02-01	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-02	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-03	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-04	A	Low	Near Midtown Drive	3	
Residential Areas	R01	R01-01	A	Low	Residential Areas in Zone B	2	
Septic systems (serves one single-family home)	R02	R02-05	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-06	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-07	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-08	A	Low	Near Broadway Drive	3	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	High	Near Colony Schools Drive	3	
Septic systems (serves one single-family home)	R02	R02-09	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-10	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-11	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-62	A	Low		3	
Highways and roads, paved (cement or asphalt)	X20	X20-01	A	Low	Broadway Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-02	A/B	Low	Midtown Drive	2	
Septic systems (serves one single-family home)	R02	R02-12	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-13	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-14	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-16	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-17	B	Low	Near LexingtonStreet and Midtown Drive		

Table 2 (continued)

Contaminant Source Inventory and Risk Ranking for Midtown Estates
Sources of Bacteria and Viruses

PWSID 227204.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-18	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-19	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-20	B	Low	Near Lexingtion Street	3	
Septic systems (serves one single-family home)	R02	R02-21	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-22	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-23	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-24	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-25	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-26	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-27	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-28	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-29	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-30	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-31	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-32	B	Low	Near Queesnboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-33	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-34	B	Low	Near Queensboro and Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-35	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-36	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-62	B	Low	Broadway Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-03	B	Low	Lexington Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-05	B	Low	Brooklyn Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-06	B	Low	Queensboro Avenues	2	
Highways and roads, paved (cement or asphalt)	X20	X20-07	B	Low	Kiva Way	2	

Table 2 (continued)

Contaminant Source Inventory and Risk Ranking for Midtown Estates

Sources of Bacteria and Viruses

PWSID 227204.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-36-60	C	Low	All residential septics in zone c	3	
Highways and roads, paved (cement or asphalt)	X20	X20-08	C	Low	Colony Schools Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-09	C	Low	Polar Lane	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	C	Low	Caribour Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	C	Low	Seagull Drive	2	

Table 3

Contaminant Source Inventory and Risk Ranking for Midtown Estates
Sources of Nitrates/Nitrites

PWSID 227204.001

Contaminant Source Type	Contaminant Source ID	CS ID tag	Zone	Risk Ranking for Analysis	Location	Map Number	Comments
Septic systems (serves one single-family home)	R02	R02-01	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-02	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-03	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-04	A	Low	Near Midtown Drive	3	
Residential Areas	R01	R01-01	A	Low	Residential Areas in Zone B	2	
Septic systems (serves one single-family home)	R02	R02-05	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-06	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-07	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-08	A	Low	Near Broadway Drive	3	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	High	Near Colony Schools Drive	3	
Septic systems (serves one single-family home)	R02	R02-09	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-10	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-11	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-62	A	Low		3	
Highways and roads, paved (cement or asphalt)	X20	X20-01	A	Low	Broadway Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-02	A/B	Low	Midtown Drive	2	
Septic systems (serves one single-family home)	R02	R02-12	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-13	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-14	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-16	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-17	B	Low	Near LexingtonStreet and Midtown Drive		

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-18	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-19	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-20	B	Low	Near Lexingtion Street	3	
Septic systems (serves one single-family home)	R02	R02-21	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-22	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-23	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-24	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-25	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-26	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-27	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-28	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-29	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-30	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-31	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-32	B	Low	Near Queesnboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-33	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-34	B	Low	Near Queensboro and Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-35	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-36	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-62	B	Low	Broadway Drive	3	
Landscaping around commercial, industrial, or government buildings	X03	X03-01	B	Medium	Colony Middle and High School	2	large nicely manicured lawn
Highways and roads, paved (cement or asphalt)	X20	X20-03	B	Low	Lexington Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-05	B	Low	Brooklyn Circle	2	

Table 3 (continued)

Contaminant Source Inventory and Risk Ranking for Midtown Estates

Sources of Nitrates/Nitrites

PWSID 227204.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-06	B	Low	Queensboro Avenues	2	
Highways and roads, paved (cement or asphalt)	X20	X20-07	B	Low	Kiva Way	2	
Septic systems (serves one single-family home)	R02	R02-36-60	C	Low	All residential septics in zone c	3	
Highways and roads, paved (cement or asphalt)	X20	X20-08	C	Low	Colony Schools Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-09	C	Low	Polar Lane	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	C	Low	Caribour Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	C	Low	Seagull Drive	2	

Table 4

Contaminant Source Inventory and Risk Ranking for Midtown Estates
Sources of Volatile Organic Chemicals

PWSID 227204.001

Contaminant Source Type	Contaminant Source ID	CS ID tag	Zone	Risk Ranking for Analysis	Location	Map Number	Comments
Highways and roads, paved (cement or asphalt)	X20	X20-01	A	Low	Broadway Drive	2	
Septic systems (serves one single-family home)	R02	R02-01	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-02	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-03	A	Low	Near Broadway Drive	3	
Residential Areas	R01	R01-01	A	Low	Residential Areas in Zone B	2	
Septic systems (serves one single-family home)	R02	R02-04	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-05	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-06	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-07	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-08	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-09	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-10	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-11	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-62	A	Low		3	
Highways and roads, paved (cement or asphalt)	X20	X20-02	A/B	Low	Midtown Drive	2	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Low	Near Colony Schools Drive	3	
Septic systems (serves one single-family home)	R02	R02-12	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-13	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-14	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-16	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-17	B	Low	Near LexingtonStreet and Midtown Drive		

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-18	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-19	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-20	B	Low	Near Lexingtion Street	3	
Septic systems (serves one single-family home)	R02	R02-21	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-22	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-23	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-24	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-25	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-26	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-27	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-28	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-29	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-30	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-31	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-32	B	Low	Near Queesnboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-33	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-34	B	Low	Near Queensboro and Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-35	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-36	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-62	B	Low	Broadway Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-03	B	Low	Lexington Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-05	B	Low	Brooklyn Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-06	B	Low	Queensboro Avenues	2	
Highways and roads, paved (cement or asphalt)	X20	X20-07	B	Low	Kiva Way	2	

Contaminant Source Inventory and Risk Ranking for Midtown Estates

Sources of Volatile Organic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-36-60	C	Low	All residential septics in zone c	3	
Highways and roads, paved (cement or asphalt)	X20	X20-08	C	Low	Colony Schools Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-09	C	Low	Polar Lane	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	C	Low	Caribour Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	C	Low	Seagull Drive	2	

Table 5

Contaminant Source Inventory and Risk Ranking for Midtown Estates

Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals

PWSID 227204.001

Contaminant Source Type	Contaminant Source ID	CS ID tag	Zone	Risk Ranking for Analysis	Location	Map Number	Comments
Highways and roads, paved (cement or asphalt)	X20	X20-01	A	Low	Broadway Drive	2	
Septic systems (serves one single-family home)	R02	R02-01	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-02	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-03	A	Low	Near Broadway Drive	3	
Residential Areas	R01	R01-01	A	Low	Residential Areas in Zone B	2	
Septic systems (serves one single-family home)	R02	R02-04	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-05	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-06	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-07	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-08	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-09	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-10	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-11	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-62	A	Low		3	
Highways and roads, paved (cement or asphalt)	X20	X20-02	A/B	Low	Midtown Drive	2	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Low	Near Colony Schools Drive	3	
Septic systems (serves one single-family home)	R02	R02-12	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-13	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-14	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-16	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-17	B	Low	Near LexingtonStreet and Midtown Drive		

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-18	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-19	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-20	B	Low	Near Lexingtion Street	3	
Septic systems (serves one single-family home)	R02	R02-21	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-22	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-23	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-24	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-25	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-26	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-27	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-28	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-29	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-30	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-31	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-32	B	Low	Near Queesnboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-33	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-34	B	Low	Near Queensboro and Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-35	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-36	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-62	B	Low	Broadway Drive	3	
Landscaping around commercial, industrial, or government buildings	X03	X03-01	B	Low	Colony Middle and High School	2	large nicely manicured lawn
Highways and roads, paved (cement or asphalt)	X20	X20-03	B	Low	Lexington Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-05	B	Low	Brooklyn Circle	2	

Contaminant Source Inventory and Risk Ranking for Midtown Estates

Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-06	B	Low	Queensboro Avenues	2	
Highways and roads, paved (cement or asphalt)	X20	X20-07	B	Low	Kiva Way	2	
Septic systems (serves one single-family home)	R02	R02-36-60	C	Low	All residential septics in zone c	3	
Highways and roads, paved (cement or asphalt)	X20	X20-08	C	Low	Colony Schools Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-09	C	Low	Polar Lane	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	C	Low	Caribour Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	C	Low	Seagull Drive	2	

Table 6

Contaminant Source Inventory and Risk Ranking for Midtown Estates
Sources of Synthetic Organic Chemicals

PWSID 227204.001

Contaminant Source Type	Contaminant Source ID	CS ID tag	Zone	Risk Ranking for Analysis	Location	Map Number	Comments
Septic systems (serves one single-family home)	R02	R02-01	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-02	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-03	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-04	A	Low	Near Midtown Drive	3	
Residential Areas	R01	R01-01	A	Low	Residential Areas in Zone B	2	
Septic systems (serves one single-family home)	R02	R02-05	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-06	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-07	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-08	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-09	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-10	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-11	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-62	A	Low		3	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Low	Near Colony Schools Drive	3	
Septic systems (serves one single-family home)	R02	R02-12	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-13	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-14	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-16	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-17	B	Low	Near LexingtonStreet and Midtown Drive		
Septic systems (serves one single-family home)	R02	R02-18	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-19	B	Low	Near Lexington Street	3	

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-20	B	Low	Near Lexingtion Street	3	
Septic systems (serves one single-family home)	R02	R02-21	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-22	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-23	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-24	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-25	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-26	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-27	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-28	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-29	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-30	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-31	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-32	B	Low	Near Queesnboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-33	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-34	B	Low	Near Queensboro and Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-35	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-36	B	Low	Near Queensboro Avenue	3	
Landscaping around commercial, industrial, or government buildings	X03	X03-01	B	Low	Colony Middle and High School	2	large nicely manicured lawn
Septic systems (serves one single-family home)	R02	R02-36-60	C	Low	All residential septics in zone c	3	

Table 7

Contaminant Source Inventory and Risk Ranking for Midtown Estates
Sources of Other Organic Chemicals

PWSID 227204.001

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Highways and roads, paved (cement or asphalt)	X20	X20-01	A	Low	Broadway Drive	2	
Septic systems (serves one single-family home)	R02	R02-01	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-02	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-03	A	Low	Near Broadway Drive	3	
Residential Areas	R01	R01-01	A	Low	Residential Areas in Zone B	2	
Septic systems (serves one single-family home)	R02	R02-04	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-05	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-06	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-07	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-08	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-09	A	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-10	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-11	A	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-62	A	Low		3	
Highways and roads, paved (cement or asphalt)	X20	X20-02	A/B	Low	Midtown Drive	2	
Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)	D10	D10-01	B	Low	Near Colony Schools Drive	3	
Septic systems (serves one single-family home)	R02	R02-12	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-13	B	Low	Near Midtown Drive	3	
Septic systems (serves one single-family home)	R02	R02-14	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-15	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-16	B	Low	Near Broadway Dirve	3	
Septic systems (serves one single-family home)	R02	R02-17	B	Low	Near LexingtonStreet and Midtown Drive		

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-18	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-19	B	Low	Near Lexington Street	3	
Septic systems (serves one single-family home)	R02	R02-20	B	Low	Near Lexingtion Street	3	
Septic systems (serves one single-family home)	R02	R02-21	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-22	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-23	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-24	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-25	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-26	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-27	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-28	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-29	B	Low	Near Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-30	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-31	B	Low	Near Brooklyn Circle	3	
Septic systems (serves one single-family home)	R02	R02-32	B	Low	Near Queesnboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-33	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-34	B	Low	Near Queensboro and Broadway Drive	3	
Septic systems (serves one single-family home)	R02	R02-35	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-36	B	Low	Near Queensboro Avenue	3	
Septic systems (serves one single-family home)	R02	R02-62	B	Low	Broadway Drive	3	
Highways and roads, paved (cement or asphalt)	X20	X20-03	B	Low	Lexington Street	2	
Highways and roads, paved (cement or asphalt)	X20	X20-05	B	Low	Brooklyn Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-06	B	Low	Queensboro Avenues	2	
Highways and roads, paved (cement or asphalt)	X20	X20-07	B	Low	Kiva Way	2	

Contaminant Source Inventory and Risk Ranking for Midtown Estates

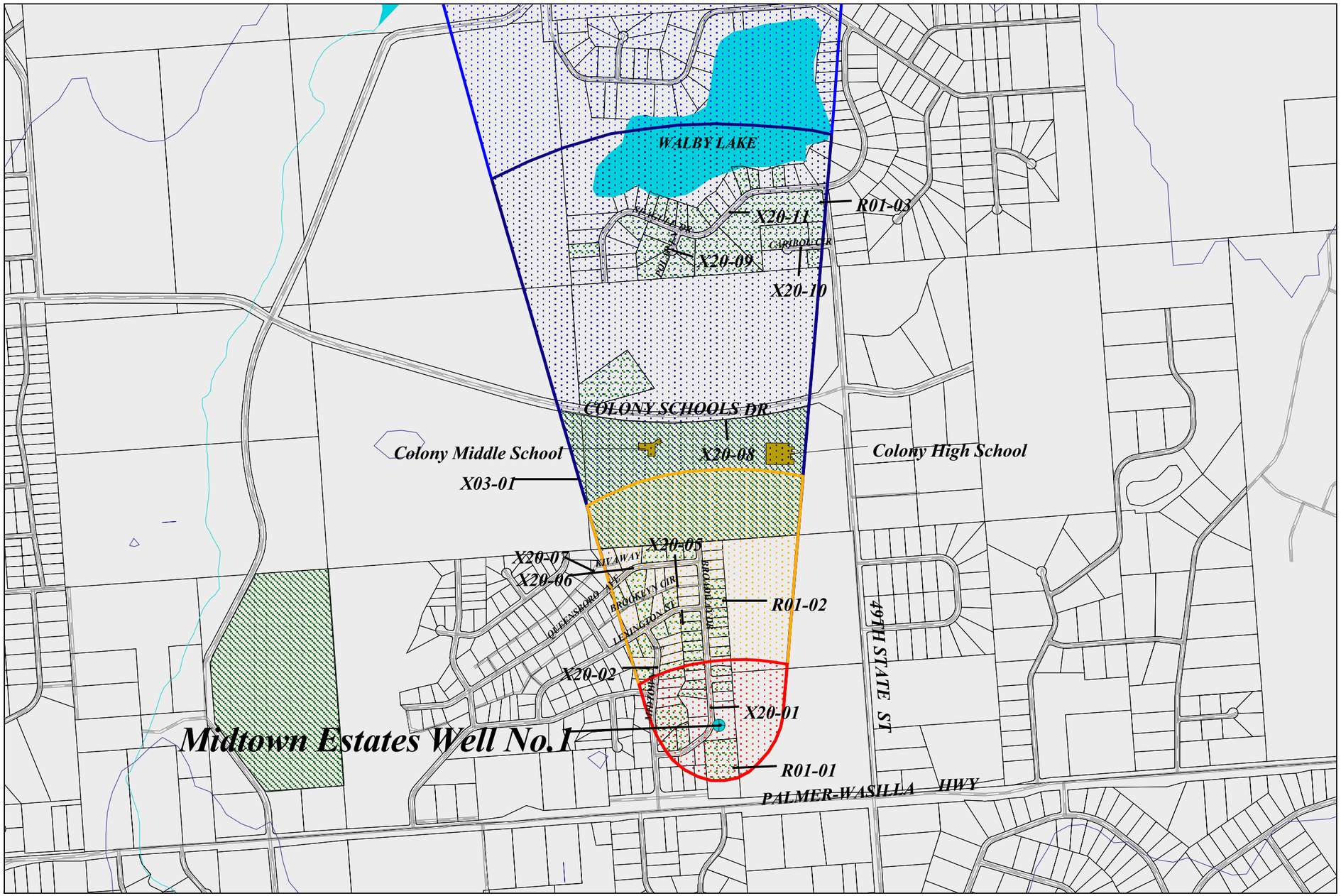
Sources of Other Organic Chemicals

Contaminant Source Type	*Contaminant Source ID*	*CS ID tag*	*Zone*	*Risk Ranking for Analysis*	*Location*	*Map Number*	*Comments*
Septic systems (serves one single-family home)	R02	R02-36-60	C	Low	All residential septics in zone c	3	
Highways and roads, paved (cement or asphalt)	X20	X20-08	C	Low	Colony Schools Drive	2	
Highways and roads, paved (cement or asphalt)	X20	X20-09	C	Low	Polar Lane	2	
Highways and roads, paved (cement or asphalt)	X20	X20-10	C	Low	Caribour Circle	2	
Highways and roads, paved (cement or asphalt)	X20	X20-11	C	Low	Seagull Drive	2	

APPENDIX C

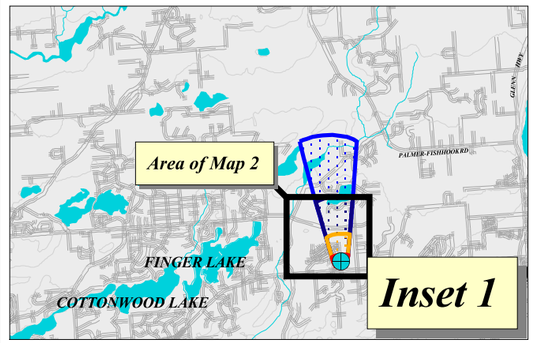
Midtown Estates
Drinking Water Protection Area
and Potential & Existing Contaminant Sources

Drinking Water Protection Area for Midtown Estates (Well No. 1) and Potential and Exisitng Sources of Contamination



Legend

- Midtown Estate Well No. 1
- Zone A Protection Area for Well No. 1
  - Several Months Time of Travel
- Zone D Protection Area for Well No. 1
  - Less than 2 Years Travel Time
- Zone C Protection Area for Well No. 1
  - Less than 5 Years Travel Time
- Zone D Protection Area for Well No. 1
  - Less than 2 Years Travel Time
- Roads
- Residential Areas (R02)
- Buildings
- Landscapping (X03)
- Rivers and Streams
- Lakes
- Elevation Contours
- Matanuska Susitna Borough Parcels



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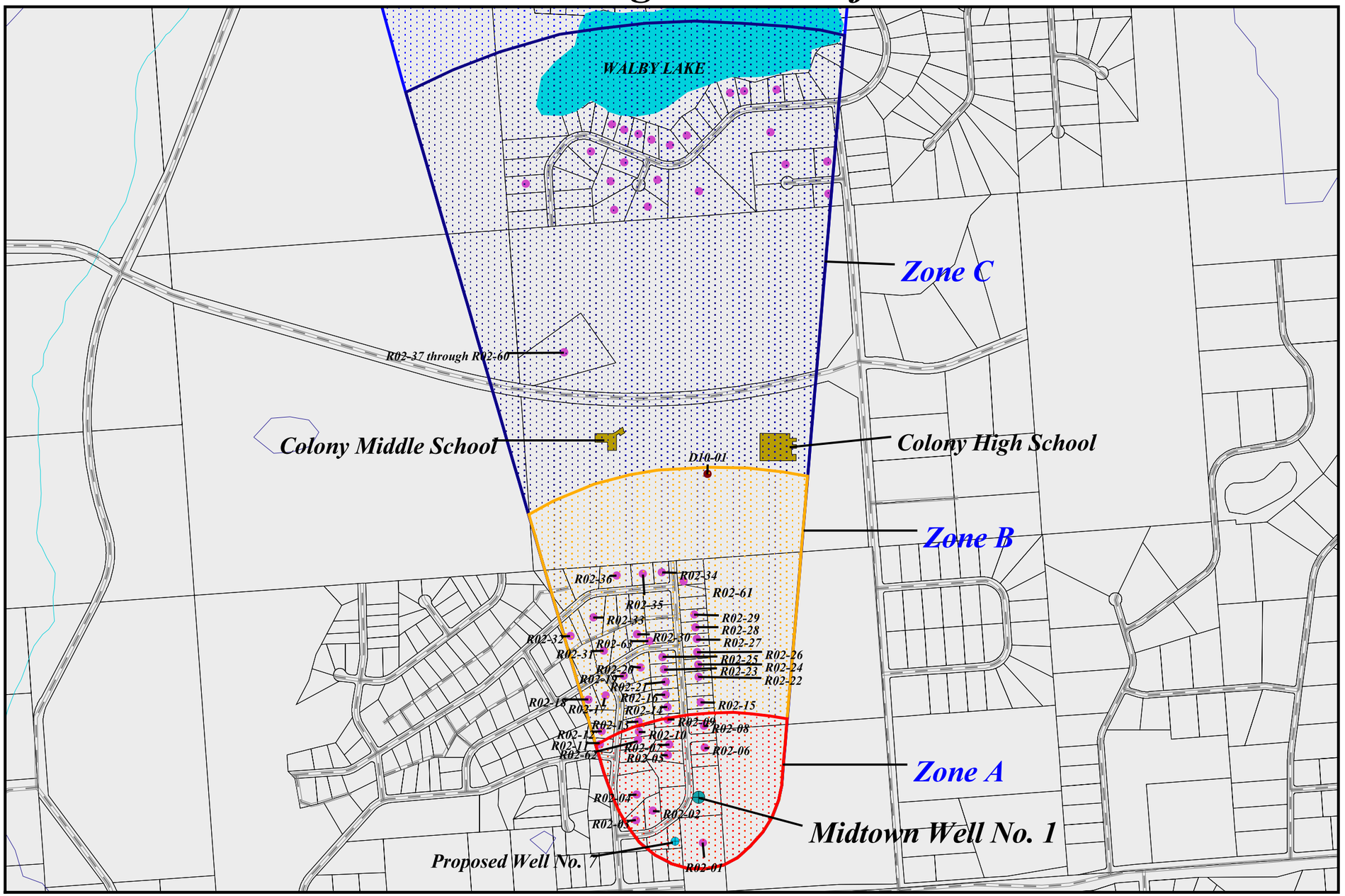
1000 0 1000 Feet

PWSID 227204.001

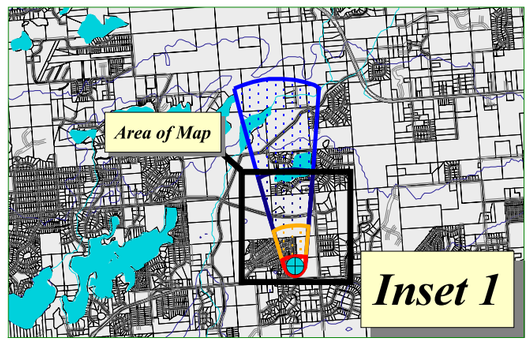
Map 2

Drinking Water Protection Area for Midtown Estates (Well No. 1) and Potential and Existing Sources of Contamination



Legend

- Midtown Estates Well No. 1
- Proposed Well No. 7
- Matanuska-pws.shp
- Zone A Protection Area for Well No. 1 — Several Months Time of Travel
- Zone B Protection Area for Well No. 1 — Less than 2 Years Travel Time
- Zone C Protection Area for Well No. 1 — Less than 5 Years Travel Time
- Zone D Protection Area for Well No. 1 — Less than 10 Years Travel Time
- Cities
- Buildings
- Roads
- Septics (R02)
- Class V Injection Well (D10)
- Rivers and Streams
- Lakes
- Elevation Contours
- Matanuska Susitna Borough Parcels



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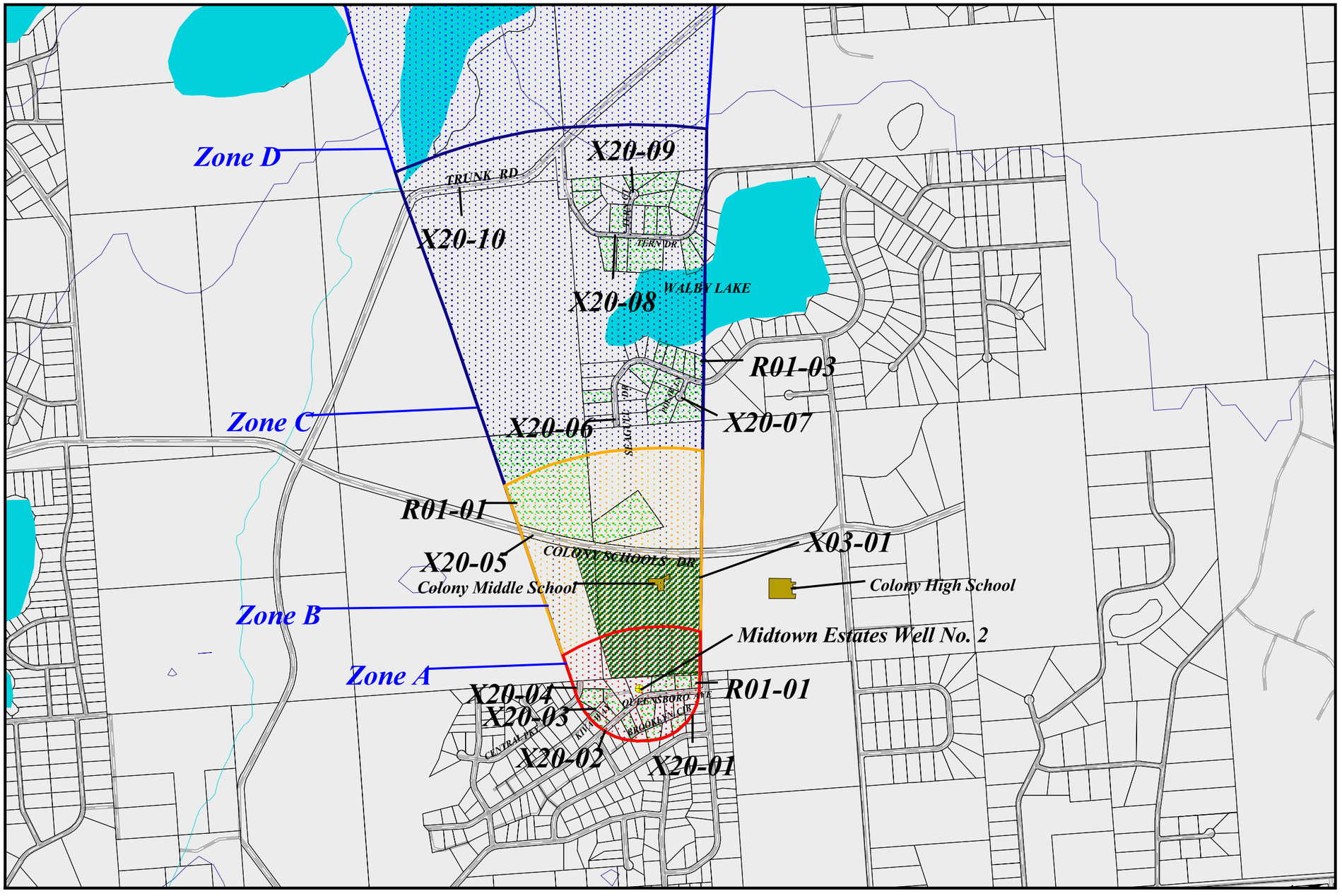
PWSID 227204.001

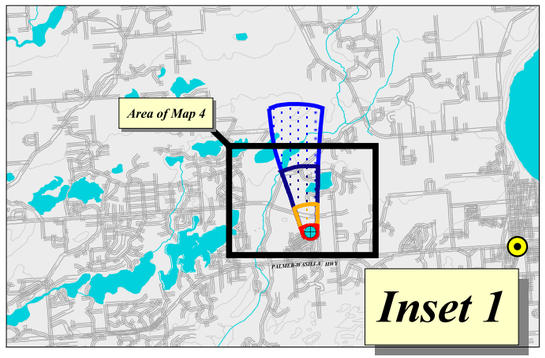
Map 3

Drinking Water Protection Area for Midtown Estates (Well No. 2) and Potential and Exisiting Sources of Contamination



Legend

- Midtown Estate Well No. 2
- Zone A Protection Area for Well No.2
  - Several Months Travel Time
- Zone B Protection Area for Well No. 2
  - Less than 2 Years Travel Time
- Zone C Protection Area for Well No. 2
  - Less than 5 Years Trave Time
- Zone D Protection Area for Well No. 2
  - Less than 10 years Travel Time
- Residential (R01)
- Buildings
- Landscapping (X03)
- Cities
- Lakes
- Rivers and Streams
- Matanuska Susitna Borough Parcels
- Roads
- Elevation Contours



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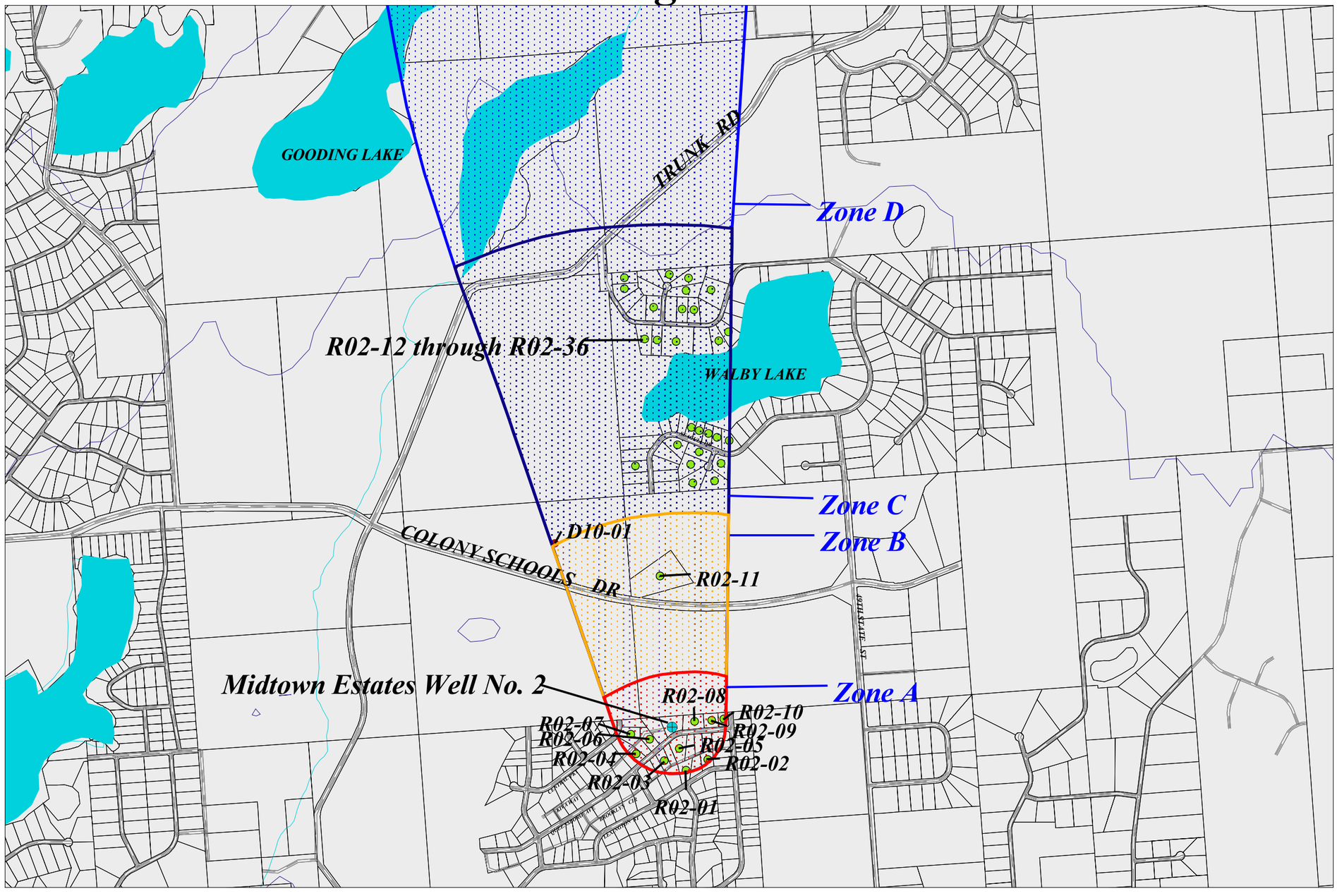
800 0 800 Feet

PWSID 227204.002

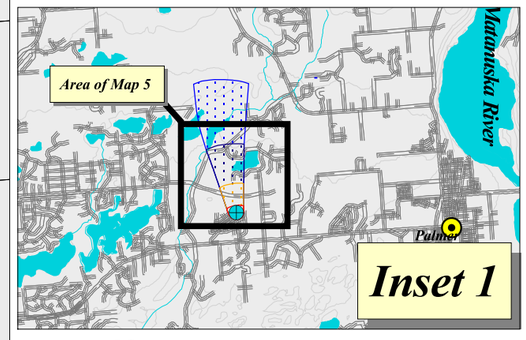
Map 4

Drinking Water Protectedtion Area for Midtown Estates (Well No.2) and Potential and Existing Sources of Contaminantion.



Legend

- Midtown Estate Well No. 2
- Zone A Protection Area for Well No.2
  - Several Months Travel Time
- Zone B Protection Area for Well No. 2
  - Less than 2 Years Travel Time
- Zone C Protection Area for Well No. 2
  - Less than 5 Years Trave Time
- Zone D Protection Area for Well No. 2
  - Less than 10 years Travel Time
- Septics (R02)
- Class V Injection Well (D10)
- Roads
- Cities
- Lakes
- Matanuska Susitna Borough Parcels
- Rivers and Streams
- Elevation Contours



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3000 0 3000 6000 Feet

PWSID 227204.002

Map 5

APPENDIX D

Vulnerability Analysis for Midtown Estates Public Drinking Water Source

Chart 1. Susceptibility of the wellhead - Midtown Estates PWSID 227204.002

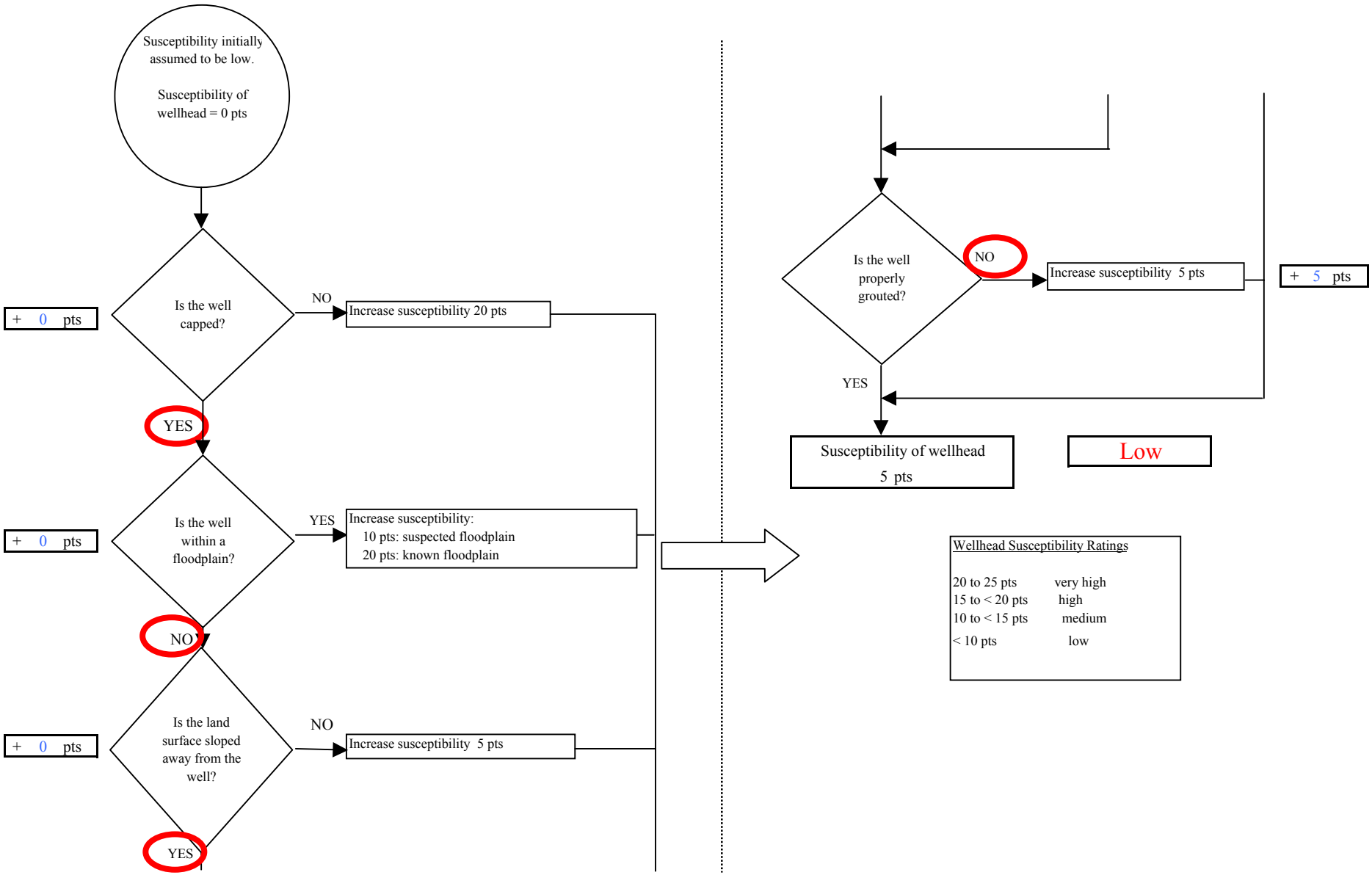


Chart 2. Susceptibility of the aquifer - Midtown Estates PWSID 227204.002

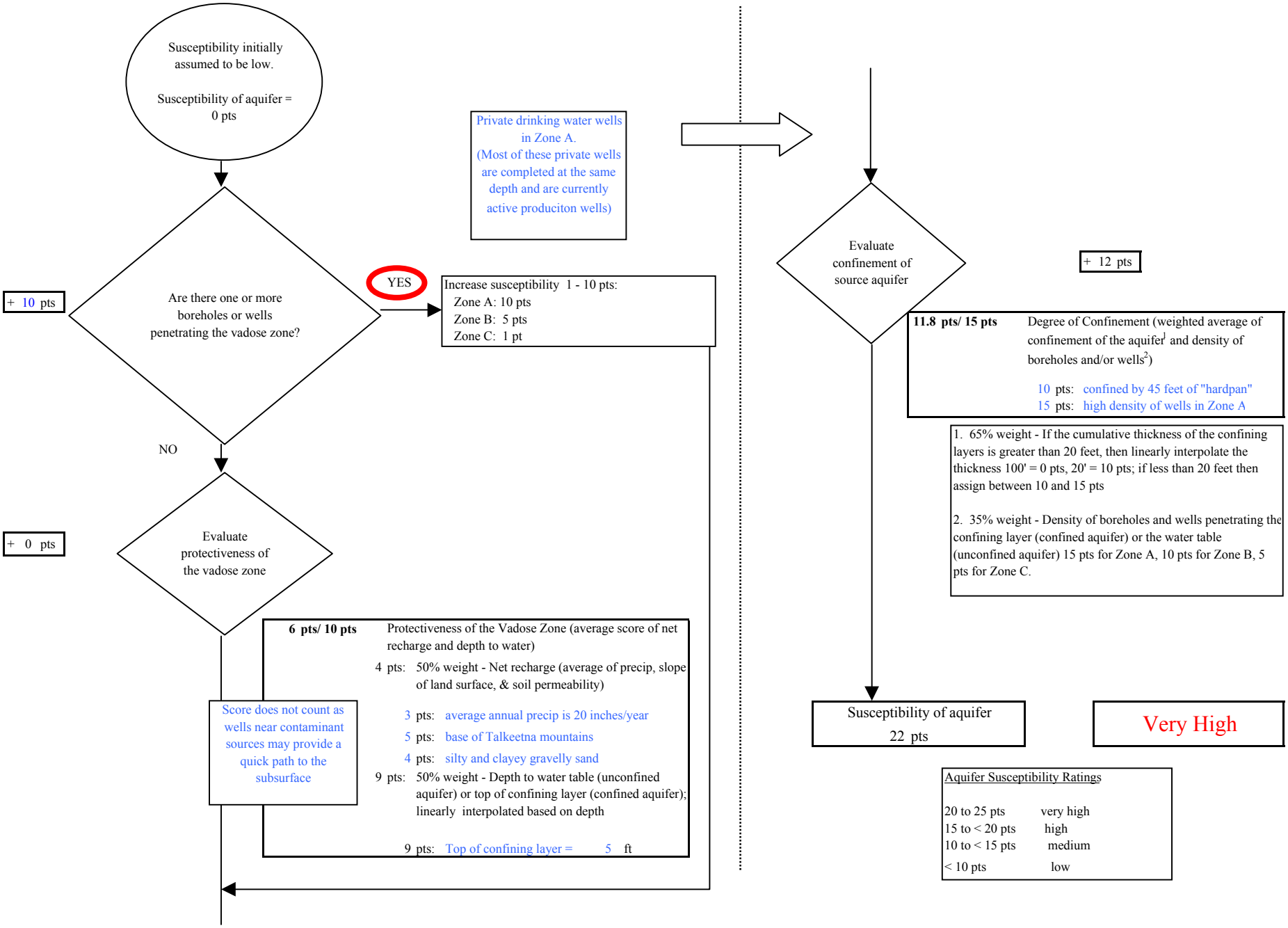
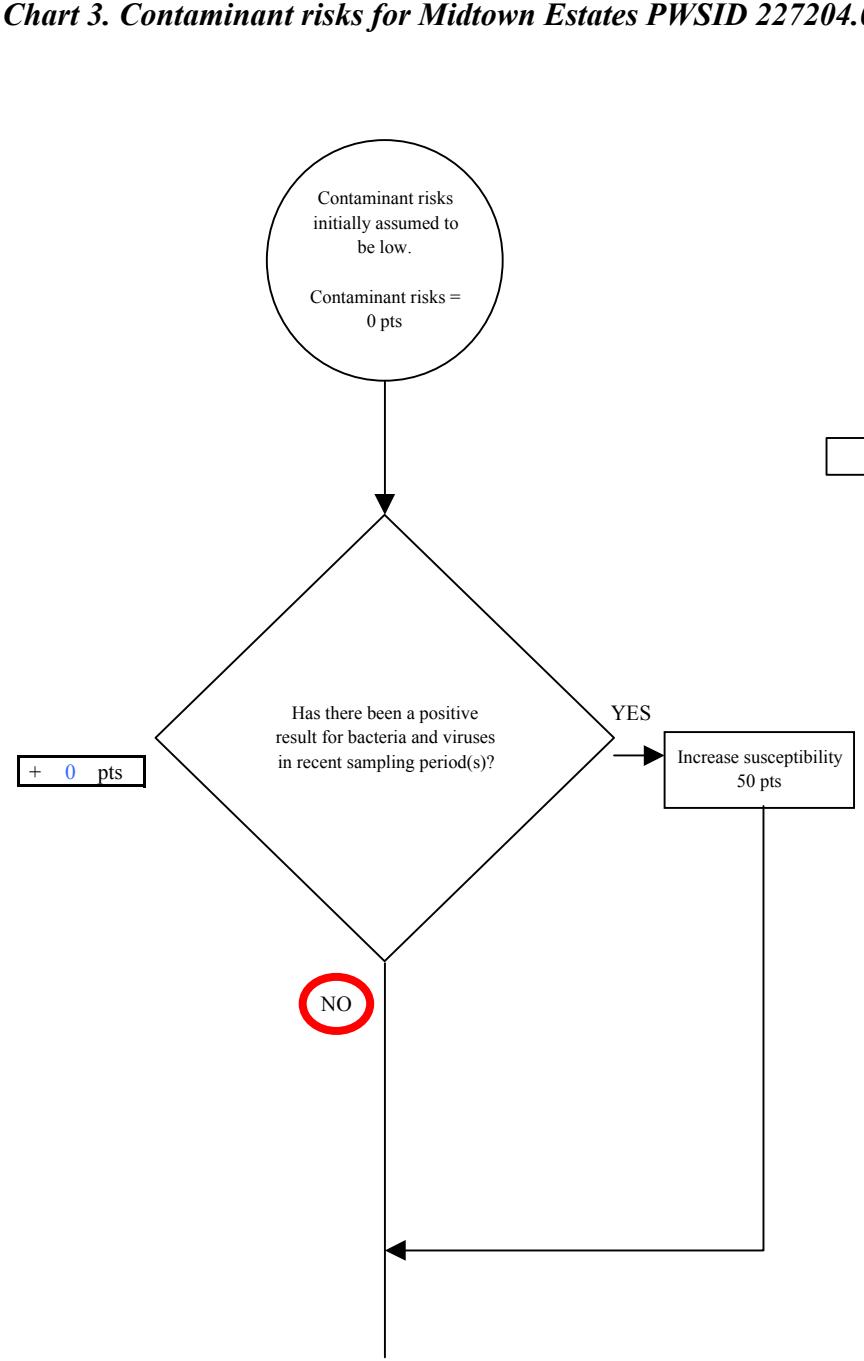
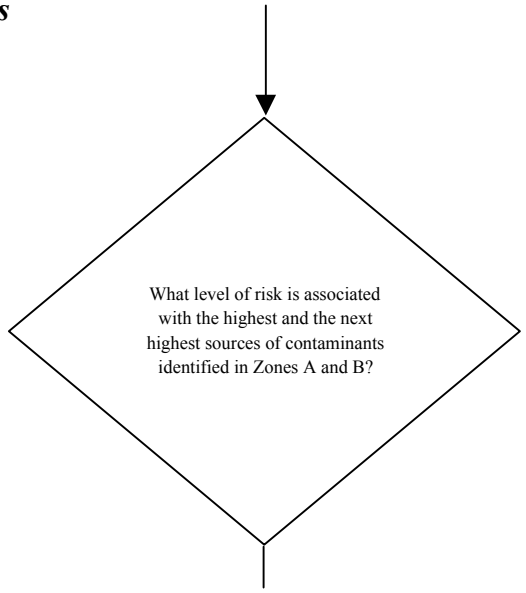


Chart 3. Contaminant risks for Midtown Estates PWSID 227204.002 - Bacteria & Viruses





+ 20 pts

Risk Rankings for Contaminant Sources Identified in Zones A and B

	Zone A	Zone B	Total
Very Highs(s)	0	0	0
High(s)	0	0	0
Medium(s)	0	0	0
Low(s)	12	4	16

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

Matrix Score 20

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 Midtown Estates PWSID 227204.002 - Bacteria & Viruses

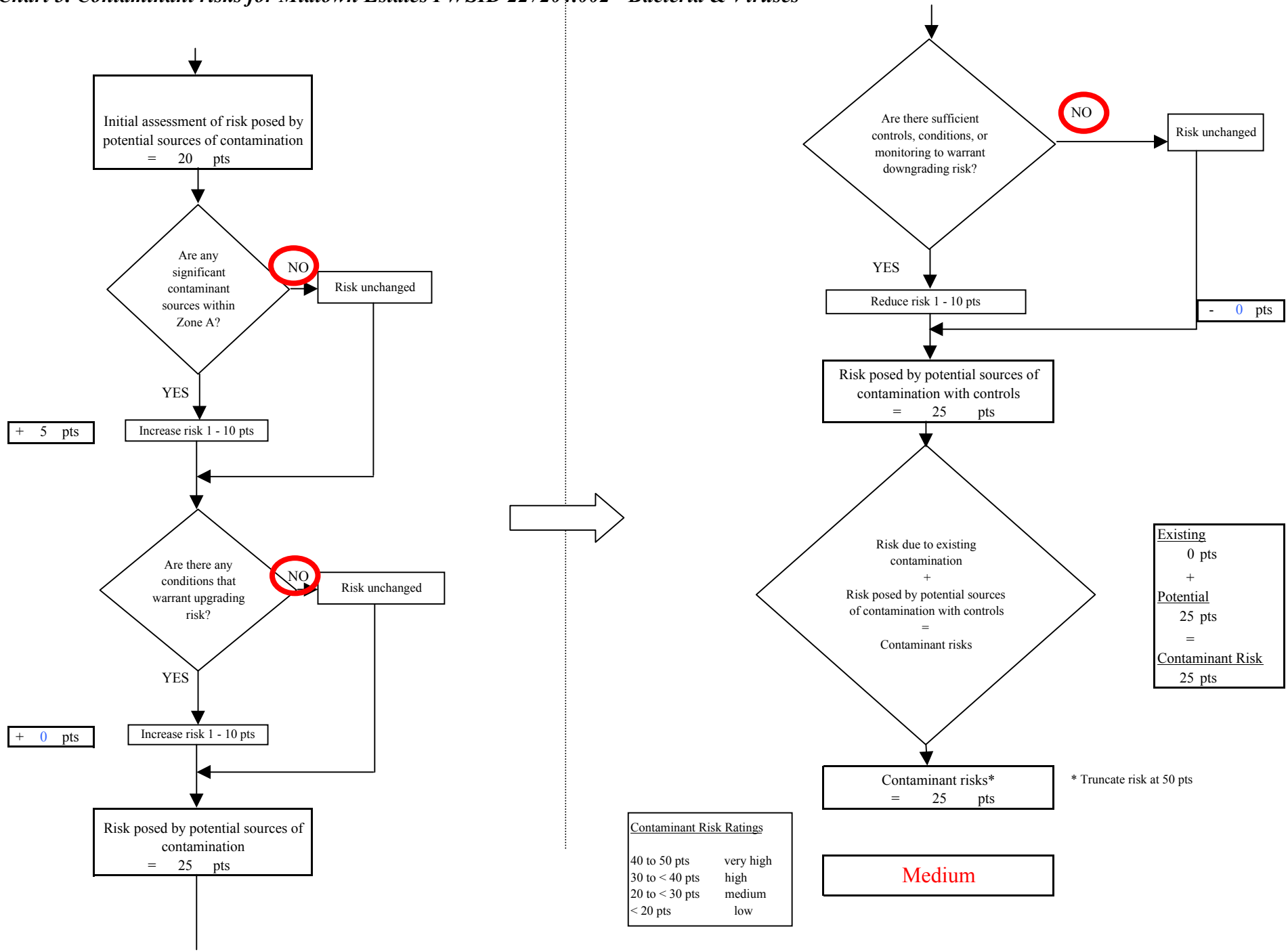


Chart 4. Vulnerability analysis for Midtown Estates PWSID 227204.002 - Bacteria & Viruses

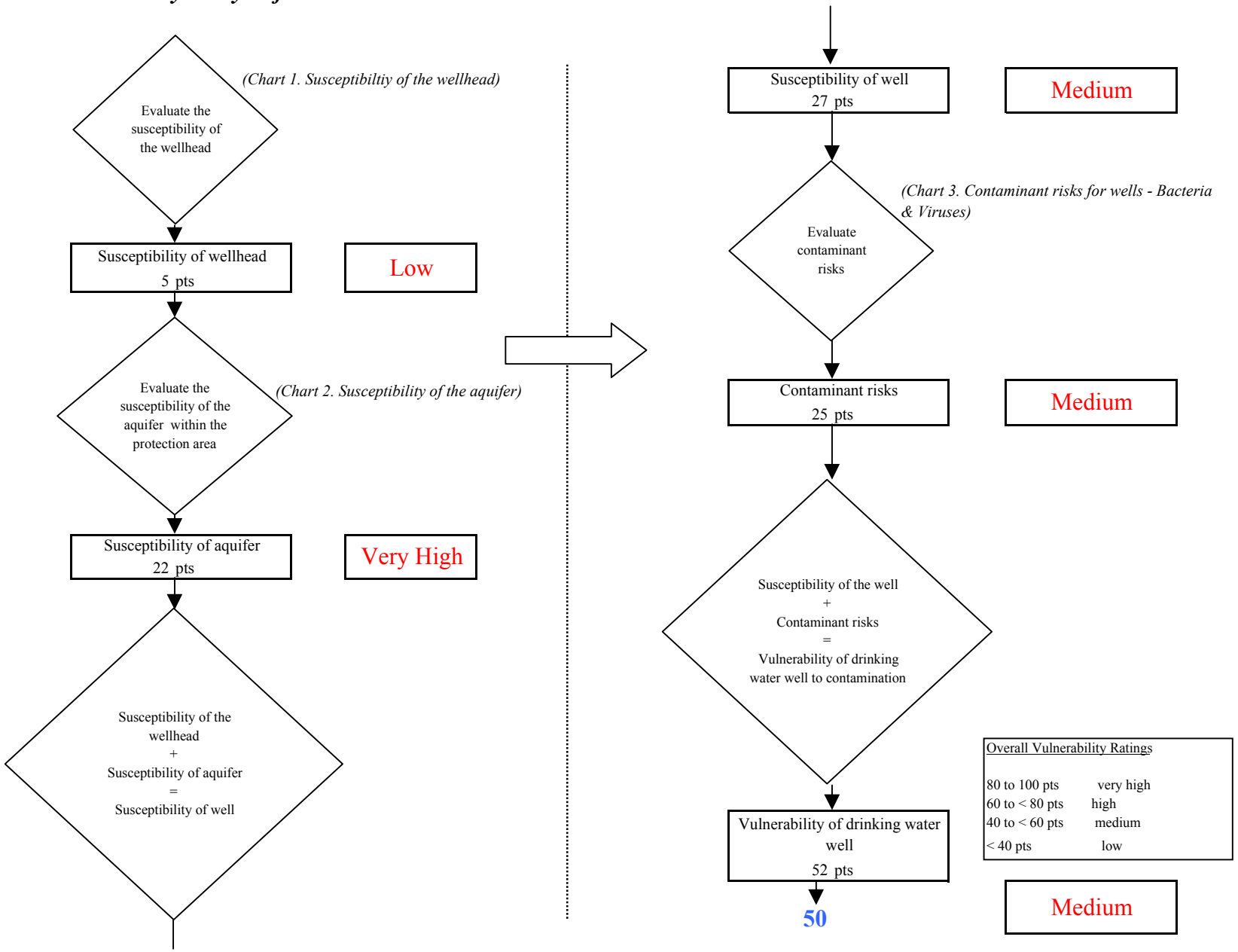


Chart 5. Contaminant risks for Midtown Estates PWSID 227204.002 - Nitrates and Nitrites

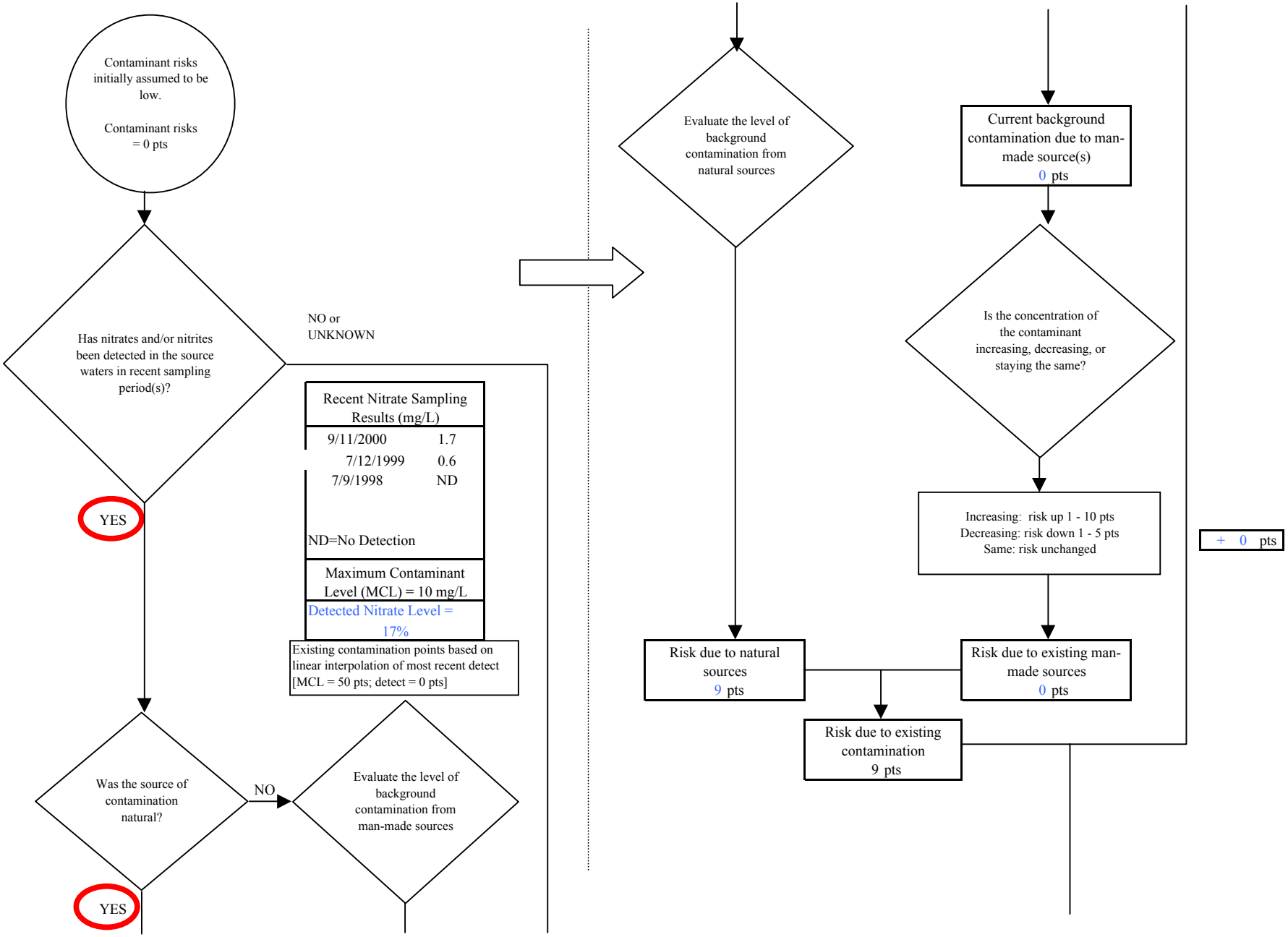


Chart 5. Contaminant risks for Midtown Estates PWSID 227204.002 - Nitrates and Nitrites

+ 30 pts

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

Risk Levels for Contaminant Sources identified in Zones A, B and C			
	Zone A	Zones B&C	Total
Very Highs(s)	0	0	0
High(s)	0	1	1
Medium(s)	0	0	0
Low(s)	2	5	7

	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.

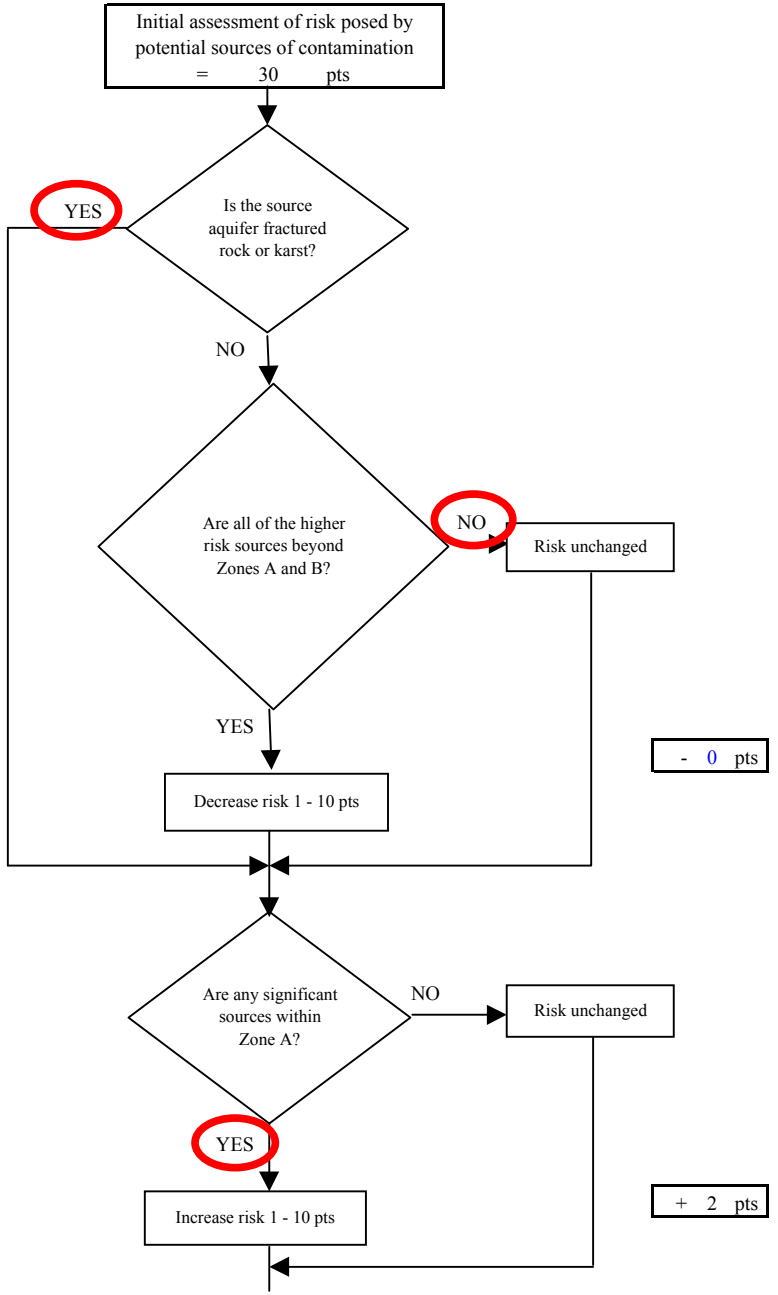
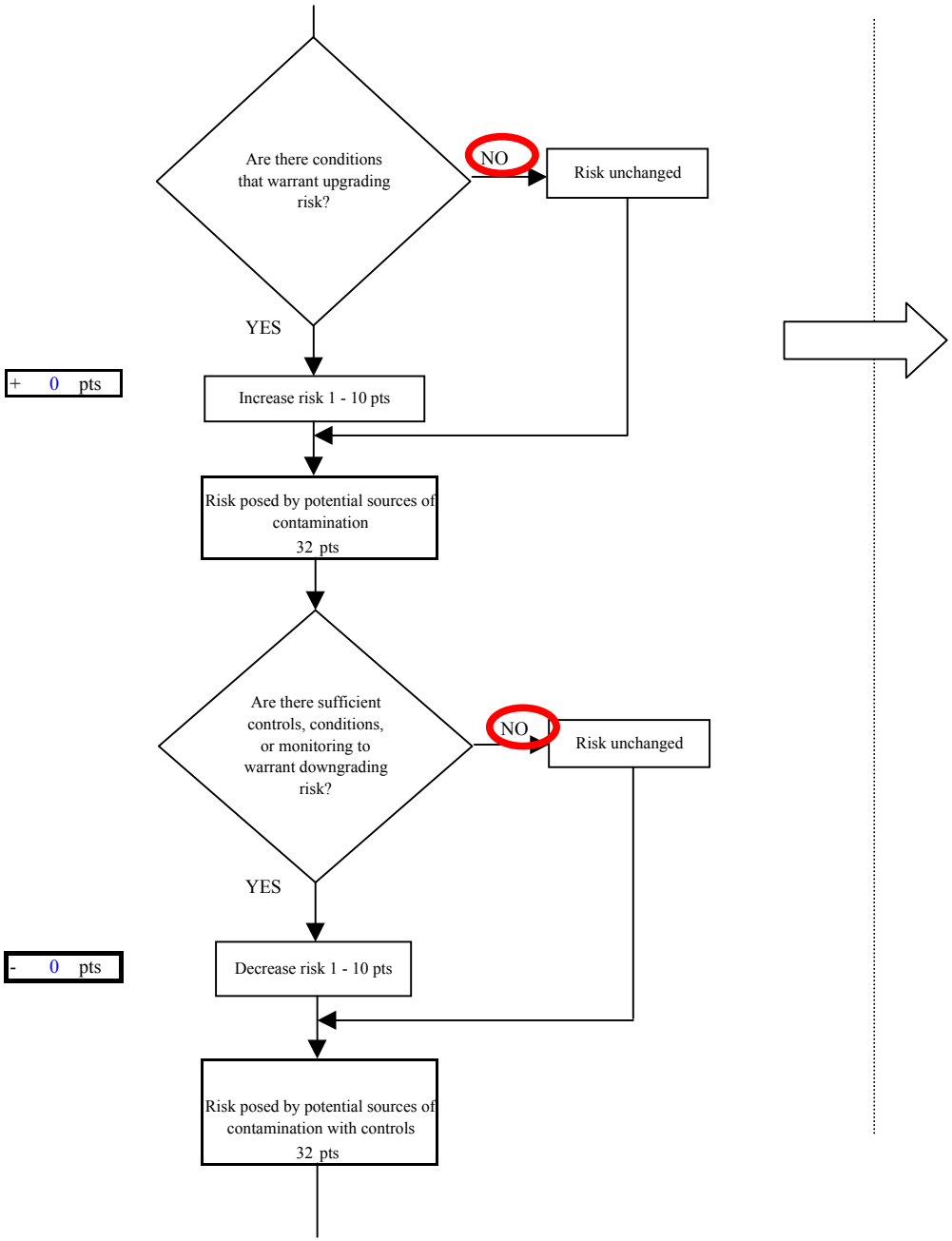
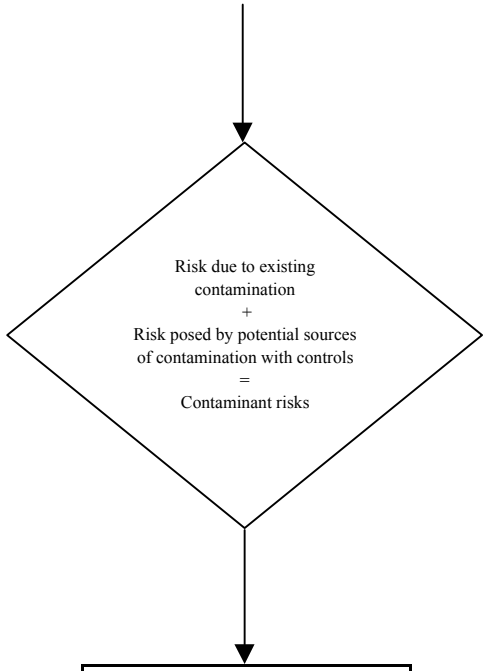


Chart 5. Contaminant risks for Midtown Estates PWSID 227204.002 - Nitrates and Nitrites





Existing
9 pts
+
Potential
32 pts
=
Contaminant Risk
41 pts

Contaminant risks*
= 41 pts

*Truncate risk at 50 pts

Very High

Contaminant Risk Ratings

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

Chart 6. Vulnerability analysis for Midtown Estates PWSID 227204.002 - Nitrates and Nitrites

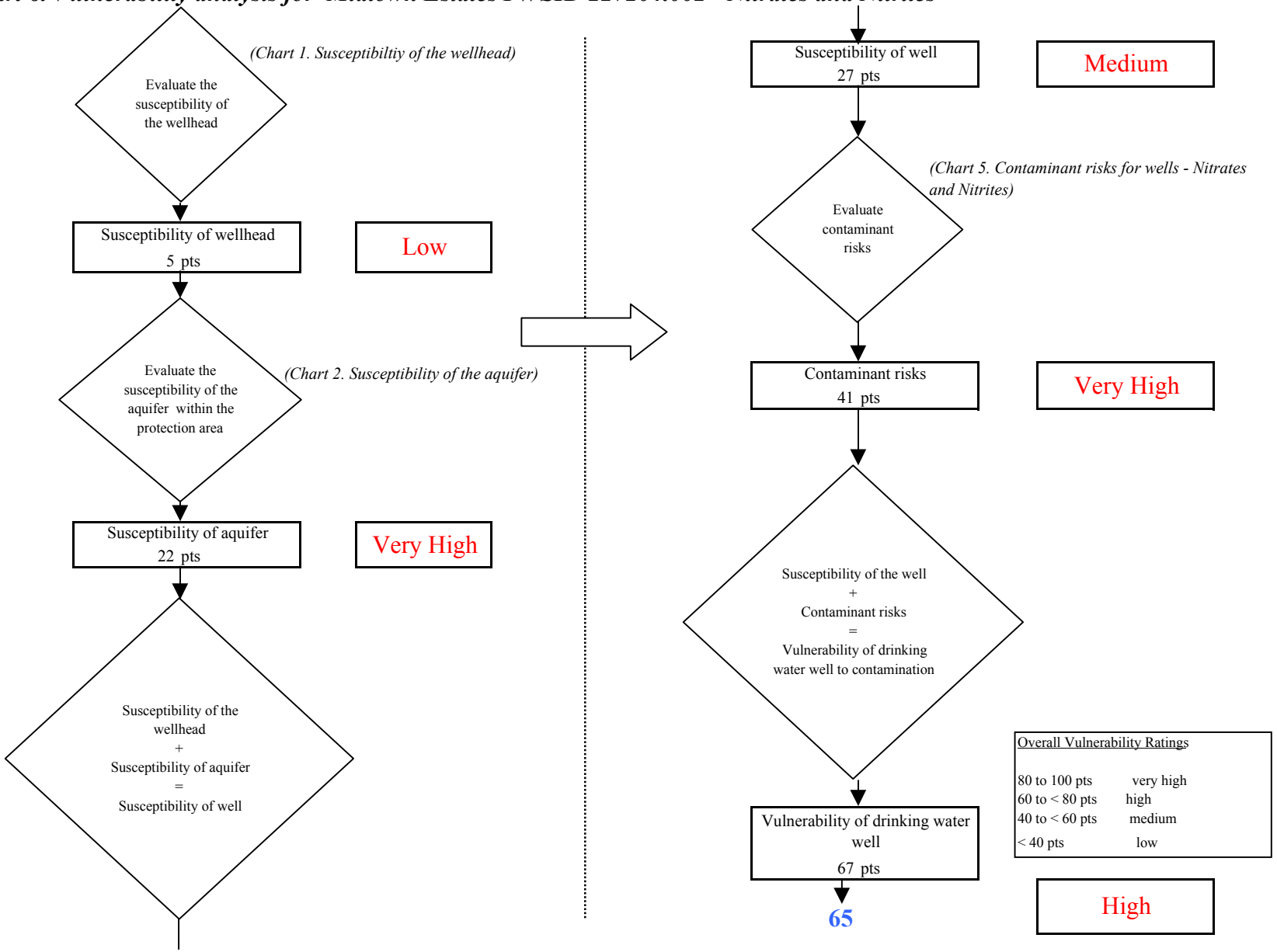


Chart 7. Contaminant risks for Midtown Estates PWSID 227204.002 - Volatile Organic Chemicals

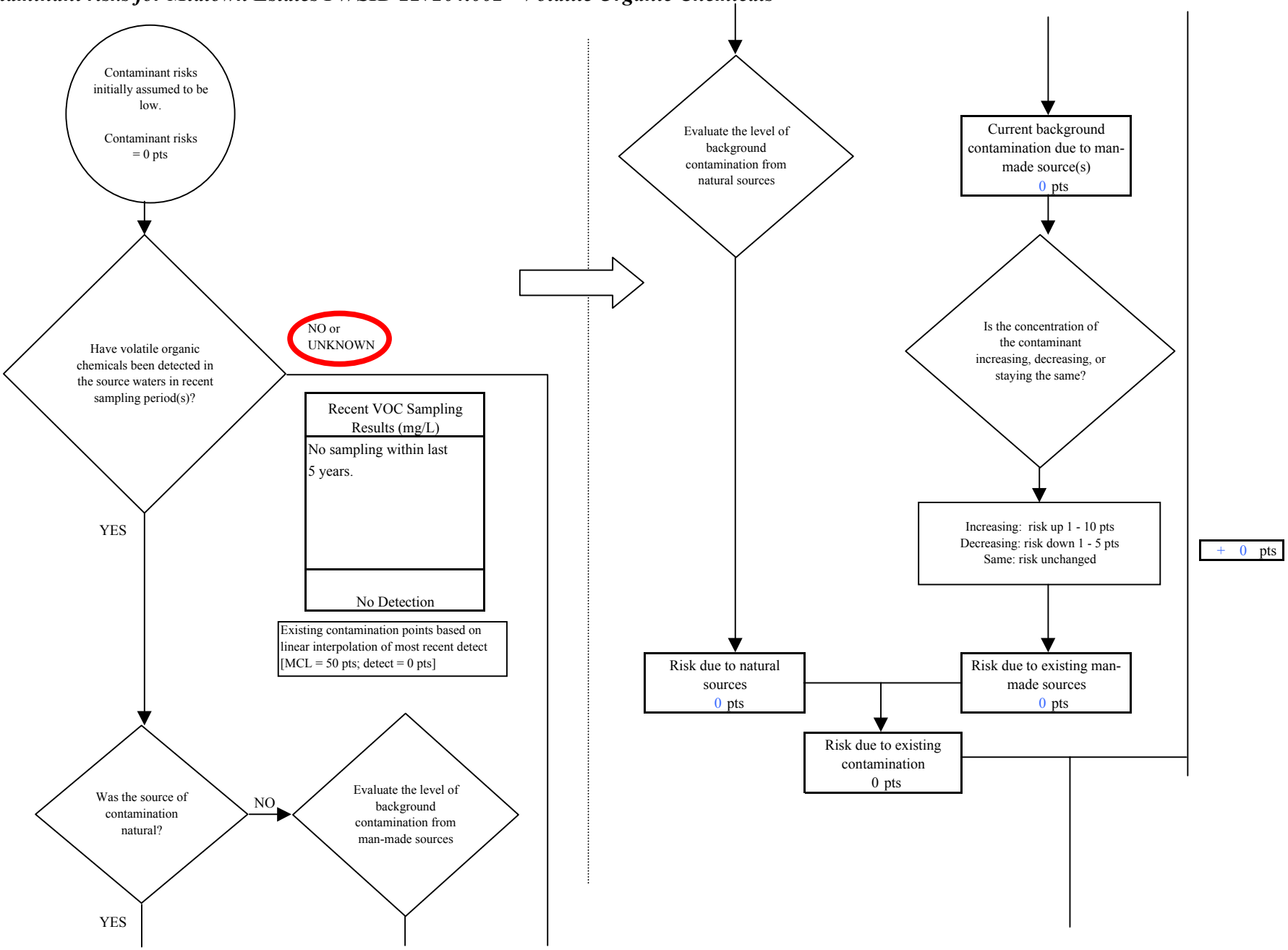


Chart 7. Contaminant risks for Midtown Estates PWSID 227204.002 - Volatile Organic Chemicals

+ 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)	3	6	9

	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	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.

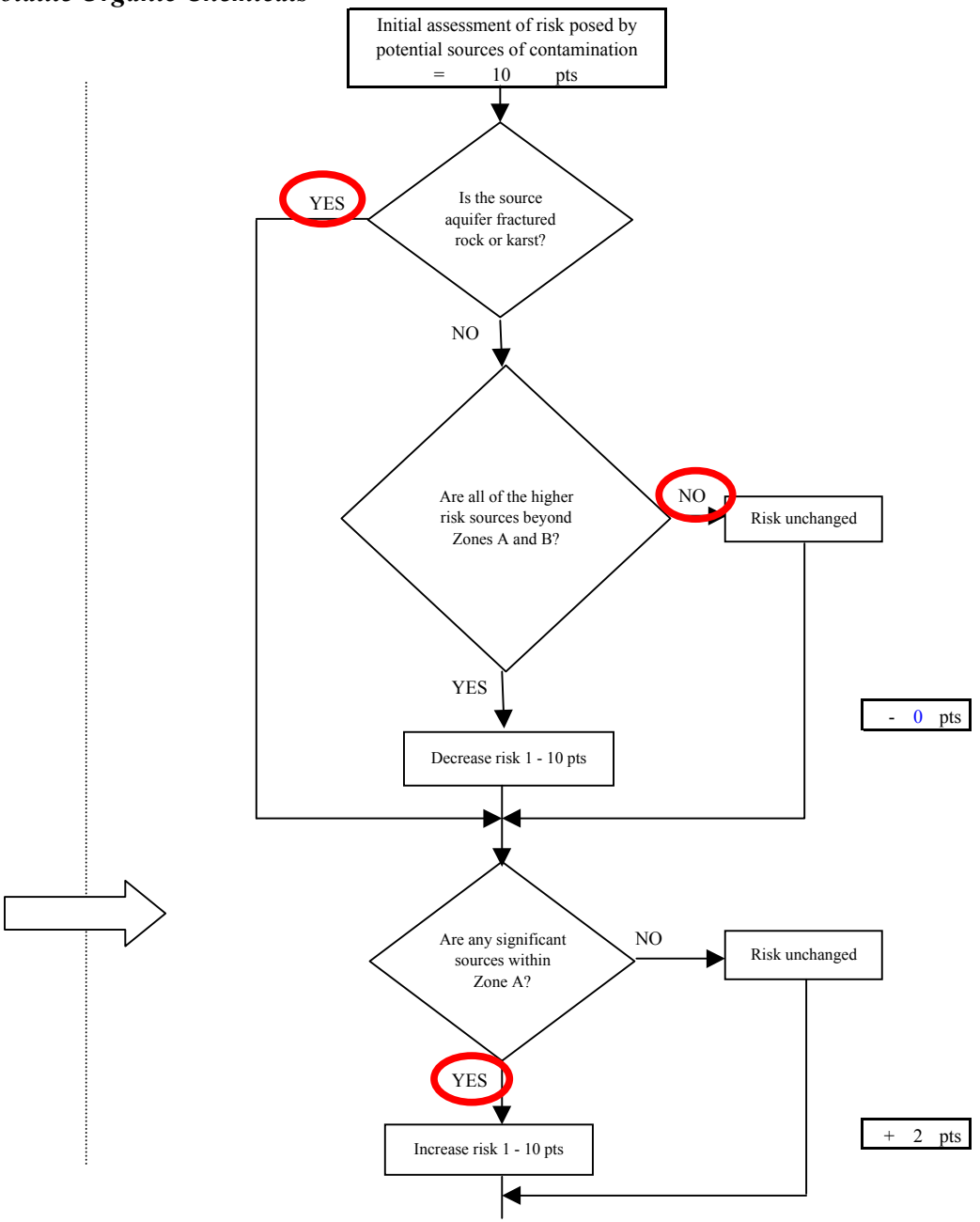
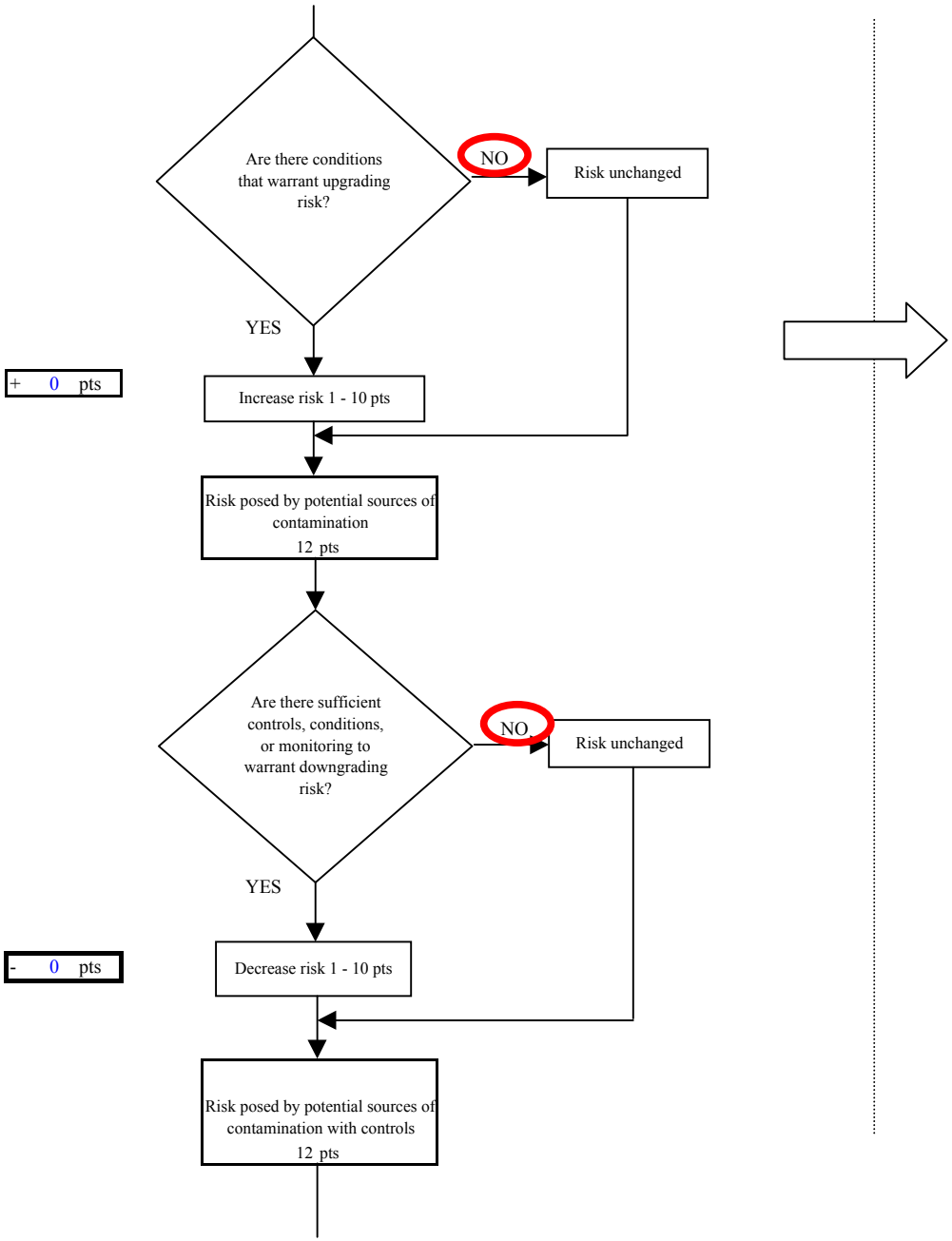


Chart 7. Contaminant risks for Midtown Estates PWSID 227204.002 - Volatile Organic Chemicals



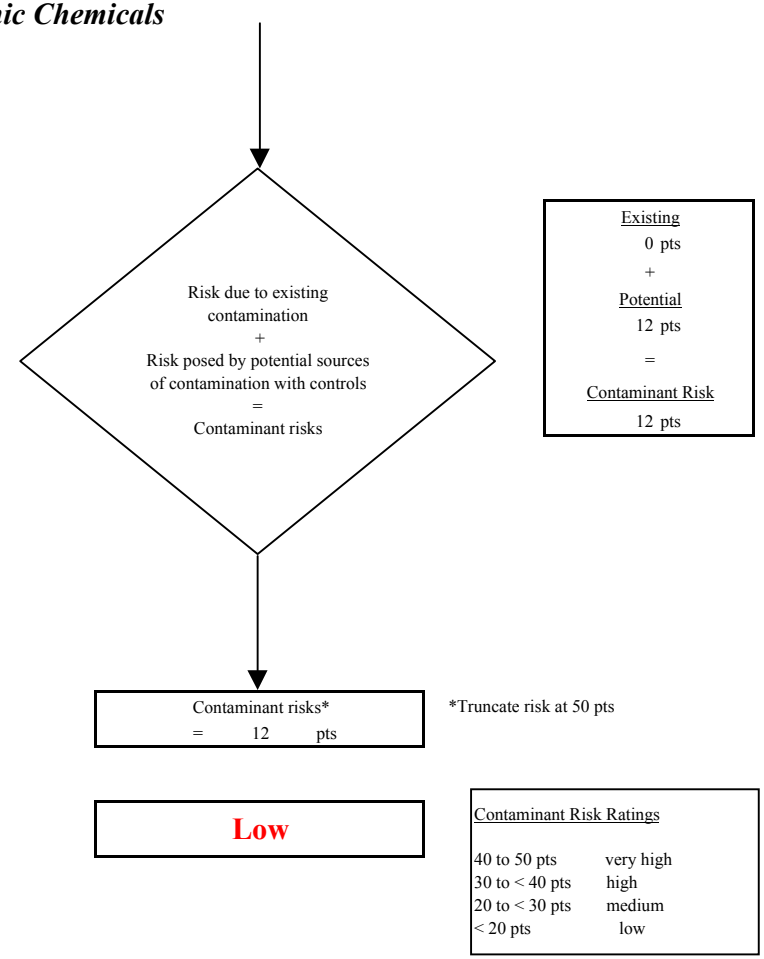


Chart 8. Vulnerability analysis for Midtown Estates PWSID 227204.002 - Volatile Organic Chemicals

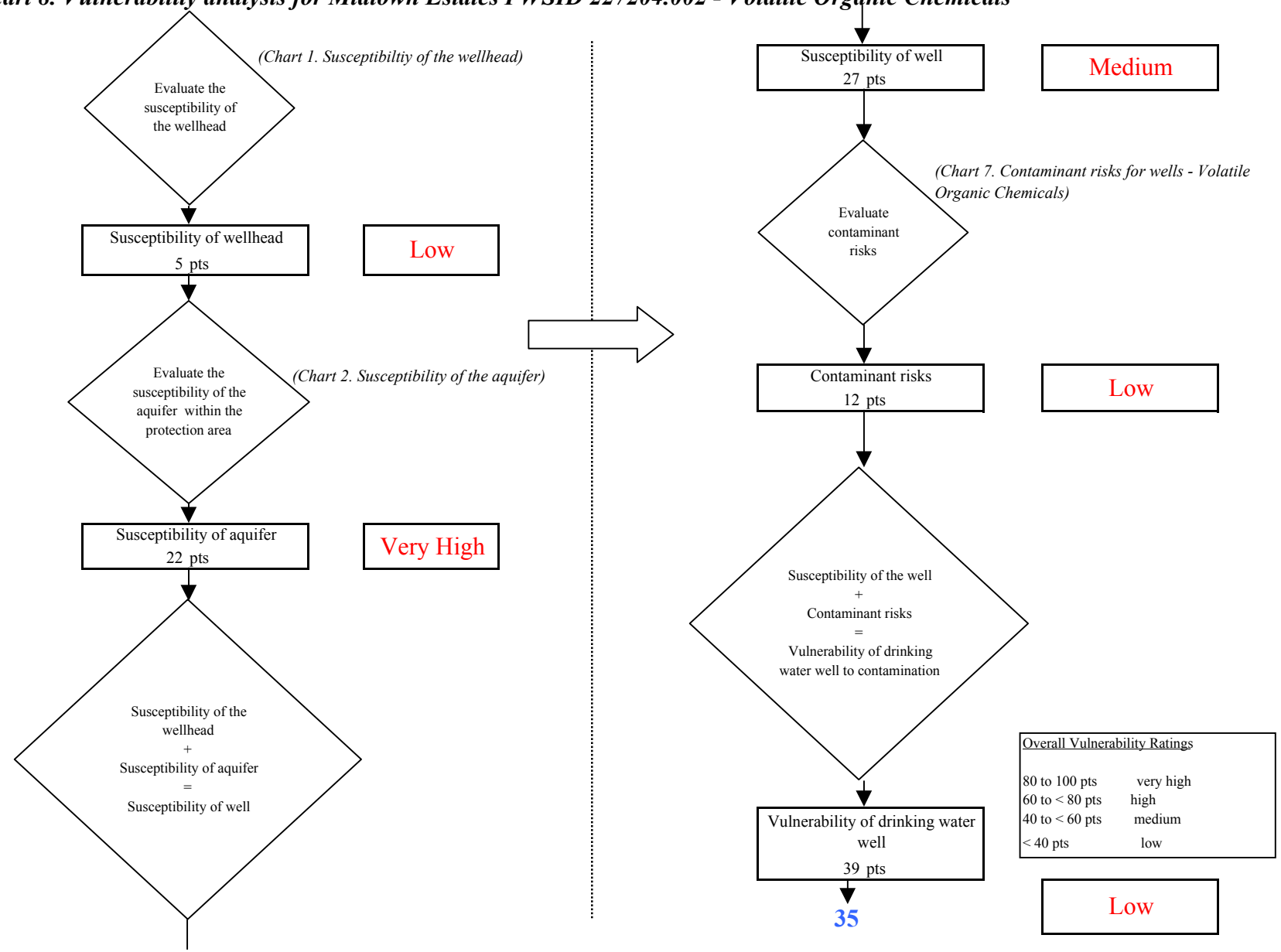


Chart 9. Contaminant risks for Midtown Estates PWSID 227204.001 - Heavy Metals, Cyanide and Other Inorganic Chemicals

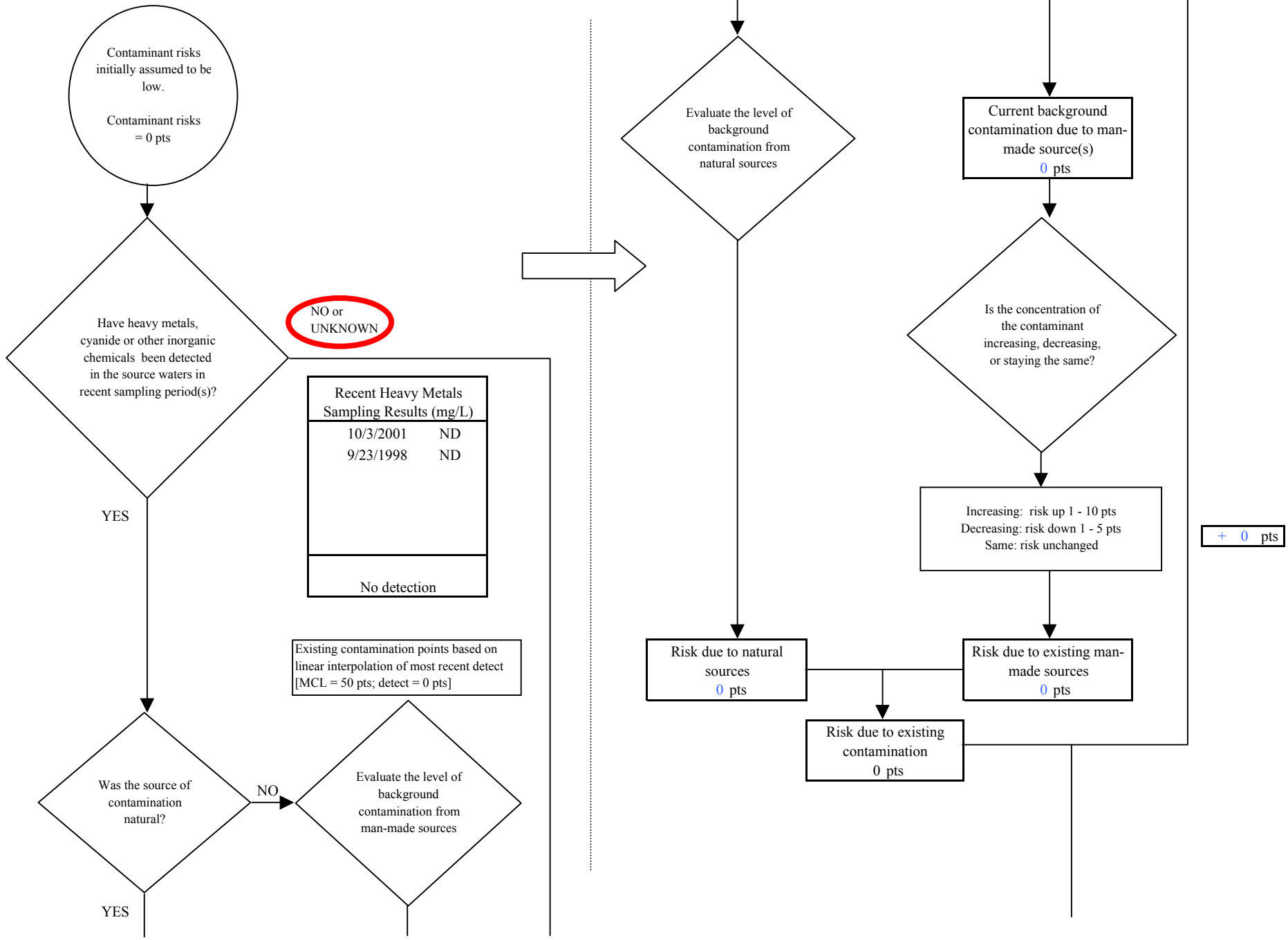


Chart 9. Contaminant risks for Midtown Estates PWSID 227204.001 - Heavy Metals, Cyanide and Other Inorganic Chemicals

+ 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)	3	7	10

	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 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.

Initial assessment of risk posed by potential sources of contamination = 10 pts

Is the source aquifer fractured rock or karst?

YES

NO

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

NO

Risk unchanged

YES

Decrease risk 1 - 10 pts

- 0 pts

Are any significant sources within Zone A?

NO

Risk unchanged

YES

Increase risk 1 - 10 pts

+ 2 pts

Chart 9. Contaminant risks for Midtown Estates PWSID 227204.001 - Heavy Metals, Cyanide and Other Inorganic Chemicals

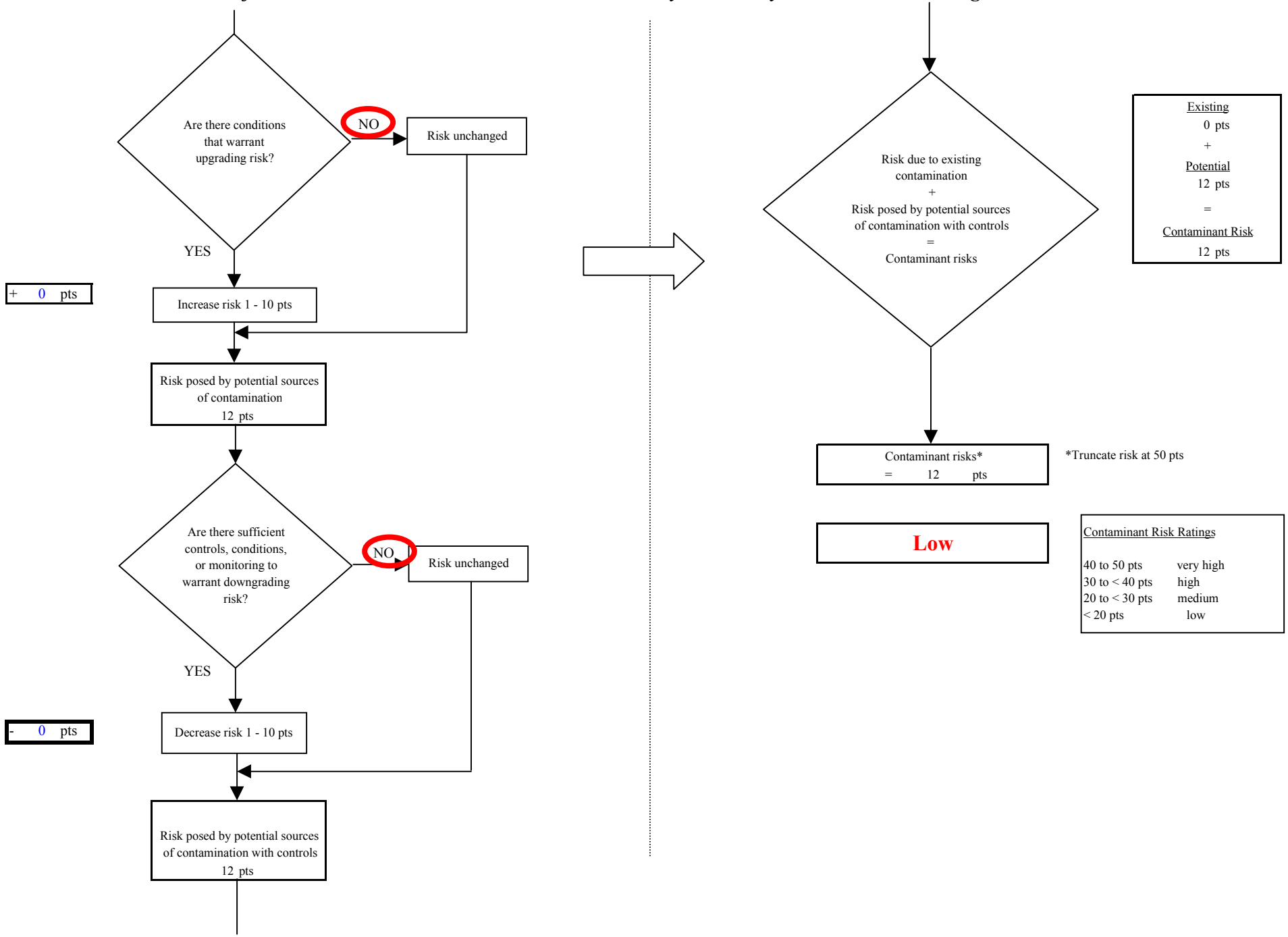


Chart 10. Vulnerability analysis for Midtown Estates PWSID 227204.001 - Heavy Metals, Cyanide and Other Inorganic Chemicals

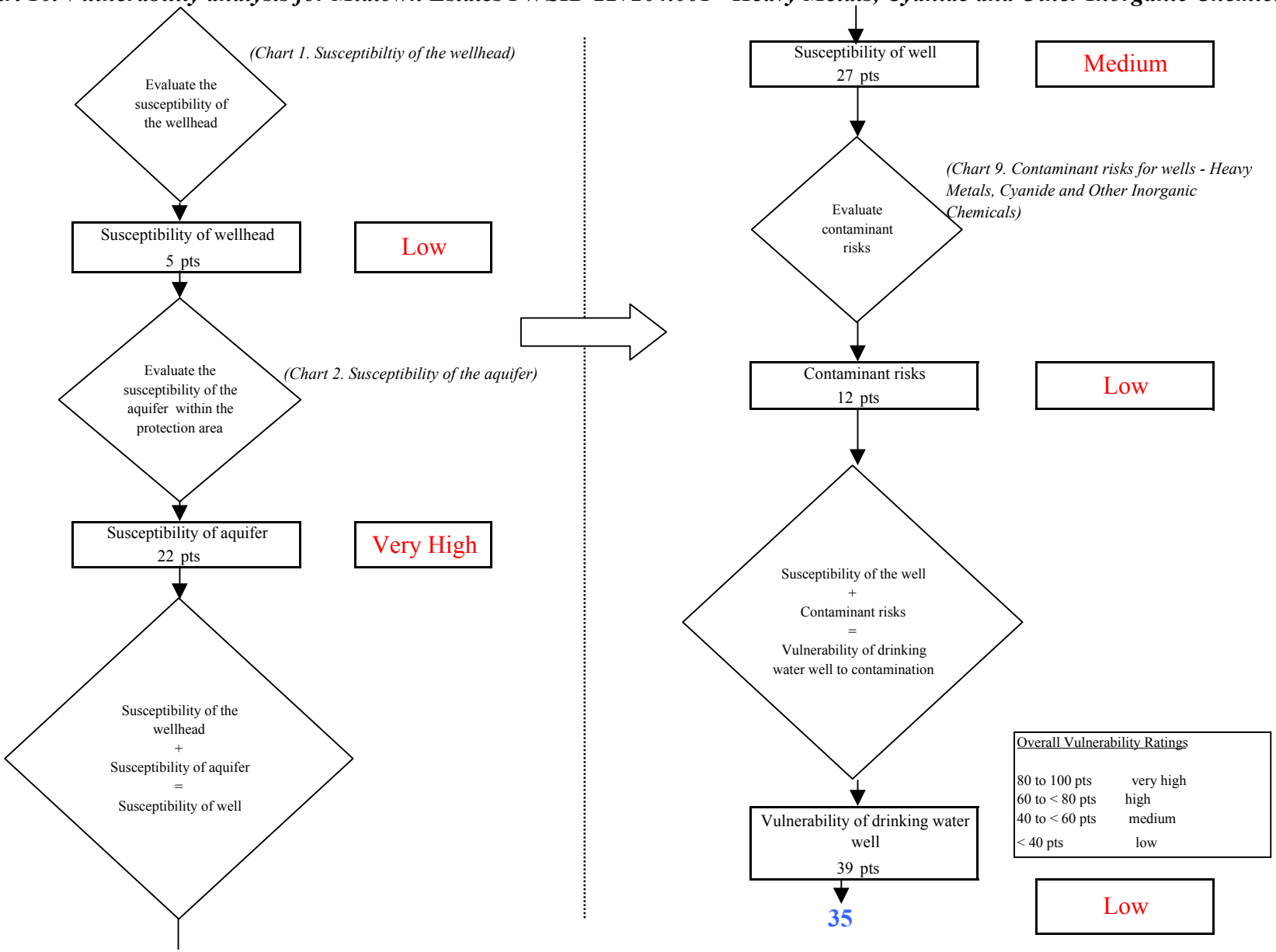


Chart 11. Contaminant risks for Midtown Estates PWSID 227204.001 - Synthetic Organic Chemicals

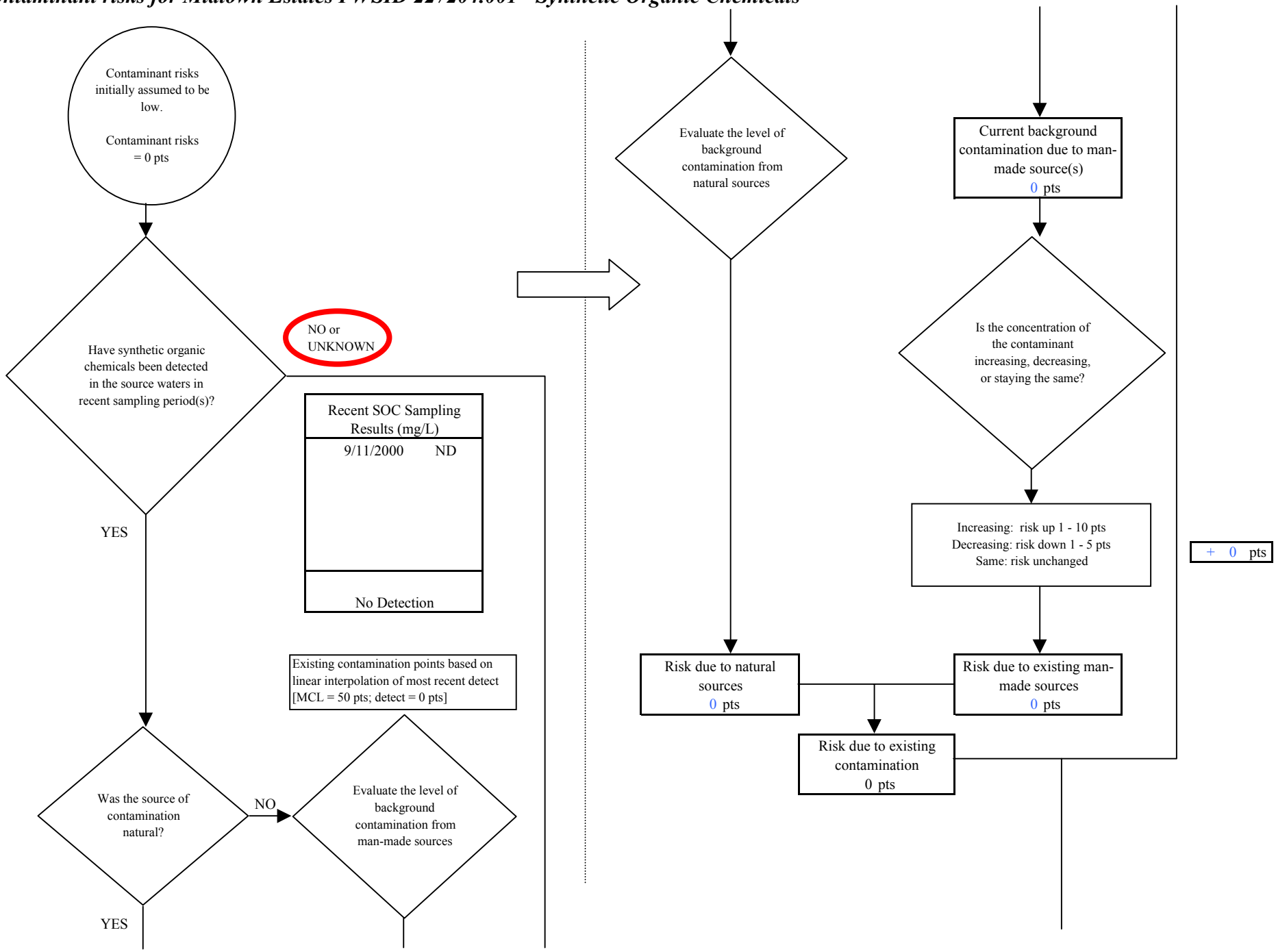


Chart 11. Contaminant risks for Midtown Estates PWSID 227204.001 - Synthetic Organic Chemicals

+ 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)	2	6	8

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

Matrix Score 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.

Initial assessment of risk posed by potential sources of contamination = 10 pts

Is the source aquifer fractured rock or karst?

YES

NO

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

NO

Risk unchanged

YES

Decrease risk 1 - 10 pts

- 0 pts

Are any significant sources within Zone A?

NO

Risk unchanged

YES

Increase risk 1 - 10 pts

+ 2 pts

Chart 11. Contaminant risks for Midtown Estates PWSID 227204.001 - Synthetic Organic Chemicals

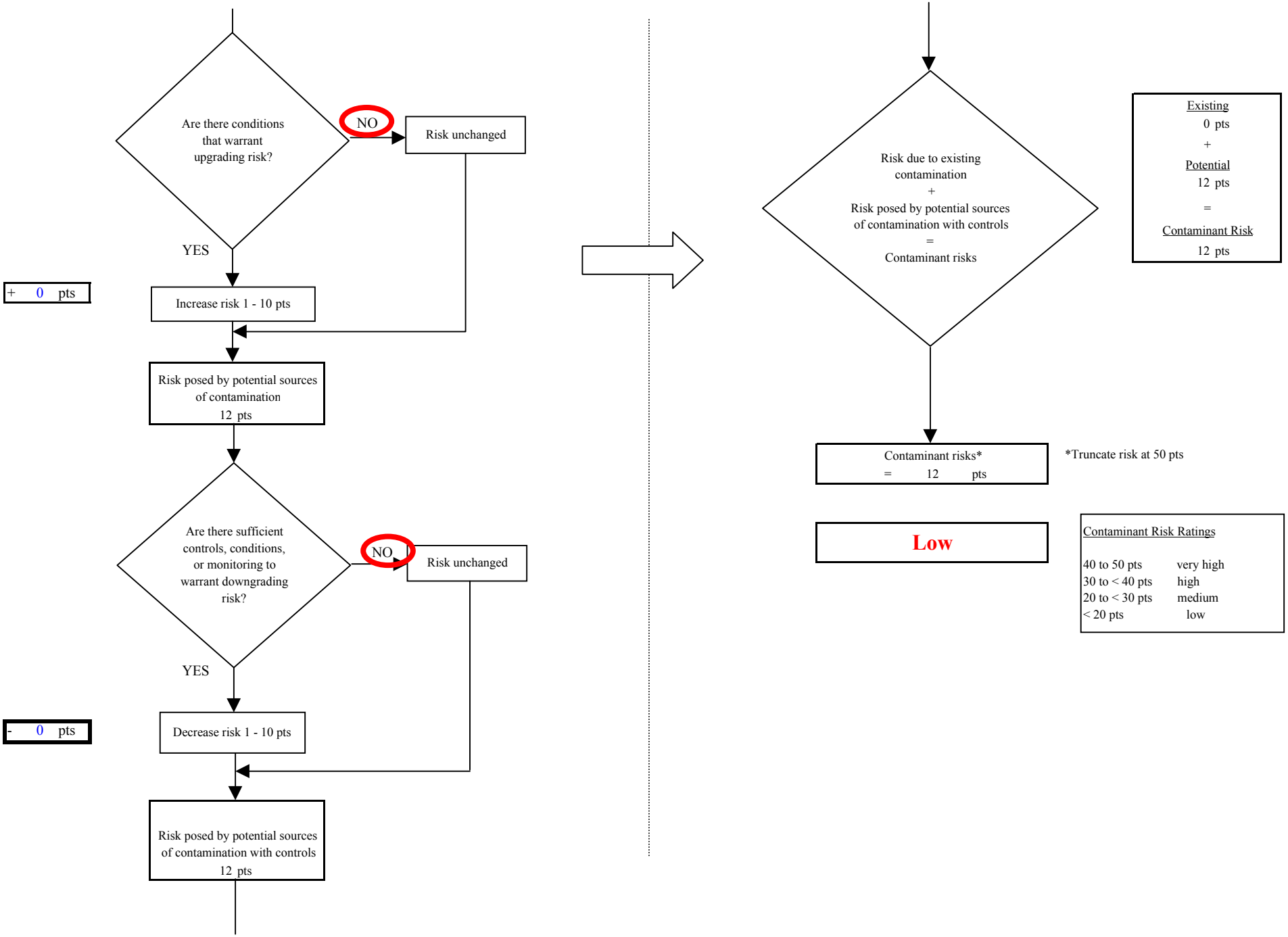


Chart 12. Vulnerability analysis for Midtown Estates PWSID 227204.001 - Synthetic Organic Chemicals

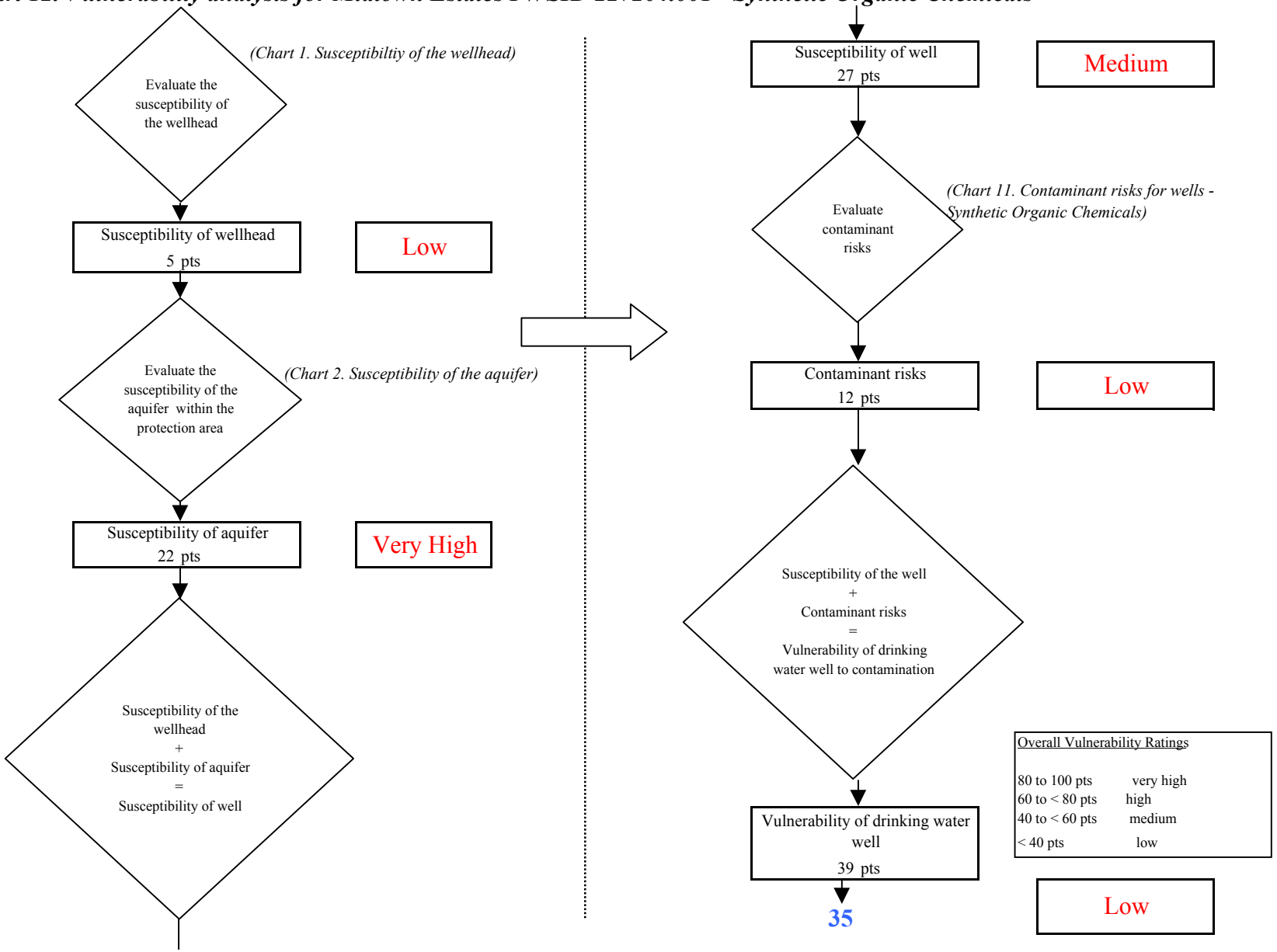


Chart 13. Contaminant risks for Midtown Estates PWSID 227204.001 - Other Organic Chemicals

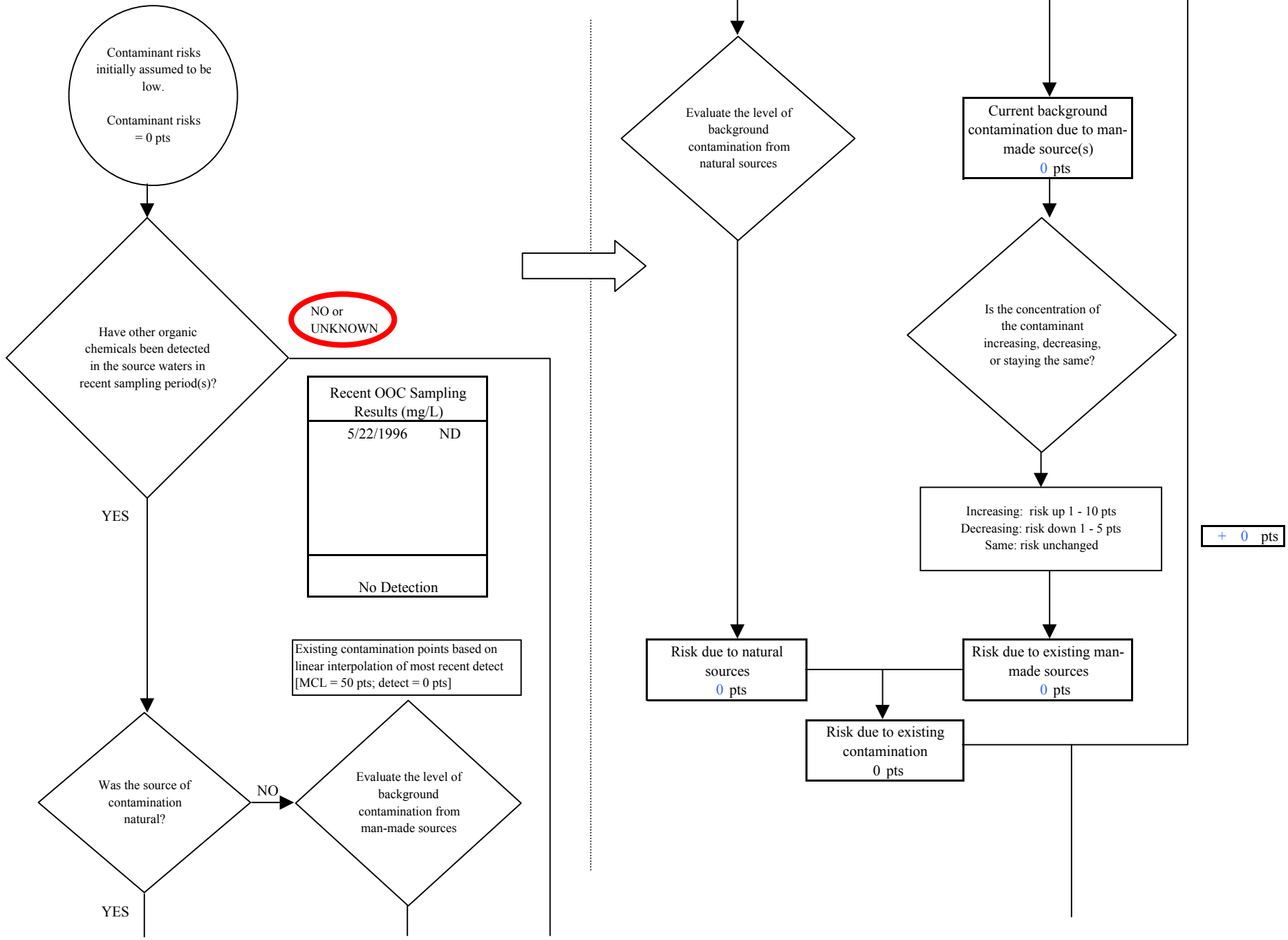


Chart 13. Contaminant risks for Midtown Estates PWSID 227204.001 - Other Organic Chemicals

+ 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)	3	6	9

	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 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.

Initial assessment of risk posed by potential sources of contamination = 10 pts

Is the source aquifer fractured rock or karst?

YES

NO

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

NO

Risk unchanged

YES

Decrease risk 1 - 10 pts

- 0 pts

Are any significant sources within Zone A?

NO

Risk unchanged

YES

Increase risk 1 - 10 pts

+ 2 pts

Chart 13. Contaminant risks for Midtown Estates PWSID 227204.001 - Other Organic Chemicals

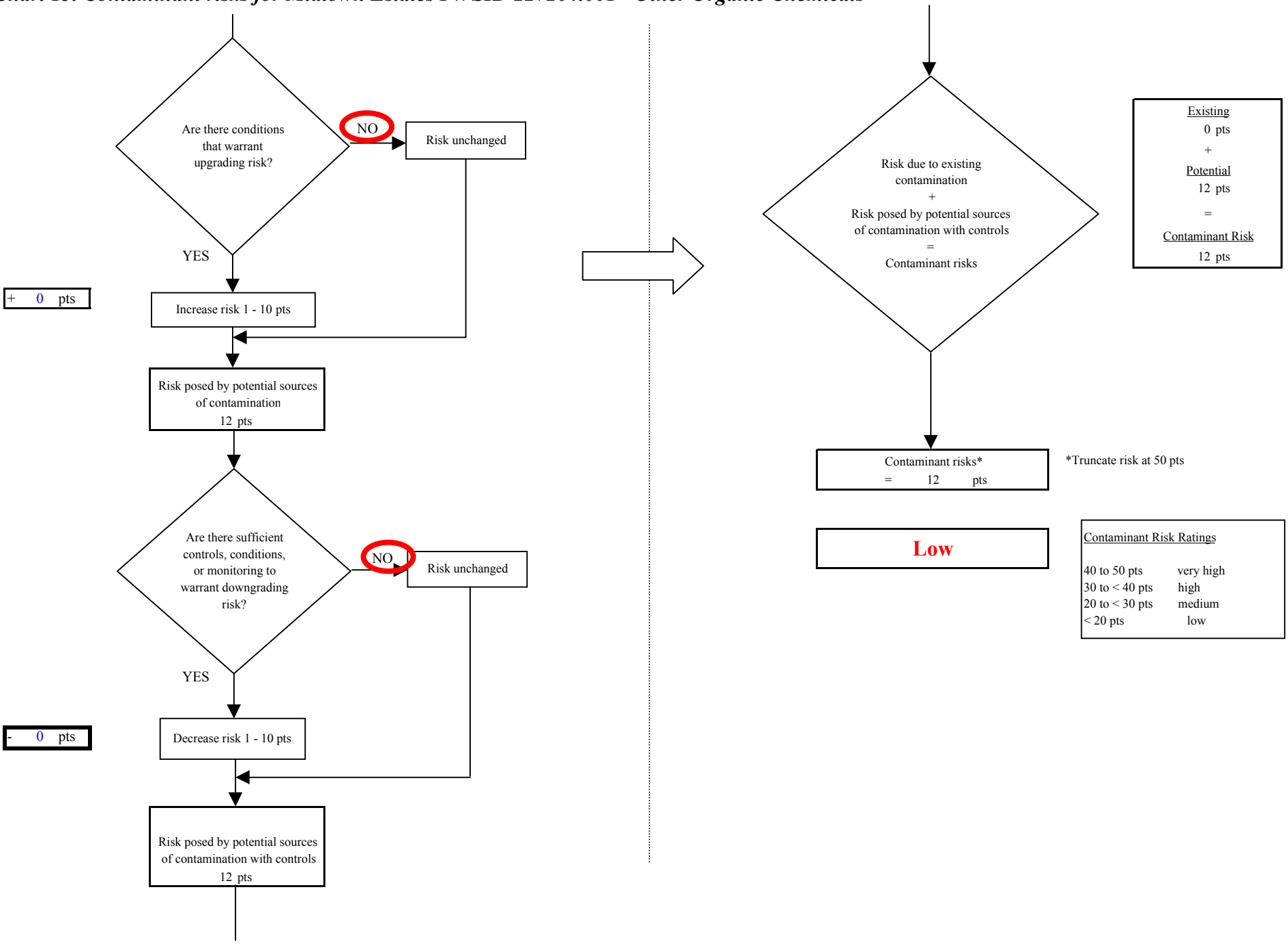


Chart 14. Vulnerability analysis for Midtown Estates PWSID 227204.001 - Other Organic Chemicals