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# Source Water Assessment

A Hydrogeologic Susceptibility and  
Vulnerability Assessment for  
Carefree Kids Daycare Drinking Water  
System,

Wasilla, Alaska

PWSID 220084

November 2006

DRINKING WATER PROTECTION REPORT Report 1593  
Alaska Department of Environmental Conservation

# Source Water Assessment for Carefree Kids Daycare Drinking Water System Wasilla, Alaska PWSID 220084

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The Drinking Water Protection (DWP) section of the Drinking Water Program 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 DWP, (907) 269-7521.

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# Source Water Assessment for Carefree Kids Daycare Source of Public Drinking Water, Wasilla, Alaska

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## Drinking Water Protection Alaska Department of Environmental Conservation

### EXECUTIVE SUMMARY

This source water assessment provides an evaluation of the vulnerability of the public water system serving the Carefree Kids Daycare to potential contamination. This Class A (community) water system consists of one well off of Carefree Drive in Wasilla. The well received a natural susceptibility rating of **Low**. This rating is a combination of a susceptibility rating of **Low** for the actual wellhead and a **Medium** rating for the aquifer in which the well is drawing water from. Identified potential and current sources of contamination for the Carefree Kids Daycare public water system include: motor vehicle dealerships, electrical manufacturing, injection wells, septic systems, quarries, and roads. These are considered as sources of bacteria and viruses, nitrates and/or nitrites, volatile organic chemicals (VOCs), heavy metals, cyanide, and other inorganic chemicals, synthetic organic chemicals (SOCs), and other organic chemicals (OOCs). Combining the natural susceptibility of the well with the contaminant risk, the public water system for Carefree Kids Daycare received an overall vulnerability rating of **High** for VOCs, OOCs, nitrates and/or nitrites, **Medium** for heavy metals, cyanide, and other inorganic chemicals, bacteria and viruses, and **Low** for SOCs.

### CAREFREE KIDS DAYCARE PUBLIC DRINKING WATER SYSTEM

Carefree Kids Daycare public water system is a Class A (community) water system consisting of one well off of Carefree Drive.

Wasilla is located near the center of the Matanuska-Susitna (Mat-Su) Borough in south central Alaska. The Mat-Su Borough encompasses approximately 23,000 square miles, including the majority of the drainage of the Susitna and Matanuska Rivers. Wasilla is located south of the Talkeetna Mountains, about 12 miles north of Knik Arm on Cook Inlet (Wickersham Alaska Corporation, 1986), (Matanuska-Susitna Borough/Fran Seager, 1991).

Glacial forces during the end of the last ice age shaped the Wasilla area. Several glacial advances and retreats left a complex system of hills, ridges, lakes, and lowlands that define the topography of today. Landforms in and around Wasilla consist of undulating

ridges of glacial till and flat benches of sand and gravel out wash (Matanuska-Susitna Borough, 1985). The Matanuska Susitna Valley is dominated by geological features created by several episodes of glacial advances and retreats. These events left the area scattered with glacial drift composed of till outwash stream deposits and estuarine and lake deposits.

Most of the soils in the area provide good sources of sand, gravel and topsoil. The deposition of silt, clay and organic muck in old lakes and depressions means that some areas have soil conditions that vary over relatively short distances. (Wickersham Alaska Corporation, 1986).

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

In the Mat-Su Valley, groundwater is primarily recharged by snowmelt and precipitation infiltrating both directly and 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. 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).

The Carefree Kids Daycare public water system serves approximately 45 non-residents through 1 service connection.

### CAREFREE KIDS DAYCARE DRINKING WATER PROTECTION AREA

The pathways most likely for surface contamination to reach the groundwater are identified as the first step in

determining a drinking water system’s risk. These areas are determined by looking at the characteristics of the soil, groundwater, aquifer, and well.

The most probable area for contamination to reach the drinking water well is the area that contributes water to the well, the groundwater capture zone. The groundwater capture zone is located in the area circling the well (the area influenced by pumping) and also the area of the water table upgradient of the well, usually forming a parabola shape.

There are many different methods for calculating the size of capture zones. Drinking Water Protection (DWP) uses a combination of two simple groundwater flow equations, the Thiem and uniform flow equations for all groundwater wells screened in unconsolidated material. The orientation of the capture zone is then drawn using a water table elevation map (if available) or a land surface elevation map of the area. The capture zone calculated by the DWP is an estimate using the available information and resources, and may differ slightly from the actual capture zone.

The parameters used to calculate the shape of this capture zone are general for the whole alluvial plain and were obtained from various United States Geological Survey (USGS) reports, area well logs, and the Groundwater textbook by Freeze and Cherry (Freeze and Cherry, 1979).

Because of uncertainties and changing site conditions, a factor of safety is added to the groundwater capture zone to form the drinking water protection area for the well.

The protection areas established for wells are usually separated into two zones, limited by the watershed. These zones correspond to times-of-travel (TOT) of the water moving through the aquifer to the well (plus the factor of safety).

The following is a summary of the two zones for wells and the calculated time-of-travel for each:

**Table 1. Definition of Zones**

| <b>Zone</b> | <b>Definition</b>                |
|-------------|----------------------------------|
| A           | Several months travel time       |
| B           | Less than 2 years time-of-travel |

The time of travel for contaminants within the water varies with their unique physical and chemical characteristics.

The drinking water protection area outlined for the Carefree Kids Daycare on Map 1 of Appendix A will serve as the focus for voluntary protection efforts.

## **INVENTORY OF POTENTIAL AND EXISTING CONTAMINANT SOURCES**

Drinking Water Protection (DWP) has completed an inventory of potential and existing sources of contamination within the Carefree Kids Daycare protection area. This inventory was completed through a search of agency records and other publicly available information. Potential drinking water contaminants are found within agricultural, residential, commercial, and industrial areas, but can also occur within areas that have little or no development.

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

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

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

## **RANKING OF CONTAMINANT RISKS**

Once the potential and existing sources of contamination have been identified, they are each assigned a ranking according to what type and level of risk they represent. Ranking of contaminant risks for a “potential” or “existing” source of contamination is a combination of toxicity and volume associated with that source. Rankings include:

- Low
- Medium
- High
- Very High

Tables 2 through 7 in Appendix B contain the ranking of inventoried 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 chemical

## **VULNERABILITY OF CAREFREE KIDS DAYCARE DRINKING WATER SYSTEM**

The vulnerability of public drinking water systems to regulated contaminants is determined by assessing the susceptibility of the wellhead, the susceptibility of the aquifer and the potential contaminant sources identified within the protection area.

The Drinking Water Protection developed a vulnerability assessment tool that assigns a vulnerability risk ranking based upon various factors associated with the well, aquifer and potential and existing contaminants identified within the protection area.

Factors contributing to the susceptibility of the wellhead are: whether the sanitary seal in place, protection from flooding, and if the well casing is properly grouted.

The wellhead for the Carefree Kids Daycare received a **Low** susceptibility rating. Plan review information from 2005 indicates the well is capped with a sanitary seal, the land surface is sloped away from the well, and the well is grouted. A sanitary seal prevents potential contaminant from entering the well while sloping of the land surface and grouting help to prevent potential contaminants from traveling down the outside of the well casing.

Factors contributing to the susceptibility of the aquifer are: whether the aquifer is confined or unconfined, whether the well is completed in unconsolidated or fractured bedrock, whether wells and bore holes are penetrating the aquifer and, if applicable, the confining layer.

The aquifer the Carefree Kids Daycare well is completed in received a **Medium** susceptibility rating. The highly transmissive aquifer material allows contaminants to travel downward from the surface with the precipitation and surface water runoff. However, the depth of the water table helps protect the aquifer by creating distance. Table 2 summarizes the Susceptibility scores and ratings for Carefree Kids Daycare.

**Table 2: Susceptibility**

|                                | <b>Rating</b> |
|--------------------------------|---------------|
| Susceptibility of the Wellhead | Low           |
| Susceptibility of the Aquifer  | Medium        |
| Natural Susceptibility         | Low           |

The Contaminant Risk has been derived from an evaluation of the routine sampling results of the water system and the presence of potential sources of contamination. Contaminant risks to a drinking water source depend on the type and distribution of contaminant sources.

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

**Table 3. Contaminant Risks**

| <b>Category</b>                                      | <b>Rating</b> |
|--|---------------|
| Bacteria and Viruses                                 | High          |
| Nitrates and/or Nitrites                             | Very High     |
| Volatile Organic Chemicals                           | Very High     |
| Heavy Metals, Cyanide, and Other Inorganic Chemicals | High          |
| Synthetic Organic Chemicals                          | Low           |
| Other Organic Chemicals                              | Very High     |

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

$$\begin{aligned} &\text{Natural Susceptibility} \\ &+ \\ &\text{Contaminant Risks} \\ &= \\ &\text{Vulnerability of the} \\ &\text{Drinking Water Source to Contamination} \end{aligned}$$

Table 4 contains the overall ratings for each of the six categories of drinking water contaminants.

**Table 4. Overall Vulnerability**

| <b>Category</b>                                      | <b>Rating</b> |
|--|---------------|
| Bacteria and Viruses                                 | Medium        |
| Nitrates and Nitrites                                | High          |
| Volatile Organic Chemicals                           | High          |
| Heavy Metals, Cyanide, and Other Inorganic Chemicals | Medium        |
| Synthetic Organic Chemicals                          | Low           |
| Other Organic Chemicals                              | High          |

**Bacteria and Viruses**

Class V injection wells in the protection area represent the greatest risk for bacteria and viruses to the drinking water well. For a complete listing of potential sources for bacteria and virus contamination please see Table 2 in Appendix B.

Only a small amount of bacteria and viruses are required to endanger public health. Coliforms are found naturally in the environment and although they aren't necessarily a health threat, it is 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 (EPA, 2006). Harmful bacteria can cause diarrhea, cramps, nausea, headaches, or other symptoms (EPA, 2006). No

samples have tested positive for coliforms in recent history.

After combining the contaminant risk for bacteria and viruses with the natural susceptibility of the well, the overall vulnerability of the well to contamination is medium.

### **Nitrates and Nitrites**

Class V injection wells in the protection area also represent the greatest risk to nitrates and nitrites for this source of public drinking water. For a complete listing of potential sources for nitrate and nitrite contamination please see Table 3 in Appendix B.

Nitrates are very mobile, moving at approximately the same rate as water. Nitrates were detected at 36% of the maximum contaminant level (MCL = 10mg/L) during recent sampling. In greater quantities nitrates/nitrites have been known to cause 'blue baby syndrome' in infants.

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

### **Volatile Organic Chemicals**

Motor vehicle dealerships represent the greatest identified risk for volatile organic chemical contamination to the well. For a complete listing of potential sources for bacteria and virus contamination please see Table 4 in Appendix B.

Volatile Organic Chemicals have not been detected within source waters. After combining the contaminant risk for volatile organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is high.

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

Abandoned wells and underground gasoline tanks represent the greatest risk for inorganic chemicals to the well. For a complete listing of potential sources for bacteria and virus contamination please see Table 5 in Appendix B.

Barium was detected in miniscule amounts far below its maximum contaminant level (MCL) in recent sampling. The MCL for barium is 2 mg/L. In greater quantities, barium is known to cause an increase in blood pressure (EPA, 2006).

After combining the contaminant risk for heavy metals, cyanide and other inorganic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is medium.

### **Synthetic Organic Chemicals**

Septic systems represent the greatest risk for synthetic organic chemicals to the well. For a complete listing of potential sources for bacteria and virus contamination please see Table 6 in Appendix B.

Synthetic organic chemicals have not been sampled for in this water system.

After combining the contaminant risk for synthetic organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is low.

### **Other Organic Chemicals**

Electrical manufacturing represent the greatest risk for other organic chemicals to the well. For a complete listing of potential sources for bacteria and virus contamination please see Table 7 in Appendix B.

Other organic chemicals have not been sampled for in this water system.

After combining the contaminant risk for synthetic organic chemicals with the natural susceptibility of the well, the overall vulnerability of the well to contamination is high.

## REFERENCES

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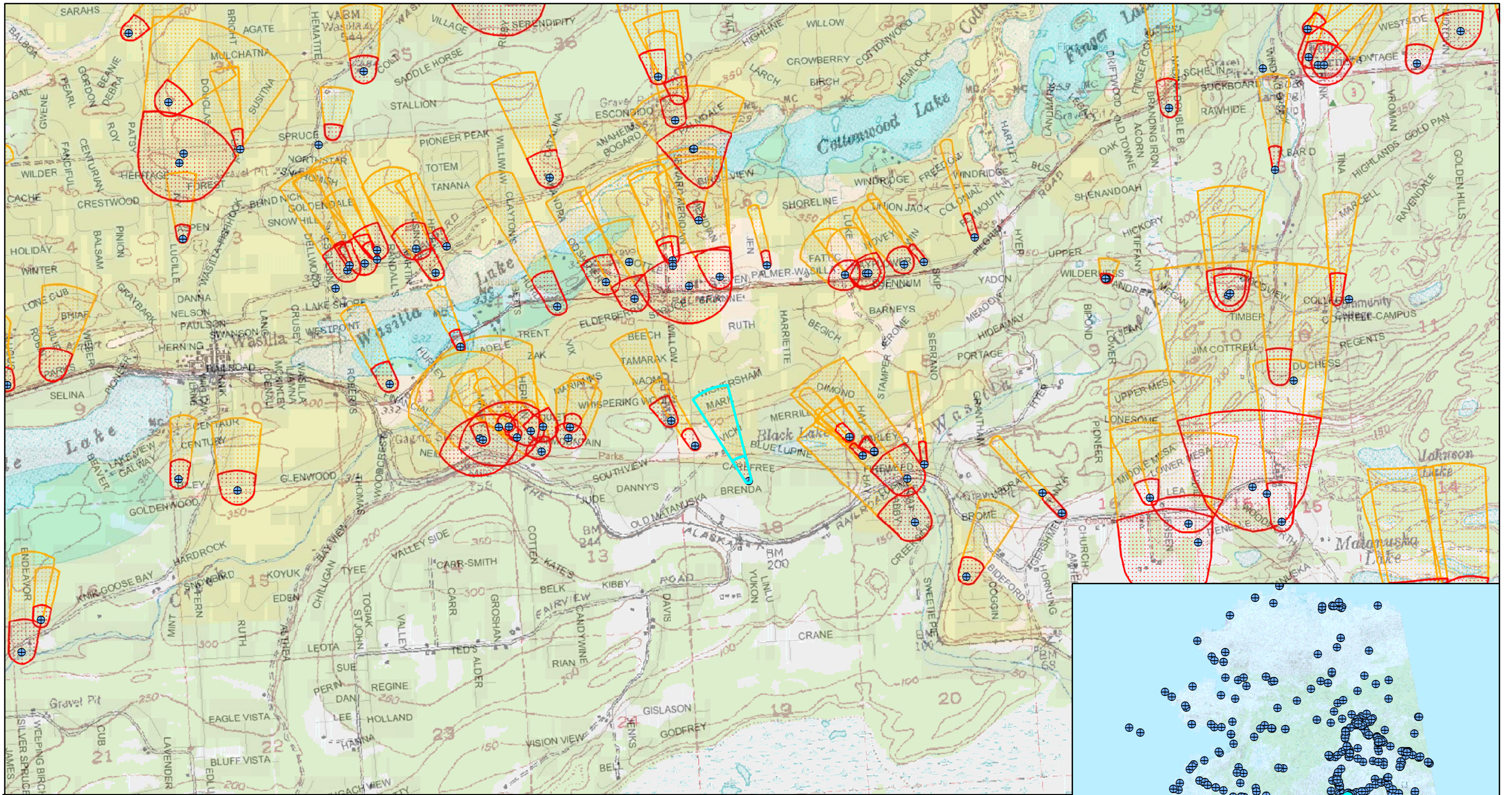
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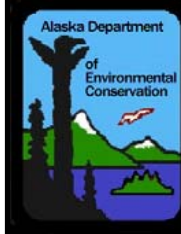

## **APPENDIX A**

### **Carefree Kids Daycare Drinking Water Protection Area Location Map (Map 1)**






Map 1- Carefree Kids Daycare and Surrounding Water Systems

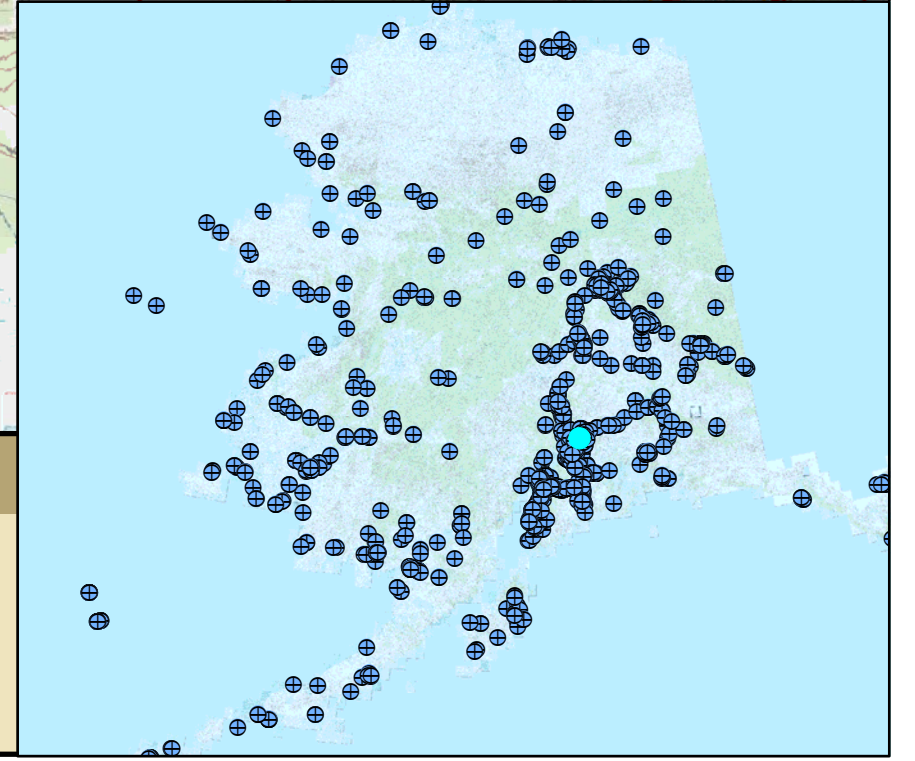
PWSID: 220084.001

0 1:35,088 8,400 Feet

Data Sources:  
 Mat-Su Borough: Roads and parcels  
 Potential Sources of Contamination: ADEC

-  Public Water Sources
-  Zone A Protection Area
-  Zone B Protection Area



## **APPENDIX B**

### **Contaminant Source Inventory and Risk Ranking for Carefree Kids Daycare (Tables 1-7)**

**Table 1**

**Contaminant Source Inventory for  
Carefree Kids Day Care**

**PWSID 220084.001**

| <b>Contaminant Source Type</b>  | <b>Contaminant Source ID</b> | <b>CS ID tag</b> | <b>Zone</b> | <b>Map Number</b> | <b>Comments</b>  |
|---|------------------------------|------------------|-------------|-------------------|--|
| Motor vehicle dealerships - cars, trucks, motor cycles, ATV's, snow machines, boats (with service department) | C27                          | C27-1            | A           |                   |  |
| Quarries (sand, gravel, rock, other?)   | E10                          | E10-1            | A           |                   |  |
| Septic systems (serves one single-family home)  | R02                          | R02-1-2          | A           |                   |  |
| Highways and roads, paved (cement or asphalt)   | X20                          | X20-1-2          | A           |                   |  |
| Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)                           | D10                          | D10-1-2          | B           |                   |  |
| Electrical, electronic, computer, and communications equipment/component manufacturing                        | I13                          | I13              | B           |                   | No other information besides contaminant type and location provided by the operator. |
| Septic systems (serves one single-family home)  | R02                          | R02-3-11         | B           |                   |  |
| Highways and roads, paved (cement or asphalt)   | X20                          | X20-3-6          | B           |                   |  |

**Table 2**

*Contaminant Source Inventory and Risk Ranking for  
Carefree Kids Day Care  
Sources of Bacteria and Viruses*

**PWSID 220084.001**

| <i>Contaminant Source Type</i>  | <i>Contaminant Source ID</i> | <i>CS ID tag</i> | <i>Zone</i> | <i>Risk Ranking for Analysis</i> | <i>Map Number</i> | <i>Comments</i> |
|---|------------------------------|------------------|-------------|----------------------------------|-------------------|-----------------|
| Septic systems (serves one single-family home)                                      | R02                          | R02-1-2          | A           | Low                              |                   |                 |
| Highways and roads, paved (cement or asphalt)                                       | X20                          | X20-1-2          | A           | Low                              |                   |                 |
| Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method) | D10                          | D10-1-2          | B           | High                             |                   |                 |
| Septic systems (serves one single-family home)                                      | R02                          | R02-3-11         | B           | Low                              |                   |                 |
| Highways and roads, paved (cement or asphalt)                                       | X20                          | X20-3-6          | B           | Low                              |                   |                 |

**Table 3**

*Contaminant Source Inventory and Risk Ranking for  
Carefree Kids Day Care  
Sources of Nitrates/Nitrites*

**PWSID 220084.001**

| <i>Contaminant Source Type</i>  | <i>Contaminant Source ID</i> | <i>CS ID tag</i> | <i>Zone</i> | <i>Risk Ranking for Analysis</i> | <i>Map Number</i> | <i>Comments</i> |
|---|------------------------------|------------------|-------------|----------------------------------|-------------------|-----------------|
| Quarries (sand, gravel, rock, other?)   | E10                          | E10-1            | A           | Low                              |                   |                 |
| Septic systems (serves one single-family home)                                      | R02                          | R02-1-2          | A           | Low                              |                   |                 |
| Highways and roads, paved (cement or asphalt)                                       | X20                          | X20-1-2          | A           | Low                              |                   |                 |
| Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method) | D10                          | D10-1-2          | B           | High                             |                   |                 |
| Septic systems (serves one single-family home)                                      | R02                          | R02-3-11         | B           | Low                              |                   |                 |
| Highways and roads, paved (cement or asphalt)                                       | X20                          | X20-3-6          | B           | Low                              |                   |                 |

**Table 4**

*Contaminant Source Inventory and Risk Ranking for  
Carefree Kids Day Care  
Sources of Volatile Organic Chemicals*

**PWSID 220084.001**

| <i>Contaminant Source Type</i>  | <i>Contaminant Source ID</i> | <i>CS ID tag</i> | <i>Zone</i> | <i>Risk Ranking for Analysis</i> | <i>Map Number</i> | <i>Comments</i>  |
|---|------------------------------|------------------|-------------|----------------------------------|-------------------|--|
| Motor vehicle dealerships - cars, trucks, motor cycles, ATV's, snow machines, boats (with service department) | C27                          | C27-1            | A           | Medium                           |                   |  |
| Quarries (sand, gravel, rock, other?)   | E10                          | E10-1            | A           | Low                              |                   |  |
| Septic systems (serves one single-family home)  | R02                          | R02-1-2          | A           | Low                              |                   |  |
| Highways and roads, paved (cement or asphalt)   | X20                          | X20-1-2          | A           | Low                              |                   |  |
| Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)                           | D10                          | D10-1-2          | B           | Low                              |                   |  |
| Electrical, electronic, computer, and communications equipment/component manufacturing                        | I13                          | I13              | B           | Very High                        |                   | No other information besides contaminant type and location provided by the operator. |
| Septic systems (serves one single-family home)  | R02                          | R02-3-11         | B           | Low                              |                   |  |
| Highways and roads, paved (cement or asphalt)   | X20                          | X20-3-6          | B           | Low                              |                   |  |

**Table 5**

*Contaminant Source Inventory and Risk Ranking for  
Carefree Kids Day Care  
Sources of Heavy Metals, Cyanide and Other Inorganic Chemicals*

**PWSID 220084.001**

| <i>Contaminant Source Type</i>  | <i>Contaminant Source ID</i> | <i>CS ID tag</i> | <i>Zone</i> | <i>Risk Ranking for Analysis</i> | <i>Map Number</i> | <i>Comments</i>  |
|---|------------------------------|------------------|-------------|----------------------------------|-------------------|--|
| Motor vehicle dealerships - cars, trucks, motor cycles, ATV's, snow machines, boats (with service department) | C27                          | C27-1            | A           | Low                              |                   |  |
| Septic systems (serves one single-family home)  | R02                          | R02-1-2          | A           | Low                              |                   |  |
| Highways and roads, paved (cement or asphalt)   | X20                          | X20-1-2          | A           | Low                              |                   |  |
| Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)                           | D10                          | D10-1-2          | B           | Low                              |                   |  |
| Electrical, electronic, computer, and communications equipment/component manufacturing                        | I13                          | I13              | B           | High                             |                   | No other information besides contaminant type and location provided by the operator. |
| Septic systems (serves one single-family home)  | R02                          | R02-3-11         | B           | Low                              |                   |  |
| Highways and roads, paved (cement or asphalt)   | X20                          | X20-3-6          | B           | Low                              |                   |  |



**Table 6**

*Contaminant Source Inventory and Risk Ranking for  
Carefree Kids Day Care  
Sources of Synthetic Organic Chemicals*

**PWSID 220084.001**

| <i>Contaminant Source Type</i>  | <i>Contaminant Source ID</i> | <i>CS ID tag</i> | <i>Zone</i> | <i>Risk Ranking for Analysis</i> | <i>Map Number</i> | <i>Comments</i> |
|---|------------------------------|------------------|-------------|----------------------------------|-------------------|-----------------|
| Septic systems (serves one single-family home)                                      | R02                          | R02-1-2          | A           | Low                              |                   |                 |
| Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method) | D10                          | D10-1-2          | B           | Low                              |                   |                 |
| Septic systems (serves one single-family home)                                      | R02                          | R02-3-11         | B           | Low                              |                   |                 |

**Table 7**

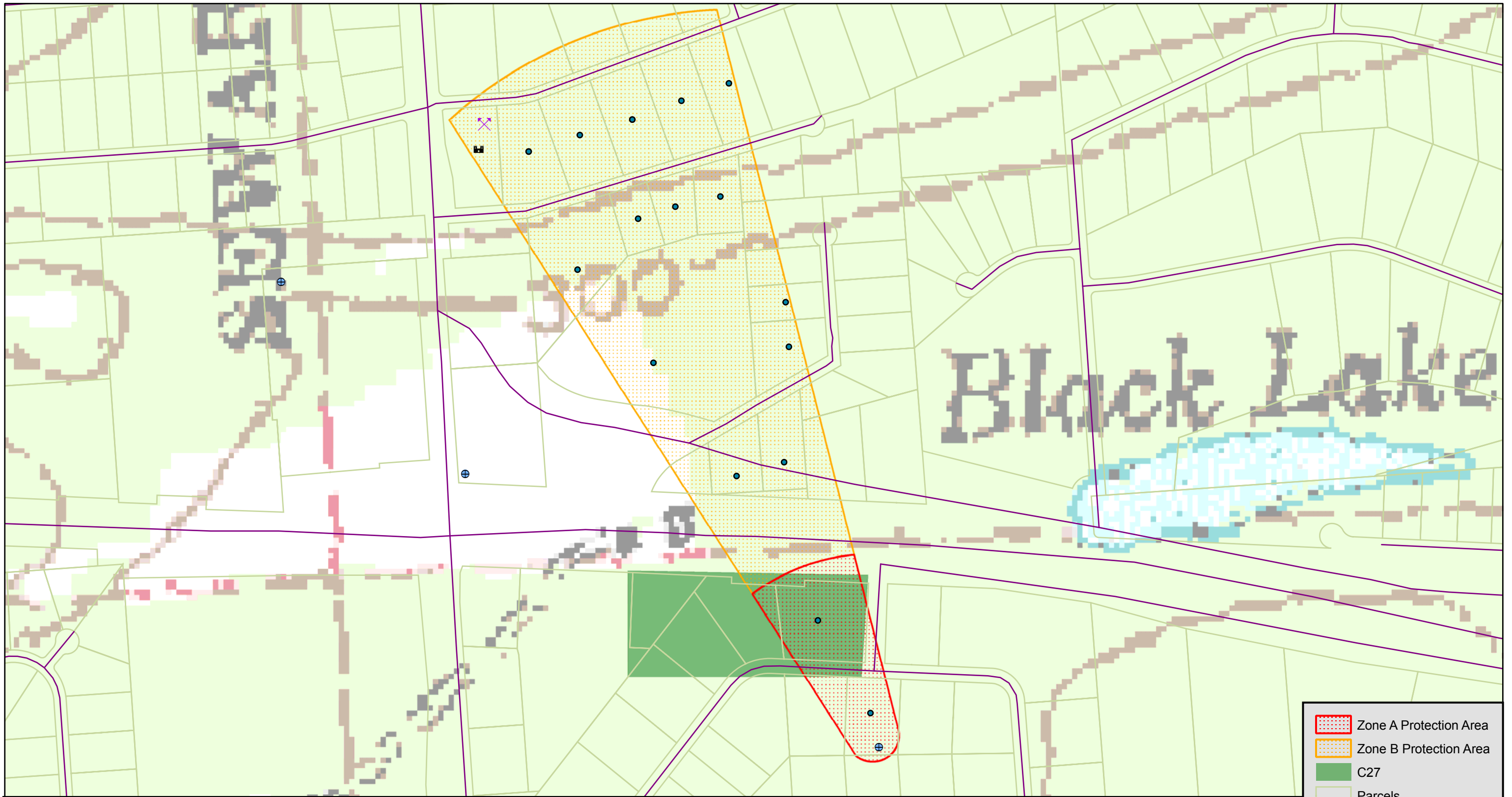
*Contaminant Source Inventory and Risk Ranking for  
Carefree Kids Day Care  
Sources of Other Organic Chemicals*

**PWSID 220084.001**

| <i>Contaminant Source Type</i>  | <i>Contaminant Source ID</i> | <i>CS ID tag</i> | <i>Zone</i> | <i>Risk Ranking for Analysis</i> | <i>Map Number</i> | <i>Comments</i>  |
|---|------------------------------|------------------|-------------|----------------------------------|-------------------|--|
| Motor vehicle dealerships - cars, trucks, motor cycles, ATV's, snow machines, boats (with service department) | C27                          | C27-1            | A           | Medium                           |                   |  |
| Quarries (sand, gravel, rock, other?)   | E10                          | E10-1            | A           | Low                              |                   |  |
| Septic systems (serves one single-family home)  | R02                          | R02-1-2          | A           | Low                              |                   |  |
| Highways and roads, paved (cement or asphalt)   | X20                          | X20-1-2          | A           | Low                              |                   |  |
| Injection wells (Class V) Large-Capacity Septic System (Drainfield Disposal Method)                           | D10                          | D10-1-2          | B           | Low                              |                   |  |
| Electrical, electronic, computer, and communications equipment/component manufacturing                        | I13                          | I13              | B           | Very High                        |                   | No other information besides contaminant type and location provided by the operator. |
| Septic systems (serves one single-family home)  | R02                          | R02-3-11         | B           | Low                              |                   |  |
| Highways and roads, paved (cement or asphalt)   | X20                          | X20-3-6          | B           | Low                              |                   |  |

## **APPENDIX C**

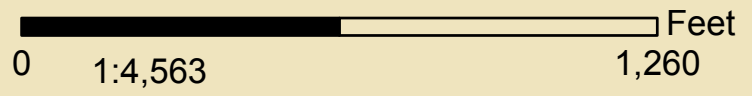
### **Carefree Kids Daycare Drinking Water Protection Area and Potential and Existing Contaminant Sources (Map 2)**



|                               |                        |
|-------------------------------|------------------------|
|                               | Zone A Protection Area |
|                               | Zone B Protection Area |
|                               | C27                    |
|                               | Parcels                |
|                               | Roads                  |
|                               | Public Water Sources   |
|                               | Septics                |
| <b>DWPP_point selection 2</b> |                        |
|                               | E10                    |
|                               | I13                    |

Map 2- Carefree Kids Daycare Potential Contaminant Sources

PWSID: 220084.001



Data Sources:  
 Mat-Su Borough: Roads and parcels  
 Potential Sources of Contamination: ADEC