



Environment

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8.1 Overview

8.1.1 Introduction

Delta City is situated in western Millard County, and is named after the delta of the Sevier River. The City's unique location provides access to Great Basin National Park, Notch Peak, and other popular outdoor amenities. The exceptional natural environment of Delta contributes to a high quality of life for residents. Therefore, preserving and maintaining the City's natural resources remains a crucial objective. This chapter addresses issues and concerns relating to Delta's environment, provides information about current conditions, incorporates public input, lists goals for preservation and maximization of natural resources, and lays out approaches and strategies for implementation of those goals. It should be reviewed periodically and updated within the context of all other General Plan chapters and against the broader context of changing economic, social, and political standards of the City.

8.2 Existing Conditions

In order to better understand community needs and future opportunities, an inventory was conducted establishing existing conditions and resources. This section details existing environmental conditions and resources, outdoor amenities, environmental resources, and risk of natural hazards.

8.2.1 Climate and Vegetation

CLIMATE

The region in which Delta City is located is classified as a Shadscale-Dominated Saline Basin Zone¹. This ecoregion is characterized as arid, with hot summers and cold winters, internally drained, and gently sloping to nearly flat. The region was inundated by Pleistocene Lake Bonneville, and has an elevation of 4,639 feet². Delta's average annual precipitation is 8.63 inches rainfall and 28 inches snowfall³, compared to Utah's 18.58 inches of annual rainfall and 4.7 inches annual snowfall.⁴

VEGETATION

Delta was settled primarily for agriculture, which remains an important economic sector today. Delta's main crop is alfalfa hay, but the City also produces corn, grain, wheat, and barley. Delta's soil has very high levels of salt and alkali. Thus, the natural vegetation is dominated by shadscale, winterfat, and greasewood, which are tolerant to salt and drought.

8.2.2 Natural Amenities

Delta City serves as an essential gateway community to a number of the state's best natural amenities. Visitors and outdoor enthusiasts travel through

Delta for access to hiking, fishing, rock climbing, 4-wheeling, and other recreational activities. Some of the neighboring natural features include:

- Gunnison Bend Reservoir
- Notch Peak
- Swasey Mountain
- Deseret Melville Abraham and Delta Reservoir
- Topaz Mountain
- Trilobite Mines
- Sawtooth Mountain Range
- Little Sahara
- Delta Shooting Range

TRAILS

Trails are an important component of the natural amenities that surround Delta. Biking, hiking, and ATV trails are prominent attractions for travelers, particularly on Topaz Mountain, Swasey Mountain, Notch Peak, and the Little Sahara. However, within the City itself, there are currently no walking or biking trails.

8.2.3 Environmental Resources

AIR AND WATER

Delta City is isolated from Utah's more urbanized Wasatch Front and other metropolitan areas, and therefore enjoys naturally clean air. The City also benefits



from access to the nearby Sevier River, which serves as the source for Gunnison bend and DMAD reservoirs. Delta uses water from the Sevier primarily for agricultural irrigation, but domestic use in recent years has risen.

FOSSILS AND MINERALS

The soil in and around Delta is rich with fossil and mineral resources, and mining these resources is a thriving, local industry. Trilobite fossils are commonly found in the region west of Delta. Nearby Topaz mountain is named for its abundant stores of topaz. Obsidian, opal, and geodes can also be found throughout the region.

8.2.4 Water Considerations

There are three known aquifers in the Delta area that produce water for local, municipal, and irrigation uses: deep artesian, shallow artesian and water-table aquifers. Delta City owns five water wells (Sugar Factory, Yard, Main, Gardner and Ridgetop), all of which derive water from the deep artesian aquifer. As more wells are developed in the area, the quality of groundwater may be degraded by introduction of arsenic.

ARSENIC LEVELS

In Utah, the formation of arsenic is associated with volcanic processes. Extinct volcanoes in the Delta area are no more than 12 miles away from the City, resulting in significant arsenic levels in the area's main aquifers.

On January 22, 2001, The US Environmental Protection Agency (EPA) adopted the new standard for arsenic in drinking water of 10 parts per billion (ppb), replacing the old standard of 50 ppb.(1) Water systems had to meet the new standard by January 23, 2006.

UPDATED FACILITIES

In 2007, Delta drilled a new well and installed a new water storage tank in order to comply with the EPA's arsenic regulations. The tank has a two-million gallon capacity. (2) Traces of arsenic remain present in the groundwater derived from all of the City's wells. However, the quality of groundwater from the Ridgetop and Gardner wells still meet current EPA drinking water standards. The Ridgetop Well's arsenic content is currently 5 ppb, while the Gardner Well is 7-8 ppb.

IMPACT ZONES

Since the groundwater in both the shallow and deep artesian aquifers flows southwest, groundwater with high levels of arsenic is not likely to move toward Delta City's wells under normal conditions. However, the development of more wells in the vicinity of existing City wells may cause a reversal of groundwater flow. To prevent this from happening, a zone of protest is delineated based on the impact zone of the existing wells.

WELL IMPACT ZONE

Based on the hydrogeologic conditions, the impact

zone of each of Delta's wells was approximated using its 15-year Time of Travel (TOT) zone. (see Map 8.1) This zone shows the long-term impact area for each well, providing protection to the drinking water and allowing the City sufficient time to develop a new source in the case of a contamination incident.

PROTEST ZONE

If a new well is proposed to be developed in the shallow or deep artesian aquifers near the City wells, the new well would have a similar impact zone. To avoid overlap between the new well and the City wells, a buffer of approximately 3,300 feet (the maximum extent of the 15-year TOT zone) is drawn to form the protest zone.

CURRENT MITIGATION METHODS

The current best practices, as recommended by Sunrise Engineering, are as follows. Delta City should prioritize protecting the area around City wells so that other wells do not draw on the aquifer, raising arsenic levels. A single well may not cause a reversal of groundwater flow, but as more wells are developed in the area, the cumulative effects of these wells would likely cause such a reversal and, consequently, an increase in arsenic concentration in the water. Delta City should therefore protest any proposal to develop a new well in the shallow or deep artesian aquifers within the protect zone.

It is also recommended that Delta implement a water quality monitoring program to track arsenic concentration variations over time. At the beginning, water samples should be collected for laboratory analysis to monitor month-to-month variations. After the first year, water samples should be collected quarterly, so the City can continue to monitor changes.

8.2.5 Natural Hazards

Delta City has a responsibility to increase the awareness of natural hazards to its residents. The City works to mitigate these hazards and their impact through zoning ordinances, land-use regulations, and building codes. Delta must also educate and prepare local residents to act appropriately in the event of a natural disaster.

FLOODS

Considering the fact that Delta City receives very little average rainfall, and is relatively flat, the Federal Emergency Management Agency (FEMA) has determined that Delta is at low risk for flooding. The only significant threat is the DMAD reservoir, as dam failure has the potential to cause a considerable, though unlikely, flooding event.

FIRES

Although Delta experiences one of the driest climates in the state, due to the City's prominent agriculture industry and relatively barren land, the Utah Division of Forestry, Fire, and State Lands ranked

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the community as being at very low risk for wildfires.⁸ This designation is based on factors such as the number of fire occurrences, fuels hazards, values protected, and fire protection capabilities of the local community. However, Delta residents and local government officials should still take proper precautions to mitigate risks.

GEOLOGICAL HAZARDS

In order to ensure the safety and protection of residents and property; cities and counties may enact geologic hazard ordinances to encourage prudent land uses in hazardous areas. The purpose of this section is to outline a series of geologic hazards associated with Delta.

EARTHQUAKES

Delta City has a high earthquake risk, and has experienced 13 sizable earthquakes since 1931. The largest earthquake within 30 miles of Delta was a 3.3 magnitude in 1993.⁹ The City sits in close proximity to several minor faults; approximately 10 miles south of Sugarville Area Faults, 35 miles east of Drum Mountain Fault Zone, and 20 miles north of Clear Lake Fault Zone.

LANDSLIDES

Although there are no significantly damaging landslides or rockfalls in Delta's history, some of the recreational areas to which Delta provides access have an increased landslide threat, and travelers and residents should be made aware of such risks. Areas that are generally prone to landslides include: steep natural slopes, particularly in weak geologic materials, steep construction-related cut or fill slopes, areas in or at the mouths of drainages (such as canyons), slopes below leaking canals or ponds, developed hillsides where septic-tank soil-absorption systems are used and landscapes are irrigated, below cliffs or hills with outcrops of fractured rock, and sites of previous landslides.

8.3 Public Input

Collecting and addressing public input in the drafting of a General Plan is integral to the success of the Plan and the community. Ideas and goals that are created using resident input are far more likely to come to fruition than those that are formed without public participation. Throughout the writing process of Delta City's General Plan, residents, property and business owners, and developers were asked to share their thoughts, recommendations, and desires for the future of the City. The following subsections explain methods used to obtain this feedback and the accompanying results. Although some of the information and feedback gleaned from resident input has already been synthesized into previous sections and subsections of this chapter, it is also included here for clarity.

Over the course of the creation of this General Plan, there were six public meetings. During the first two, the executive committee discussed what they

would like to see in the vision statement and goals. After drafting a vision statement and element goals, two more meetings provided opportunities for individual residents to give insight, feedback, and comments to the BYU team. A survey was then conducted to gather further public input. In the final two meetings, after hearing public comment the Plan was recommended to and adopted by the City Council. All public input relevant to this chapter has been included below.

8.3.1 Survey Data

A survey composed by the BYU team and the Executive Committee was dispersed to Delta residents, business owners, and property owners via social media and water bills. Of the estimated 3,478 people currently living in Delta (as per the American Community Survey's 2017 data), 193 residents, or 5.5%, participated in the survey. Consequently, it should be acknowledged that data summarized in this subsection represents the insights of a small portion of Delta's population and may not be proportionally representative of the opinions of the community as a whole. No comments were received in the survey that pertain to the contents of this chapter.

8.3.2 Public Meetings

This section discusses residents' comments from both of the public input meetings held at the Community Center on Main Street. Those who attended were encouraged to provide feedback on goal statements, idea lists, questions, and maps drafted for each of the eight General Plan elements. A scanned image of the environment map used at these meetings can be seen on page 156.

Public comments about the environment fell into four categories: good environmental practices, safety and health, water quality, and green spaces. Many residents made suggestions for the City to implement more environmentally sustainable practices, including better waste management, water conservation, and limiting idling cars. Concerns about safety and health focused on air pollution sources and waste from commercial facilities. Comments on water and air quality centered on the the current aquifer and the water drawn from City wells. Residents suggested that the City has done good things with existing green spaces. However, they feel that current urban vegetation puts a strain on Delta's water supply, and that the City should enforce ordinances to maintain vacant lots and yards.

8.4 Goals

Delta's community vision is to foster a thriving city by preserving Delta's heritage, expanding the local economy, and facilitating a sense of community. The environment goals seek to promote the community vision by outlining good environmental practices to support a high quality of life within the City. They also address concerns



regarding the enhancement of natural amenities and risk of natural hazards. These goals are further supported by the strategies found in the Approach and Opportunities section of the chapter.

GOAL 1: MAINTAIN ENVIRONMENTAL RESOURCES SUCH AS AIR AND WATER QUALITY BY ENCOURAGING GOOD ENVIRONMENTAL PRACTICES BY RESIDENTS AND DEVELOPERS.

GOAL 2: LEVERAGE THE NATURAL AMENITIES IN AND AROUND DELTA IN ORDER TO ATTRACT OUTDOOR RECREATIONALISTS.

GOAL 3: BEAUTIFY THE CITY BY PRESERVING OPEN SPACE, IMPROVING AND ENHANCING EXISTING GREEN SPACES, AND ADDING URBAN VEGETATION.

GOAL 4: MITIGATE POTENTIAL NATURAL HAZARDS AND POLLUTION.

8.5 Approach and Opportunities

This section suggests strategies intended to help individual parties work together to achieve community goals. Each goal is discussed individually, considering community planning principles, public input, and potential opportunities that the City may choose to explore in

order to ensure maximum effectiveness. The subsequent tables designate responsibilities and actions to individual parties.

8.5.1 Goal 1: Maintain environmental resources such as air and water quality by encouraging good environmental practices by residents and developers.

Delta enjoys exceptionally good air quality, and it is the responsibility of residents to preserve it for future generations. Residents can contribute by developing good environmental habits, such as reducing the number of car trips by walking or cycling to nearby destinations, when practical. Delta currently does not have a recycling program, but neighbors can coordinate with one another to collect recyclables and innovate methods for reuse. Business owners and developers, along with residents, should work together to limit idling vehicles, conserve water resources, and explore alternate solutions for single-use items, such as plastic utensils or packaging.

The executive committee has a responsibility to create a set of standards and regulations outlining good environmental practices, and establish a system of enforcement. The Mayor should direct and organize regular monitoring of air quality in and around Delta, so as to identify changes over time and take early action in the case of observed decline in quality.

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8.5.2 Goal 2: Leverage the natural amenities in and around Delta in order to attract outdoor recreationalists.

Delta's unique location makes it a central access point to Utah's west desert. Many outdoor enthusiasts travel through Delta on their way to enjoy recreational activities, such as hiking, rock climbing, or operating off-road vehicles. This creates an opportunity for the City to attract visitors, thus strengthening its tourism sector. With coordination between residents, business owners, and City officials, Delta will be able to supplement the local economy by leveraging its proximity to natural amenities. Residents can help maintain the natural, wholesome quality that makes these recreation destinations desirable by cleaning up trash, staying on designated trails, and protecting the areas from vandalism. Businesses should determine which amenities might be the most profitable for Delta's economy and cater their services to recreational visitors, capitalizing on these nearby locations. The City Council can also stimulate Delta's tourism sector by increasing wayfinding signage to better service visitors. The executive committee should coordinate with Millard county for all tourism efforts, including procuring necessary funding or additional resources.

Trails add significant environmental and public health benefits to the community. For individuals, benefits include providing places for physical activity, improving mental health, reducing stress, facilitating connections to nature, and increasing social interactions. Trails also improve the environment in a number of ways. They reduce flooding risks by capturing and detaining floodwaters, and protect human health and property loss by deterring development in areas prone to events like mudslides, wildfires, and flooding. Conversely, straying from trails degrades plant life and can cause erosion. Recreationalists and trail users should take precautions to stay on designated paths and to keep them free of trash and waste.

8.5.3 Goal 3: Beautify the city by preserving open space, improving and enhancing existing green spaces, and adding urban vegetation.

Preserving Delta's unique rural quality includes sustaining and enriching existing natural green spaces, and planning for urban vegetation. Business owners and developers should designate usable open spaces to be landscaped intentionally and tastefully. The Planning Commission must create a strategy to guide open space preservation for future decades and update zoning codes and building applications accordingly. The City Council may use this as an opportunity to launch a beautification commission, which would be responsible for incentivizing and assisting residents and

businesses to maintain and landscape their properties. The Mayor may also lead efforts to plant street trees, particularly on Main street and other more heavily used roads within Delta. Finally, every resident and stakeholder should contribute to water conservation and beautification efforts by investigating different possibilities for drought-tolerant landscaping and design.

8.5.4 Goal 4: Mitigate potential natural hazards to minimize loss of life and property.

While residents consider Delta to be an especially safe place in regards to natural hazards, proper precautions should be taken to prepare all residents for unforeseen circumstances. Residents are encouraged to outline an emergency preparedness plan for individual households and families. Elements of these plans may include safe behavior during an event, evacuation points, and emergency meeting locations. The executive committee should start by assessing which hazards are high risk to the City, and determining the potential severity. This can help guide the Planning Commission in ensuring all private buildings and public facilities are in accordance with current building code to promote the safety of all residents. The City Council and Mayor should also work together to produce a City-wide emergency preparedness plan available to the public. Recommendations specific to different hazards include the following:

FLOODING HAZARDS

Business owners and homeowners adjacent to Gunnison Bend and DMAD Reservoirs should be made aware that these areas pose a significant, though unlikely, flooding threat, and the City should make necessary preparations in case of such an event.

FIRE HAZARDS

Appropriate precautions to mitigate loss from fires include:

1. The Planning Commission should ensure that all building code standards are in compliance with the Utah State Fire Code Act adopted in 2011.
2. Provide proper setbacks between buildings in the Zoning Ordinance.
3. Modify the development review process to ensure that each building plan follows the fire safety standards as outlined in the International Building Code and Zoning Ordinance.
4. Include and publicize fire evacuation routes in the City-wide emergency preparedness plan.

GEOLOGICAL HAZARDS

Geologic hazards can be considered at various times during planning and development but, in general, are best considered early in the process. Some geologic hazards cannot be mitigated or are too costly to mitigate

and, therefore, are best avoided. Other hazards are easily mitigated and need not influence land use significantly as long as the hazard is identified.

1. Residents can avoid geologic hazards by selecting construction sites that have been carefully evaluated by professional geologists or engineers.
2. City officials should implement code requiring developers to conduct special review procedures and meet specific ordinances for building on hillsides or in other environmentally sensitive areas.
3. City officials should prepare construction guidelines for roads and other improvements on sensitive hillsides.
4. City code should also include regulations that limit development densities on lands that contain severe hazards or constraints.

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RESIDENTS	BUSINESS OWNERS AND DEVELOPERS	PLANNING COMMISSION	CITY COUNCIL	MAYOR
Explore options for more drought-tolerant and water-wise landscaping				
Limit vehicle idling time		Create standards and regulations for good environmental practices		
Consider active transportation for in-town trips				Monitor air and water quality with the City
Conserve water resources by reducing excessive irrigation or indoor use				
Explore alternatives to single use items and plastics				
Coordinate recycling efforts between neighbors				

Table 8.5.1: Environment Goal 1 Approach and Opportunities

RESIDENTS	BUSINESS OWNERS AND DEVELOPERS	PLANNING COMMISSION	CITY COUNCIL	MAYOR
Help maintain the condition and high quality of environmental and recreational facilities	Determine what natural amenities have the potential to be profitable for Delta's economy		Increase wayfinding signage for nearby outdoor recreation options	
	Market services to individuals traveling to and from the west desert	Coordinate with county efforts for tourism		

Table 8.5.2: Environment Goal 1 Approach and Opportunities

RESIDENTS	BUSINESS OWNERS AND DEVELOPERS	PLANNING COMMISSION	CITY COUNCIL	MAYOR
Purposefully landscape and utilize open spaces				
	Designate areas to be preserved for open space	Update zoning code and building applications to reflect the goals of the general plan	Establish a beautification commission to encourage residents and businesses to maintain their properties' landscaping	Plant street trees
		Develop a strategy for open space preservation		
Explore options for more drought-tolerant and water-wise landscaping				

Table 8.5.3: Environment Goal 3 Approach and Opportunities

RESIDENTS	BUSINESS OWNERS AND DEVELOPERS	PLANNING COMMISSION	CITY COUNCIL	MAYOR
		Determine what hazards threaten the City and to what degree		
Create a household emergency preparedness plan		Ensure private buildings and public facilities meet current building code	Create an City-wide emergency preparedness plan	

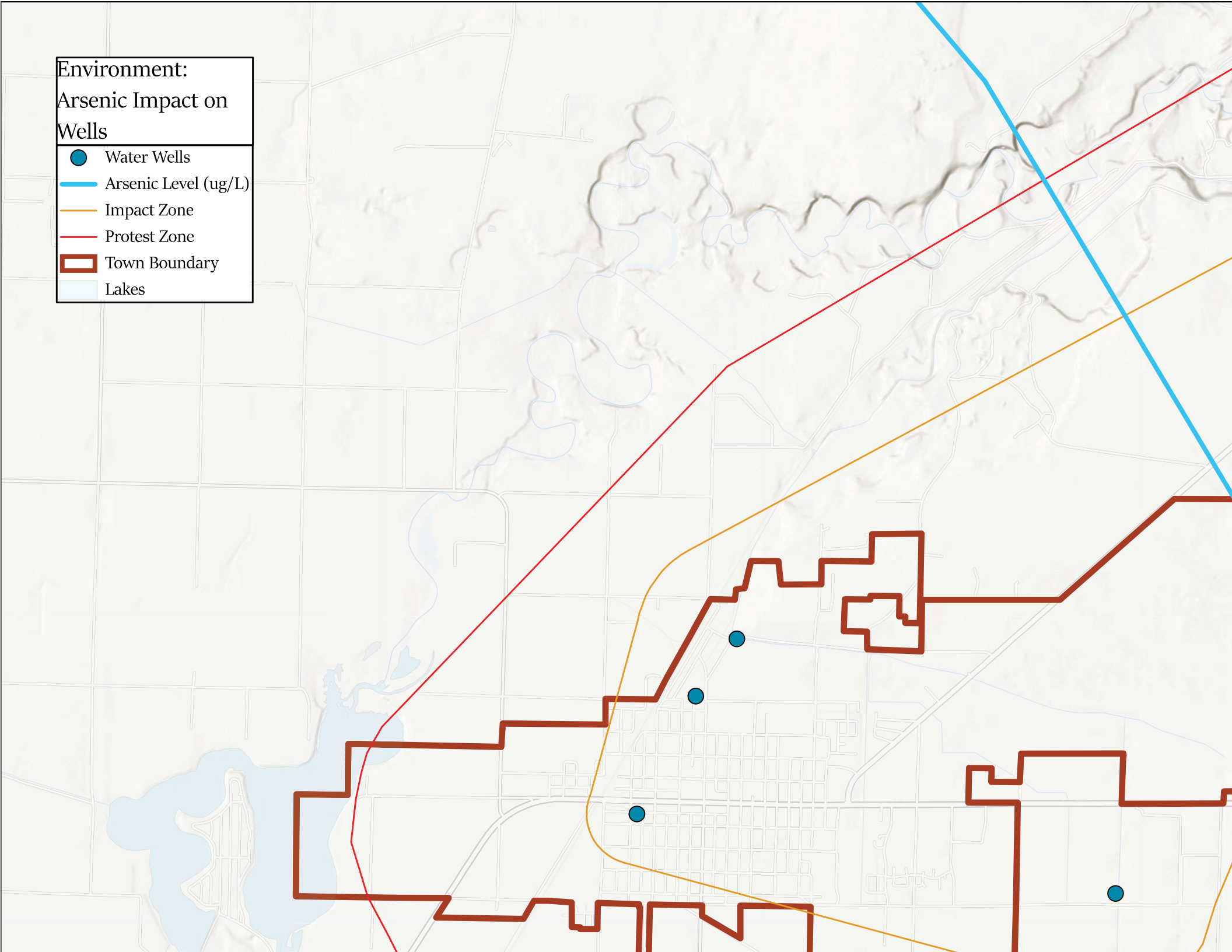
Table 8.5.4: Environment Goal 4 Approach and Opportunities



**MAP 8.1:
ARSENIC IMPACT
ON WELLS**


Environment:
Arsenic Impact on Wells


- Water Wells
- Arsenic Level (ug/L)
- Impact Zone
- Protest Zone
- ▭ Town Boundary
- Lakes



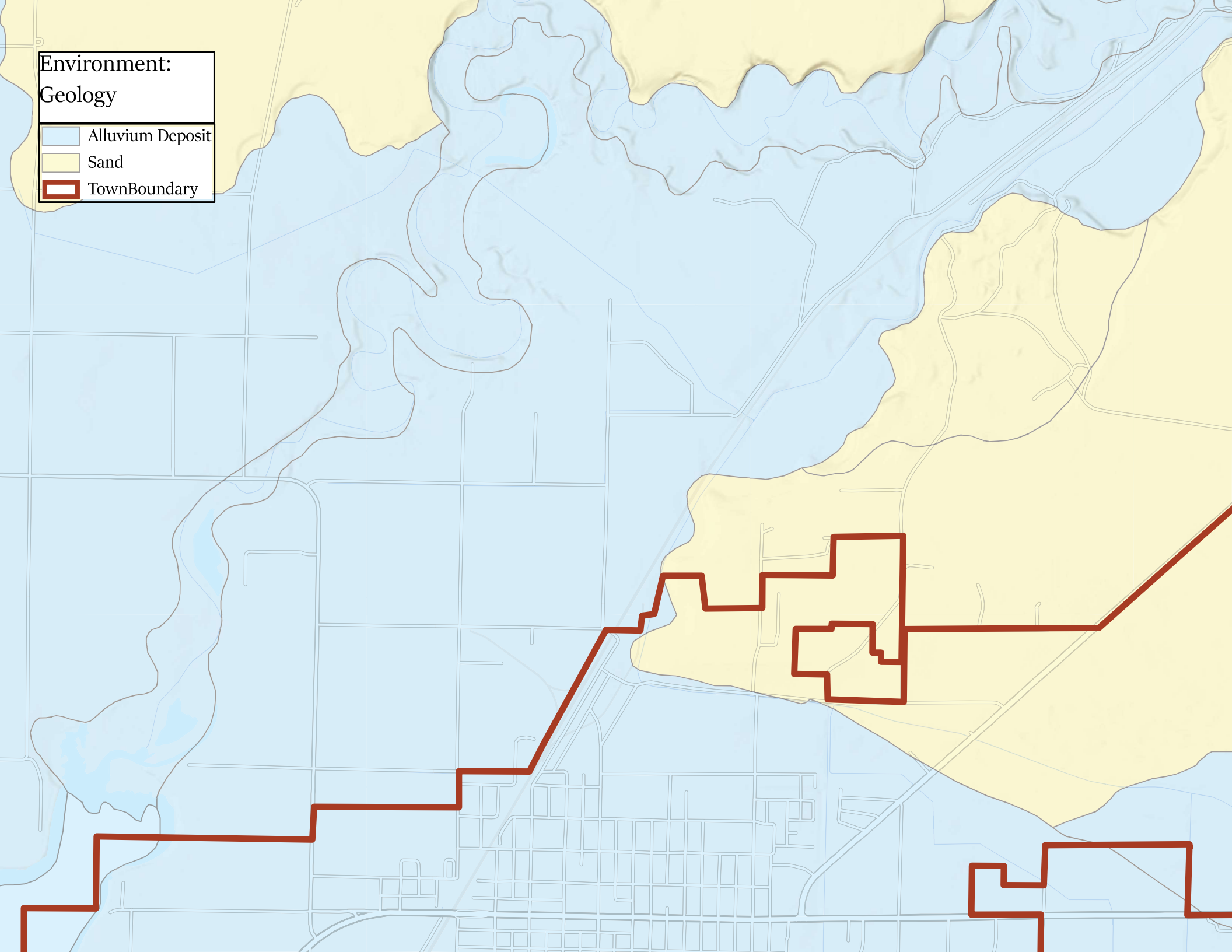
Environment:

Geology

 Alluvium Deposit

 Sand

 TownBoundary



**Environment:
Earthquakes, Volcanos, Fossils**

- Earthquake Epicenters, Magnitude >3.0
- ▲ Volcanic Cones
- ★ Fossil Sites

