

PHYSICAL PROFILE

Natural and physical features/attributes of the City of Jordan are simultaneously a bountiful resource and a factor limiting development/redevelopment. Natural Resources in and around Jordan provide the foundation for maintaining a healthy environment, high quality of life and sustainable growth. Jordan's natural resources are one of its greatest assets. Located within the Minnesota River Valley Basin it is surrounded by beautiful bluff lines. Preserving and improving on natural resources will not only continue to provide a base for recreation, but will also help to support the local economy by providing high quality resources from which to draw. Because of increasing affluence and people's growing desire to reside and work in metropolitan areas with high scenic amenities, it is imperative that Jordan plan for the protection of its natural resources.

Within Chapter 3 of this plan (Demographic Trends and Assumptions), it is noted that Jordan is projected to increase 128% in population throughout the course of the next two decades, from an estimated 5,048 in 2005 to over 11,500 by 2030. Much of this growth can be attributed to Jordan's natural amenities. Efforts should be directed toward wetlands and water resources, soils and geology, topography and drainage, wildlife and rare species, natural scenery, forests, prairies, and native plant communities. The concept of sustainable development should provide direction. Sustainable development can be seen as *"development that maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs."* (Minnesota Legislature, 1996.) The perspective of sustainability calls upon us to invest our time and energy in efforts which simultaneously strengthen the environmental, economic and social dimensions of any issue.

This Chapter provides background information on the City of Jordan's physical profile that is intended to assist in guiding growth and preserving natural resources. This chapter includes:

1. A Physical Profile including information on area, climate, topography, waters, watershed, groundwater, vegetation, rare species and soil conditions;
2. Natural Resource Objectives; and
3. Natural Resource Policies/Recommendations.

I. PHYSICAL SETTING

A. Size

The 2000 Census identifies 2.64 square miles of land area (1,690 acres) with Jordan of which 2.61 is square miles of land and 0.02 square miles is water. Since the 2000 Census the City has acquired 294 additional acres (.46 square miles) through annexation.

B. Climate

The climate of Jordan and surrounding Central Minnesota region is characterized by warm, humid summers with severe local storms and occasional tornadoes. The winter seasons are generally cold and relatively dry. The average 30 year annual precipitation for the years 1961 to 1990 has been 27 to 28 inches of water based on data from the State Climatology Office, Division of Waters, Minnesota Department of Natural Resources. Nearly half of this area's annual precipitation falls during the growing season of May through September or 12 to 13 inches of precipitation. The normal precipitation during the months of April through October has been 22 to 29 inches. During late December, January, and early February, temperatures frequently remain below zero. Frost in

Minnesota takes place as early as September and ends as late as May. Soil freeze occurs in Minnesota during the late fall and early winter months.

II. LAND RESOURCES

A. Ecologic Framework

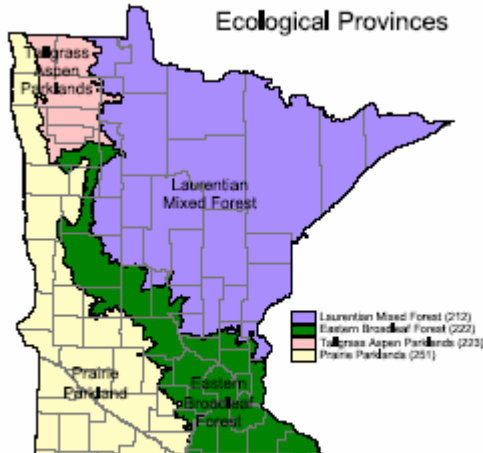


Figure 2-1
Minnesota Ecological
Regions

Source: MNDNR

According to the Department of Natural Resources, sections within this province are further defined by the origin of glacial deposits, regional elevation, distribution of plants and regional climate. Minnesota has 10 sub-ecological sections and Jordan lies within the Minnesota and NE Iowa Morainal division. This subsection is defined by two primary criteria. First, it is basically one landform that is definable. Second, one pre-settlement vegetation community was uniform and dominant. West of this unit, tall grass prairie was the primary vegetative community, suggesting basic differences in climate, topography, and natural disturbance. East of the unit, savanna and tall grass prairie communities reflect differences in topography and fire regimes, as well as parent material. To the north, the Mississippi River and a fairly extensive outwash plain/lake plain defines the boundary.

Topography is characteristically gently to moderately rolling across this subsection. Soils were formed in thick deposits of gray limy glacial till left by the retreat of the Des Moines lobe. Red oak, sugar maple, basswood, and American elm were most common in this dominantly forested region. Presently, much of the region is farmed.

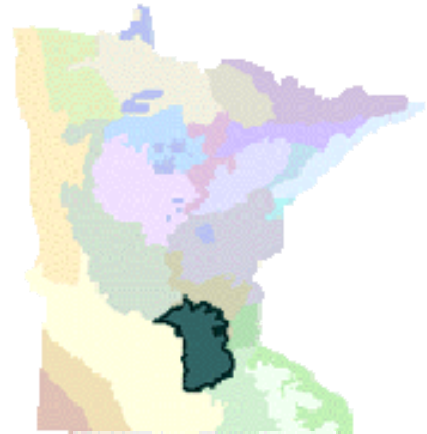
B. Topography and Drainage

Map 2-1 illustrates topography within the City of Jordan. The area features steep slopes throughout the community, many of which have a slope of 18% or greater. The steepest areas run in a north-south line parallel to Sand Creek's eastern bank. While these provide a barrier to development, they also provide a vital role in protecting the community from floodwaters. Several other areas of moderate to steep slopes are scattered throughout the southern portion of Jordan, with another major

Minnesota includes four of North America's ecological regions or biomes which represent major climate zones which converge: prairie parkland, deciduous forest and coniferous forest. The Ecological Classification System (ECS) is a nationwide system developed to manage natural resources on a sustainable basis. This system integrates climatic, geologic, hydrologic, topographic, soil and vegetation data. Jordan is included within the Eastern Broadleaf Forest province. This province bridges the transition zone between prairie to the west and true forest to the east. Major landforms include lake plains, outwash plains, end moraines, ground moraines, and drumlin fields.

Figure 2-2
Big Woods Subsection

Source: MNDNR



slope line running southwest from the old town area past the north side of Mill Pond. These areas generally are of unique value to the community and function best if allowed to exist in a natural state or exist with limitation on development such that they will not be urbanized or irrevocably altered. The City should require that areas of 18% slope or greater be shown on surveys submitted with development proposals in order to determine if the area is subject to the zoning district requirements. The topography of Jordan varies greatly with Sand Creek and bluff areas with slopes greater than 30%.

C. Soils

Many of the environmental decisions about using a resource are based on the kind of soil and the ability of the soil to support that resource use. The characteristics of the soils in the Jordan area are examined in order to make proper decisions on the use of the land and to protect the natural environment. Existing soils in the City have been principally responsible for the area's overall development pattern and may impose limitations or increased sensitivity to future urban development/redevelopment.

An illustration of soils (Map 2-2a) along with a soil survey legend (Map 2-2b) within the City of Jordan is included on the following pages and is reflective of USGS datum. Soil surveys provided by USGS provide information about erosion rates, depth to groundwater, surface and subsurface (to 5 feet) soil texture, engineering interpretations and suitability for activities such as private sewage treatment, building limitations, and nonmetallic mining sites to name few. This information is invaluable in making water and land resource management decisions. Soils with identical or near identical profiles are grouped into a soil series, normally named for a geographical feature where it was first described. Each series has the same characteristics, regardless of where it is subsequently found. Soil associations, which are described on a general county soils map, are a distinct pattern of soil series in defined proportions. Soil association maps provide an overview of the soils at a county level. These maps can help identify where high runoff or erosion could be expected, or where areas of high or low agricultural potential are likely to be located. These maps are not adequate for detailed planning and site selection of structures or roads. There are five general soil associations in Jordan area:

Alluvium - Located along the flood plain of Sand Creek, including most of Jordan west of Hwy. 21 and north of the Mill Pond. Clay and silt interbedded with sand and gravel. 3' to 10' or more thick.

Glacial Till - Located on top of bluffs around Jordan to the east and south. Gray clayey till. 15' to 50' thick.

Peat - Located in the large marsh southwest of the intersection of Highway 169 and Highway 282. Decomposed organic debris; water-saturated. 3'+ thick.

Sand/Silt/Clay, Terraced - Middle terrace is located northwest of Chicago & Northwestern railroad line on north side of Jordan; 75' to 115' above present flood plain. Upper terrace is located southwest of Mill Pond; 120' to 180' above present flood plain. Fine sand/silt/clay deposited by wind and by glacial River Warren.

Colluvium - Located on steep slopes around Jordan. Gray to yellowish-brown friable material, re-worked by down slope movement. Less than 3' to 6' thick or more.

D. Vegetation and Rare Species

The DNR has prepared a map of **Regionally Significant Terrestrial and Wetland Ecological Areas** which is included at the close of this Chapter as Map 2-3. Significant terrestrial and

wetland ecological areas occur within and near to the corporate limits/annexation areas primarily corresponding with the Minnesota River corridor and adjacent to tributary streams/creeks.

Biological survey and Metro Wildlife Corridor Areas. Metro Wildlife Corridor Focus Areas have been identified by the DNR and partner organizations/entities as reflected in Map 2-4 at the close of this chapter. The Metro Wildlife Corridor Project is a partnership of several entities which will establish priorities, coordinate work by the partner organizations and focus on areas with greatest regional importance for habitat. Using natural resource assessments and regional prioritization, the Metro Wildlife Corridor program will: work protect and restore priority natural lands in core habitat areas; establish habitat corridors; create buffers for existing protected land; and, increase public access to nature-related recreation.

The focus areas shown on the map identify regionally significant upland and/or wetland habitat area and wildlife corridors that the DNR, along with public and private partners, are committed to preserving. Within the corporate limits of the City of Jordan there are distinctly wooded areas. In addition, several wooded areas exist within the townships in close proximity to the City, particularly adjacent to Sand Creek, adjacent to surface waters and adjacent to wetland communities.

As defined by the Minnesota Department of Natural Resources Scott County is within the “Big Woods” Ecological Classification. On dry sites common trees included oak, aspen and birch; moist sites were dominated by sugar maple, basswood, elm and ash. Pine trees were commonly interspersed with the deciduous trees. Where the forest canopy was broken/interrupted a dense layer of tall shrubs such as prickly ash, dogwood and the like were common. Beneath dense canopies the shrub layer was sparse or absent. Preservation of existing woodlands enhances the quality of life and preserves remaining biological diversity.

The Scott County Biological Survey, illustrated on Map 2-5, identifies native plant communities within the County. Floodplain with Forest Silver Maple are identified on the NW area of the community, with Maple Basswood Forest and Oak Forest to the NE. Wet Meadow and Emergent Marsh are located on the south side of Highway 169. A Metro Wildlife Corridor Study identifies areas of ecological significance within the City of Jordan and adjacent townships. The areas are depicted in the map at the close of this Chapter illustrate the areas along Sand Creek and the Minnesota River.

III. SURFACE WATER RESOURCES

A. Watershed

The term ‘watershed’ refers to the entire physical area or basin drained by a distinct stream or riverine system. Gravity and topography are the two major factors that define a watershed. Watersheds help review authorities to evaluate the quality and quantity of local water resources. Jordan is contained within the Sand Creek Watershed. The Sand Creek watershed is in west-central Scott County in the south-central part of Minnesota on the south bank of the Minnesota River. The Scott County Soil Survey identifies the majority of the watershed as alluvial land subject to frequent overflow. The watershed drains an area of 263 square miles, the majority of which is upstream of Jordan.

Within the Twin Cities Metropolitan Area local governments (cities, townships and counties) are required to prepare plans to address water quality issues within their borders. These plans are prepared in support of the watershed management plans for the Watershed Management Organizations (WMOs) within which the city or township lies. The Scott WMO covers the majority of Scott County and is comprised of portions of five watersheds: Sand Creek, Southwest, Shakopee Basin, Credit River and Prior Lake Spring Lake watersheds. The remainder of the County is within four other watershed jurisdictions: the Lower Minnesota River Watershed District, the Prior Lake

Spring Lake Watershed District, The Black Dog WMO or the Scott County portion of the Vermillion River Joint Powers Organization.

B. Lakes, Rivers and Streams

Approximately 11% percent of the City's total land area is comprised of surface waters (public water inventory and national wetland inventory). Map 2-6 is reflective of the national wetland inventory (NWI) for areas within the City of Jordan. The map illustrates surface water resources. Major surface water features within the City include Mill Pond and Sand Creek eastern edge of community (tributary to Minnesota River). Mill Pond is a man-made lake which is classified as a recreational development lake. Access is obtained through the City Park on the east central shore of the Lake. In addition to Mill Pond and Sand Creek, there are several protected wetlands existing within and in close proximity to the corporate limits. Surface waters classified by the Minnesota Department of Natural Resources (MNDNR) are subject to shoreland regulations, including Mill Pond and Sand Creek. Map 2-6a includes the NWI with public waters.

The Clean Water Act requires states to publish, every two years, an updated list of streams and lakes that are not meeting their designated uses because of excess pollutants. The list, known as the 303(d) list, is based on violations of water quality standards and is organized by river basin. A Total Maximum Daily Load (TMDL) study identifies both point and non-point sources of each pollutant that fails to meet water quality standards. Water quality sampling and computer modeling determine how much each pollutant source must reduce its contribution to assure the water quality standard is met. Rivers and streams may have several TMDLs, each one determining the limit for a different pollutant. The Minnesota Pollution Control Agency (MPCA) is the state agency responsible for protecting Minnesota's water quality. Mill Pond is currently not listed by the MPCA as a state impaired water; however, Sand Creek was listed as a state impaired water in the 2004 Final TMDL List of Impaired Waters and the draft 2006 TMDL list. Sand Creek has also been listed for aquatic life under the invertebrate Index of Biotic Integrity (IBI) and turbidity and assigned a 5A classification on the 2004 TMDL List. The IBI is a regionally based index used to measure the integrity of rivers and streams and to determine the level of their impairment. The 5A classification indicates the listed water is impaired by one or more pollutant. A TMDL study is estimated to be complete in 2010.

C. Wetlands

Wetlands have historically been regarded as obstacles to development rather than areas of intrinsic value. However, it is now generally accepted that wetlands are valuable for storing essential surface waters, stabilizing surface waters to minimize the danger of droughts of floods and supporting wildlife habitat. Wetlands are also the primary method of recharging aquifers ensuring a continued water supply. Wetlands cleanse and purify surface water by removing nutrients and other contaminants from storm water runoff.

Wetlands are also illustrated on Map 2-6. The source for these data is the National Wetland Inventory (NWI) and Scott County Soils and Water District identified wetlands. Wetlands represent approximately 7.18% of the surface in the future land use boundary or 758 acres of the 10,560 acres.

The Army Corps of Engineers and the Department of Natural Resources are ultimately responsible for the overall protection of wetland; however, the City is the local governmental unit responsible for implementing wetland protection measures and administers the Wetland Conservation Act (WCA). The City has completed a Comprehensive Wetland Management Plan. Proper implementation of creek, bluff and wetland buffers in new developments is critical to maintain wetland functions within the City.

D. Flood Plains

In 1969, the Minnesota Legislature enacted the State Flood Plain Management Act (Minnesota Statutes, Chapter 103F). This Act stresses the need for a comprehensive approach to solving flood problems by emphasizing nonstructural measures, such as floodplain zoning regulations, flood insurance, flood proofing and flood warning and response planning. By law, Minnesota flood prone communities are required to: 1) adopt floodplain management regulations when adequate technical information is available to identify floodplain areas, and 2) to enroll and maintain eligibility in the National Floodplain Insurance Program (NFIP) so that people may insure themselves from future losses through the purchase of flood insurance. The Department of Natural Resources (DNR) is the state agency with the overall responsibility for implementation of the State Flood Plain Management Act.

The City of Jordan experienced significant floods in the early 1960s. Structures as well as bridges along the creek were destroyed during the flood and many homes were damaged or destroyed. The City has continued to experience severe flooding both in the spring, as a result of snowmelt combined with rainfall, and in the summer due to heavy rainfall. The flood problems in the Sand Creek Watershed, particularly in Jordan, were studied briefly in 1984, when the St. Paul Army Corp. of Engineers District prepared an initial appraisal report that evaluated the potential for Federal interest in constructing improvements for flood control in Jordan. The St. Paul District identified an alternative that had a favorable benefit-cost ratio and recommended proceeding with a detailed study. However, the City chose not to proceed with a study at that time.

In 1997, 1998, and 2001, Jordan experienced street and minor structure flooding. The City again asked the St. Paul District to review the flooding problems to see if a solution would be possible and feasible. The St. Paul District's May 2002 initial appraisal report reviewed the flooding situation to determine if there was a Federal interest in proceeding to a more detailed feasibility study. The initial appraisal report indicated that diversion of floodwaters through an open channel into a wetland west of Jordan might be feasible. The City provided a letter of support in 2004. The report was submitted to the Corps' Mississippi Valley Division in May 2004 and was approved in September 2004. The study is on hold until Federal funds are provided. The estimated cost to complete the feasibility study is \$470,000. As a result the City, through federal funding, constructed a dike to protect the majority of the lower town community from the threat of floods. The lower town area remains in the floodway as defined by the Flood Insurance Rate Map (FIRM) developed by the Federal Emergency Management Agency (FEMA).

Flood plain information presented in this document is based on the 1986 FEMA map being used at this time. In 1995, the City investigated the process and implementation probability of amending this map to eliminate those properties that could be taken out of the flood way as identified on the FIRM map. The map is still in need of an amendment and will require follow up by City officials. The County has taken the initiative in the FIRM Map Amendment and expects the changes to occur in 2008.

An analysis of the 1986 map identifies the flood plain in Jordan to be a large area, primarily in two areas of the community. The first is the area parallel to Highway 169 through the entire corporate limits of the city. The second area is the lower-town flat area, this area also being in the northeastern quadrant of the Highway 169 and Highway 282 intersection. The floodway area extends up to Rice Street or the railroad tracks.

E. Water Control Structures

Water control structures include the Mill Pond Spillway, which is maintained by the City. The MN DNR provides dam safety oversight. In addition to this water control structure and others within the Sand Creek Watershed, there are hundreds, perhaps thousands of culverts and box channels that control the flow of surface water throughout the District. These facilities are maintained by the cities,

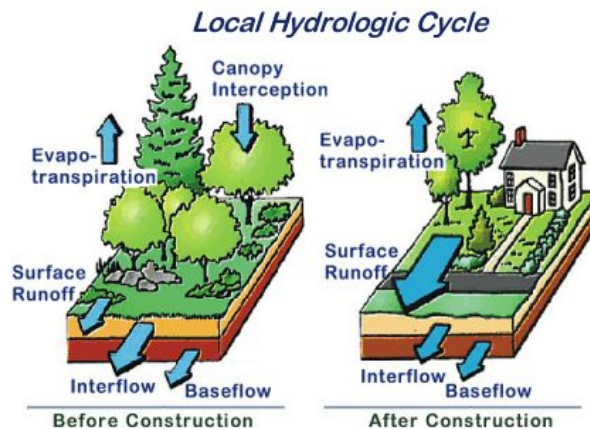
townships and county governments as well as by the Minnesota Department of Transportation (MNDOT).

The presence of culverts, bridges and other water control structures has a significant influence on flood control. The City has undertaken a comprehensive inventory of their respective flow control structures and facilities.

F. Local Hydrologic Cycle

Groundwater and surface water are both part of the “hydrologic cycle”. Development has a profound influence on the quality of waters. To start, development dramatically alters the local hydrologic cycle (see Figure 2-4 below). The hydrology of a site changes during the initial clearing and grading that occur during construction. Trees, meadow grasses, and agricultural crops that intercept and absorb rainfall are removed and natural depressions that temporarily pond water are graded to a uniform slope. Cleared and graded sites erode, are often severely compacted, and can no longer prevent rainfall from being rapidly converted into storm water runoff.

**Figure 2-4
Local Hydrologic Cycle**



Source: MNDNR

The situation worsens after construction. Roof tops, roads, parking lots, driveways and other impervious surfaces no longer allow rainfall to soak into the ground. Consequently, most rainfall is converted directly to runoff. The increase in storm water can be too much for the existing natural drainage system to handle. As a result, the natural drainage system is often altered to rapidly collect runoff and quickly convey it away (using curb and gutter, enclosed storm sewers, and lined channels). The storm water runoff is subsequently discharged to downstream waters.

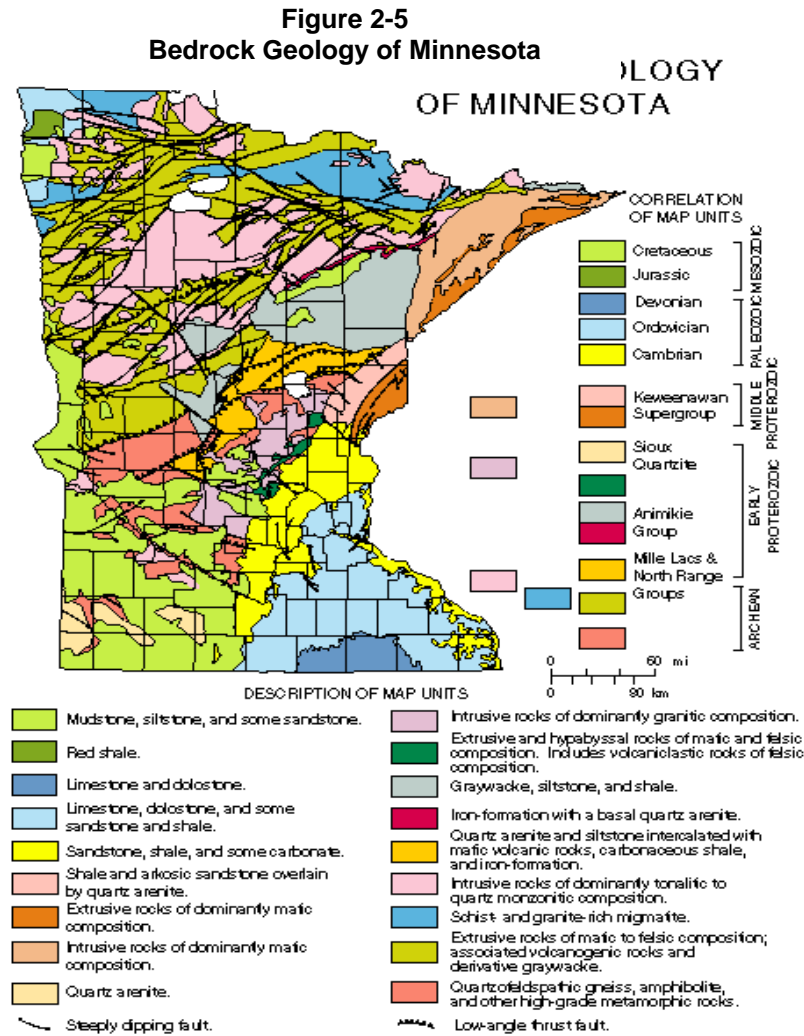
Water Quality is affected by the accumulation of trash, oil and rubber from cars, fertilizers and pesticides applied to lawns, sediment from bare or poorly vegetated ground and other pollutants entering streams, rivers and the Lakes. Inflow of sediment can cloud water, blocking sunlight from submerged plants. Sediment also settles to the bottom of streams, clogging the gravel beds used by fish for laying their eggs. Nutrients, such as phosphorus and nitrogen, from fertilizers enter the water and promote unusually rapid algae growth. As this algae dies, its decomposition reduces or eliminates oxygen needed by fish, shellfish, and other aquatic life for survival.

IV. GROUND WATER RESOURCES

A. Geologic Framework

Subsurface geology and groundwater are important considerations for all communities as they are the source of potable (i.e. drinkable) water. Hydrogeology is the study of the interrelation of subsurface geology and water. Because the consequences of human actions and forces at work above ground have a direct impact upon our ground water resources it is important to consider hydro geologic resources.

As shown in Figure 2-5, geologic conditions vary greatly in different parts of Minnesota.



Source: Minnesota Geological Survey

Hydro geologic conditions determine how sensitive ground water may be to contamination by chemicals and pollutants introduced at ground level. Sensitivity to pollution is described in terms of the length of time it takes for a drop of water to cycle from absorption into the ground to discharge (removal) from an aquifer. The pollution sensitivity of an aquifer is assumed to be inversely proportional to the time of travel: shorter cycle times may indicate a higher sensitivity, longer cycle times may represent a greater travel time and increased geologic protection. Contaminants are assumed to travel at the same rate as water. There are four pollution sensitivity categories: Very High, High, Moderate, and Low. The pollution sensitivity of an aquifer is assumed to be inversely proportional to the time of travel. Very High sensitivity indicates that water moving downward from

the surface may reach the ground-water system within hours to months leaving little time to respond to and prevent aquifer contamination. Low sensitivity where it takes decades to centuries for the cycle to be complete may allow enough time for a surface contamination source to be investigated and corrected before serious ground-water pollution develops. It is important to note higher pollution sensitivity categories do not mean water quality has been or will be degraded and low sensitivity does not guarantee that ground water is or will remain uncontaminated. Jordan's soil properties do not contribute to a high pollution sensitivity category as the soil properties are loam over loam. The loam is a balanced mixture of silt, sand and clay.

The areas in Scott County most susceptible to contamination are along the Minnesota River and the lower part of Sand Creek, where the water table is near the land surface and the unconsolidated subsoil materials are both thin and highly permeable. Areas with less than 50 feet of cover over a bedrock aquifer are vulnerable to contamination. Septic tanks are one example of pollution sources that can impair groundwater quality if improperly located. In areas of shallow depth to bedrock, great care is needed to safeguard groundwater supplies from contamination. The natural water quality of each of the major aquifers in Scott County is suitable for human consumption, irrigation, and industry.

Surficial Water-Table Aquifers

High water-table aquifers occur in Scott County along the Minnesota River and near Prior Lake. These aquifers carry large volumes of water, close to the land surface. These aquifers are recharged rapidly by infiltration of precipitation or surface water. Thickness averages 50 feet to 100 feet.

Prairie du Chien-Jordan Aquifer

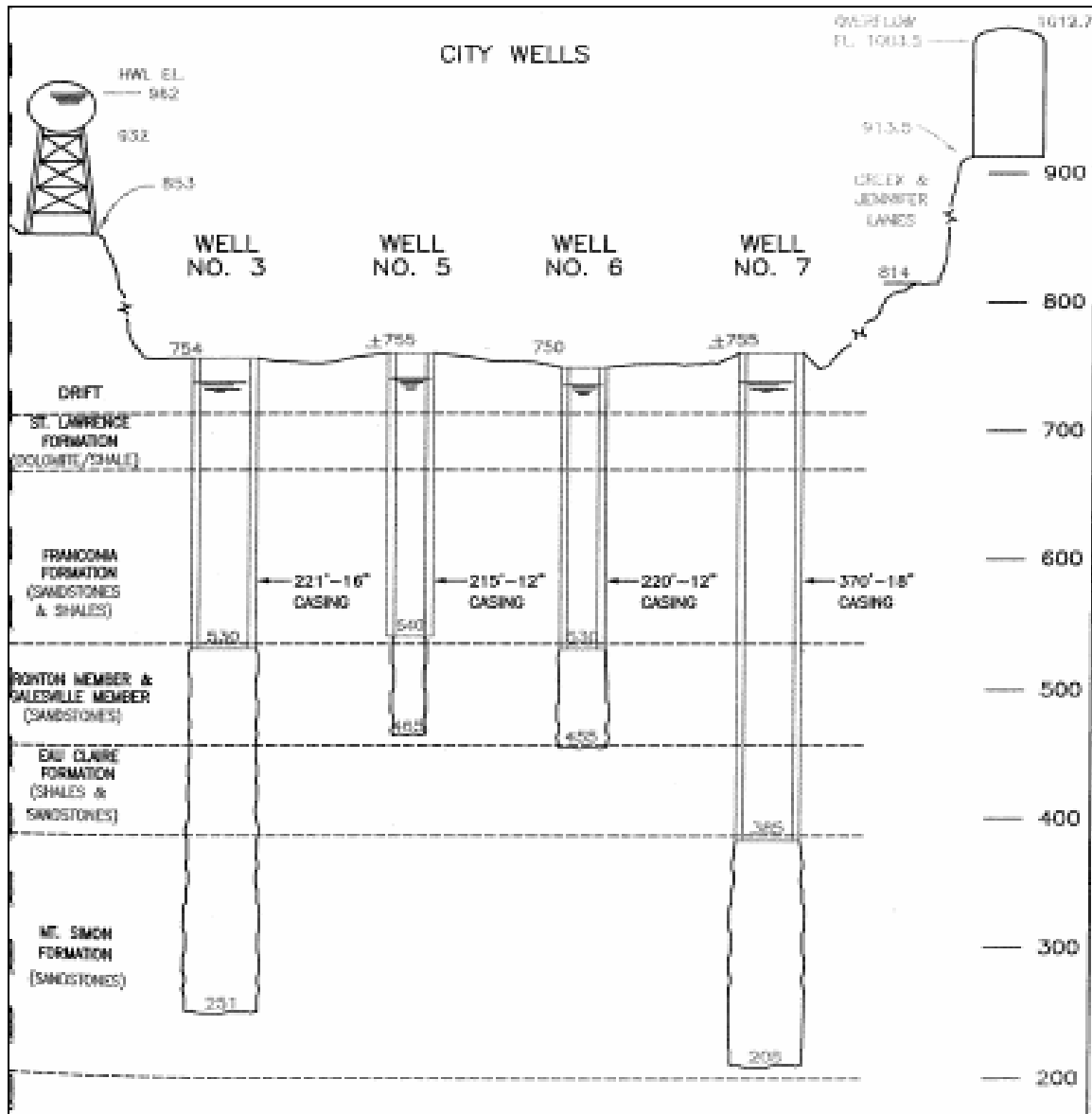
This aquifer is in the Jordan sandstone, which is the top layer of bedrock found south and east of downtown Jordan. It is a major source of water supply, and can be up to 200 feet thick.

Franconia-Ironton-Galesville Aquifer

This aquifer underlies the St. Lawrence Formation, which serves as a regional confining bed beneath the Prairie du Chien-Jordan aquifer. The aquifer is about 200 feet thick.

Mount Simon Aquifer

This aquifer is the source of water for City wells 3 and 7. This aquifer is beneath the Eau Clair Formation. The aquifer is approximately 200 feet thick.



Source: Bolton & Menk, Inc., Consulting Engineers & Surveyors

The Minnesota Pollution Control Agency reports 13 confirmed instances of leaking underground storage tanks (LUST) within the City over the past 26 years. Most files on the sites have been closed as of the drafting of this Plan. The sites are identified in the following table.

**TABLE 2-1
LEAKING UNDERGROUND STORAGE TANK SITES**

Site and MPCA Leak ID#	Address	Release Discovered Date	Product Released	Leak Site Complete Site Closure Date	Contaminated Soils Remaining
Tri-Mart 3590	240 Triangle Lane	11-26-1990	Waste Oil	01-30-1995	N
Utility and Highway Reconstruction 4509	Between 1 st & 2nd on Broadway	08-23-1991	Gasoline, Type Unknown	09-27-1993	Y
Utility and Highway Reconstruction 4508	S of Water St on Broadway	08-23-01991	Fuel Oil 1 & 2	03-03-1993	Y
Scott County Oil Co 4523	116 S. Broadway St.	09-11-1991	Gasoline Unleaded	09-07-1993	Y
Jim's Auto 4697	20251 Johnson Memorial Dr.	10-16-1991	Fuel Oil 1 & 2	09-03-1998	S
Triangle Oil Co. 11718	240 Triangle Lane	08-27-1998	Fuel Oil 1 & 2	10-20-1999	Y
Jordan Texaco 11991	255 Triangle Lane	10-26-1998	Gasoline, Type Unknown	07-27-2006	U
Scott County Oil Co. 13375	116 S Broadway St	03-20-2000	Gasoline Leaded	01-25-2002	Y
Former Gas Station 13785	410 N. Broadway St.	11-21-2000	---	---	U
Scott County Oil Company 14229	425 Rice Street N	05-18-2001	Fuel Oil 1 & 2	---	U
Mullin Trucking Company 16238	16477 Jordan Ave. S.	10-11-2005	Waste Oil	03-07-2006	U
Scott County Public Works 16437	600 Country Trail E	05-05-2006	Motor Oil	07-18-2006	Y
Marks Amoco 2249	300 Broadway St. N	01-19-1990	Gasoline, Type Unknown	03-21-1995	Y

Source: MN Pollution Control Agency, 2006

Jordan draws its groundwater from a groundwater source with four wells ranging from 290 to 547 feet deep which draw from both the Iron-ton-Galesville aquifer and the Mount Simon Aquifer. The Minnesota Department of Health determined in 2005 that the Jordan source of groundwater *was not* particularly susceptible to contamination. Studies during that year show that no contaminants were detected at levels that violated federal drinking water standards, however, some contaminants were detected in trace amounts that were below the legal limits.

The City of Jordan has adopted the second phase of a Wellhead Protection Plan. The purpose of a Wellhead Protection Plan is to ensure the current and future safety of the City's drinking water supply.

V. AIR, NOISE AND LIGHT POLLUTION

The air quality is also an important and sometimes forgotten issue of importance for communities; air pollution is increasingly a regional and global problem. Pollutants can blow in from cities hundreds of miles away. An air toxic monitoring study was completed in 2005 by the MPCA (Apple Valley test site #470 located at 225 Garden View Drive on Westview Elementary School). This was the closest test site for air toxins to Jordan. According to the MPCA, "The average concentrations of the air toxins were compared to health benchmarks. The Apple Valley test site measured 62 air toxins. The average concentrations of the air toxins were compared to health benchmarks. No compounds individually exceeded health benchmarks. When the risk from all monitored carcinogens were added together for the Apple Valley location, the increased excess cancer risk was 3 in 100,000. Risks below 1 in 100,000 are considered negligible. The acute and chronic hazard indices for the monitored compounds were both below 1 which indicates current levels should not pose a health concern."

Residents at the initial visioning session indicated that they wished to retain the small town atmosphere of the community. Visual pollution from light and noise pollution detract from the small town atmosphere. Lighting should not detract from the views of the lake at night and blinking, flashing and bright lights are a nuisance and can easily be controlled through modern advances in lighting which reduce glare and concentrate lighting on-site. Not only can good lighting design and devices control light pollution, they also are more cost efficient and energy efficient. Furthermore, commercial and industrial lighting should not detract from residential uses. Noise ordinances can ensure that noises do not cause nuisances to residents as well.

VI. ARCHEOLOGICAL RESOURCES

The history of a City helps a community define its sense of "place". Historic patterns of development, to a large measure, dictate where a community will grow in the future. History also gives us a window to view the lives of our forbearers and a mirror to reflect their images in our own endeavors.

As time progresses, Jordan may face the loss of more and more of one of its truly non-renewable resources. These resources are the archaeological and historic sites that give the City's modern day residents a tie to the past. Many of these cultural resources are being purposefully demolished or destroyed while others face the natural elements and slowly erode away, some without any knowledge. One threat to these resources is that their significance, or even their existence, is largely unknown. Development, redevelopment, or failure to maintain these sites can diminish or destroy historic and archaeological resources. However, widespread knowledge of archaeological sites can increase the likelihood that they will be disturbed or vandalized. Encroaching development and modernization require the need for preservation of archaeologically and historically significant sites. Because the known, or suspected, historic resources may have no significant relationship to current or likely future uses or activities in Jordan, it is questionable if they will play a role in determining or affecting the City's character. However, State guidelines call for municipalities to review construction or other ground disturbing activity within prehistoric archaeological sensitive and historic sensitive areas.

Jordan lies within the Prairie Lakes Archeological Region of the State and also in an area where there is a medium to high probability of archeological site existence concentrated along the region's streams and lakes. Information obtained from the Office of the State Archaeologist (OSA), State Historic Preservation Office (SHPO), and MNDOT indicate the presence of some archaeological sites, however, locations have not been verified and are rather schematic. There are two major water features in the Big Woods subsection, the Minnesota River and Lake Minnetonka. River valley floors and terraces in the Big Woods subsection also have the potential to contain deeply buried archaeological sites. An area of high site potential very clearly delineates the Minnesota River in the center of this region. The zone of high site

potential along the river coincides primarily with alluvium and to a lesser degree with terrace landforms. At least eight tributaries of the Minnesota River have high or medium site potential. These tributaries include Carver, Silver, and Bevens Creeks in Carver County; Sand Creek and Credit River in Scott County; Buffalo Creek and Rush River in Sibley County; and Forest Prairie and Cherry Creeks in Le Sueur County. Site potential is based upon statistical relationships between known sites and environmental factors. Areas along the eastern portion of the City along Sand Creek may warrant review and appropriate coordination with the State Historic Preservation Office (SHPO) as to area sensitivity. For further reference, data is available in the records of SHPO.

VII. AGGREGATE RESOURCES

As required by the Metropolitan Council the location of aggregate resources in Jordan have been identified, as illustrated in the *Minnesota Geological Survey Information Circular 46. Map 2-13 - Aggregate Resources* illustrates the location of aggregate resources in Jordan. The majority of resources remaining in Jordan consist of small scattered sites, including those which are underlying developed properties.

There are no former or active mining areas within the current city limits of Jordan. Within the proposed growth boundaries there are two sites. The Schmitt pits are located on the SW side of the community, along County Road 66. This is an active mining area. A proposed mining area is located within Sand Creek Township, off Valleyview Drive. An EAW has been completed with an interim use permit proposed to be acted on by Scott County in the first quarter of 2009.

To address aggregate resources in undeveloped areas, the Jordan's Zoning Ordinance contains guidelines for the issuance of a Conditional Use Permit to allow land reclamation and mining. The owners of parcels which contain aggregate resources may apply for a conditional use permit as a part of the development to mine or capture the aggregate resource prior to grading the site for future development. It is recommended the Zoning Ordinance be amended to allow these uses as Interim Use Permits which expire upon completion of the mining or land reclamation, rather than a conditional use permit which follows with the land.

The Natural Resources Chapter identifies the need to preserve and improve wetlands and ground water. Wetland areas take priority over aggregate resources that may lie below the surface and will not be mined.

VIII. DEVELOPMENT CONSTRAINTS

A review of several natural features has been reviewed in this Chapter. It should be noted that several of the natural features identified in this Chapter, including but not limited to water bodies, topography, soils, wetlands, flood prone areas, potential archeological sites and regionally significant ecological areas, will present constraints to future development. Several of these significant natural features/areas exist in the proposed growth area of the City. Map 2-7 illustrates potential constraints to development. The boundaries on the map are a compilation of floodplain areas, National Wetland Inventory data areas, areas of steep slope, soils survey data and DNR Public Waters Inventory data. Field verification was not done to determine wetland existence. It should be noted that further review of these and sites identified is required prior to development. This map is intended to provide a general overview. The City should require that areas proposed within these areas be shown in detail as necessary to determine development suitability and protection when submitted with development proposals.

VIII. NATURAL RESOURCES OBJECTIVES AND RECOMMENDATIONS

Objective: To the extent possible establish a balance between promoting, protecting, enhancing and preserving natural and physical features (including, but not limited to, woodlands, wetlands, soils, steep slopes, surface waters, groundwater) while managing requests for development and redevelopment.

Policy/Recommendations:

1. Encourage efforts to preserve wildlife species including preservation of natural habitat areas and pre-settlement (native) vegetative communities where feasible.
2. Encourage the use of natural resource data/studies for planning and review of development and redevelopment such as soils, topography, groundwater etc.
3. Carefully regulate development in areas adjacent to shorelands, wetlands and floodprone areas to preserve these as attractive amenities.
4. Encourage development to conform to the natural limitations presented by topography, soils or other natural conditions.
5. Identify and protect significant scenic areas, open spaces, historic or archaeological sites. Emphasize proper management of open space areas in order to preserve trees, wildlife, pre-settlement (native) landscape communities, floodplain, water quality and similar environmentally sensitive features.

Objective: Protect the quality and use of surface water through support and coordination with the, Scott Watershed Management Organization and state and federal agencies.

Policy/Recommendations:

1. Encourage and promote land use practices to protect and improve surface water resources.
2. Establish a priority listing of water areas to monitor surface water quality and quantity.
3. Evaluate the impact of storm water runoff on surface water in the City and respective growth areas as outlined in the Comprehensive Surface Water Management Plan and proactive implementation of watershed management tools developed by the Scott Watershed Management Organization, as amended or updated.
4. Enforce existing regulations and develop programs and new regulations where necessary to protect surface water.
5. Support the coordination of planning and implementation efforts between the Scott Watershed Management Organization as well as state and federal agencies.

Objective: Protect and preserve groundwater supply and quality through support and coordination with Scott Watershed Management Organization and state and federal agencies.

Policy/Recommendations:

1. Protect ground resource from contamination through the continued implementation of a Wellhead Protection Plan and other programs.
2. Identify geologically sensitive areas in the City and define the limits and recharge areas of aquifers.
3. Map areas of Leaking Underground Tanks.

Objective: Protect air quality in the City to comply with MPCA standards.

Policy/Recommendations:

1. Review performance standards within the Zoning Ordinance to ensure that they adequately control dust and wind erosion related to land use and development activities.

Objective: Preserve the environment as a sustainable resource to insure both present and future generations a good quality of life.

Policy/Recommendations:

1. Continue to coordinate plans and work with all agencies responsible for the protection and restoration of our environment.
2. Continue to administer and support the state environmental review program (EAW, EIS).
3. Enforce City's regulations including storm water violations.
4. Continue Participation in the National Flood Insurance Program and enforcement and directives of Floodplain regulations.
5. Ensure protection of solar access where appropriate by examining the Subdivision and Zoning Ordinance to ensure that solar energy access is available where appropriate and that the ordinance is in accordance with State Statute.

Objective: Educate the community about its natural resource assets and encourage them to think about their use and impact on the natural resources of the community and greater areas.

Policy/Recommendations:

1. Maintain a current list of persons to contact at various local, state and federal agencies which are responsible for protecting the environment.
2. Distribute new information relating to environmental regulations to all policy makers and elected officials as it becomes available.
3. Promote environmental stewardship including reducing, recovering and recycling waste materials.
4. Maintain data that reflects the economic benefits of clean water to the local economy.
5. Attend meetings of the Scott Watershed Management Organization to share information on surface water issues and to gain better insights on surface water issues.
6. Provide developers and owners with technical assistance in applying Best Management Practices for storm water management on road and land development projects.
7. Seek opportunities, such as conferences and publications to learn about emerging issues regarding the environment and provide training for elected and appointed officials to assist them in dealing with the complexities of environmental issues.
8. Provide information to property owners on Conservation Easements and agencies that will assist in the management of the easements.

Objective: Every effort shall be made to identify and protect prehistoric and historic sites which meet national, state, or local criteria for historic designation from destruction or harmful alteration.

Policy/Recommendations:

1. The State Historic Preservation Office (SHPO) should be referred to for all land use proposals where a possible impact to a historic or archaeological site has been identified.
2. Applicants with land use proposals that contain areas identified as being archaeologically sensitive should be required to conduct an investigation of the area's archaeological significance. The scale and location of the proposal will determine if such an investigation will be required.