SECTION 3 – WATERSHED INVENTORY

3.1. Introduction

In order to develop management strategies to improve water quality in Antelope Creek, it is first necessary to understand the stream conditions and watershed characteristics. During the summer and fall of 2010, the project team conducted a watershed inventory to evaluate the factors potentially affecting water quality in Antelope Creek. The inventory included a desktop review of existing information and field surveys to fill data gaps.

3.2. Collection of Existing Information

Desktop review included:

- NDEQ and other historical water quality records
- Hydrologic and hydraulic information
- Available Geographic Information Systems (GIS) data
- Land-use
- Storm drainage system
- Lincoln/Lancaster Comprehensive Plan and other existing planning documents
- Existing water quality projects

For planning purposes, the City refers to the upper portion of the watershed as Holmes Lake Watershed, and the lower portion as Antelope Creek watershed.

Field surveys included:

- Inspection of outfalls for dry weather flows and further investigation of outfalls with dry weather flows
- Characterizing typical land-use areas
- Locating possible illicit connections, nutrient sources, or sediment loadings
- Inventory of bird activity under bridges
- Tour of the Lincoln Children's Zoo
- Tour of the watershed with key members of the project team

3.2.1 Physical Setting

Watershed Size and Boundaries

The watershed for Antelope Creek covers a total of 13.1 square miles (8,389 acres), from approximately 98th and Pine Lake Road, flowing to the northwest through the heart of Lincoln to the confluence of Salt Creek. The watershed includes Holmes Lake, a 112 acre flood control and recreational reservoir located between 56th and 70th Streets and Van Dorn Avenue. For planning purposes, the City refers to the upper portion of the watershed as Holmes Lake Watershed, and the lower portion as Antelope Creek Watershed. The divide between these two sub-watersheds lies on a line across Holmes Lake Dam from approximately 70th and A Street south, to near 56th and Pioneers Boulevard. This Basin Plan only addresses the lower portion of the watershed known as Antelope Creek Watershed.

Picture 5: Sunken Gardens

Antelope Creek Watershed

Antelope Creek watershed was re-delineated to update the previous watershed boundary and provide an accurate boundary for future use. Data used to update the boundary include the existing watershed boundary, storm drain system layout, updated contours provided by Light Detection and Ranging (LIDAR) data, and site walkthroughs. The updated watershed boundary covers approximately 4,932 acres from Holmes Lake Dam downstream to the northwest 5.7 stream miles. The watershed is approximately 2.1-miles wide and nearly 100% urbanized. Significant landmarks located within the watershed include:

- University of Nebraska–Lincoln(UNL) City Campus and Innovation Campus, Bob Devaney Sports Center
- City recreational facilities including Union Plaza, Antelope Park, Jim Ager Memorial Golf Course, and Sunken Gardens
- Lincoln High and Southeast High Schools
- Lincoln Children's Zoo

Topography

Antelope Creek watershed is nearly 100% urbanized, and overall is sloped mildly ranging from 0 to 11%. Antelope Creek, at the outlet of Holmes Lake Dam, is at an elevation of approximately 1,210 feet. The confluence with Salt Creek is at an elevation of approximately 1,122 feet. The highest point in the watershed is just south of 70th and A Street, 1,330 feet. Overall, Antelope Creek bottom has a fairly constant slope along the entire length with an average slope of 0.3%.

Soils

The project area is covered by a variety of soil types typical for most areas in Lancaster County. Soil types for the project area have been summarized in Table 3-1. The soil summary was provided by the USDA and NRCS web soil survey.

Table 3-1. Watershed Soil Types

Map Unit Name	Hydrologic Soil Group	Slope %	Approximate % of Area
Aksarben silty clay loam	C	2 to 6	1.6%
Aksarben silty clay loam	C	6 to 11	0.2%
Burchard clay loam	C	6 to 11	0.1%
Wymore silty clay loam	D	3 to 6	0.6%
Colo-Nodaway silty clay loams	C	Flat	1.0%
Nodaway silt loam	B	(Channelized)	0.2%
Urban land-Judson complex	C	1 to 3	5.7%
Urban land-Kennebec complex	B	0 to 2	20.7%
Urban land-Pawnee-Mayberry complex	D	2 to 6	1.5%
Urban land-Wymore complex	C	0 to 2	2.6%
Urban land-Wymore-Aksarben complex	C	2 to 6	54.0%
Urban land-Crete-Aksarben complex	C	0 to 2	11.2%
Arents, earthen dam	D	NA	0.2%
Water	NA	NA	0.4%

Source: USDA Web Soil Survey

The three predominant soil types are the Urban land-Wymore-Aksarben complex, Urban land-Kennebec complex and the Urban land-Crete-Aksarben complex which comprise about 88% of the total area. The Urban land-Wymore-Aksarben complex is characterized as a gently sloping, well drained silty clay loam. This soil type can generally infiltrate 0.06 to 0.20 in/hr. The Urban land-Kennebec complex is characterized as a flat, moderately well drained silt loam. This soil type can generally infiltrate 0.6 to 2.0 in/hr. The Urban land-Crete-Aksarben

complex is characterized as flat, moderately well drained silty clay. This soil type can generally infiltrate 0.06 to 0.20 in/hr.

Regional Geology

According to the Lancaster County soil survey, the bedrock in Lancaster County is Pennsylvanian and Permian age limestone with interbedded shale and shaley limestone, and interbedded shale and sandstone of the Dakota Group of the Cretaceous age. Exposed Dakota sandstone and shale are present in areas of Antelope Creek including areas near Lincoln Children's Zoo.

Antelope Creek watershed was historically a native prairie dominated by big bluestem, little bluestem, and other grass species. Prior to urbanization and substantial flood control projects, Antelope Creek had a sandstone bottom and several sandstone outcroppings. Antelope Creek remains influenced by groundwater, especially downstream towards the confluence with Salt Creek. Several areas of groundwater seeps were noted during the field survey. Groundwater seeps are more frequent closer to the confluence with Salt Creek, as is evident by the increased base flow near Salt Creek.

3.2.2 Land-Use

Existing Land-Use

The City of Lincoln/Lancaster County Planning Department regularly updates the existing land-uses using a detailed number category within GIS. Land-use categories describe how property owners utilize the land (*i.e.,* residential for homes, commercial for businesses, and industrial for manufacturing). Overall, the watershed consists mostly of residential land-uses that have been in place for more than 50 years. The second most common land-use is for transportation (*i.e.,* uses such as roads, railroads, and Right-of-Ways). Two land-use summaries are provided, including a detailed breakdown (Table 3-2) and a composite breakdown (Table 3-3) based upon standard land-use classifications. Figure 3-1 shows the existing land-uses within the Antelope Creek watershed.

Table 3-2. Detailed Land-Use Summary

Land-Use Type	Land-Use Area (Acres)	% of Project Area	Land-Use Type	Land-Use Area (Acres)	% of Project Area
Single Family Detached	1,854.4	37.60%	Light Industrial	48.8	0.99%
Street/ROW	1,172.4	23.77%	Heavy Industrial	41.7	0.85%
School	372.3	7.55%	Hospital	30.6	0.62%
Park	317.1	6.43%	Rail Road	28.8	0.58%
Commercial	180.0	3.65%	Single Family Attached	24.8	0.50%
Multi Family	145.7	2.95%	Golf Course	22.3	0.45%
Open Space	144.8	2.94%	Dormitory	20.5	0.42%
Duplex	142.3	2.89%	Vacated ROW	11.2	0.23%
Public Owned	132.8	2.69%	Utility Facility	2.5	0.05%
Vacant Land	72.3	1.47%	Commercial / Residential	2.0	0.04%
Parking Lot	57.7	1.17%	Parking Garage	1.9	0.04%
Nursing Home	53.6	1.09%	Stream, Creek, Ditch	1.2	0.02%
Church	49.4	1.00%	Unknown	0.6	0.01%
			TOTAL	**4,932**	**100%**

Source: Lincoln/Lancaster County Planning Department 2010

Table 3-3. Composite Land-Use Summary

Land-Use Type	Total Acres	Percentage of Project Area
Single Family Residential	1,879	38%
Multiple Family Residential	309	6%
Commercial (shopping Areas)	182	4%
Industrial	93	2%
Public/Quasi-Public (schools)	639	13%
Transportation (Roads)	1,261	25%
Park/Recreation/Open space	569	12%
Total	**4,932**	**100%**

Source: Lincoln/Lancaster County Planning Department 2010

Future Land-Use

Due to the majority of the watershed being fully developed, future land-uses matched closely to the existing land-uses according to the Lincoln/Lancaster County future land-use map. Significant changes in land-use had occurred from 2000 to 2011 due to the Antelope Valley Project; which increased the use of land for transportation, recreation, and commercial use in the area. UNL's Innovation Campus, at the site of the former Nebraska State Fairgrounds, was being developed during the development of this Basin Plan. At the time of the planning period, no other significant changes were planned.

3.2.3 Storm Drainage System

The storm drainage system in the Antelope Creek watershed largely consists of typical curb and gutter, with a few surface drainage tributaries to Antelope Creek. Sheetflow, directly into Antelope Creek, occurs in limited locations along the stream channel. The storm drainage system is typical of an urban area. The system includes approximately 86 miles of storm drain pipe across the watershed. The majority of the system's storm drain pipe is in generally good condition and primarily made up of 15-inch (21.8%), 18-inch (15.3%), and 24-inch (11.7%) reinforced concrete pipe. From Holmes Lake to the confluence of Salt Creek, roughly 3,775 storm drain inlets collect flows discharging to approximately 223 outfalls to Antelope Creek. The outfalls vary in size from 2-inch foundation drains to an 8 foot by 10 foot enclosed conduit outfall.

From Holmes Lake to the confluence of Salt Creek, roughly 3,775 storm drain inlets collect flows discharging to approximately 223 outfalls to Antelope Creek.

Three unnamed tributaries to Antelope Creek exist: one segment through Antelope Park, and two segments that branch off to the north and south near 56th and Van Dorn Street. Figure 3-2 displays the storm drainage system, Antelope Creek, and two tributary segments.

Picture 6: Sediment deposits below an outfall above the labyrinth weir

N

Salt Creek

180

27TH ST

33RD ST

HOLDREGE ST

VINE ST

O ST

O ST

34

10TH ST

48TH ST

56TH ST

70TH ST

G ST

D ST

Antelope Creek Basin

A ST

VAN DORN ST

27TH ST

48TH ST

Holmes Lake

2

PIONEERS BLVD

Land Use

- Single Family Residential
- Multiple Family Residential
- Commercial
- Industrial
- Park/Recreation/Open Space
- Public/Quasi-Public
- Transportation

Antelope Creek Watershed Basin Management Plan

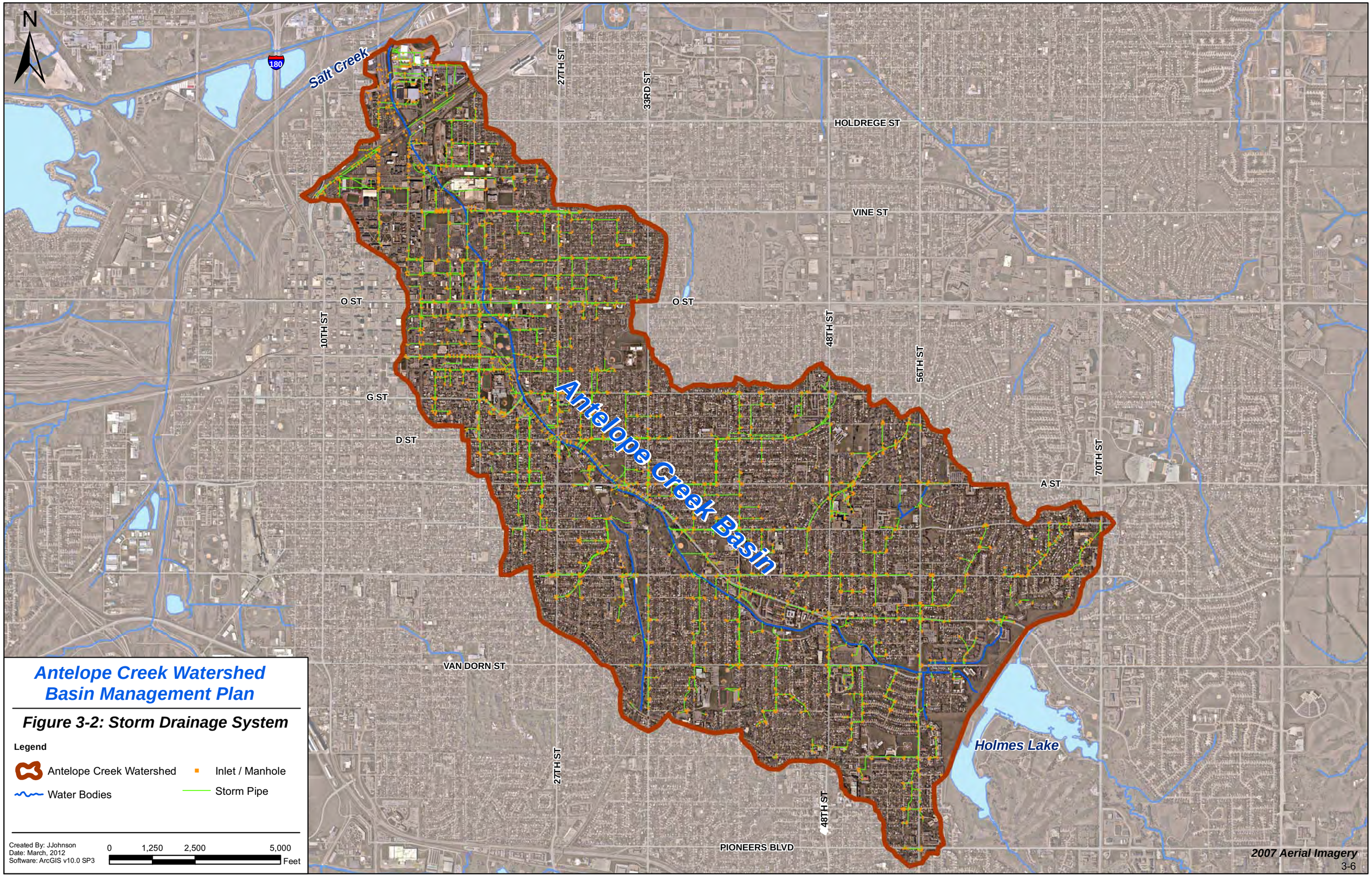
Figure 3-1: Existing Land Use

Legend

- Antelope Creek Watershed
- Water Bodies

Created By: JJohnson
Date: March, 2012
Software: ArcGIS v10.0 SP3

0 1,250 2,500 5,000 Feet



Antelope Creek Watershed Basin Management Plan

Figure 3-2: Storm Drainage System

Legend

- Antelope Creek Watershed
- Water Bodies
- Inlet / Manhole
- Storm Pipe

Created By: JJohnson
Date: March, 2012
Software: ArcGIS v10.0 SP3

0 1,250 2,500 5,000 Feet

3.2.4 Hydrologic and Hydraulic Data

Antelope Creek, a tributary to Salt Creek, originates near 91st and Pine Lake Road. Since the completion of the Holmes Lake Dam in 1962, major floods have not occurred; however, some local flooding such as in July, 1967, resulted from several heavy rains. On September 8, 1989 Holmes Lake reached a record high elevation when a storm produced 8 inches of rain in the Antelope Creek watershed. Since the construction of Holmes Lake, additional urban development has taken place in the Antelope Creek watershed between Salt Creek and Holmes Lake Dam, which has increased storm runoff and potential downstream flooding.

Picture 7: The labyrinth weir above Union Plaza is a recently constructed flood control structure installed as part of The Antelope Valley Project

Flows begin at the outfall of Holmes Lake, flowing through an open channel underneath many street bridges, through residential and business neighborhoods, until conveyed underground into an enclosed conduit near 23rd and N Street, just west of Elliott Elementary School. Antelope Creek remains underground between N and Vine Streets, until it leaves the enclosed conduit southwest of the Old Cushman Building on UNL's City Campus near 21st and Vine Street. The final leg meanders in an open channel through the eastern edge of the UNL campus, underneath the Burlington Northern Santa Fe Railway tracks, and continues between North 14th Street and the western edge of Innovation Campus where it empties into Salt Creek south of Cornhusker Highway. Base flow patterns in Antelope Creek are dependent upon the amount of water being released from Holmes Lake, surface water runoff, and groundwater infiltration; these flows travel through the original channel which includes the enclosed conduit. Several groundwater boils are visible in the creek south of Vine Street.

In 2010, the City and LPSNRD completed significant changes to Antelope Creek as part of the Antelope Valley Project due to urbanization of the watershed. Flood control improvements included creation of an open waterway, with gently rising grassy slopes, to carry 100-year flood waters through a one-half block wide linear park, named Union Plaza. Flood control improvements completed in 2010 allow high-flows during flood events to move through the existing box culvert, as well as the newly created open channel passing through Union Plaza. A labyrinth weir located near the entrance of the box culvert controls the amount of water that flows through the existing box culvert. Improvements to the channel narrowed the floodplain such that more than 800 homes, 200 businesses and over 50 acres of UNL's City Campus are no longer threatened by the 100-year flood. The new open linear park waterway is aesthetically designed and attractive to encourage recreational, housing, and business redevelopment.

3.3. Historic Water Quality Data

Sources of water quality data for Antelope Creek include NDEQ, UNL, the City, and EA. Details and discussion on water quality date can be found in SECTION 5 - WATER QUALITY MONITORING. Water quality data for Antelope Creek, from below the Holmes Lake dam to the confluence with Salt Creek, is summarized below:

- NDEQ rotating basin sampling plan data for 2002-2008 collected at Antelope Creek at the State Fairgrounds. This location was included in NDEQ's water quality assessment for 2010 (NDEQ 2010) and was provided in electronic format by NDEQ. (Note: the data set forming the basis of the Antelope Creek TMDLs for ammonia and E. coli was limited to 2002-2004, and is discussed further in SECTION 4 – TMDL ASSESSMENT.)
- NDEQ collected additional monitoring data for Antelope Creek in 2009, also limited to the State Fairground sampling location, and was provided electronically by NDEQ.
- UNL conducted in-stream monitoring at five locations in Antelope Creek, which were visited six times during the summer of 2009. These sites were chosen to assess whether pollutants of concern were entering Antelope Creek from locations such as the State Fairgrounds, the Lincoln Children's Zoo and Sunken Garden, and the Holmes Park Dog Run (upstream of Holmes Lake).
- As part of its NPDES illicit discharge detection and elimination monitoring program, the City conducts a dry weather sampling program of its storm drain system. The program is implemented on a 5 year rotating basis for three groups of sample locations. The most recent sampling results were the 2009 sampling

program, conducted by UNL. From June to August 2009, 51 storm drains were monitored throughout the City. Of these sites, 23 were located in the Antelope Creek watershed.

- NDEQ collected in-stream samples near the Lincoln Children's Zoo for fecal coliform throughout the summer of 1999.
- The City conducted wet weather flow monitoring in other Lincoln watersheds as part of NPDES monitoring in the 1990s and more recently in 2006-2007. Although these samples were not collected within the Antelope Creek watershed, they are still useful in characterizing runoff quality likely to be expected for similar land uses in the Antelope Creek watershed.
- EA completed water quality sampling and sediment sampling as part of the Basin Plan in 2010 and 2011. A variety of parameters were analyzed including *E. coli*, copper, selenium, conductivity, total phosphorus, ammonia, dissolved organic carbons, and general field parameters.

3.4. Existing Water Quality Projects

The City, LPSNRD, UNL, and several businesses and non-profit organizations have planned and implemented "green practices" in the Antelope Creek watershed. Below is a summary of some of the projects that have occurred recently.

- **UNL's 19th and Vine Parking Garage** – Pervious concrete was installed in the north surface parking lot, along with stormwater filtration and reduction system for the parking garage. Rainwater from top parking deck is filtered through site landscape before reaching a perforated drain pipe covered with filter fabric. Stormwater is absorbed by site turf and trees and leftover water is filtered by the fabric before entering storm pipe.
- **UNL's Whittier Research Center** – Installation of 700 square feet of Green Roof.
- **UNL's Abel/Sandoz Dormitories** – Installation of a bioswale south of the building. Native vegetation will infiltrate stormwater prior to running into underground stormwater infrastructure.
- **Rain Gardens –** Approximately 20 rain gardens have been installed within the watershed as part of the City of Lincoln Rain Garden Project.
- **Lewis Field Parking Lot –** This new lot utilizes rain garden islands and pervious pavement to reduce the amount of stormwater runoff and improve water quality.
- **27th and Randolph/F Street (2005 Stormwater Bond) –** The City retrofitted two parking lots located at 27th and Randolph Street (American Legion Park) and 27th and F Street. The parking lot at American Legion Park was retrofitted with a bio-swale in order to capture and treat the first flush during a rainfall event. The parking lot at 27th and F Street was retrofitted with both a rain garden and pervious pavement. The rain garden captures and treats the first flush much like the bio-swale. The pervious pavement was installed beneath the parking stalls and sidewalks, and captures and treats the stormwater that falls on it.

Picture 8: Curb-cut bioswale in the new parking lot at the Parks and Recreation Office

- **Antelope Creek Tributary Restoration (2005 Stormwater Bond) –** This unnamed tributary to Antelope Creek winds through Antelope Park and had severe stream bank erosion that caused damage to trees, trails, a pedestrian bridge, and threatened to damage streets close to the channel bank. This project reduced erosion problems and removed the threat of damage to amenities in the park by adding a winding stream and placing large rocks along sections of the channel.
- **South 48th Green Street –** In 2009, the City began design of a 'green street' on 48th from Pioneers north to Calvert near the divide between Antelope Creek and Beal Slough. This effort included more than 5,000 square feet of bio-swale as a demonstration site intended to receive and treat stormwater runoff. The City intends to monitor effectiveness of the bio-swale over a 2-year period and incorporate it into other areas in the community. Construction on the project began May 2010.

- **Parks and Recreation Department –** The City finished installation of several BMPs at the Parks and Recreation Office Building in 2011 including a parking lot bioswale and rain gardens.
- **Silva cells in Union Plaza –** The City utilized NDEQ funding in 2009 to install silva cell structures in Union Plaza. Silva cells are subsurface framework systems that can be stacked several units deep and topped with a deck to support pavement or other hardscape surfaces and collect stormwater runoff. Trees growing in these structures will utilize stormwater runoff which is designed to infiltrate and be retained prior to entering Antelope Creek.
- **Assurity Life Insurance Company Building –** Assurity Life Insurance Company's new 180,000 square foot office is located on approximately 9.5 acres adjacent to Union Plaza. The site design includes multiple stormwater management practices intended to limit pollutant loading to the adjacent Antelope Creek. Features include native and naturalized landscaping, bioretention gardens/cell, stormwater harvesting/cisterns, pervious pavement, and a green roof system.
- **Lincoln Children's Zoo –** In 2010, the Children's Zoo received Nebraska Environmental Trust funding to improve water and soil management in two highly utilized public areas of the zoo. The project is intended to reduce runoff and increase water quality while enhancing the aesthetic appeal of the space. Surface water will be managed by bio-filtration methods including natural sand filtering, water detention, and large rain garden areas.
- **Groundwater Guardian Green Sites –** The Groundwater Foundation's program recognized good stewards of groundwater by encouraging managers of highly-managed green spaces to implement, measure, and document their groundwater friendly practices. In the project area this includes:
    - Community CROPS – Antelope
    - Madonna Rehabilitation Hospital
    - SE Park District of the City of Lincoln
    - Jim Ager Junior Golf Course
    - Lincoln Children's Zoo
    - First-Plymouth Congregational Church

3.5. Dry Weather Survey

Dry weather flows from the storm drainage system are of potential concern to Antelope Creek; primarily because they may represent ongoing sources of pollution associated with illicit connections, illicit discharges of washwater or other inappropriate discharges to Antelope Creek. During 2010, EA inventoried the City's outfalls to Antelope Creek. Outfalls with dry weather flows were re-visited one week later (no rain during that time) to check for flows again. Of the 223 outfalls, 12 were observed to have flow during dry weather conditions. These 12 outfalls were further evaluated by tracking the flows up through the storm drain system to investigate the source. Table 3-4: Summary of Dry Weather Flows summarizes the known dry weather flows contributing to Antelope Creek. Multiple groundwater seeps were noticed while performing the dry weather flow survey. The frequency of the seeps increased with proximity to Salt Creek. Data collected during the dry weather survey included pipe size, type of flow, odor, algae growth, sediment deposits, and location using a handheld Global Position System (GPS). Natural seeps into the storm drain system are not considered to be illicit discharges. A full analysis of dry weather flow and results from sampling can be found in SECTION 5 - WATER QUALITY MONITORING.

Picture 9: EA staff collecting a dry weather sample in 2011

Table 3-4. Summary of Dry Weather Flows

Outfall Location	Pipe Size (in)	Comments
South of Big "X", Under Pedestrian Bridge	72	Some flow originates from Memorial Stadium.
South of Big "X", Under Pedestrian Bridge	60	Source unknown.
Between Big "X" and Y Street	60x72	50% of flow from near Jorgensen Hall on UNL campus, 50% of flow from surface drains near The Village Dorms on UNL Campus. Both sources are believed to be Air-Conditioning condensate.
17th and Y Street	42	Flow originates from Abel Dorm Air-Conditioning unit.
17th and Y Street	96x126	Source unknown.
North of Vine Street Bridge	48x84	Source unknown.
Under 40th Street Bridge	36	Source traced to Lincoln High School. Source is believed to be Air-Conditioning condensate.
North of Y Street Bridge	72	Source unknown.
South of A Street Bridge	120x60	Source generated between 28th and Arlington, and Jefferson and Arlington (water service line break). This line was repaired in May of 2011, and greatly reduced this dry weather flow.
33rd and Capital Parkway	84x60	Source traced to Tabitha Health Care Services. Source is believed to be Air-Conditioning condensate.
West of Pedestrian Bridge near S. Cotner and Normal Blvd	80x60	Source traced to Bryan LGH Medical Center. Source is believed to be Air-Conditioning condensate.
East of 48th and Normal	60	Source unknown.
East of 48th and Normal	84x60	Flow dissipates upstream. Source is believed to be groundwater infiltration.

Source: EA Engineering Field Survey 2010

3.6. Pollutants and Pollution Sources

A number of potential pollution sources were identified based on the results of the watershed inventory. A summary is provided below. A more detailed description of each pollution source is discussed in SECTION 6 - POLLUTION SOURCES AND CONTROL STRATEGIES.

- **Wildlife and pet waste** – There are 29 bridge crossings in the watershed. Many of the older structures provide opportunities for birds to nest and perch where their droppings may contribute to contaminants in Antelope Creek. Existing habitat in the watershed provides room for wildlife such as raccoons, squirrels, and other feral animals that contribute to pollution sources. Domesticated pets, such as cats and dogs, can also provide a significant source of pollution if waste is not properly disposed.
- **Fertilizers** – Excess nutrients in the stream, which may originate from over-fertilizing, contribute to algal blooms in the water. Improper storage and disposal of fertilizers, over application, or incidental application to impervious surfaces, such as concrete driveway and sidewalks, can lead to nutrients entering Antelope Creek through stormwater runoff.
- **Soil erosion and construction site runoff** – Sediment can enter a stream through natural processes, erosion, or through activities such as construction sites. Sedimentation of a waterway decreases the biological function of the water and is detrimental to aquatic habitat. In addition, sediment picks up nutrients such as nitrogen and phosphorus, and carries them into a waterway, which can create an incubation zone for bacteria growth.

- **Gravel/Sand** – Large amounts of gravel and sand were observed on the downstream side of many bridges. The gravel, primarily applied in the winter to provide better traction, is flushed off parking areas and streets after rain events.
- **Oils and Grease** – Droppings from vehicles include oil and grease. Examples include runoff from maintenance facilities, streets, and parking lots.
- **Heavy Metals** – The source of heavy metals within Antelope Creek are unknown and are not a focus of this management plan.

Picture 10: Bird droppings are commonly found under Antelope Creek bridges

3.6.1 Stormwater Permits

The City of Lincoln and UNL each hold an active municipal separate storm drainage system (MS4) permit, administered through the National Pollutant Discharge Elimination System (NPDES) Program by NDEQ. Each is authorized to discharge to the Salt Creek and receiving waters (including Antelope Creek). Two industrial discharges were noted in the Antelope Creek TMDL, each of which is no longer in use.

3.7. GIS Database

The project team used GIS to manage and organize existing and new geographical information using Arc GIS software. All data was formatted in order to be compatible with existing City GIS data. GIS was used to create plan maps, manage databases, query information, etc. Information includes a variety of datasets such as:

- GPS – used to locate dry weather flows, outfalls, water and sediment sampling locations
- Aerial photography – 2010 color imagery
- Storm drainage system infrastructure
- Lakes and streams
- Hydraulic Unit Code (HUC)
- Existing land-use
- Streets and roads

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