

SOUTHEAST BASIN

22.1 SOUTHEAST DRAINAGE BASIN

The Southeast drainage basin is shown graphically in Figure 22.1. The northwesterly portions of the basin are currently planned to be served by the Beal Slough Trunk sewer system and have been included in the Beal Slough Trunk Sewer system evaluation (Chapter 12). The remaining areas are currently identified as Tier III growth areas. The areas and corresponding peak flow used to evaluate the system are outlined in Table 22.1.

Table 22.1 Service Areas and Flows - Southeast Basin ^(1, 2) Wastewater Facilities Master Plan Update - 2007 City of Lincoln, Nebraska								
Basin	Existing		Existing and Tier I		Existing and Tiers I & II		Existing and Tiers I, II & III	
	Area (ac)	Flow (cfs)	Area (ac)	Flow (cfs)	Area (ac)	Flow (cfs)	Area (ac)	Flow (cfs)
Southeast Basin	NA	NA	NA	NA	NA	NA	3,494	22.28
1. Based on Information Provided by LWWS. 2. Areas as of July, 2006.								

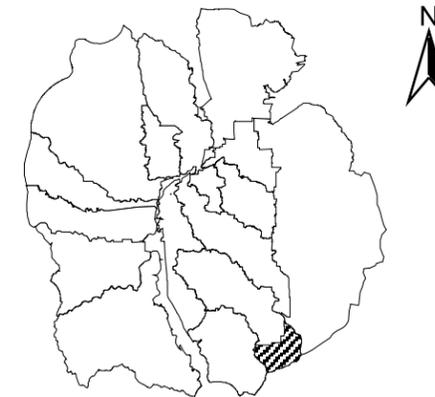
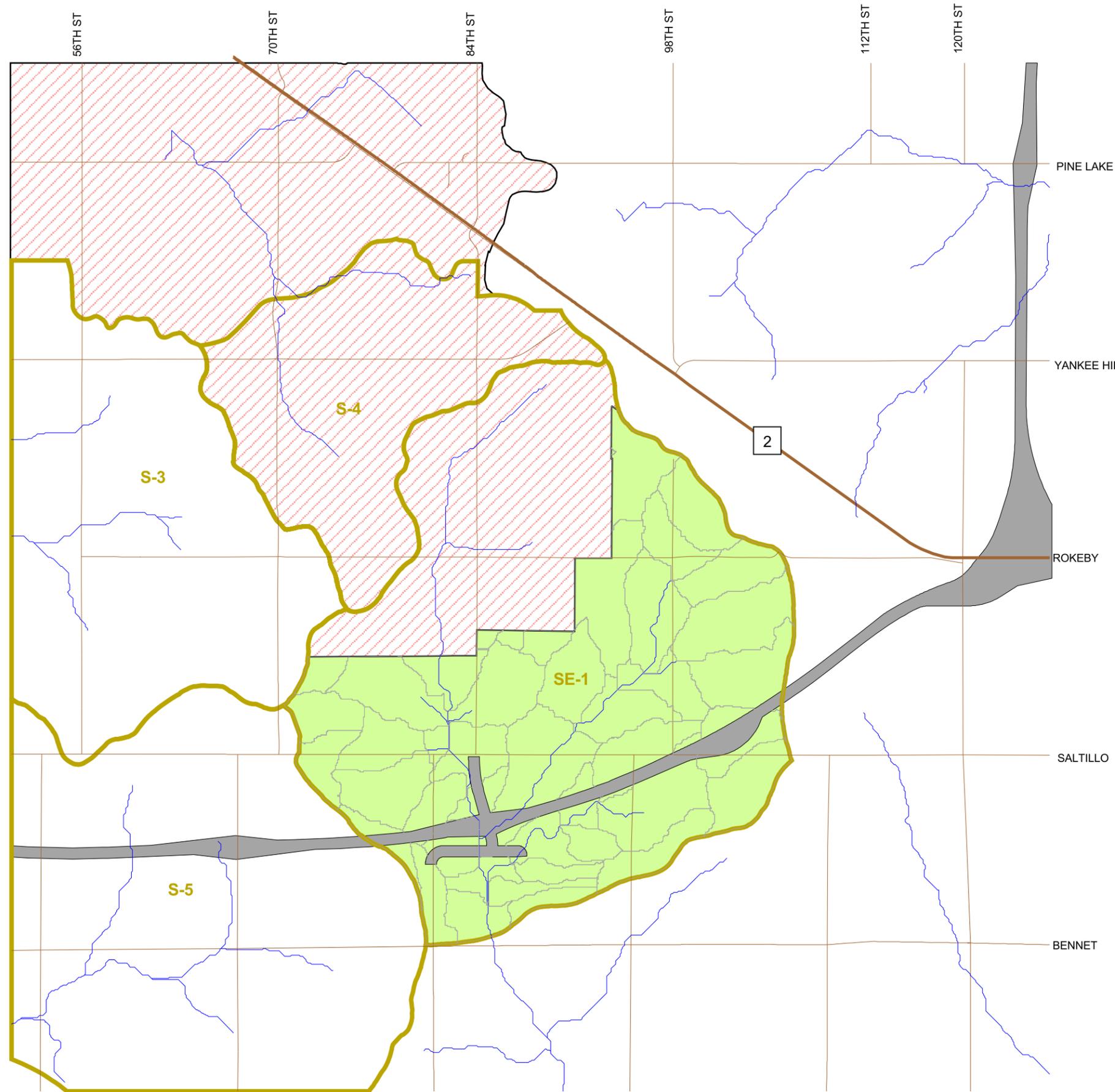
The basin is unique in the sense that the southern portions drain to the south, away from the existing trunk sewer systems. For the purpose of this study, it was assumed that the wastewater would be collected and flow south by gravity, then pumped to the Upper Southeast Basin System. However, directing the wastewater north towards Beals Slough or Antelope trunk sewers is a possibility that may be considered as development dictates. Another possibility is to pump the wastewater northeast to the Stevens Creek Basin Trunk Sewer.

22.2 MODELING RESULTS

The modeling results for the scenarios discussed below are located in Appendix D.

22.2.1 Existing, Tier I and Tier II Conditions

There are currently not any trunk sewers in the Southeast Basin. There is not any unserved Tier II growth areas, therefore modeling scenarios or I were not run for these conditions.



Key Map

- LEGEND**
- Streams
 - Streets
 - Utility Planning Zones
 - Beltway
 - Beal Slough Service Area
 - Tier III Area



Figure 22.1 Basin Map
 Southeast Basin Trunk Sewer
 Wastewater Facilities Master Plan Update - 2007
 City of Lincoln, Nebraska

22.2.2 Tier III

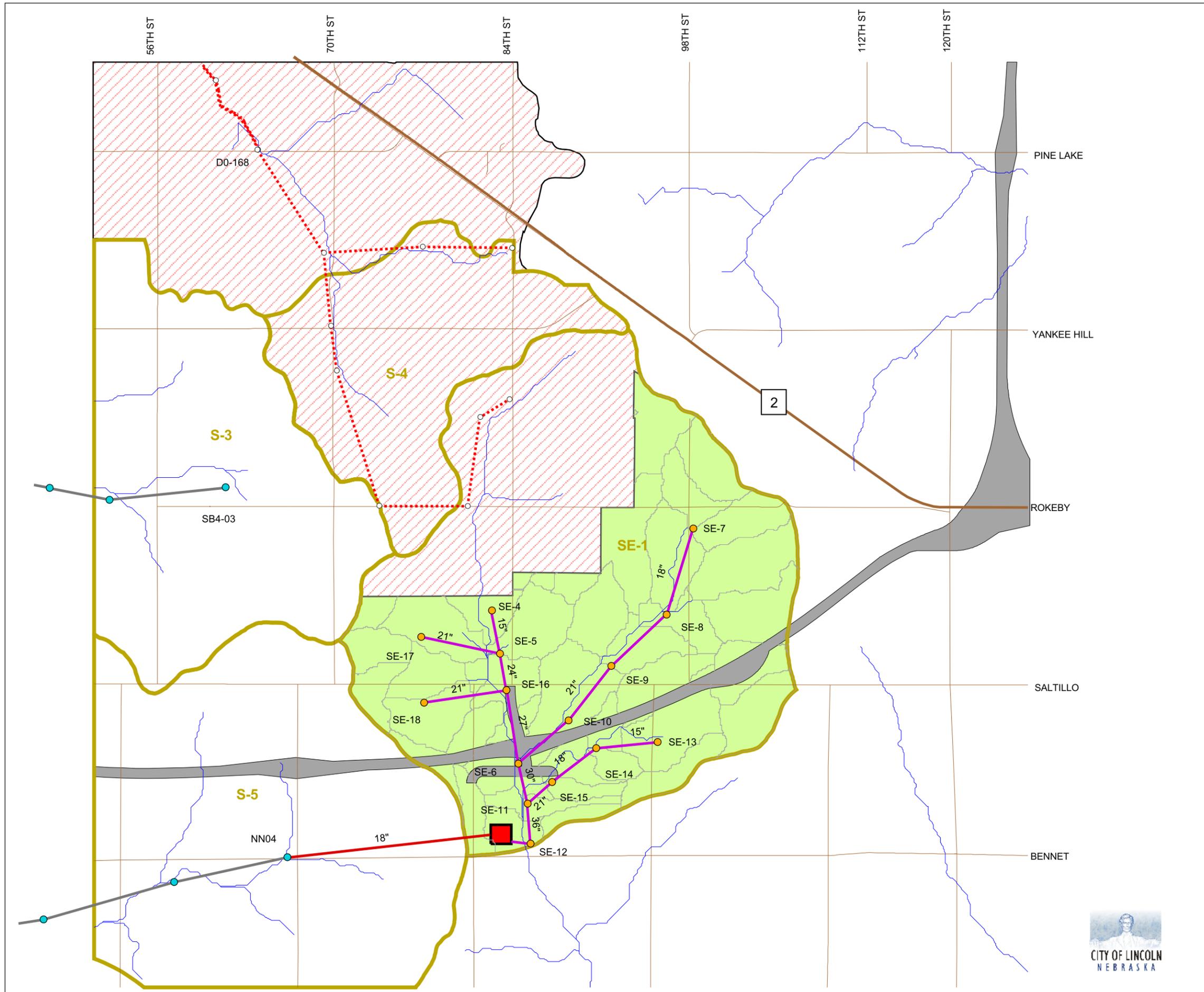
The alignment of the new pipes designed to convey the Tier III flows from the Southeast Basin is presented in Figure 22.2. The alignment closely follows natural drainage channels. The new Tier III pipes were sized and analyzed with the Tier III SWMM model.

22.3 TIER III IMPROVEMENTS

Piping was added as part of the Tier III improvements as shown in Figure 22.2. In addition to this gravity piping, a new lift station was modeled. This lift station, modeled near 84th Street and Bennet, will pump the wastewater to the Upper Southeast Basin trunk sewer through 6,200 ft of 18-inch force main as shown in Figure 22.2. A 3.0 MG storage facility is included as part of the lift station to store peak flows until the downstream Upper Southeast Basin Salt Valley Trunk Sewers can handle the additional flow. The improvements for the Southeast Basin are outlined in Tables 22.2 and 22.3 below.

Pipe ID	US Manhole	DS Manhole	Diameter (ft)	Length (ft)	Slope (%)	Design Capacity (cfs)	Tier
SE-P4	SE-4	SE-5	1.75	1,816	0.25	7.92	III
SE-P16	SE-17	SE-5	1.75	2,400	0.25	7.92	
SE-P14	SE-5	SE-16	2.00	1,106	0.25	11.31	
SE-P17	SE-18	SE-16	1.75	2,492	0.25	7.92	
SE-P15	SE-16	SE-6	2.25	2,218	0.25	15.49	
SE-P5	SE-7	SE-8	1.50	2,689	0.25	5.25	
SE-P6	SE-8	SE-9	1.50	2,250	0.25	5.25	
SE-P7	SE-9	SE-10	1.75	2,084	0.25	7.92	
SE-P8	SE-10	SE-6	2.00	1,995	0.25	11.31	
SE-P9	SE-6	SE-11	2.50	1,213	0.25	20.51	
SE-P11	SE-13	SE-14	1.25	1,847	0.25	3.23	
SE-P12	SE-14	SE-15	1.50	1,666	0.25	5.25	
SE-P13	SE-15	SE-11	1.75	994	0.25	7.92	
SE-P10	SE-11	SE-12	3.00	1,164	0.25	33.35	

Pipe ID	US Manhole	DS Manhole	Capacity , cfs	Tier I Conditio ns		Tier I & II Conditions		Tier I, II, & III Conditions		Tier
				Q, cfs	d/D	Q, cfs	d/D	Q, cfs	d/D	
SE-P4	SE-4	SE-5	7.92	NA	NA	NA	NA	6.99	0.74	III
SE-P16	SE-17	SE-5	7.92					1.56	0.74	
SE-P14	SE-5	SE-16	11.31					8.54	0.69	
SE-P17	SE-18	SE-16	7.92					2.15	0.79	
SE-P15	SE-16	SE-6	15.49					10.68	0.87	
SE-P5	SE-7	SE-8	5.25					2.25	0.91	
SE-P6	SE-8	SE-9	5.25					5.56	0.91	
SE-P7	SE-9	SE-10	7.92					6.42	0.77	
SE-P8	SE-10	SE-6	11.31					8.80	0.97	
SE-P9	SE-6	SE-11	20.51					19.48	0.79	
SE-P11	SE-13	SE-14	3.23					3.21	0.91	
SE-P12	SE-14	SE-15	5.25					4.62	0.76	
SE-P13	SE-15	SE-11	7.92					4.62	0.84	
SE-P10	SE-11	SE-12	33.35					24.10	0.66	



Key Map

LEGEND

- Beals Slough Pipes
- Upper SE Basin Proposed Pipes
- Tier III Pipes
- Proposed Force Main
- Streams
- Streets
- Utility Planning Zones
- Beltway
- Proposed Tier III Lift Station
- Beal Slough Service Area
- Tier III Area

0 0.5 1 Miles



Figure 22.2 Proposed Sewer Improvements
 Southeast Basin Trunk Sewer
 Wastewater Facilities Master Plan Update - 2007
 City of Lincoln, Nebraska

22.4 SUMMARY OF RECOMMENDED IMPROVEMENTS

Recommendations for maintenance and improvements of the Southeast Basin Sewer System include:

- Tier III Flows
 - Construct new sewer lines to service the Tier III area.
 - Construct lift station and an 18-inch force main to pump wastewater to the Upper Southeast Basin sewer system.
 - Construct 3.0 MG of storage at the lift station.

The proposed improvements have been located outside of the designated saline wetland areas within this basin. The wetlands are environmentally protected, which would be difficult to obtain approval for construction within this area.

The proposed alignments of the sanitary sewers are preliminary and developed for planning purposes. It is recommended that a detailed study be performed prior to designing the improvements to make certain conformance with existing and proposed development and to determine project phasing. In most cases, the alignments shown closely follow natural drainage ways. Until full development of the system, some pipes will be oversized with regard to interim flows. These sewers should be periodically inspected to determine if deposition is occurring.

A summary of the improvement projects identified with planning costs is outlined in Table 22.4.

This is a unique basin as it drains away from previously established trunk sewers. Due to topographic features, it is recommended that the alternatives be re-evaluated as development begins in the basin. Other options that should be evaluated at this time include but are not limited to:

1. Pumping the wastewater to the Stevens Creek Basin Trunk Sewer.
2. Allowing the wastewater to flow south by gravity until it reaches Salt Creek and then north to the Upper Southeast Basin Trunk Sewer. This would eliminate the need for a lift station.

**Table 22.4 Recommended Improvements – Southeast Basin
Wastewater Facilities Master Plan Update - 2007
City of Lincoln, Nebraska**

Tier	ID	Description	Location ⁽¹⁾	Parameters	Unit Price	Planning Cost ⁽²⁾
III	SE-6	36-inch	SE-11 to SE-12	1,164 lf	\$360.00	\$419,000
III	SE-7	30-inch	SE-6 to SE-11	1,213 lf	\$300.00	\$364,000
III	SE-8	27-inch	SE-16 to SE-6	2,218 lf	\$270.00	\$599,000
III	SE-9	24-inch	SE-5 to SE-16, SE-10 to SE-6	3,101 lf	\$240.00	\$744,000
III	SE-10	21-inch	SE-4 to SE-16, SE-17 to SE-5, SE-18 to SE-16, SE-9 to SE-10, SE-15 to SE-11	9,786 lf	\$210.00	\$2,055,000
III	SE-11	18-inch	SE-7 to SE-9, SE-14 to SE-15	6,605 lf	\$180.00	\$1,189,000
III	SE-12	15-inch	SE-13 to SE-14	1,847 lf	\$150.00	\$277,000
III	SE-13	Storage Basin	West of MH SE-12	3,000,000 gal	\$4.00	\$12,000,000
III	SE-14	Lift Station	West of MH SE-12	3,000,000 gal	\$1.00	\$3,000,000 ⁽³⁾
III	SE-15	18-inch Force Main	Tier III Lift Station to USE NN04	6,200 lf	\$144.00	\$893,000

Notes:

1. Upstream and downstream nodes for each pipe section.
2. ENR CCI for Kansas City = 8512 (July 2006).
3. This cost may not be needed or may be reduced depending on the type of storage used and other site specific hydraulics issues.