

APPENDIX C WASTEWATER COLLECTION SYSTEM

EXHIBIT 1

WASTEWATER COLLECTION SYSTEM

SS-1 Short Term Goal

EAGLEVIEW DEVELOPMENT TO NORTH CENTER POINT ROAD

Construction of this 18-inch PVC gravity sanitary sewer trunk will provide sanitary services to the most northerly portions of the City's Wastewater Collection System. Reaching the Eagleview Development, this 18-inch trunk will connect downstream to a new 60-inch diameter manhole east of North Center Point Road. From here a section of 24-inch PVC gravity sewer will be bored under the road and extend to the existing 24-inch gravity sewer that eventually makes its way to the NW Lift Station. This existing 24-inch gravity sewer was extended eastward along the NW Lift Station driveway to meet the sanitary sewer needs of the Center Point Road Church of Christ. This segment is projected to primarily serve residential zoning.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 18"	1865	LF	\$125.00	\$233,125.00
2	Sanitary Sewer, PVC, 24"	125	LF	\$150.00	\$18,750.00
3	Sanitary Sewer Manholes, 48"	7	EA	\$5,000.00	\$35,000.00
4	Sanitary Sewer Manholes, 60"	1	EA	\$7,500.00	\$7,500.00
5	36" Steel Casing Pipe (Jack & Bore)	100	LF	\$750.00	\$75,000.00
5	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
6	Rock Excavation	200	CY	\$60.00	\$12,000.00
7	Seeding/Topsoil	2.28	ACRE	\$15,800.00	\$36,024.00
8	Easement	2.28	ACRE	\$37,000.00	\$84,360.00
9	Mobilization, Traffic Control, etc.	1	LS	\$20,110.00	\$20,110.00
Subtotal:					\$524,000.00
Contingency (20%):					\$105,000.00
CONSTRUCTION TOTAL:					\$629,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$114,500.00
TOTAL PROJECT COST:					\$744,000.00

EXHIBIT 2 WASTEWATER COLLECTION SYSTEM

SS-2 Short Term Goal

QUASS ROAD TO KINGS CHURCH EAST PROPERTY LINE

Generally traveling in the west and northwest direction through the areas with the lowest topography, this 12-inch PVC gravity sewer extends from Quass Road to the South Leg of the NW Trunk sewer. It has a collection area (CA-2) of nearly 250 acres as shown in Figure 23: Wastewater Collection System – Segment Regions Map. A detailed breakdown can be found in Table 23: Northwest & Northwest Extension Sewershed Capacity Demand & Design Recommendations.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 12"	2905	LF	\$100.00	\$290,500.00
2	Sanitary Sewer Manholes, 48"	10	EA	\$5,000.00	\$50,000.00
3	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
4	22" Steel Casing Pipe (Jack & Bore)	100	LF	\$400.00	\$40,000.00
5	Rock Excavation	300	CY	\$60.00	\$18,000.00
6	Seeding/Topsoil	3.33	ACRE	\$15,800.00	\$52,614.00
7	Easement	3.33	ACRE	\$37,000.00	\$123,210.00
8	Mobilization, Traffic Control, etc.	1	EA	\$86,400.00	\$86,400.00
Subtotal:					\$662,000.00
Contingency (20%):					\$132,000.00
CONSTRUCTION TOTAL:					\$794,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$143,000.00
TOTAL PROJECT COST:					\$937,000.00

EXHIBIT 3 WASTEWATER COLLECTION SYSTEM

SS-3 Intermediate Goal

NW TRUNK (North Leg) FROM COUNTY HOME ROAD TRUNK TO NORTH CENTER POINT ROAD

This goal proposes construction of a 24-inch PVC gravity sewer with a downstream connection to an existing 24-inch gravity sewer that was extended eastward along the driveway to the NW Lift Station. In general, it will extend to the southeast, following the lowest topography and creek bed, to a point north of County Home Road. Additional conveyances branching into two separate upstream segments are proposed from this point. Execution of this project goal greatly depends on the rate of development, actual demand, and the status of the NW Lift Station and downstream conveyances increasing their capacity.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 24"	3020	LF	\$125.00	\$377,500.00
2	Sanitary Sewer Manholes, 60"	11	EA	\$7,500.00	\$82,500.00
3	Connection to Existing Sanitary Sewer	2	EA	\$1,700.00	\$3,400.00
4	Rock Excavation	600	CY	\$60.00	\$36,000.00
5	Seeding/Topsoil	3.47	ACRE	\$15,800.00	\$54,826.00
6	Easement	3.47	ACRE	\$37,000.00	\$128,390.00
7	Mobilization, Traffic Control, etc.	1	LS	\$103,000.00	\$103,000.00
Subtotal:					\$786,000.00
Contingency (20%):					\$157,000.00
CONSTRUCTION TOTAL:					\$943,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$170,000.00
TOTAL PROJECT COST:					\$1,113,000.00

EXHIBIT 4 WASTEWATER COLLECTION SYSTEM

SS-4 Intermediate Goal

NW TRUNK (South Leg) FROM KINGS WAY TO NW TRUNK (North Leg)

Bridging its upstream SS-2 and downstream SS-3 segments, this 18-inch PVC gravity sewer segment is dependent on the completion of segments SS-1 and SS-3. Implementation of this sewer segment will depend on the rate of development and actual use of the wastewater collection system.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 18"	2006	LF	\$125.00	\$250,750.00
2	Sanitary Sewer Manholes, 48"	7	EA	\$5,000.00	\$35,000.00
3	Connection to Existing Sanitary Sewer	2	EA	\$1,700.00	\$3,400.00
4	28" Steel Casing Pipe (Jack & Bore)	100	LF	\$500.00	\$50,000.00
5	Rock Excavation	400	CY	\$60.00	\$24,000.00
6	Seeding/Topsoil	2.30	ACRE	\$15,800.00	\$36,340.00
7	Easement	2.30	ACRE	\$37,000.00	\$85,100.00
8	Mobilization, Traffic Control, etc.	1	LS	\$73,000.00	\$73,000.00
Subtotal:					\$558,000.00
Contingency (20%):					\$112,000.00
CONSTRUCTION TOTAL:					\$670,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$121,000.00
TOTAL PROJECT COST:					\$791,000.00

EXHIBIT 5 WASTEWATER COLLECTION SYSTEM

SS-5 Intermediate Goal

KINGS WAY FORCE MAIN AND LIFT STATION DECOMMISSION

Upon the decommissioning of the Kings Way Lift Station, this 18-inch PVC force main sewer will extend west to Quass Road. This segment will increase the future downstream capacity of the NW Lift Station upon completion of SS-14.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer Force Main, PVC, 18"	3412	LF	\$125.00	\$426,500.00
2	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
3	28" Steel Casing Pipe (Jack & Bore)	100	LF	\$500.00	\$50,000.00
4	Lift Station Demolition	1	EA	\$25,000.00	\$25,000.00
5	Rock Excavation	400	CY	\$60.00	\$24,000.00
6	Seeding/Topsoil	3.92	ACRE	\$15,800.00	\$61,936.00
7	Easement	3.92	ACRE	\$37,000.00	\$145,040.00
8	I380 Lift Station	1	LS	\$500,000.00	\$500,000.00
9	Mobilization, Traffic Control, etc.	1	LS	\$61,708.80	\$61,708.80
Subtotal:					\$1,296,000.00
Contingency (20%):					\$259,000.00
CONSTRUCTION TOTAL:					\$1,555,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$280,000.00
TOTAL PROJECT COST:					\$1,835,000.00

EXHIBIT 6 WASTEWATER COLLECTION SYSTEM

SS-6 Intermediate Goal

DUAL 6-INCH FORCE MAIN AROUND KINGS WAY CHURCH

This 6-inch PVC force main sewer will connect the existing NW Lift Station downstream force main that runs south along Center Point Road to the SS-5 18-inch force main sewer.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer Force Main, PVC, 6"	1146	LF	\$35.00	\$40,110.00
2	Connection to Existing Sanitary Sewer	2	EA	\$1,700.00	\$3,400.00
3	12" Steel Casing Pipe (Jack & Bore)	200	LF	\$200.00	\$40,000.00
4	Rock Excavation	200	CY	\$60.00	\$12,000.00
5	Seeding/Topsoil	1.3	ACRE	\$15,800.00	\$20,856.00
6	Easement	1.3	ACRE	\$37,000.00	\$48,840.00
7	Mobilization, Traffic Control, etc.	1	LS	\$8,260.30	\$8,260.30
Subtotal:					\$173,000.00
Contingency (20%):					\$35,000.00
CONSTRUCTION TOTAL:					\$208,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$37,000.00
TOTAL PROJECT COST:					\$245,000.00

EXHIBIT 7 WASTEWATER COLLECTION SYSTEM

SS-7 Intermediate Goal

NW LIFT STATION 20-YEAR DESIGN PUMPING CAPACITY

This infrastructure improvement represents the need for upsizing the lift station pumping capacity from the present 10-year design (2025) to the 20-year design (2035) flows. This may include replacement of the structure to house the lift station pumps, however the downstream force main conveyance (dual 6-inch) was designed for this 20-year design need. Kings Way Lift Station will not be able to support these flows which explains why SS-5 and SS-6 must be completed prior to increasing the pumping capacity at the NW Lift Station.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Lift Station (Structure, Pumps, Controls)	1	LS	\$400,000.00	\$400,000.00
2	Mobilization, etc.	1	LS	\$50,000.00	\$50,000.00
Subtotal:					\$450,000.00
Contingency (20%):					\$90,000.00
CONSTRUCTION TOTAL:					\$540,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$97,000.00
TOTAL PROJECT COST:					\$637,000.00

EXHIBIT 8 WASTEWATER COLLECTION SYSTEM

SS-8 Long Term Goal

I-380 TRUNK, LIFT STATION, AND FORCE MAIN TO WILDFLOWER

Construction of a 21-inch gravity sewer will start at the existing Wildflower Lift Station and run generally west/northwest along the lowest topographical elevations, eventually reaching the lowest point along the I380 east right-of-way boundary. This low point will be the site of the I-380 Lift Station and subsequent 18-inch force main. The route of conveyance for both the gravity sewer and force main shall share the same alignment. This I-380 lift station will replace and encompass a larger service area than the current Wildflower lift station. The force main from Wildflower Lift Station to the east was originally sized with this future expansion in mind, however there will be additional legwork to ensure all new sizing needs are being met at the time of actual design. The I-380 Lift Station is projected to serve a collection area almost equally comprised of residential and commercial property.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer Force Main, PVC, 18"	2800	LF	\$90.00	\$252,000.00
2	Sanitary Sewer, PVC, 21"	2800	LF	\$150.00	\$420,000.00
3	Sanitary Sewer Manholes, 60"	10	EA	\$7,500.00	\$75,000.00
4	Connection to Existing Sanitary Sewer	2	EA	\$1,700.00	\$3,400.00
5	36" Steel Casing Pipe (Jack & Bore)	200	LF	\$750.00	\$150,000.00
6	Rock Excavation	300	CY	\$60.00	\$18,000.00
7	Seeding/Topsoil	3.21	ACRE	\$15,800.00	\$50,718.00
8	Easement	3.21	ACRE	\$37,000.00	\$118,770.00
9	I380 Lift Station	1	LS	\$500,000.00	\$500,000.00
10	Mobilization, Traffic Control, etc.	1	LS	\$79,394.00	\$79,394.00
Subtotal:					\$1,667,000.00
Contingency (20%):					\$333,000.00
CONSTRUCTION					\$2,000,000.00
TOTAL:					\$2,360,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$360,000.00
TOTAL PROJECT COST:					\$2,360,000.00

EXHIBIT 9 WASTEWATER COLLECTION SYSTEM

SS-9 Long Term Goal

WILDFLOWER LIFT STATION DECOMMISSION

This proposed infrastructure improvement is for the decommissioning and demolition of the Wildflower Lift Station. Implementation of this project will largely be based on the progression of development in the area or as maintenance needs dictate major repairs or improvements to the Wildflower Lift Station.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Lift Station Decommission	1	LS	\$50,000.00	\$50,000.00
2	Downstream Capacity Review and Survey	1	LS	\$10,000.00	\$10,000.00
Subtotal:					\$60,000.00
Contingency (20%):					\$12,000.00
CONSTRUCTION TOTAL:					\$72,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$13,000.00
TOTAL PROJECT COST:					\$85,000.00

EXHIBIT 10 WASTEWATER COLLECTION SYSTEM

SS-10 Ultimate Buildout

NORTH TROY TO NORTH MENTZER – ADJACENT TO QUARRY

Assuming a minimum pipe slope of 0.5%, this 21-inch gravity sewer is estimated to serve 25 acres of residential zoning and 15 acres of commercial. As the connecting sewer segment for all development in the northeast sewershed area to the existing wastewater collection system, a large conveyance capacity is required even though its direct collection area is relatively small.

The majority of this segment runs adjacent to Dry Creek just south of Welding Quarry from North Troy Road to North Mentzer Road. Due to the proximity to the quarry and creek bed it has been assumed there will be significant rock excavation as part of this infrastructure improvement project. The alignment includes several jack and bore locations including one railroad crossing.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 21"	3600	LF	\$150.00	\$540,000.00
2	Sanitary Sewer Manholes	12	EA	\$7,500.00	\$90,000.00
3	36" Steel Casing Pipe (Jack & Bore)	300	LF	\$750.00	\$225,000.00
4	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
5	Rock Excavation	2400	CY	\$60.00	\$144,000.00
6	Seeding/Topsoil	4.13	ACRE	\$15,800.00	\$65,254.00
7	Easement	4.13	ACRE	\$37,000.00	\$152,810.00
8	Mobilization, Traffic Control, etc.	1	LS	\$49,688.00	\$49,688.00
Subtotal:					\$1,268,000.00
Contingency (20%):					\$254,000.00
CONSTRUCTION TOTAL:					\$1,522,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$274,000.00
TOTAL PROJECT COST:					\$1,796,000.00

EXHIBIT 11

WASTEWATER COLLECTION SYSTEM

SS-11 Ultimate Buildout

DECOMMISSION KERVIN COURT (Add gravity main)

This infrastructure improvement proposes the decommissioning of the existing Lift Station at Kervin Court with a connecting 8-inch PVC gravity sewer extension to the proposed sewer segment, SS-10.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 8"	850	LF	\$50.00	\$42,500.00
2	Sanitary Sewer Manholes, 48"	3	EA	\$5,000.00	\$15,000.00
3	12" Steel Casing Pipe (Jack & Bore)	100	LF	\$200.00	\$20,000.00
3	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
4	Lift Station Demolition	1	EA	\$25,000.00	\$25,000.00
5	Rock Excavation	300	CY	\$60.00	\$18,000.00
6	Seeding/Topsoil	0.98	ACRE	\$15,800.00	\$15,484.00
7	Easement	0.98	ACRE	\$37,000.00	\$36,260.00
8	Mobilization, Traffic Control, etc.	1	LS	\$7,697.20	\$7,697.20
Subtotal:					\$182,000.00
Contingency (20%):					\$36,000.00
CONSTRUCTION TOTAL:					\$218,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$37,400.00
TOTAL PROJECT COST:					\$255,000.00

EXHIBIT 12 WASTEWATER COLLECTION SYSTEM

SS-12 Ultimate Buildout

DECOMMISSION MAPLE STREET LIFT STATION (Add gravity main)

This infrastructure improvement will decommission the existing Lift Station at Maple Street with the addition of a connecting 8-inch PVC gravity sewer extension to the proposed sewer segment, SS-10.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 8"	1005	LF	\$50.00	\$50,250.00
2	Sanitary Sewer Manholes, 48"	4	EA	\$5,000.00	\$20,000.00
3	12" Steel Casing Pipe (Jack & Bore)	100	LF	\$200.00	\$20,000.00
4	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
5	Lift Station Demolition	1	EA	\$25,000.00	\$25,000.00
6	Rock Excavation	1000	CY	\$60.00	\$60,000.00
7	Seeding/Topsoil	1.15	ACRE	\$15,800.00	\$18,170.00
8	Easement	1.15	ACRE	\$37,000.00	\$42,550.00
9	Mobilization, Traffic Control, etc.	1	LS	\$10,883.50	\$10,883.50
Subtotal:					\$249,000.00
Contingency (20%):					\$50,000.00
CONSTRUCTION TOTAL:					\$299,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$54,000.00
TOTAL PROJECT COST:					\$353,000.00

EXHIBIT 13 WASTEWATER COLLECTION SYSTEM

SS-13 Ultimate Buildout

NW FORCE MAIN (North Leg)

Stretching from North Center Point Road in the southeast direction this segment is segment is necessary for increasing pumping capacity from the NW Lift Station to an estimated 13,601,340 GPD.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer Force Main, PVC, 18"	3200	LF	\$125.00	\$400,000.00
2	Connection to Existing Sanitary Sewer	11	EA	\$1,700.00	\$18,700.00
3	28" Steel Casing Pipe (Jack & Bore)	100	LF	\$500.00	\$50,000.00
4	Rock Excavation	600	CY	\$60.00	\$36,000.00
5	Seeding/Topsoil	3.67	ACRE	\$15,800.00	\$57,986.00
6	Easement	3.67	ACRE	\$37,000.00	\$135,790.00
7	Mobilization, Traffic Control, etc.	1	LS	\$105,000.00	\$105,000.00
Subtotal:					\$803,000.00
Contingency (20%):					\$161,000.00
CONSTRUCTION TOTAL:					\$964,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$174,000.00
TOTAL PROJECT COST:					\$1,138,000.00

EXHIBIT 14

WASTEWATER COLLECTION SYSTEM

SS-14 Ultimate Buildout

NW FORCE MAIN (South Leg)

This 18-inch PCV force main will be the completing connection to increase pumping capacity from the NW Lift Station. With conveyance generally traveling in the southern direction towards Kings Way where it will connect with SS-5 and make its way to Quass Road and eventually connecting with the existing wastewater collection system.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer Force Main, PVC, 18"	3500	LF	\$125.00	\$437,500.00
2	Connection to Existing Sanitary Sewer	2	EA	\$1,700.00	\$3,400.00
3	28" Steel Casing Pipe (Jack & Bore)	100	LF	\$500.00	\$50,000.00
4	Rock Excavation	700	CY	\$60.00	\$42,000.00
5	Seeding/Topsoil	2.41	ACRE	\$15,800.00	\$38,078.00
6	Easement	2.41	ACRE	\$37,000.00	\$89,170.00
7	Mobilization, Traffic Control, etc.	1	LS	\$100,000.00	\$100,000.00
Subtotal:					\$760,000.00
Contingency (20%):					\$152,000.00
CONSTRUCTION TOTAL:					\$912,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$164,000.00
TOTAL PROJECT COST:					\$1,076,000.00

EXHIBIT 15

WASTEWATER COLLECTION SYSTEM

SS-15 Ultimate Buildout

VOGT STREET TO NORTH MENTZER ROAD

As the upstream segment to SS-10, this 21-inch PVC gravity sewer extends the wastewater collection system past Wendling Quarry in a general northeast direction into the Northeast Sewershed area. Prioritization is driven by development needs in the north east and completion of only one infrastructure improvement (SS-10).

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 21"	2900	LF	\$150.00	\$435,000.00
2	Sanitary Sewer Manholes, 60"	10	EA	\$7,500.00	\$75,000.00
3	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
4	Rock Excavation	2000	CY	\$60.00	\$120,000.00
5	Seeding/Topsoil	3.33	ACRE	\$15,800.00	\$52,614.00
6	Easement	3.33	ACRE	\$37,000.00	\$123,210.00
7	Mobilization, Traffic Control, etc.	1	LS	\$40,376.00	\$40,376.00
Subtotal:					\$848,000.00
Contingency (20%):					\$170,000.00
CONSTRUCTION TOTAL:					\$1,018,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$183,000.00
TOTAL PROJECT COST:					\$1,201,000.00

EXHIBIT 16

WASTEWATER COLLECTION SYSTEM

SS-16 Ultimate Buildout

VOGT STREET FROM EAST KNOLL TO TRUNK SEWER

After the completion of SS-10 and SS-15, construction of this 8-inch PVC gravity sewer will provide services to 19 acres of existing residential development currently not being served. As a connection from SS-17 to the trunk line, it runs from East Knoll Drive north in alignment with Vogt Street. This infrastructure infill project must be completed before SS-17 can be completed which will provide an additional 55 acres of existing residential development with wastewater collection services.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 8"	1660	LF	\$50.00	\$83,000.00
2	Sanitary Sewer Manholes, 48"	6	EA	\$5,000.00	\$30,000.00
3	12" Steel Casing Pipe (Jack & Bore)	100	LF	\$200.00	\$20,000.00
4	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
5	Rock Excavation	400	CY	\$60.00	\$24,000.00
6	Seeding/Topsoil	1.9	ACRE	\$15,800.00	\$30,178.00
7	Easement	1.9	ACRE	\$37,000.00	\$70,670.00
8	Mobilization, Traffic Control, etc.	1	LS	\$11,977.00	\$11,977.00
Subtotal:					\$272,000.00
Contingency (20%):					\$54,000.00
CONSTRUCTION					\$326,000.00
TOTAL:					\$326,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$59,000.00
TOTAL PROJECT COST:					\$385,000.00

EXHIBIT 17 WASTEWATER COLLECTION SYSTEM

SS-17 Ultimate Buildout

EAST KNOLL (Emerald Court, Briarwood Lane) SEWER SERVICE INFILL

As a wastewater collection system infill project, construction of this 8-inch PVC gravity sewer will provide service to 55 acres of existing residential development. This infrastructure improvement will generally follow an alignment along East Knoll Drive to add services to the existing residences on Emerald Court and Briarwood Lane.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 8"	4440	LF	\$50.00	\$222,000.00
2	Sanitary Sewer Manholes, 48"	15	EA	\$5,000.00	\$75,000.00
3	12" Steel Casing Pipe (Jack & Bore)	100	LF	\$200.00	\$20,000.00
4	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
5	Rock Excavation	900	CY	\$60.00	\$54,000.00
6	Seeding/Topsoil	5.1	ACRE	\$15,800.00	\$80,580.00
7	Easement	5.1	ACRE	\$37,000.00	\$188,700.00
8	Mobilization, Traffic Control, etc.	1	LS	\$93,297.00	\$93,297.00
Subtotal:					\$735,000.00
Contingency (20%):					\$147,000.00
CONSTRUCTION					\$882,000.00
TOTAL:					
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$159,000.00
TOTAL PROJECT COST:					\$1,041,000.00

EXHIBIT 18 WASTEWATER COLLECTION SYSTEM

SS-18 Ultimate Buildout

TULLYMORE, WICKLOW, MACKENZIE, MORGAN, SINGER HILL INFILL

The addition of this 8-inch PVC gravity sewer infill infrastructure improvement will provide wastewater collection services to existing residences on Tullymore Drive, Wicklow Drive, Morgan Court, and Singer Hill Lane.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 8"	8110	LF	\$50.00	\$405,500.00
2	Sanitary Sewer Manholes, 48"	28	EA	\$5,000.00	\$140,000.00
3	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
4	Rock Excavation	800	CY	\$60.00	\$48,000.00
5	Seeding/Topsoil	9.3	ACRE	\$15,800.00	\$147,098.00
6	Easement	9.3	ACRE	\$37,000.00	\$344,470.00
7	Mobilization, Traffic Control, etc.	1	LS	\$163,015.00	\$163,015.00
				Subtotal:	\$1,250,000.00
				Contingency (20%):	\$250,000.00
				CONSTRUCTION TOTAL:	\$1,500,000.00
				<u>Other Project Costs</u>	
				Engineering, Construction, and Administration:	\$270,000.00
				TOTAL PROJECT COST:	\$1,770,000.00

EXHIBIT 19 WASTEWATER COLLECTION SYSTEM

SS-19 Ultimate Buildout

TRUNK to TULLYMORE, WICKLOW, MACKENZIE, MORGAN, SINGER HILL INFILL

After completion of SS-8's I-380 Lift Station, this 12-inch PVC sewer will serve as a connection between the Lift Station and the 8-inch PVC sewer construction in the project segment SS-18.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 12"	2020	LF	\$80.00	\$161,600.00
2	Sanitary Sewer Manholes, 48"	7	EA	\$5,000.00	\$35,000.00
3	Connection to Existing Sanitary Sewer	2	EA	\$1,700.00	\$3,400.00
4	Rock Excavation	200	CY	\$60.00	\$12,000.00
5	Seeding/Topsoil	2.3	ACRE	\$15,800.00	\$36,656.00
6	Easement	2.3	ACRE	\$37,000.00	\$85,840.00
7	Mobilization, Traffic Control, etc.	1	LS	\$16,725.00	\$16,725.00
				Subtotal:	\$351,000.00
				Contingency (20%):	\$70,000.00
				CONSTRUCTION TOTAL:	\$421,000.00
<u>Other Project Costs</u>					
				Engineering, Construction, and Administration:	\$76,000.00
					\$497,000.00

EXHIBIT 20 WASTEWATER COLLECTION SYSTEM

SS-20 Ultimate Buildout

ALONG COUNTY HOME ROAD FROM RR to NW TRUNK (North & South Legs)

Located in the Northwest Sewershed Region, this infrastructure improvement stretches from the railroad tracks along County Home Road, crossing the Cedar Valley Nature Trail to Quass Road before turning north. It will then follow the lowest terrain generally northwest in direction to the Wastewater Collection System junction of the 24-inch PVC sewer proposed in SS-3 and the 18-inch PVC sewer proposed in SS-4. It has a collection area (CA-20) of approximately 400 acres as shown in Figure 23: Wastewater Collection System – Segment Regions Map. The capacity estimated to be demanded from this collection area is just over 3.6 million GPD requiring a minimum slope of 0.75% of this 15” PVC gravity sewer.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 15"	7450	LF	\$100.00	\$745,000.00
2	Sanitary Sewer Manholes, 48"	25	EA	\$5,000.00	\$125,000.00
3	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
4	22" Steel Casing Pipe (Jack & Bore)	400	LF	\$400.00	\$160,000.00
5	Rock Excavation	1400	CY	\$60.00	\$84,000.00
6	Seeding/Topsoil	5.13	ACRE	\$15,800.00	\$81,054.00
7	Easement	5.13	ACRE	\$37,000.00	\$189,810.00
8	Mobilization, Traffic Control, etc.	1	LS	\$208,000.00	\$208,000.00
Subtotal:					\$1,595,000.00
Contingency (20%):					\$319,000.00
CONSTRUCTION TOTAL:					\$1,914,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$345,000.00
TOTAL PROJECT COST:					\$2,259,000.00

EXHIBIT 21 WASTEWATER COLLECTION SYSTEM

SS-21 Ultimate Buildout

COUNTY HOME ROAD TO VOGT STREET

Extending the 21-inch PVC sewer infrastructure improvement proposed in SS-15 from its end near Vogt Street and Dry Creek, east of Wendling Quarry, it travels along Dry Creek eventually heading north to the intersection of C Avenue and County Home Road. The 18-inch PVC sewer is estimated to serve a collection area (CA-21) of just over 400 acres.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 18"	5150	LF	\$125.00	\$643,750.00
2	Sanitary Sewer Manholes, 48"	18	EA	\$5,000.00	\$90,000.00
3	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
4	Rock Excavation	700	CY	\$60.00	\$42,000.00
5	Seeding/Topsoil	5.91	ACRE	\$15,800.00	\$93,378.00
6	Easement	5.91	ACRE	\$37,000.00	\$218,670.00
7	Mobilization, Traffic Control, etc.	1	LS	\$54,475.00	\$54,475.00
Subtotal:					\$1,144,000.00
Contingency (20%):					\$229,000.00
CONSTRUCTION TOTAL:					\$1,373,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$247,000.00
TOTAL PROJECT COST:					\$1,620,000.00

EXHIBIT 22 WASTEWATER COLLECTION SYSTEM

SS-22 Ultimate Buildout

NORTH OF EPIC EVENT CENTER TO COUNTY HOME ROAD

This 15-inch PVC sewer begins at the end of the proposed infrastructure improvement project SS-21, at the intersection of C Avenue and County Home Road. It will generally follow the lowest point of the topography to the NE corner of the Epic Event Center property and continuing on in a northwest direction.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 15"	3920	LF	\$100.00	\$392,000.00
2	Sanitary Sewer Manholes, 48"	14	EA	\$5,000.00	\$70,000.00
3	22" Steel Casing Pipe (Jack & Bore)	100	LF	\$400.00	\$40,000.00
4	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
5	Rock Excavation	600	CY	\$60.00	\$36,000.00
6	Seeding/Topsoil	4.50	ACRE	\$15,800.00	\$71,100.00
7	Easement	4.50	ACRE	\$37,000.00	\$166,500.00
8	Mobilization, Traffic Control, etc.	1	LS	\$36,865.00	\$36,865.00
Subtotal:					\$814,000.00
Contingency (20%):					\$163,000.00
CONSTRUCTION TOTAL:					\$977,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$176,000.00
TOTAL PROJECT COST:					\$1,153,000.00

EXHIBIT 23 WASTEWATER COLLECTION SYSTEM

SS-23 Ultimate Buildout

FROM EAGLE VIEW DEVELOPMENT TO NORTH LIMITS OF FLUM (Future Land Use Map)

This 18-inch PVC sewer is the last proposed infrastructure improvement project and will serve the very far northern limits of the City of Robins FLUM as identified in Figure 22: Wastewater Collection System Map – Ultimate Buildout. It has been assumed that this area is entirely comprised of residential zoning making up an area of nearly 1,000 acres.

OPINION OF PROBABLE PROJECT COSTS					
ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	EXTENDED PRICE
1	Sanitary Sewer, PVC, 18"	6400	LF	\$125.00	\$800,000.00
2	Sanitary Sewer Manholes, 48"	22	EA	\$5,000.00	\$110,000.00
3	28" Steel Casing Pipe (Jack & Bore)	100	LF	\$500.00	\$50,000.00
4	Connection to Existing Sanitary Sewer	1	EA	\$1,700.00	\$1,700.00
5	Rock Excavation	900	CY	\$60.00	\$54,000.00
6	Seeding/Topsoil	7.4	ACRE	\$15,800.00	\$116,130.00
7	Easement	7.4	ACRE	\$37,000.00	\$271,950.00
8	Mobilization, Traffic Control, etc.	1	LS	\$67,689.00	\$67,689.00
Subtotal:					\$1,471,000.00
Contingency (20%):					\$294,000.00
CONSTRUCTION TOTAL:					\$1,765,000.00
<u>Other Project Costs</u>					
Engineering, Construction, and Administration:					\$318,000.00
TOTAL PROJECT COST:					\$2,083,000.00

EXHIBIT 24
WASTEWATER COLLECTION SYSTEM

2015 NW QUADRANT SANITARY SEWER COLLECTION SYSTEM EVALUATION

**NORTHWEST QUADRANT SANITARY SEWER
COLLECTION SYSTEM EVALUATION
ROBINS, IOWA**

PROJECT NO. 114.0781.08

AUGUST 2015

Prepared by
SNYDER & ASSOCIATES, INC.
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Cedar Rapids, Iowa 52404
Phone: 319.362.9394

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APPENDIX

Exhibit A: City of Robins Future Land Use Map – October 18, 2010

Exhibit B: Northwest Lift Station and Sanitary Sewer Facility Plan – November 7, 2013

Exhibit C: Design Concept Report, Robins 1997 Trunk Sewer Expansion – May 5, 1997

Exhibit D: Agreement Between City of Cedar Rapids and City of Robins for the Construction, Operation, and Maintenance of Water Pollution Control Facilities – October 22, 1980

Exhibit E: 28E Agreement Between Cedar Rapids, Marion, Hiawatha, Robins and Linn County Regarding the planning, construction, and maintenance participation for the Indian Creek and Dry Run Creek Sanitary Sewer System Program – January 11, 2007

Exhibit F: Amendment No. 1 to the 28E Agreement Between Cedar Rapids, Marion, Hiawatha, Robins and Linn County Regarding the planning, construction, and maintenance participation for the Indian Creek and Dry Run Creek Sanitary Sewer System Program – August 8, 2008



I. Purpose and Scope

The City of Robins is working towards making the community a desirable location for future commercial and industrial development and is also continuing to see significant residential development. Upon completion of the 2014 NW Quadrant Lift Station project located northwest of the Toddville United Church of Christ, the City of Robins has a means of sewer collection for the northwest area of the City. The primary focus of this evaluation is to provide the City of Robins a planning tool to accommodate growth and to supply information for the Robins Economic Development Initiative (REDI) to strategically encourage businesses to move to Robins.

This evaluation will assess the collection system improvements required to serve the northwest quadrant of Robins and connect into the existing collection system.

This evaluation includes:

- Service Area and Land Use
- Existing System Evaluation and Downstream Limitations
- Estimated Future Design Development and Wastewater Flows
- Preliminary Design for the Primary and Secondary Components of the Collection System
- Phasing Plans for the Future Improvements, Primary Components
- Order of Magnitude Cost Estimates, Primary Components
- Proposed Sanitary Sewer Districts and Connection Fees

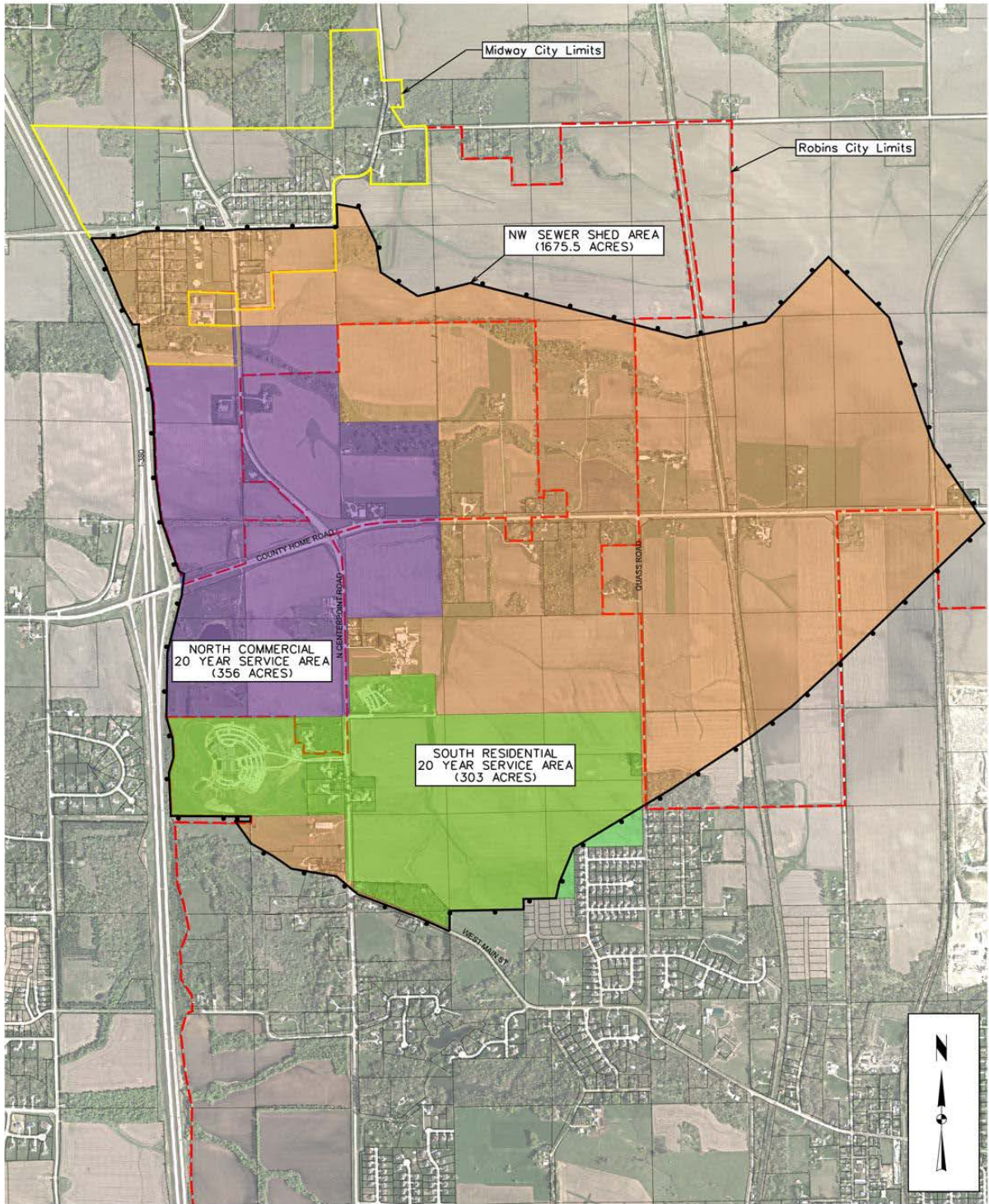
II. Service Area and Land Use

For the purposes of this report, the future growth of the Northwest Quadrant has been subdivided into two planning periods, current conditions to 20 year growth projections and ultimate build-out development potential. Within the City of Robins developmental growth occurs with some volatility, and while certain estimates are being placed upon future development activities, locations, and schedules, the actual growth of this region will be continuously monitored to avoid any future sanitary sewerage capacity shortfalls. Assumptions often change as more information becomes available which is indicative by the differing flow predictions used during design of the existing and proposed features of the collection system.

For the current growth conditions to the 20 year design, the evaluation boundaries have been defined by the expectations of representatives from the City Council and REDI, as well as projections made in the 2013 Comprehensive Plan. Flow rates used for all future growth were based on City of Robins Future Land Use map dated October 18, 2010 for the proposed service area and paired with the design criteria set forth in the DNR Design Standards for development types. The Future Land Use Map can be found in the Appendix.



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CITY OF ROBINS
 PROJECTED SERVICE AREA
 APRIL 2015



SNYDER & ASSOCIATES
 Engineers and Planners

FIGURE II.A



Currently, the model developed for this Northwest Service Area focuses on commercial growth near the County Home Road and North Center Point Road intersection and residential growth east of North Center Point Road and south of Kings Way. Figure II.A depicts the Ultimate Service Area (evaluation limits) as well as the 20 year service area. The anticipated breakdown of the 20 year service area is 356 acres of commercial development and 303 acres of residential development based on the Future Land Use Map. Portions of this area are not currently within City limits, but annexation of those areas is expected sometime in the future. The DNR minimum design equivalent for commercial development is 5,000 gallons per day per acre (gpd/acre) and 1,000 gpd/acre for residential development. Representatives of the City of Robins and Snyder & Associates agree that, while full development of the 660 acres within 20 years could be possible, there is a great disparity from the present day nearly undeveloped state to the 20 year developed area.

Through the use of existing topographical data, an ultimate build-out region that could be served by the 2014 Northwest Quadrant Lift Station has also been determined. Ultimate build-out conditions would include further estimated development of 935 acres (approx. 1,595 acres total) that could consist of commercial, industrial, and residential development. Full development of the area will require upgrades to the 2014 Northwest Quadrant Lift Station and the 2010 Northwest Quadrant Lift Station (aka Kings Way Lift Station), as well as additional force main and gravity main to serve as the primary collection system and the construction of a secondary collection system.

If at some point the City of Robins annexes Midway, an additional 240 acres of development, or approximately 350,000 gpd, would need to be considered.

III. Existing Collection System and Lift Stations

The construction of the 2014 Northwest Quadrant Lift Station was based upon the City's desire to serve the greatest region through the use of a gravity sewer collection system that flows to a common lift station. The 2014 Northwest Quadrant Lift Station was built to eventually allow for the decommissioning of the Kings Way Lift Station. The force main from the Kings Way Lift Station empties into the 2007 Dry Creek Sewer Extension Project. The capacities of each of the above mentioned projects are detailed below.

A. 2014 Northwest Quadrant Lift Station

The 2014 Northwest Quadrant Lift Station project was constructed with a set of parallel 6-inch force mains and two pumps capable of 278 gallons per minute (gpm) at 116 feet of head (TDH). This design point was chosen to meet the 10-year design flow rate of 400,000 gallons per day (gpd), with the largest pump out of service, utilizing only one of the 6-inch force mains. The 20-year design flow rate of 1,600,000 gpd could then utilize both 6-inch force mains with an estimated TDH of 249 feet and a velocity of 6.3 fps. At the time the facility was designed, only the "Commercial Growth Area" was considered, as shown in Figure II.A, as there was no gravity sewer connection to the "Residential Growth Area". It was also expected that the "Residential Growth Area" was to be served by the Kings Way Lift Station for a period of time and that commercial growth would come first.



Table III.A.1 – 2014 Northwest Quadrant Force Main Design

Design Period	Total Area (Acres)	Pumping Capacity	Force Main Size	Approx. TDH (feet)	Velocity (ft/sec)
10-Year Design Flow (2024)	80	400,000 gpd	6-inch	117	3.2
20-Year Design Flow (2034)	320	1,600,000 gpd	Dual 6-inch	249	6.3

B. Kings Way Lift Station

The Kings Way Lift Station project (2010) was constructed with a single 6-inch force main and two pumps capable of 209 gallons per minute (gpm) at 63 feet of head (TDH) which then empties into an 18” PVC gravity main designed with 0.12% slope. This design point was chosen assuming 60% of the area, sewer shed (SS-A) (See Figure IV.A), would develop over the next 20 years and to match the pumps selected for the lift station at the Wildflower development for maintenance purposes. The lift station can currently pump 300,000 gallons per day (gpd), with the largest pump out of service.

Table III.B.1 – Kings Way Force Main Design

Design Period	Total Area (Acres)	Pumping Capacity*	Force Main Size	Approx. TDH (feet)	Velocity (ft/sec)
20-Year Design Flow (2025)	165	300,000 gpd	6-inch	63	2.37
Ultimate Design Flow	350	490,000 gpd	6-inch	83	3.86

*Design Flow

C. Existing Gravity Sewer

The 2007 Dry Creek Sewer Extension project was constructed with an 18” gravity main beginning at the intersection of Robinwood Drive and West Knoll Drive and increasing to a 30” gravity main southward to the end of Rickey Allen Drive. The approximately 1,100 acre service area (900 acres developed) defined for the project is bound by North Center Point Road to the west, County Home Road to the north, the railroad to the east and West Main Street to the south. The area included a mix of residential, commercial/office space and a golf course.

Through other projects, construction of the 18” gravity main continued westward through Woodland Estates and northward along Quass Road to terminate just south of the future Kings Way street extension. The 1997 Northwest Sanitary Sewer Trunk, Lift Station and Force Main project connected Woodland Estates to the existing collection system including a lift station at the intersection of West Knoll Drive and Robinwood Drive. During the construction of Woodland Estates 1st Addition, the City paid the developer to upsize the 8” gravity main to 18” within the development. In 2000 the City extended the 18” sanitary sewer from Woodland Drive north to the end of the D & M Subdivision. In 2010 the City installed additional 18” gravity sewer in conjunction with the Kings Way Lift Station project from the future connection of Quass Road and Kings Way southward to the northern end of the D & M Subdivision.



Table III.C.1 – Gravity Sewer Capacities

Project	Gravity Main Size	Minimum Slope	Design Capacity (GPD)	Peak Capacity (GPD)**
1997 NW Trunk	18"	0.50%	4,380,000	5,176,000
Woodland Estates	18"	0.20%	2,770,000	3,274,000
D & M	18"	0.16%	2,480,000	2,928,000
2007 Dry Creek Sewer*	18"	0.34%	3,615,000	4,268,000
Kings Way Lift Station (upstream)	8"	1.15%	838,000	882,000
Kings Way Lift Station (downstream)	18"	0.12%	2,145,000	2,536,000

* At the intersection of West Knoll and Robinwood Drive

**Calculated by Manning’s Equation

D. Cedar Rapids Water Pollution Control Facility

The City of Robins and the City of Cedar Rapids have an agreement in place pertaining to the construction, operation, and maintenance of the Cedar Rapids Water Pollution Control Facilities. This agreement was signed in 1980, and stated that the City of Robins would be provided the following capacity at the treatment plant:

Table III.D.1 – 1980 Agreement Allowable Flows to Cedar Rapids Water Pollution Control Facility

Maximum Flow	1.120 MGD
Average Flow	0.400 MGD
BOD	600 lbs/day
SS	800 lbs/day
TKN	120 lbs/day

The agreement also states that the capacity set forth is the total capacity available to the City of Robins except that the City of Cedar Rapids reserves the right to sell additional capacity in the future if additional capacity is available. Furthermore, where additional capacities are not readily available, then the City of Robins is required to reduce its loadings or aid the City of Cedar Rapids in water pollution control facility expansion as it benefits City of Robins.

In recent years, the City of Robins has exceeded the limitations of the agreement with the City of Cedar Rapids. (See Table III.D.2) The City of Cedar Rapids is aware of the sanitary sewer flows contributed by the City of Robins to the Water Pollution Control Facility, as Cedar Rapids staff monitors the flow rates on a daily basis and provide the monthly totals to the City of Robins and Snyder & Associates. All parties have recently communicated and agree that there should be some discussions to address and update the agreement and the outdated flow limitations, however that topic is not being addressed within this report.



Table III.D.2 – Robins Actual Sewage Flow to Cedar Rapids Water Pollution Control Facility

	2009	2010	2011	2012	2013	2014
Max Day (GPD)	1,262,722	1,009,950	1,632,317	576,000	960,000	1,052,000
Average Day (GPD)	325,310	456,507	497,435	310,652	351,438	351,674

E. Indian & Dry Run Creek Trunk Sanitary Sewer Capacity Improvements Study

In 2007, a completed study of the capacity needs of the Indian and Dry Run Creek Trunk Sanitary Sewer was submitted to the Linn County Regional Planning Commission. The Indian and Dry Run Creek Trunk Sanitary Sewer will extend from the Cedar Rapids Water Pollution Control Facility near Highway 13 north through Cedar Rapids, Marion, Hiawatha and terminating near South Troy Park in Robins. This study was prepared for the purposes of sizing and prioritizing upgrades to these trunk sewers based on capacity needs and costs. Planning for the future growth of the City of Robins was included within this study, as Robins is located at the most upstream collection point along the Indian Creek Trunk Sanitary Sewer.

The City of Robins originally requested 4.90 MGD in April of 2005. The requested peak flow was then revised to 8.22 MGD in May of 2008.

IV. Future Collection System and Lift Stations

Through the use of existing topographical data, an ultimate build-out region that could be served by the 2014 Northwest Quadrant Lift Station was determined (Figure II.A). The developed area in the tables below is based on eighteen percent (18%) of the land assumed to become dedicated right-of-way (ROW) or remain undeveloped. A peaking factor of 3.04 was calculated utilizing a population equivalent, based on DNR design flows, 100 gallons per capita per day (gpcd) and projected residential land use areas. No peaking factor was applied to the commercial and industrial uses as the DNR design flows already take that into consideration. The flow calculations performed both included and excluded the annexation of Midway. If at some point Midway is annexed, the effects on the collection system sizing within Robins City limits are relatively insignificant and have been taken into account. The main impact would be to the size of the lift station pumps and structures.

From the ultimate build-out area, five (5) smaller sewer sheds were defined based on the topography of the land and the areas that could be served by gravity sewer. The layout of the Primary and Secondary collector systems followed the lowest elevations within each sewer shed to maximize the serviceability for each area. The individual sewer sheds and collection system layout can be found in Figure IV.A.

Table IV.1 – Future System Requirements

Design Period	Total Area (Acres)	Developed Area (Acres)	Design Flow (GPD)	Peak Flow (GPD)
20-Year Design* Flow (2035)	659	516	1,720,000	2,150,000
Ultimate Design* Flow	1595	1200	3,700,000	5,000,000

*Refer to Figure II.A for the design limits.

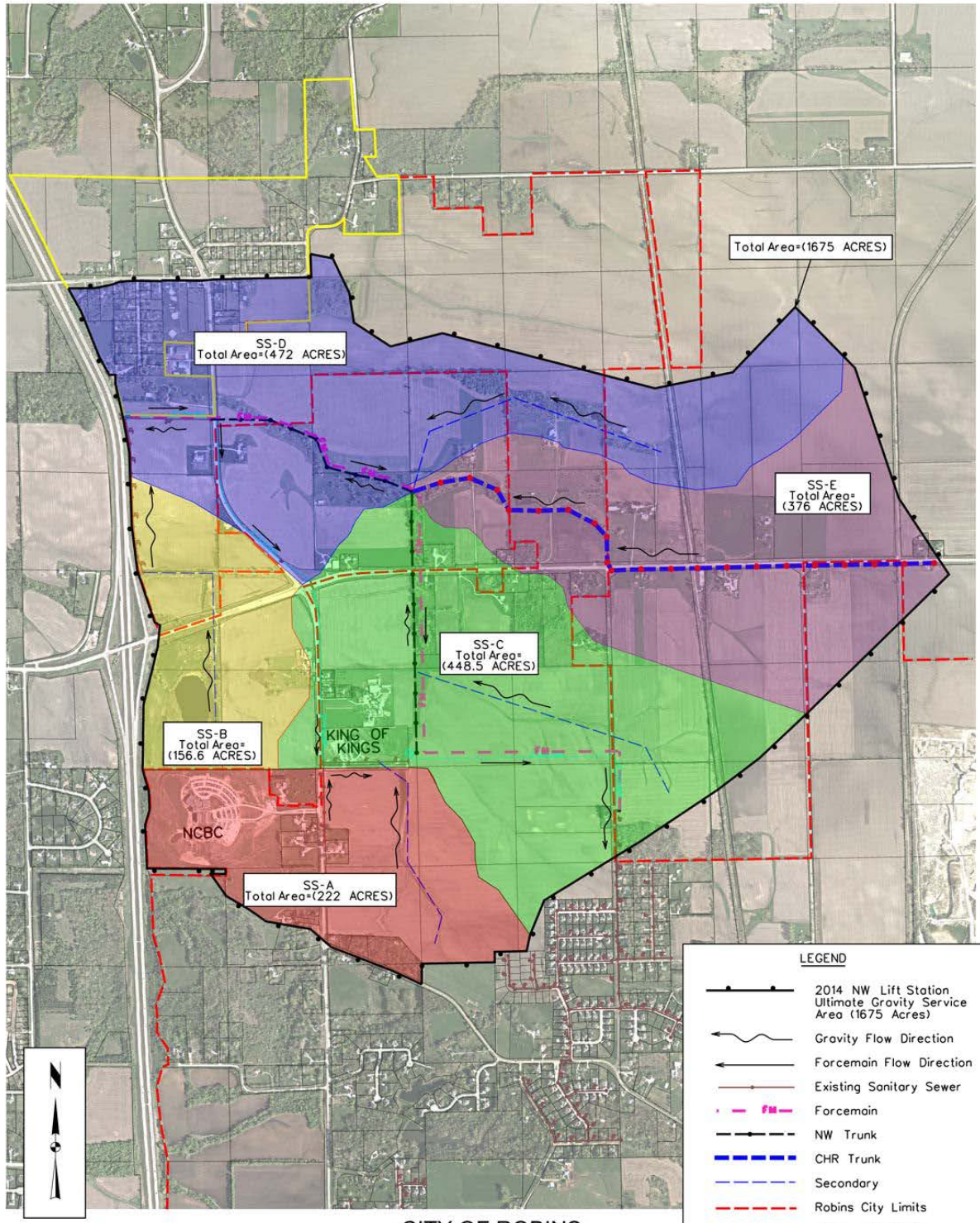


Table IV.2 – Future System Requirements Including Midway

Design Period	Total Area (Acres)*	Developed Area (Acres)	Design Flow (GPD)	Peak Flow (GPD)
Ultimate Design Flow	1835	1378	4,000,000	5,700,000



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**CITY OF ROBINS
 GRAVITY SEWER SHEDS
 APRIL 2015**

SNYDER & ASSOCIATES
 Engineers and Planners

FIGURE IV.A



A. 20 Year Build-Out Gravity Sewer and Force Main

Over the next 20 years, it is expected that commercial growth near the County Home Road and North Center Point Road intersection and residential growth east of North Center Point Road and south of Kings Way will occur. The 20 year projected development area was determined from information found in the 2013 Comprehensive Plan and input from REDI and City staff.

Table IV.A.1 – South Residential Area

Development Type	Service Area (Developed)	Design Criteria	Design Capacity	Peaking Factor	Peak Flow
Residential	208	1,000 gpd/acre	0.21MGD	3.04	0.62 MGD
Commercial	30	5,000 gpd/acre	0.15 MGD	-	0.15 MGD
Industrial	-	10,000 gpd/acre	-	-	-
Total	238		0.36 MGD		0.77 MGD

Through the construction of a 12-inch gravity sewer main at a minimum allowable slope of 0.22% (necessary to meet 2 fps minimum velocity), the carrying capacity through the pipe would be approximately 1.0 MGD when flow is at a depth of 3/4 the pipe diameter. This would serve SS-A and a south portion of SS-C.

Table IV.A.2 – North Commercial Area

Development Type	Service Area (Developed)	Design Criteria	Design Capacity	Peaking Factor	Peak Flow
Residential	8	1,000 gpd/acre	0.008 MGD	3.04	0.02 MGD
Commercial	270	5,000 gpd/acre	1.35 MGD	-	1.35 MGD
Industrial	-	10,000 gpd/acre	-	-	-
Total	278		1.36 MGD		1.37 MGD

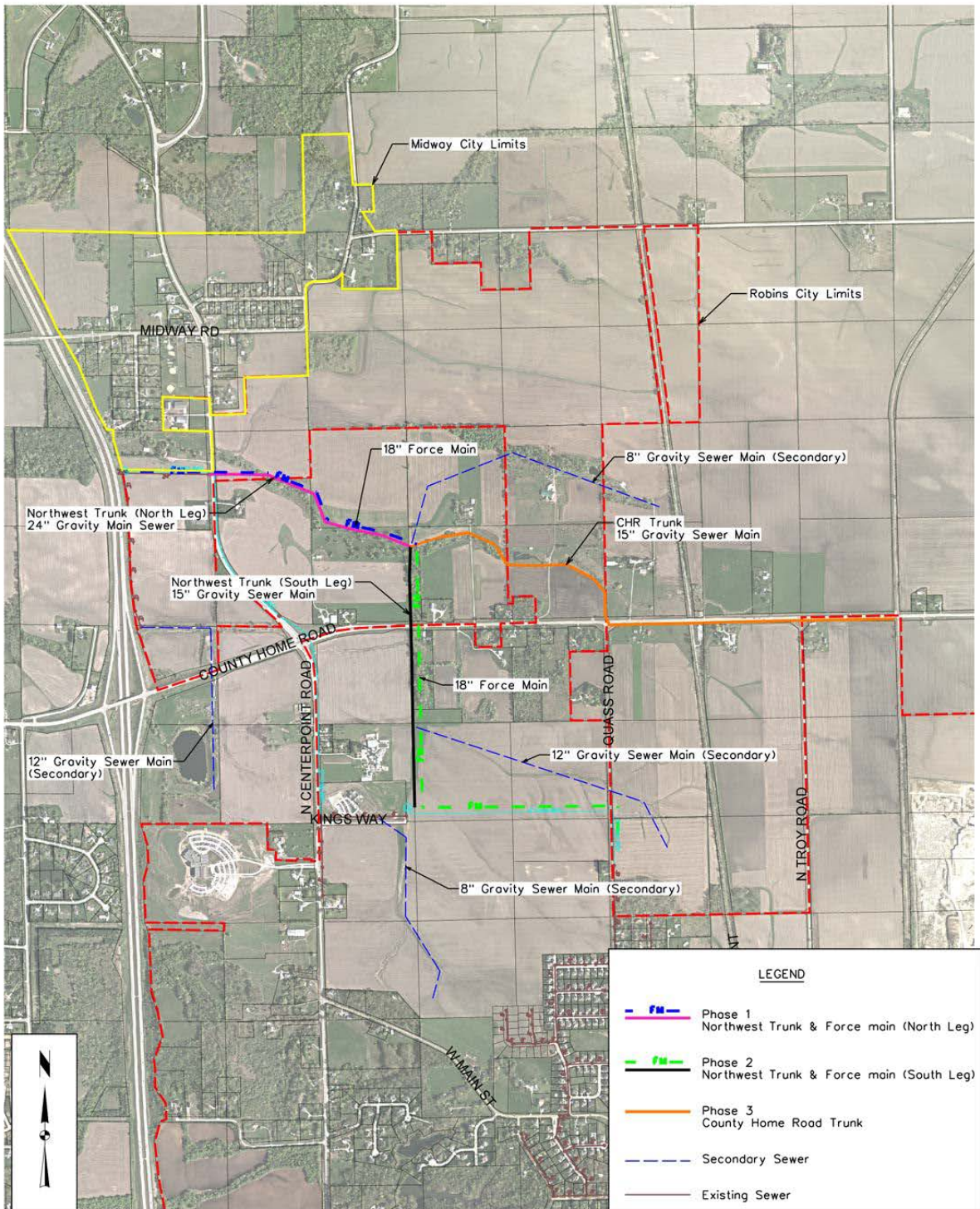
Two (2) trunk sewers are necessary to serve the North Commercial area. To serve the west portion of the area, SS-B, the construction of a 12-inch gravity sewer main at a minimum allowable slope of 0.22% (necessary to meet 2 fps minimum velocity), is necessary to have a carrying capacity of approximately 1.0 MGD when flow is at a depth of 3/4 the pipe diameter. This main was constructed during the 2014 Northwest Quadrant Lift Station project.

To serve the east portion of the area, SS-D and the west half of SS-E, a 12-inch gravity sewer main at a minimum allowable slope of 0.22% (necessary to meet 2 fps minimum velocity), is necessary to have a carrying capacity of approximately 1.0 MGD when flow is at a depth of 3/4 the pipe diameter.

B. Ultimate Build-Out Gravity Sewer and Force Main

The five (5) smaller sewer sheds in Figure IV.A were used to determine the alignments of the Primary and Secondary sanitary sewers. The Primary collector mains are to be projects constructed by the City are detailed in the following tables and shown in Figure IV.B. The Secondary mains are expected to be constructed by the developers of each property. Preliminary sizing of the Secondary mains has been provided later in this report. The City may need to cost share with the developers to upsize the mains to ensure the appropriate sizes are constructed.





**CITY OF ROBINS
PRIMARY COLLECTION SYSTEM
APRIL 2015**



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FIGURE IV.B



1. Northwest Trunk Gravity Sewer – South Leg

Table IV.B.1 - Northwest Trunk Gravity Sewer Ultimate Design Capacity (South Leg)

Development Type	Service Area (Developed)*	Design Criteria	Design Capacity	Peaking Factor	Peak Flow
Residential	375	1,000 gpd/acre	0.39 MGD	3.04	1.16 MGD
Commercial	117	5,000 gpd/acre	0.59 MGD	-	0.59 MGD
Industrial	-	10,000 gpd/acre	-	-	-
Total	492		0.98 MGD		1.75 MGD

*Exclusive of known ROW and parkland dedication

Through the construction of a 21-inch gravity sewer main at a minimum allowable slope of 0.10% (necessary to meet 2 fps minimum velocity), the carrying capacity through the pipe would be approximately 3.2 MGD when flow is at a depth of 3/4 the pipe diameter. This would serve SS-A and SS-C. If the slope of the main could be increased, a 15-inch main at 0.20% would carry 1.9 MGD when flow is at a depth of 3/4 the pipe diameter.

2. Northwest Trunk Gravity Sewer – North Leg

Table IV.B.2 - Northwest Trunk Gravity Sewer Ultimate Design Capacity (North Leg)

Development Type	Service Area (Developed)*	Design Criteria	Design Capacity	Peaking Factor	Peak Flow
Residential	638	1,000 gpd/acre	0.67 MGD	3.04	2.04 MGD
Commercial	405	5,000 gpd/acre	2.03 MGD	-	2.03 MGD
Industrial	37	10,000 gpd/acre	0.37 MGD	-	0.37 MGD
Total	1080		3.07 MGD		4.44 MGD

*Exclusive of known ROW and parkland dedication

Through the construction of a 24-inch gravity sewer main at a minimum allowable slope of 0.08% (necessary to meet 2 fps minimum velocity), the carrying capacity through the pipe would be approximately 4.1 MGD when flow is at a depth of 3/4 the pipe diameter. The main would be at capacity during the peak flow events. This main would serve SS-A, SS-C, SS-D and SS-E.

As previously mentioned in Section IV.A above, the 12-inch segment required to service the east portion of the North Commercial Area could be installed as a 24-inch to serve the ultimate build-out area. The velocities would be approximately 1.6 fps (0.08 MGD) and the pipe would have excess capacity for a period of time, but it would make fiscal sense as the 12" main and 24" main would be installed within the same alignment when the upgrade to a 24" is necessary.

3. Northwest Trunk Force Main and Lift Station – Excludes Midway

Table IV.B.3 - Northwest Trunk Force Main and Lift Station Ultimate Design Capacity

Development Type	Service Area (Developed)*	Design Criteria	Design Capacity	Peaking Factor	Peak Flow
Residential	638	1,000 gpd/acre	0.67 MGD	3.04	2.04 MGD
Commercial	525	5,000 gpd/acre	2.63 MGD	-	2.63 MGD
Industrial	37	10,000 gpd/acre	0.37 MGD	-	0.37 MGD
Total	1200		3.67 MGD		5.04 MGD

*Exclusive of known ROW and parkland dedication



Utilizing an 18-inch force main with a flow of 3.67 MGD the velocity would be 3.2 fps with a TDH of 112 feet. At 5.26 MGD the velocity would be 4.4 fps with a TDH of 133 feet. Both design points fall within the range of acceptable TDH and velocity. This force main would serve SS-A, SS-B, SS-C, SS-D and SS-E.

4. County Home Road Gravity Sewer

Table IV.B.4 – County Home Road Gravity Sewer Ultimate Design Capacity

Development Type	Service Area (Developed)*	Design Criteria	Design Capacity	Peaking Factor	Peak Flow
Residential	76	1,000 gpd/acre	0.09 MGD	3.04	0.27 MGD
Commercial	170	5,000 gpd/acre	0.85 MGD	-	0.85 MGD
Industrial	37	10,000 gpd/acre	0.37 MGD	-	0.37 MGD
Total	283		1.31 MGD		1.49 MGD

*Exclusive of known ROW and parkland dedication

Through the construction of a 15-inch gravity sewer main at a minimum allowable slope of 0.15% (necessary to meet 2 fps minimum velocity), the carrying capacity through the pipe would be approximately 1.6 MGD when flow is at a depth of 3/4 the pipe diameter. This main would service the east portion of SS-E.

5. Northwest Trunk Force Main and Lift Station – Includes Midway

Table IV.C.1 - Northwest Trunk Force Main and Lift Station Ultimate Design Capacity

Development Type	Service Area (Developed)*	Design Criteria	Design Capacity	Peaking Factor	Peak Flow
Residential	786	1,000 gpd/acre	0.82 MGD	3.04	2.49 MGD
Commercial	545	5,000 gpd/acre	2.73 MGD	-	2.73 MGD
Industrial	47	10,000 gpd/acre	0.47 MGD	-	0.47 MGD
Total	1378		4.02 MGD		5.69 MGD

*Exclusive of known ROW and parkland dedication

Utilizing an 18-inch force main with a flow of 4.02 MGD the velocity would be 3.5 fps with a TDH of 117 feet. At 5.69 MGD the velocity would be 5.0 fps with a TDH of 145 feet. Both design points fall within the range of acceptable TDH and velocity. This force main would serve SS-A, SS-B, SS-C, SS-D, SS-E and Midway.

In Section IV.B.3 above, the 18-inch force main required to service the area exclusive of Midway would remain acceptable if Midway was annexed.

C. Lift Stations

Construction of the 2014 Northwest Quadrant Lift Station project sized the force main and wet well to allow for upsizing the pumps to 1.6 MGD capacity from the current 0.4 MGD. At such a time the 1.6 MGD design point is met, more extensive work to upsize the wet well and pumps will need to occur. Likewise, at some point, the constructed dual 6-inch force main will no longer have adequate capacity to serve this region, nor will the downstream Kings Way Lift Station be able to serve these high flows. It has been assumed that the Kings Way Lift Station can be upgraded to 0.8 MGD from the current 0.3 MGD capacity. At some point the Kings Way Lift Station will be eliminated and the 2014 Northwest Quadrant Lift Station will serve the entire area of this evaluation.



V. Recommendations

Preliminary design criteria for the sanitary sewer collection improvements can be found in the tables below. The design capacities are based on the main size required at the most downstream point and minimum slopes, therefore smaller mains may be chosen if the pipe slope can be increased.

A. Primary Collector System

It is anticipated that the City will be responsible for the design, construction and financing of the primary collector system as seen in Figure IV.B. Estimated costs for the improvements can be found later in the report and were the basis for the sanitary sewer connection fee calculations.

Table V.A.1 – Primary Gravity Sewer Recommendations

Project	Gravity Main Size	Minimum Slope	Design Capacity*
Northwest Trunk Gravity Main (South Leg)	15-inch	0.20%	1.9 MGD
Northwest Trunk Gravity Main (North Leg)	24-inch	0.08%	4.1 MGD
County Home Road Trunk	15-inch	0.15%	1.6 MGD

*Calculated by Manning’s Equation

Table V.A.2 – Force Main Recommendations

Project	Force Main Size	Pumping Capacity**	Approx. TDH (feet)	Velocity (ft/sec)
Northwest Trunk Force Main*	18-inch	5.26 MGD	140	6.6

*With the inclusion of Midway the Pumping Capacity would increase to 6.17 MGD, TDH to 161 ft. and Velocity to 7.8 ft/sec.

**Peak Flow

B. Secondary Collector System

A preliminary evaluation of the secondary collection system has been performed to ensure as the area develops the collection system is appropriately sized in its entirety. Table V.B.1 details the preliminary sizing, slopes and the associated flow capacity.

It is anticipated that the developers will front the costs for the improvements, therefore cost analysis has not been provided.

Table V.B.1 – Secondary Gravity Sewer Recommendations

Sewer Shed	Gravity Main Size	Minimum Slope	Design Capacity*
SS-A	8-inch	0.4%	0.50 MGD
SS-B	12-inch	0.22%	1.08 MGD
SS-C	12-inch	0.22%	1.08 MGD
SS-D	8-inch	0.4%	0.50 MGD

*Calculated by Manning’s Equation



VI. Phasing

The growth over the next 20 years is expected to consist of commercial growth near the County Home Road and North Center Point Road intersection and residential growth east of North Center Point Road and south of Kings Way. There are three ways the growth may occur, residential, commercial or residential and commercial simultaneously. In all of the situations, the Kings Way Lift Station will be the limiting aspect for growth. The DNR requires the pumps to meet the peak flow demands with one pump out of service, and therefore is the determining factor of when the lift station upgrades are required.

Upgrades have been evaluated to provide the longest term solution for each scenario as well as minimizing the number of upgrades required to get to the chosen design points in the most cost effective manner.

Portions of the Northwest Trunk gravity main may need to be constructed on an earlier schedule just to service the North Commercial Area. At the time the gravity sewer is constructed, it is recommended the force main be constructed in parallel to reduce the overall construction costs and minimize land disturbances.

It is possible that the sequence of development would allow the dual 6-inch force mains installed as part of the 2014 Northwest Quadrant Lift Station project to be extended past the Kings Way Lift station and run parallel to the Kings Way 6-inch force main. Essentially the 2014 Northwest Quadrant Lift Station would serve the North Commercial Area and the Kings Way Lift Station would serve the South Residential Area. This would allow the City to delay the Northwest Trunk sewer construction and subsequent upgrades to the 2014 Northwest Quadrant Lift Station, but may result in additional construction costs.

At some point, the capacity of the Northwest Quadrant Lift Station will exceed the capacity of the 18" gravity sewer beginning at Quass Road and extending through Woodland Estates and connecting to the 2007 Dry Creek Sewer Project at Robinwood Drive and West Knoll Drive. Costs, sizing and phasing to upgrade the 18" gravity main have not been evaluated as part of this study.

A. Residential

Assuming residential growth will occur first and no additional flow will be contributed from the North Commercial Area, once 95 acres, or 37% of the land, in the South Residential Area is developed the Kings Way Lift Station will require upgrades. The Kings Way Lift Station would likely be upgraded to meet the peak flow of the South Residential area which is 820,000 gallons per day.

B. Commercial

Assuming commercial growth will occur first and no additional flow will be contributed from the South Residential Area, once 61 acres, or 22% of the land, in the North Commercial Area is developed the Kings Way Lift Station will require upgrades.

Upgrade 1 – The Kings Way Lift Station would likely be upgraded to meet the peak flow of the South Residential area which is 820,000 gallons per day. This is also a reasonable design point for TDH and flow within the existing 6-inch force main.



Upgrade 2 – Once 81 acres, or 29% of the land, is developed the 2014 Northwest Quadrant Lift Station will require upgrades. The lift station would likely be upgraded to 1,600,000 gallons per day as force main piping and structural provisions have been made for that capacity.

Upgrade 3 – Once 161 acres, or 58% of the land, is developed the Kings Way Lift Station will be decommissioned, the dual 6-inch force mains (2014 Northwest Quadrant Lift Station Project) shall be abandoned, and the Northwest Trunk gravity main and force main shall be constructed.

C. Residential and Commercial

Assuming growth of the area will occur simultaneously, once 75 acres, or 14% of the land, is developed the Kings Way Lift Station will require upgrades.

Upgrade 1 – The Kings Way Lift Station would likely be upgraded to meet the peak flow of the South Residential area which is 820,000 gallons per day. This is also a reasonable design point for TDH and flow within the existing 6-inch force main.

Upgrade 2 – Once 96 acres, or 18% of the land, is developed the 2014 Northwest Quadrant Lift Station will require upgrades. The lift station would likely be upgraded to 1,600,000 gallons per day as force main piping and structural provisions have been made for that capacity.

Upgrade 3 – Once 197 acres, or 37% of the land, is developed the Kings Way Lift Station will be decommissioned, the dual 6-inch force mains (2014 Northwest Quadrant Lift Station Project) shall be abandoned, and the Northwest Trunk gravity main and force main shall be constructed.

Upgrade 4 – Once 389 acres, or 73% of the land, is developed the 2014 Northwest Quadrant Lift Station will need major modifications and would likely be upgraded to accommodate an intermediate flow scenario. As that point is more than 20 years away, the actual size and capacity will be determined at a later date.

VII. Cost Summary

The estimated construction costs are detailed in the tables below. The estimates represent approximate project costs, and include engineering and construction costs. These estimates should be used for planning purposes only. *All costs shown represent year 2015 construction estimates and should be inflated to the anticipated year of construction for budgeting purposes.*

Upgrading the Kings Way Lift Station from 0.3 MGD to 0.8 MGD would cost approximately **\$348,000**, which includes two (2) pumps, a larger generator, structural modifications and design and construction engineering fees.

Upgrading the 2014 Northwest Quadrant Lift Station from 0.4 MGD to 1.6 MGD would cost approximately **\$174,000** which includes two (2) pumps, a larger generator and design and construction engineering fees.



Table VII.1 – Opinion of Probable Cost – Northwest Trunk (South Leg)

ITEM NO.	ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	ITEM TOTAL
1	Sanitary Sewer, PVC, 15"	LF	3500	\$60.00	\$210,000.00
2	Sanitary Sewer Force Main, PVC, 18"	LF	7050	\$80.00	\$564,000.00
3	Sanitary Sewer Manholes	EA	15	\$3,500.00	\$52,500.00
4	Connection to Existing Sanitary Sewer	EA	2	\$1,500.00	\$3,000.00
5	28" Steel Casing Pipe (Jack & Bore)	LF	80	\$500.00	\$40,000.00
6	36" Steel Casing Pipe (Jack & Bore)	LF	80	\$750.00	\$60,000.00
7	Rock Excavation	CY	2000	\$60.00	\$120,000.00
8	Seeding/Topsoil	ACRE	8.00	\$14,000.00	\$112,000.00
9	Easement	ACRE	8.00	\$35,000.00	\$280,000.00
10	Mobilization, Traffic Control, etc.	LS	1	\$217,000.00	\$217,000.00
11	Design and Construction Engineering	LS	1	\$319,000.00	\$319,000.00
	SUBTOTAL				\$1,977,500.00
	CONTINGENCIES (20%)				\$395,500.00
TOTAL OPINION					\$2,373,000.00



Table VII.2 – Opinion of Probable Cost – Northwest Trunk (North Leg)

ITEM NO.	ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	ITEM TOTAL
1	Sanitary Sewer, PVC, 24"	LF	3100	\$100.00	\$310,000.00
2	Sanitary Sewer Force Main, PVC, 18"	LF	4250	\$80.00	\$340,000.00
3	Sanitary Sewer Manholes	EA	10	\$3,500.00	\$35,000.00
4	Connection to Existing Sanitary Sewer	EA	2	\$1,500.00	\$3,000.00
5	28" Steel Casing Pipe (Jack & Bore)	LF	50	\$500.00	\$25,000.00
6	36" Steel Casing Pipe (Jack & Bore)	LF	50	\$750.00	\$37,500.00
7	Rock Excavation	CY	1400	\$60.00	\$84,000.00
8	Seeding/Topsoil	ACRE	5	\$14,000.00	\$70,000.00
9	Easement	ACRE	6	\$35,000.00	\$210,000.00
10	Mobilization, Traffic Control, etc.	LS	1	\$168,000.00	\$168,000.00
11	Design and Construction Engineering	LS	1	\$247,000.00	\$247,000.00
	SUBTOTAL				\$1,529,500.00
	CONTINGENCIES (20%)				\$305,900.00
TOTAL OPINION					\$1,835,400.00



Table VII.3 – Opinion of Probable Cost – County Home Road Trunk

ITEM NO.	ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	ITEM TOTAL
1	Sanitary Sewer, PVC, 15"	LF	7300	\$60.00	\$438,000.00
2	Sanitary Sewer Manholes	EA	20	\$3,500.00	\$70,000.00
3	Connection to Existing Sanitary Sewer	EA	1	\$1,500.00	\$1,500.00
4	22" Steel Casing Pipe (Jack & Bore)	LF	200	\$400.00	\$80,000.00
5	Rock Excavation	CY	1400	\$60.00	\$84,000.00
6	Seeding/Topsoil	ACRE	5.00	\$14,000.00	\$70,000.00
7	Easement	ACRE	6.00	\$35,000.00	\$210,000.00
8	Mobilization, Traffic Control, etc.	LS	1	\$143,000.00	\$143,000.00
9	Design and Construction Engineering	LS	1	\$211,000.00	\$211,000.00
	SUBTOTAL				\$1,307,500.00
	CONTINGENCIES (20%)				\$261,500.00
TOTAL OPINION					\$1,569,000.00

VIII. Sanitary Sewer Connection Fees

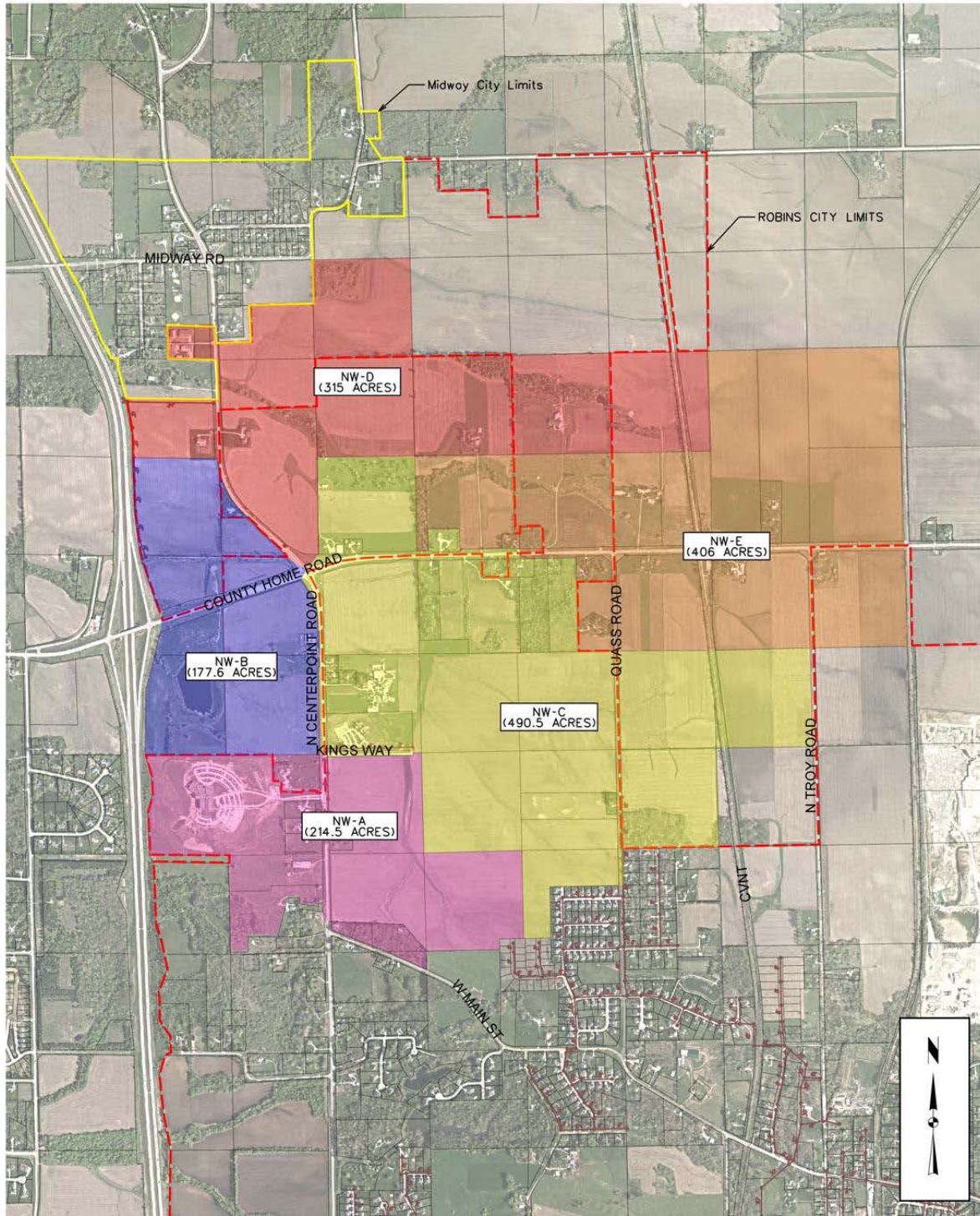
As the City of Cedar Rapids provides sanitary sewer treatment for the City of Robins, Robins does not collect much revenue from sanitary sewer usage. To that end, the City has elected to charge sanitary sewer connection fees to recoup the costs for providing infrastructure. Utilizing the estimated construction costs from the tables in the previous section as well as the actual construction costs from previous projects (2007 Dry Creek Sewer, Kings Way Sewer and Lift Station, and 2014 NW Quad Sewer and Lift Station), sanitary sewer connection fees have been estimated for the area encompassed by this evaluation. The fees will need to be adjusted at the time of construction to reflect actual costs as well as to incorporate inflation.

The fees exclude Midway, but include area that will likely be annexed into the City of Robins at a later date and is not limited to current City limits.

Estimating the sanitary sewer connection fees at this time, spreads the costs out to the entire area that will benefit from the improvements and also helps prevent fee adjustments to previously developed areas as more infrastructure is put in place. The total estimated cost of past, present and future infrastructure is approximately \$8.3 million.

Sanitary sewer districts were defined by combining the sewer sheds (Figure IV.A) and following existing parcel lines. This defines which properties will be charge which fees without much confusion. Figure VIII.A illustrates the sanitary sewer districts.





CITY OF ROBINS
 DIVIDED SANITARY SEWER DISTRICTS
 APRIL 2015



SNYDER & ASSOCIATES
 Engineers and Planners

FIGURE VIII.A



A. Sanitary Sewer Connection Fees – Improvement Utilization

The sanitary sewer connection fees based on Improvement Utilization defined the infrastructure improvements that benefited a certain sewer district. If an improvement did not benefit an individual sewer district currently or at any time in the future, that sewer district would not participate in the payback for that improvement. For example, the County Home Road Trunk Sewer project will only benefit the NW-E sanitary sewer district and therefore the sanitary sewer connection fee for NW-A, NW-B, NW-C and NW-D will not include the cost of those improvements.

Table VIII.A.1 – Sanitary Sewer Connection Fees – Improvement Utilization

Sewer District	Connection Fee	Collected Fee
NW-A	\$6,431.91 /acre	\$817,110.07
NW-B	\$4,183.58 /acre	\$609,263.51
NW-C	\$6,431.91 /acre	\$2,500,791.62
NW-D	\$4,896.53 /acre	\$1,166,842.02
NW-E	\$9,609.37 /acre	\$3,199,151.27
Total	-	\$8,293,158.49

B. Sanitary Sewer Connection Fees – Population Equivalent

The DNR accepted residential flow rate is 100 gallons per capita per day (gpcd). Utilizing the residential flow rate, the commercial rate of 5,000 gallons per acre per day and industrial rate of 10,000 gallons per acre per day were converted to a population equivalent. Dividing that into the total estimated infrastructure cost equated to a connection fee of \$218.90 per person. For the residential connection fee, it was assumed that the lots would be 1/3 acre each with 3.3 persons per household. If larger lots are constructed, the collected fee would be reduced. For example the City would lose \$74.43 for every ½ acre lot constructed, \$146.67 for each 1 acre lot constructed and \$204.46 for each 5 acre lot constructed. Although a different residential rate could be calculated for each size of lot, ultimately there will be a lot size that was not previously calculated and ensuring the City is not overcharging would become increasingly difficult.

Table VIII.B.1 – Sanitary Sewer Connection Fees – Population Equivalent

Development Type	Connection Fee	Collected Fee
Residential*	\$722.38 /lot	\$1,552,689.81
Commercial	\$10,945.23 /acre	\$5,896,631.24
Industrial	\$21,890.45 /acre	\$807,757.70
Total	-	\$8,257,078.75

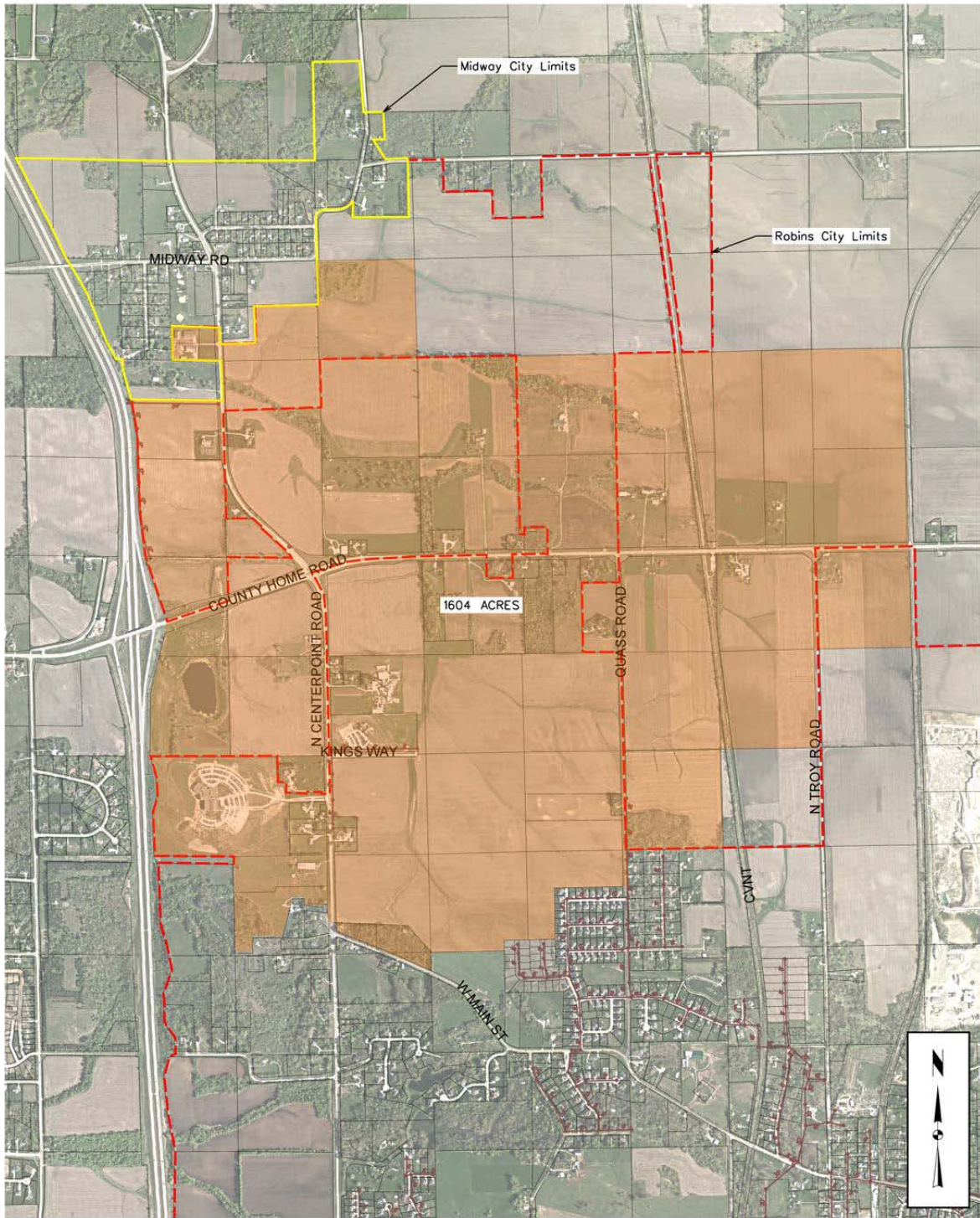
*Based on 0.33 acre lots

C. Sanitary Sewer Connection Fees – Flat Rate

A flat rate was calculated based on the entire sewer district area (Figure VIII.C) and dividing that into the total estimated infrastructure costs. With this rate structure every entity serviced would pay for a portion of every trunk sewer improvement constructed within the service area.



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CITY OF ROBINS
 NW QUAD SANITARY SEWER DISTRICT
 APRIL 2015



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 Engineers and Planners

FIGURE VIII.C



Table VIII.C.1 – Sanitary Sewer Connection Fees – Flat Rate

Connection Fee	Calculated Acres*	Collected Fee
\$6,730.14 /acre	1,227	\$8,257,078.75
Total	-	\$8,257,078.75

*Excludes undevelopable land & land that has waived fees

D. Sanitary Sewer Connection Fees – Combination

Utilizing a combination of the flat rate connection fee and the DNR accepted design criteria of 1,000 gallons per acre per day residential, 5,000 gallons per acre per day commercial and 10,000 gallons per day industrial usage, a development fee and connection fee were determined. The development fee was calculated to allow the City to recoup 50% of the capital improvement costs and will be applied to every acre developed. The developer of the land would be charged this fee at the time of submitting the preliminary plat, final plat or engineering fees. The connection fee was calculated to recoup the remaining 50% of the capital improvement costs and to allocate the amount based on the DNR accepted flow rates. For example since a residential area is estimated to use 1,000 gallons per day per acre and a commercial area is estimated to use 5,000 gallons per day per acre, the commercial property would pay 5 times the connection fee that a residential user would. The connection fee would be paid at the time the building permit was pulled or could also be paid for by the developer.

Table VIII.D.1 – Sanitary Sewer Connection Fees – Combination

Development Type	Development Fee	Connection Fee
Residential	\$3,365.07 /Acre	\$1,200 /Lot
Commercial	\$3,365.07 /Acre	\$6,000 /Lot
Industrial	\$3,365.07 /Acre	\$12,000 /Lot
Total		

Table VIII.D.2 – Combination Sanitary Sewer Connection Fees – Projected Revenue*

Development Type	Fee	Acres	Lots	Collected Fee**
Development Fee	\$3,365.07 /Acre	1,227	-	\$4,128,539.37
Residential	\$1,200 /Lot	-	2,092	\$2,510,690.91
Commercial	\$6,000 /Lot	-	269	\$1,616,220.00
Industrial	\$12,000 /Lot	-	7	\$88,560.00
Total				\$8,344,010.28

*Based on year 2015 rates

**Based on 0.33 acre residential lots, 2 acre commercial lots and 5 acre industrial lots



Table VIII.D.3 – Combination Sanitary Sewer Connection Fees – Rates Adjusted for Inflation*

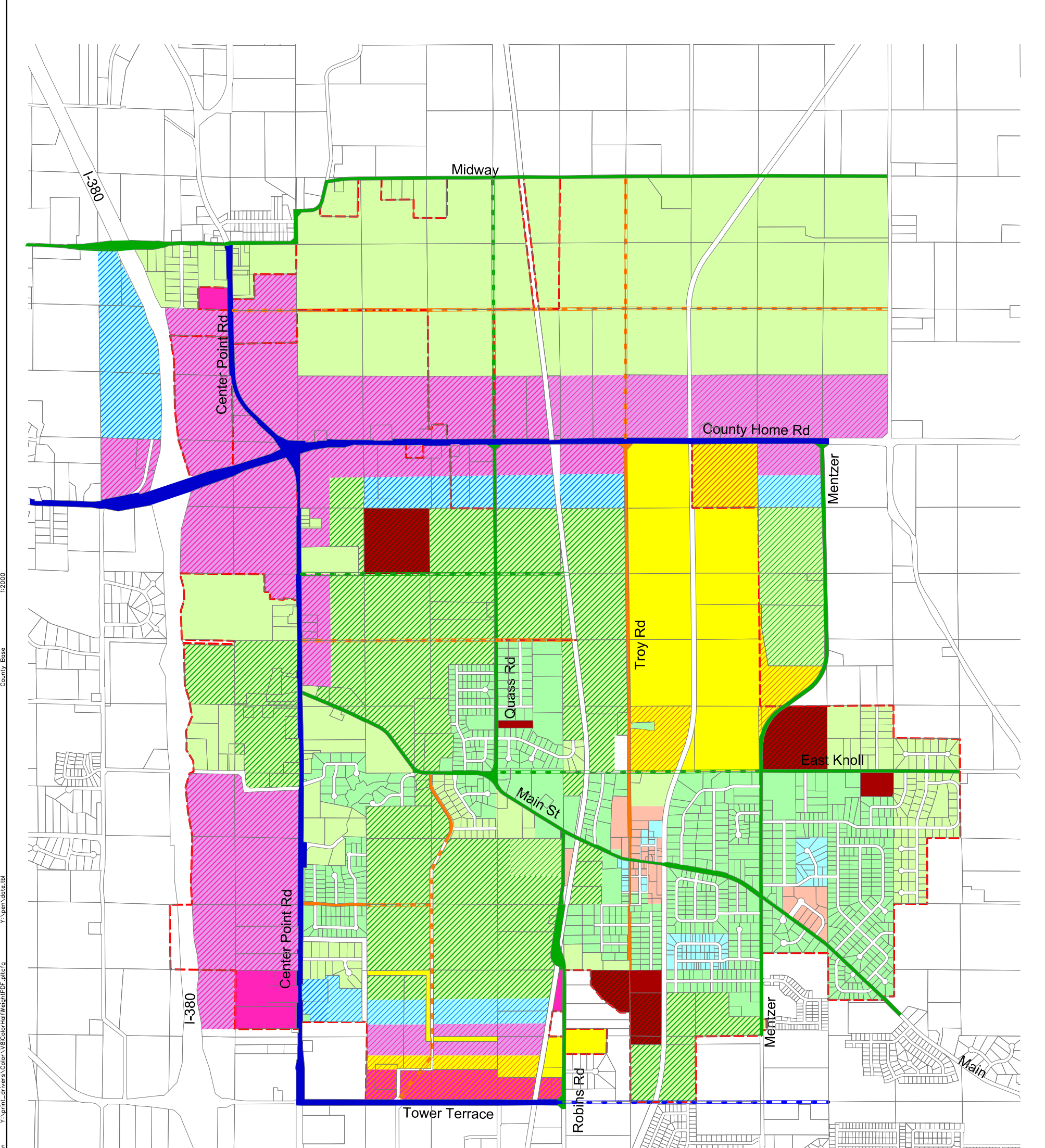
Year	Development Fee (per Acre)		Residential Connection Fee (per Lot)	Commercial Connection Fee (per Lot)	Industrial Connection Fee (per Lot)
2015	\$3,365.07	+	\$1,200.00	\$6,000.00	\$12,000.00
2016	\$3,466.02	+	\$1,236.00	\$6,180.00	\$12,360.00
2017	\$3,570.00	+	\$1,273.08	\$6,365.40	\$12,730.80
2018	\$3,677.10	+	\$1,311.27	\$6,556.36	\$13,112.72
2019	\$3,787.42	+	\$1,350.61	\$6,753.05	\$13,506.11
2020	\$3,901.04	+	\$1,391.13	\$6,955.64	\$13,911.29
2021	\$4,018.07	+	\$1,432.86	\$7,164.31	\$14,328.63
2022	\$4,138.61	+	\$1,475.85	\$7,379.24	\$14,758.49
2023	\$4,262.77	+	\$1,520.12	\$7,600.62	\$15,201.24
2024	\$4,390.65	+	\$1,565.73	\$7,828.64	\$15,657.28
2025	\$4,522.37	+	\$1,612.70	\$8,063.50	\$16,127.00
2026	\$4,658.04	+	\$1,661.08	\$8,305.40	\$16,610.81
2027	\$4,797.79	+	\$1,710.91	\$8,554.57	\$17,109.13
2028	\$4,941.72	+	\$1,762.24	\$8,811.20	\$17,622.40
2029	\$5,089.97	+	\$1,815.11	\$9,075.54	\$18,151.08
2030	\$5,242.67	+	\$1,869.56	\$9,347.80	\$18,695.61
2031	\$5,399.95	+	\$1,925.65	\$9,628.24	\$19,256.48
2032	\$5,561.95	+	\$1,983.42	\$9,917.09	\$19,834.17
2033	\$5,728.81	+	\$2,042.92	\$10,214.60	\$20,429.20
2034	\$5,900.67	+	\$2,104.21	\$10,521.04	\$21,042.07
2035	\$6,077.69	+	\$2,167.33	\$10,836.67	\$21,673.33

*Based on 3% inflation per year










Appendix



















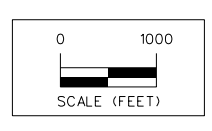


STREETS LEGEND

-  MAJOR ARTERIAL
-  MINOR ARTERIAL
-  COLLECTOR
-  LOCAL STREET
-  FUTURE MAJOR ARTERIAL
-  FUTURE MINOR ARTERIAL
-  FUTURE COLLECTOR

ZONING LEGEND

-  A-1 AGRICULTURAL
-  R-1 LOW DENSITY SINGLE-FAMILY RESIDENTIAL
-  R-2 MEDIUM DENSITY SINGLE-FAMILY RESIDENTIAL
-  R-3 LOW DENSITY MULTIPLE-FAMILY RESIDENTIAL
-  R-4 HIGH DENSITY MULTIPLE-FAMILY RESIDENTIAL
-  RMH MOBILE HOME PARK RESIDENTIAL
-  C-1 CENTRAL BUSINESS DISTRICT
-  C-2 HIGHWAY COMMERCIAL
-  I-1 LIGHT INDUSTRIAL
-  I-2 HEAVY INDUSTRIAL
-  P-1 PUBLIC USE
-  FUTURE COMMERCIAL
-  FUTURE MULTIPLE-FAMILY RESIDENTIAL
-  FUTURE SINGLE-FAMILY RESIDENTIAL
-  FUTURE INDUSTRIAL
-  FUTURE PUBLIC USE



UPDATED: October 18, 2010

**CITY OF ROBINS
ROBINS FUTURE LAND USE MAP**




5/1/2015 KJS M:\2014_PROJECTS\114_0781\Robins_NW_Quad_SS_Study\Cadd\Robins_Future_Land_Use_for_consideration.dgn Y:\print_drivers\Color\VBIColor\Hatch\Weight\pctc1g Y:\perm\date.tbl County_Base 1:2000

Exhibit B

**NORTHWEST LIFT STATION AND SANITARY SEWER
FACILITY PLAN
ROBINS, IOWA**

PROJECT NO. 113.0626.08

NOVEMBER 2013

	<p>I hereby certify that this Engineering Document was prepared by me or under my direct personal supervision and that I am a duly Licensed Professional Engineer under the Laws of the State of Iowa.</p>
	<p><u>Lindsay Beaman</u> <u>11-7-13</u></p>
	<p>Lindsay R. Beaman, P.E. Date</p>
	<p>License Number 19971</p>
	<p>My License Renewal Date is December 31, 2013</p>
<p>Pages or sheets covered by this Seal:</p>	
<p>All</p>	
<p>_____</p>	
<p>_____</p>	

Prepared by
SNYDER & ASSOCIATES, INC.
5005 Bowling Street SW, Suite A
Cedar Rapids, Iowa 52404
Phone: 319.362.9394

November 7, 2013

Marty Jacobs, P.E.
Iowa Department of Natural Resources
502 East 9th St
Des Moines, IA 50319

RE: CITY OF ROBINS – NW LIFT STATION AND SANITARY SEWER FACILITY PLAN

Dear Marty,

On behalf of the City of Robins, Snyder & Associates is submitting for your review the enclosed Northwest Lift Station and Sanitary Sewer Facility Plan. This facility plan has been prepared as required by the IDNR for the proposed construction of a sanitary sewer lift station. The City intends to construct a lift station within the northwestern quadrant of the city in order to serve future development within this area. This report evaluates project locations, preliminary design and planning periods that contribute to the feasibility of this project. The City of Robins does not seek the aid of SRF Funding.

This project has been spurred by the proposed construction of a convenience store/fuel station to be located in this region and the need for sanitary sewer services to this property. While the present day capacity needs of the lift station will be relatively low, the City desires to promote further development throughout this region through availability of public utilities. The proposed location of the lift station allows for long range service to an area of approximately 1,800 acres. As development of this 1,800 acre area likely won't occur over the course of 20 years, short term and long range planning have both been considered for the sizing and staging of the sanitary sewer improvements.

Questions and/or comments can be directed towards myself or Kelli Scott at (319) 350-3464. We appreciate your review of this facility plan and look forward to your approval of the proposed design criteria so that we may proceed with the preparation of plans and specifications.

Sincerely,

SNYDER & ASSOCIATES, INC.



Lindsay Beaman, P.E.
Project Engineer

Enclosure

CC: City of Robins

Exhibit 9B - Preliminary Review of Facility Plan Checklist

Iowa Department of Natural Resources Wastewater Engineering Section

“Facility Plan” means a report certified by a professional engineer licensed to practice in Iowa and prepared in conformance with Chapter 11 of the Iowa Wastewater Facilities Design Standards (IWWFDS). A Facility Plan will not be required for non-funded minor sewer extensions, minor trunk and interceptor sewers, and minor pump stations where comprehensive planning is not completed, necessary or required. Facility planning submittals may be returned if they are deemed incomplete by the Department.

The transmittal letter referenced in Section 11.2.2 of the IWWFDS and a completed Exhibit 9B checklist by the engineer shall be bound with the engineering report. The transmittal letter must:

- Describe fully the scope of the project identified in Design Schedule A.
- Provide a statement on the feasibility of the project.
- Include a statement that this report has been accepted by the client.
- Indicate that the proposed project is in conformance with the long range planning of the area.
- Reference all information and approved planning reports necessary for a review.
- Clearly indicate the purpose of the submittal.

Exhibit 9B is divided into four sections as follows:

- Section 1 – All Projects
- Section 2 – New or Expanded Wastewater Treatment Facility Projects
- Section 3 – Earthen Basin Projects
- Section 4 – SRF Funded Projects

Section 1 must be completed for all projects. Sections 1 and 2 must be completed for projects involving new or expanded wastewater treatment facilities. Sections 1, 2, and 3 must be completed for projects that consist of new or expanded wastewater treatment lagoon facilities. Sections 1 and 3 must be completed for projects involving new or expanded equalization with earthen basins. In addition, complete Section 4 if the project is SRF funded.

Responses of “**Yes**”, “**No**”, “**?**”, or **Not Applicable (“N/A”)** may be used by DNR in completing Exhibit 9B Preliminary Review with explanations given, as appropriate. A “?” mark may be used by DNR staff where additional follow-up, or the consideration of additional information may be warranted before a comment is offered. Every attempt should be made to complete the Exhibit 9B preliminary review checklist using good engineering judgment and as accurately as possible for the benefit of decision makers. If the response is “No” by the engineer for location maps and/or geotechnical report, the transmittal letter must acknowledge that the Facility Plan is incomplete and provide adequate need and justification for the Department to initiate a concept review.

Section 1 – All Projects

1. N/A A work initiation meeting determination has been made. If the meeting was determined to be necessary, the meeting has been held. The scope and milestones for the project have been clearly established.
2. Yes A project location and a recommended alternative have been proposed by the A/E and the conclusion accepted by the Owner in accordance with Step 17, Section 11.2 of the Iowa Wastewater Facilities Design Standards and Design Schedule A.
3. Yes A completed and signed Design Schedule A has been submitted in accordance with Section 11.1 of the Iowa Wastewater Facilities Design Standards.
4. N/A Any proposed variation from the design standards contained in Chapter 567 IAC 64 is identified by the Engineer in accordance with Design Schedule A with justification provided in accordance with DNR rules.
5. Yes A complete and achievable project implementation schedule has been provided identifying all project milestones in accordance with Section 11.2.5.3(k) of the Design Standards.
6. Yes The Appendix (Technical Information and Design Criteria) is provided per Design Standard 11.2.11.
7. Yes The facility plan is signed and certified by a professional engineer licensed in the State of Iowa.

Section 1 – Comment Box:

Section 2 – New or Expanded Wastewater Treatment Plant Projects

8. N/A The Owner has filed an application for a new or amended NPDES permit as needed for the improvements described in the Facility Plan.
9. N/A Completed and signed Design Schedules F and G have been submitted in accordance with Section 11.1 of the Iowa Wastewater Facilities Design Standards.
10. N/A The location maps are prepared by the Engineer in accordance with Design Schedule F (dated October 2005) to the recommended scale and provide all requested detail to conduct a site survey investigation for the proposed new or expanded wastewater treatment facilities.
11. N/A All hydraulic and organic design loadings in Design Schedule G and the Facility Plan are consistent with the preliminary design loadings concurred by the Department.
12. N/A The project has conformed to the Waste Load Allocation (WLA) determination and the effluent limits which have been established by the DNR through Steps 9, 11, 12, 13, and 14 of the wastewater construction permitting procedures.
13. N/A Where anti-degradation requirements apply, the recommended alternative is consistent with the anti-degradation alternatives analysis approved by the Department.
14. N/A New Process Evaluation - all required engineering data and design basis formulated from the data for New Process Evaluation has been approved by the Department under Section 14.4.3 and was prepared by a licensed professional engineer other than the one employed by the manufacturer or patent holder.

Section 2 – Comment Box:

Section 3 – Projects with Earthen Basins (Lagoon and Equalization Basins)

- 15. N/A A completed geotechnical investigation engineering report is provided as a supplement to the engineer's report.

Section 3 – Comment Box:

Section 4 – State Revolving Fund (SRF) Loan Projects

- 16. N/A The proposed project is a fundable category (Refer to Subrule 567 IAC 90.2) for receipt of a CWSRF loan.

- 17. N/A The Intended Use Plan application (Exhibit 8) is enclosed with the Facility Plan, including EPA Form 4700-4 and the "Assurance with Respect to Real Property Acquisition" form.

- 18. N/A The Property/Easement Acquisition Schedule is included.

- 19. N/A The Owner has submitted all required Exhibit 5 information to the Environmental Review Services Coordinator in order to initiate the SRF environmental review.

Section 4 – Comment Box:

This page for DNR Use Only

DNR Decisions:

--- 9B Complete

--- Concept Review Request

Conclusions by DNR:

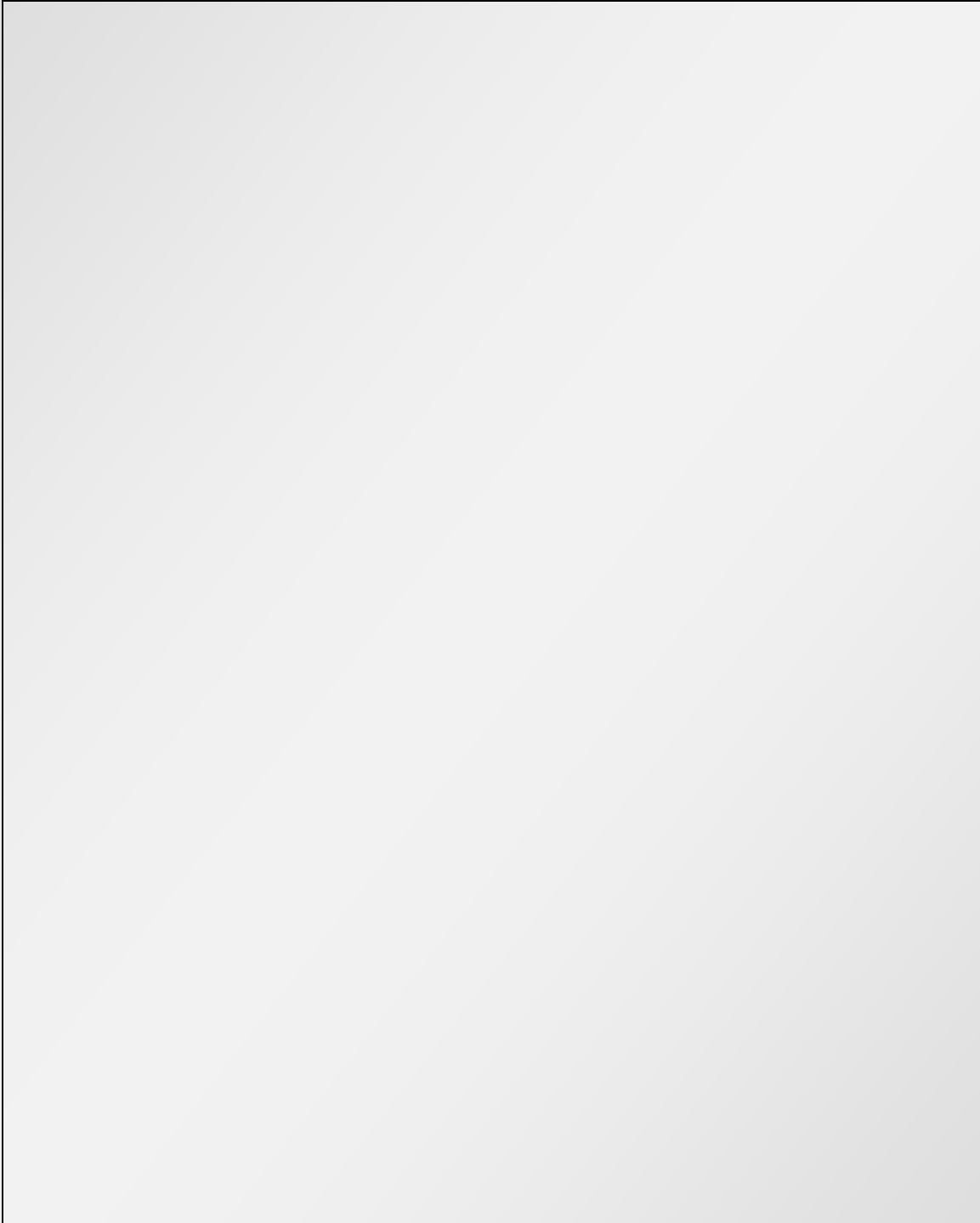
A large, empty rectangular box with a thin black border, intended for DNR conclusions. It occupies the majority of the lower half of the page.

Exhibit 11A

Iowa Department of Natural Resources Wastewater Engineering Section

Construction Permit Application

SCHEDULE A, General Information

APPLICANT		ENGINEER					
OWNER City of Robins		FIRM Snyder & Associates					
ADDRESS 265 South 2 nd St., Robins, IA 52328		ADDRESS 5005 Bowling St. SW, Suite A, Cedar Rapids, IA 52404					
REPRESENTATIVE Honorable Ian Cullis, Mayor	TELEPHONE 319-393-0588	PROJECT OFFICER Lindsay Beaman, P.E.	TELEPHONE 319-362-9394				
PROJECT IDENTIFICATION NW Sanitary Sewer and Lift Station		ESTIMATED START DATE * 3/1/2014	ESTIMATED COMPLETION DATE 11/1/2014				
PLEASE RESPOND TO ALL QUESTIONS							
1. Has an engineering report, facilities plan or other information previously been submitted for this project? If Yes=>		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO				
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">PROJECT IDENTITY</td> <td style="width:50%;">DATE SUBMITTED</td> </tr> </table>		PROJECT IDENTITY	DATE SUBMITTED				
PROJECT IDENTITY	DATE SUBMITTED						
2. Does the project and construction permit application, as submitted, follow the recommendations, design loadings, construction schedule, permit limits, and conclusions of the approved engineering report or facilities plan? If No=> Provide the design basis and technical information justifying all changes.		<input type="checkbox"/>	<input type="checkbox"/>				
3. Are there three complete sets of plans and specifications accompanying this application? For a minor gravity sewer extension within the meaning of 455B.183.3 Code of Iowa and Design Standard 11.1, two complete sets will be adequate for expeditious approval. For more complex projects, three sets of plans and specifications may be requested.		<input type="checkbox"/>	<input checked="" type="checkbox"/>				
4. Are approved standard specifications a part of this application? If Yes=>		<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">APPROVED STANDARD SPECIFICATIONS OF (municipality or firm) Cedar Rapids Metropolitan Area Standard Specifications</td> <td style="width:50%;">DATE APPROVED April 2003</td> </tr> </table>		APPROVED STANDARD SPECIFICATIONS OF (municipality or firm) Cedar Rapids Metropolitan Area Standard Specifications	DATE APPROVED April 2003				
APPROVED STANDARD SPECIFICATIONS OF (municipality or firm) Cedar Rapids Metropolitan Area Standard Specifications	DATE APPROVED April 2003						
5. Does each set of plans and specifications or engineering report accompanying this application contain a "professional engineering seal" executed in conformance with 542B.16, Code of Iowa? If No=> Processing will be delayed pending receipt of applicable design schedules and certified plans, specifications or engineering report.		<input checked="" type="checkbox"/>	<input type="checkbox"/>				
6. Is this a joint wastewater and water supply project? If Yes=> A construction permit application for the water supply project should be submitted separately to the Water Supply Section. A water supply permit fee may be required.		<input type="checkbox"/>	<input checked="" type="checkbox"/>				
7. Is the applicant to provide treatment of effluent resulting from this construction? If No=> A Sewage Treatment Agreement (DNR Form 29) executed by the authority providing treatment must accompany this application.		<input type="checkbox"/>	<input type="checkbox"/>				
8. Is a new or amended operation permit necessary to use the facilities described in this application? If Yes=> A new or amended permit to operate may be requested prior to the receipt of a construction permit.		<input type="checkbox"/>	<input checked="" type="checkbox"/>				
9. Is any waterline located within 10 feet; or any private or public well, lake, or public recreation area located within 400 feet of the proposed construction? If Yes=> Identify and locate the facility(s) relative to the proposed construction.		<input type="checkbox"/>	<input checked="" type="checkbox"/>				
10. Will construction inspection be conducted by a licensed engineer employed by the applicant? If No=>		<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:100%;">NAME OF ENGINEERING FIRM CONDUCTING INSPECTION</td> </tr> </table>		NAME OF ENGINEERING FIRM CONDUCTING INSPECTION					
NAME OF ENGINEERING FIRM CONDUCTING INSPECTION							
11. Will this project utilize CWSRF loan funds?		<input type="checkbox"/>	<input checked="" type="checkbox"/>				
CERTIFICATION							
APPLICANT		ENGINEER					
I certify that I am the authorized representative of the owner and state that the project identified above is approved by the owner.		I certify that all aspects of design included in this application conform to applicable standards contained in Chapter 567 IAC 64, or that an explanation and justification for any proposed variations from such standards is attached. I am familiar with the information contained in this application, and to the best of my knowledge, such information is complete and accurate.					
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><i>Jess S Ceelex</i></td> <td style="width:50%;">11-5-2013</td> </tr> </table>		<i>Jess S Ceelex</i>	11-5-2013	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><i>Lindsay Beaman</i></td> <td style="width:50%;">11-7-13</td> </tr> </table>		<i>Lindsay Beaman</i>	11-7-13
<i>Jess S Ceelex</i>	11-5-2013						
<i>Lindsay Beaman</i>	11-7-13						
SIGNATURE		SIGNATURE					
DATE		DATE					
* Estimated Construction Start Date: Complete applications must be submitted at least 120 days in advance of the date for starting construction in accordance with Rules 567 IAC 60.4 and 64.2							
PLEASE COMPLETE THE SCHEDULE CHECKLIST ON THE FOLLOWING PAGE OF THIS FORM							

Construction Permit Application
SCHEDULE A, General Information, page 2

DOCUMENT CHECKLIST

Identify all categories included in this project. Also, identify schedules attached to this application.

SCHEDULE	TITLE	ATTACHED	INCLUDED IN PROJECT	SUBMITTAL DATE
B	Collection system	<input type="checkbox"/>	<input type="checkbox"/>	_____
C	Lateral Sewer Extension	<input type="checkbox"/>	<input type="checkbox"/>	_____
D	Trunk & Interceptor Sewer	<input type="checkbox"/>	<input type="checkbox"/>	_____
E	Wastewater Pump Station	<input type="checkbox"/>	<input type="checkbox"/>	_____
F	Treatment Project Site Selection	<input type="checkbox"/>	<input type="checkbox"/>	_____
G	Treatment Project Design Data	<input type="checkbox"/>	<input type="checkbox"/>	_____
H1	Schematic Flow Diagram	<input type="checkbox"/>	<input type="checkbox"/>	_____
H2	Treatment Process Loading and Removal Efficiency	<input type="checkbox"/>	<input type="checkbox"/>	_____
H3	Mechanical Plant Reliability	<input type="checkbox"/>	<input type="checkbox"/>	_____
I	Screening, Grit Removal and Flow Measurement	<input type="checkbox"/>	<input type="checkbox"/>	_____
J	Septic Tank System	<input type="checkbox"/>	<input type="checkbox"/>	_____
K1	Controlled Discharge Pond	<input type="checkbox"/>	<input type="checkbox"/>	_____
K2	Aerated Pond	<input type="checkbox"/>	<input type="checkbox"/>	_____
K3	Anaerobic Lagoon	<input type="checkbox"/>	<input type="checkbox"/>	_____
L	Setting Tanks	<input type="checkbox"/>	<input type="checkbox"/>	_____
M	Fixed Film Reactor – Stationary Media	<input type="checkbox"/>	<input type="checkbox"/>	_____
N	Rotating Biological Contactor	<input type="checkbox"/>	<input type="checkbox"/>	_____
O	Aeration Tanks or Basins	<input type="checkbox"/>	<input type="checkbox"/>	_____
P	Gas Chlorination	<input type="checkbox"/>	<input type="checkbox"/>	_____
Q	Sludge Digestion and Holding	<input type="checkbox"/>	<input type="checkbox"/>	_____
R1	Sludge Dewatering and Disposal	<input type="checkbox"/>	<input type="checkbox"/>	_____
R2(A & B)	Low Rate Land Application of Sludge	<input type="checkbox"/>	<input type="checkbox"/>	_____
R3	Land Application of Sewage Sludge (To be developed)	<input type="checkbox"/>	<input type="checkbox"/>	_____
S	Land Application of Wastewater (To be developed)	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Sewage Treatment Agreement	<input type="checkbox"/>	<input type="checkbox"/>	_____

Identify any categories included in this project which are not provided in the above list of schedules.

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APPENDIX

Exhibit A: Northwest Lift Station and Sanitary Sewer – Future Service Areas

Exhibit B: Northwest Lift Station and Sanitary Sewer – Ultimate Build-Out Gravity Sewer

Exhibit C: Agreement Between City of Cedar Rapids and City of Robins for the Construction, Operation, and Maintenance of Water Pollution Control Facilities



I. Purpose and Scope

The City of Robins intends to construct a sanitary sewer lift station within the northwestern quadrant of the city limits in order to serve future development within this area. Through engineering consultation, the City has determined the most appropriate location for construction of this lift station in order to provide the greatest development area that could be ultimately served by gravity sewer. The design of this Northwest Lift Station will take into consideration the effects of both short term and long term development.

The purpose of this Facility Plan is to evaluate the collection system improvements that will connect this northwest quadrant of Robins into the remainder of the collection system.

This evaluation includes:

- Planning Period and Rate of Development Projections
- Estimated Future Design Development and Wastewater Flows
- Existing System Evaluation
- Recommended Design Alternative in consultation with City Staff
- Basis of Design for the Recommended Alternative
- Implementation Schedule for the Design and Construction of Improvements

II. Analysis of Future Conditions

A. Service Area and Land Use

For the purposes of this report, the future growth of the Northwest Lift Station service area has been subdivided into three planning periods, current conditions to 10 years growth projections, 10 years to 20 years growth projections, and ultimate build-out development potential. Within the City of Robins developmental growth occurs with some volatility, and while certain estimates are being placed upon future development activities, locations, and schedules, the actual growth of this region will be continuously monitored to avoid any future sanitary sewerage capacity shortfalls.

For the current growth conditions to the 20 year design, the boundaries of the lift station service region have been defined by the expectations of representatives of both the City Council and the local Robins economic development group. (See Exhibit A) Flow rates used for all future growth were based on City of Robins zoning designations for the proposed service areas paired with the design criteria set forth in the DNR Design Standards for development types.

Currently, the model developed for this Northwest Service Area considers 320 acres of commercial growth incorporated into the 20-year planning period. The DNR minimum design equivalent for commercial development is 5,000 gallons per day per acre (gpd/acre). Representatives of the City of Robins and Snyder & Associates agree that, while full development of the 320 acres within 20 years could be possible, there is a great disparity from the present day nearly undeveloped state to the design 320 developed commercial area. There are downsides to oversized utility improvements and these are briefly discussed later within the report. As such, the present day lift station design will incorporate a 10-year projected growth figure in addition to the 20-year growth projection. Representatives of the



City of Robins have indicated that a 25% development of this 320 acre area is a reasonable projection for occurrence within the next 10 years.

Table II.A – Future Design Capacity

Design Period	Service Area	Design Criteria	Needed Capacity
10-Year Design Flow	80 Acres (25%)	5,000 gpd/acre	400,000 gpd
20-Year Design Flow	320 Acres (100%)	5,000 gpd/acre	1,600,000 gpd

Through the use of existing topographical data, an ultimate build-out region that could be served by a lift station at this location has also been reviewed. Ultimate build-out conditions would include further estimated development of 1,500 acres (approx. 1,800 acres total) that could consist of commercial, industrial, and residential development. The currently proposed lift station design has not taken into consideration the sufficient capacity necessary for such extensive development. Therefore, the City of Robins will need to revisit development goals and existing conditions that are occurring within this area at some later date.

B. Site Selection and Configuration

The site selection was based upon the City’s desire to serve the greatest region through the use of a gravity sewer collection system that flows to a common lift station. The site of lift station improvements was also prompted by the development and early construction of a convenience store/fuel station along County Home Road between North Center Point Road and Interstate 380.

The Northwest Lift Station will be located within the Robins corporate limits east of Interstate 380, west of North Center Point Road, south of the unincorporated community of Midway, and north of County Home Road. More specifically, it will be located within the NE ¼ of the SE ¼ of Section 7, Township 84 North, Range 7 West, Linn County, Iowa. The construction site and final facility location will be on land that is not owned by the City of Robins, and the City will acquire permanent easements for any improvements located on private property.

This location is outside of any floodplain; therefore no permits will be submitted to the Iowa Department of Natural Resources or the US Army Corps of Engineers. Permits that will be applied for and acquired prior to construction include: DNR Wastewater Construction Permit, DNR NPDES General Permit No. 2 for Storm Water Discharge Associated with Construction Activities, and a DNR Air Quality Bureau Registration for Stationary Compression Ignition Internal Combustion Engines (Less than 400 Brake Horsepower).

The lift station will include a concrete wet well structure with a single incoming gravity sewer, a trash basket, variable frequency drive (VFD) controlled pumps, a diesel emergency generator, and electrical control equipment. Two submersible solids handling pumps will be sized such that the design flow rate may be achieved with the largest pump out of services.

C. Force Main and Pumping Alternatives

The initial stages of lift station pump design require the sizing of the proposed force main in order to determine the affects of head losses occurring within the pipe on the performance and operation ranges of the lift station pumps. Within this particular project, the static head has a large impact on the total dynamic head (TDH) regardless of the force main size. This static head represents the vertical distance

between the highest and lowest points along the force main. The difference between the proposed surface level of the wastewater within the wet well (lowest point) and the highest point within the proposed force main alignment is estimated to be 66 feet. The friction head losses, which also attribute to TDH, are primarily based upon the length and diameter of the force main piping. The minor losses (the head losses that occur through valves and fittings) have been considered inconsequential at this point, but will be taken into effect during the final design phases. The final pump selection will be based upon the design flow and the resulting TDH that is calculated within the designed force main. Per DNR Standards, the minimum self-scouring velocity of the force main shall not be less than two feet per second and the maximum velocity should not exceed eight feet per second.

Some preliminary force main sizing selections were reviewed for both appropriate pump TDH and force main sizing based on proposed capacities at particular points in time. These options are summarized below:

Table II.C – Preliminary Force Main Design

Option	Design Period	Pumping Capacity	Force Main Size	Approx. TDH (feet)	Velocity (ft/sec)
1	10-Year Design Flow	400,000 gpd	6-inch	117	3.2
	20-Year Design Flow	1,600,000 gpd	6-inch	727	12.6
2	10-Year Design Flow	400,000 gpd	8-inch	79	1.8
	20-Year Design Flow	1,600,000 gpd	8-inch	229	7.1
3	10-Year Design Flow	400,000 gpd	6-inch	117	3.2
	20-Year Design Flow	1,600,000 gpd	Dual 6-inch	249	6.3

Option 1: 10-Year and 20-Year Design Flow with 6-inch force main

Utilizing a proposed 6-inch force main to meet the demands of the 10-year design flow rate of 400,000 gpd, the estimated TDH is 117 feet with a velocity of 3.2 fps. This option would utilize 2 submersible pumps, each rated to meet the design 400,000 gpd. This option would not be able to meet the needs of the 20-year design flow rate of 1,600,000 gpd due to extremely high TDH (727 feet) and high velocity (12.6 fps). The maximum flow rate that would be capable for the purposes of achieving reasonable headlosses (<250 feet) within a 6-inch force main would need to be approximately 800,000 gpd.

Option 2: 10-Year and 20-Year Design Flow with 8-inch force main

Utilizing a proposed 8-inch force main to meet the demands of the 20-year design flow rate of 1,600,000 gpd, the estimated TDH is 229 feet with a velocity of 7.1 fps, both achievable values. However, through an 8-inch force main, the 10-year design flow rate of 400,000 gpd (and anything less than) would not have the velocity necessary to meet the minimum 2 fps self-scouring velocity (1.8 fps). The minimum flow rate that would be capable of meeting the minimum 2 fps self-scouring velocity within an 8-inch force main would need to be approximately 450,000 gpd. The pumps could be sized such to meet this minimum pumping need, however an oversized force main also leads to greater storage time within the force main, leading to septicity and the creation of hydrogen sulfide (H₂S), which could have extremely detrimental effects to any concrete structures downstream.

Option 3: 10-Year and 20-Year Design Flows within dual 6-inch force mains

Through the construction of dual parallel 6-inch force mains, the 10-year design flow rate of 400,000 gpd could be met utilizing only one of the 6-inch force mains, as evaluated through Option 1 above. The 20-year design flow rate of 1,600,000 gpd could then utilize both 6-inch force mains with an estimated



TDH of 249 feet and a velocity of 6.3 fps. This option allows for piping that could meet both the 10-year and 20-year design flows without the concern of excessive head losses or too low of pipe velocities.

Due to the large difference between the immediate, 10-year design, and 20-year design pumping needs, it is not practical to construct the lift station with pumps sized for the 20-year design. Rather, it would be more efficient to size the lift station for pumps capable of serving the immediate to the 10-year design needs, and also plan for the physical size needs associated with 20-year design capacity pumps. This would include consideration for the future needs and upgrade potential for the wet well structure and storage capacity, base elbow sizes, space between pumps, and the sizing needs of any auxiliary equipment, such as hoists and electrical service.

III. Ultimate Build-Out Plan

A preliminary plan has been put in place for the ultimate build-out of the Northwest Lift Station, such that the construction of this lift station and sanitary sewer improvements project, as well as future development of the region, can be built with future growth in mind. Some improvements may need to be oversized during initial years following construction but capable of meeting the ultimate future needs. The goal is to provide sanitary sewer services to the region with minimal future disruptions and reconstruction expenses.

A. Ultimate Build-Out Gravity Sewer

The design of the NW Sanitary Sewer and Lift Station improvements was initially prompted by the proposed development of the Burd Convenience Store at the intersection of County Home Road and North Center Point Road. The intent is to provide conveyance of sanitary sewage from the convenience store location to the NW Lift Station through gravity sewer.

The ultimate service area of the sewer collection main that will be utilized to serve the Burd Convenience store was reviewed for the purposes of sizing this pipe. Approximately 160 Acres of commercially zoned land could ultimately be served by this gravity sewer collection (as shown on attached Exhibit B – referred to as South Trunk).

Table III.A.1 - South Trunk Sewer Ultimate Design Capacity

Service Area	Design Criteria	Needed Capacity
160 Acres	5,000 gpd/acre	800,000 gpd

Through the construction of a 12-inch gravity sewer main at a minimum allowable slope of 0.22% (necessary to meet 2 fps minimum velocity), the carrying capacity through the pipe would be approximately 1.0 MGD when flow is at a depth of 3/4 the pipe diameter. This has been deemed the most appropriately sized pipe needed to meet the future design area of the collection system to the south of the proposed Northwest Lift Station and therefore will be used in the construction of the “South Trunk” sanitary sewer extension that will be installed as a part of this project.

The ultimate service area to the east of the Northwest Lift Station that would be served by a different trunk sanitary sewer pipe consists of approximately 1,640 Acres. The majority of this area exists as undeveloped agricultural land, and has not been zoned for future development potential. For the purposes of estimating the size of trunk sewer needed to serve this ultimate build-out area (as shown on



attached Exhibit B – referred to as East Trunk), assumptions were placed on development types and utilized to determine future flow rates.

Table III.A.2 - East Trunk Sewer Ultimate Design Capacity

Development Type	Service Area	Design Criteria	Needed Capacity
5% Industrial	82 Acres	10,000 gpd/acre	0.82 MGD
20% Commercial	328 Acres	5,000 gpd/acre	1.64 MGD
75% Residential	1,230 Acres	1,000 gpd/acre	1.23 MGD
Total	1,640 Acres	-	3.69 MGD

Through the construction of a 24-inch gravity sewer main at a minimum allowable slope of 0.08% (necessary to meet 2 fps minimum velocity), the carrying capacity through the pipe would be approximately 4.10 MGD when flow is at a depth of 3/4 the pipe diameter. This has been deemed the most appropriately sized pipe needed to meet the future design area of the collection system to the north and east of the proposed Northwest Lift Station and therefore will be used in the construction of the future sanitary sewer extension as this area is further developed.

No construction of “East Trunk” improvements have been scheduled to occur as a part of this project.

B. Ultimate Build-Out Force Main

The ultimate build-out service area for the Northwest Lift Station and force main has previously been discussed as consisting of 1,800 acres, which may be subject to moderate development over the next few decades. At some point, the proposed dual 6-inch force main will no longer have adequate capacity to serve this region. Likewise, the downstream Kings Way Lift Station and force main will not be able to serve these high flows either. At this time, it has been assumed that once the Kings Way Lift Station reaches the end of its useful life, it will be eliminated and NW Lift Station force main piping would be extended through its location to connect with existing Kings Way force main piping. Additional force main piping would have to be added to the Kings Way force main in order to achieve the necessary additional capacity. Furthermore, the gravity collection system that is currently routed to the Kings Way Lift Station would have to be routed north through collection system improvements to the Northwest Lift Station.

The ultimate build-out needs of the Northwest Lift Station service area have been thoroughly assessed for potential future needs, however the City of Robins and Snyder & Associates understand that as development and growth within the area occurs, the needs of the sanitary sewer collection system must be re-reviewed and re-analyzed to determine the most appropriate course of action to be pursued.



C. Cedar Rapids Water Pollution Control Facility

The City of Robins and the City of Cedar Rapids have an agreement in place pertaining to the construction, operation, and maintenance of the Cedar Rapids Water Pollution Control Facilities. This agreement was signed in 1980, and stated that the City of Robins would be provided the following capacity at the treatment plant:

Table III.C.1 – 1980 Agreement Allowable Flows to Cedar Rapids Water Pollution Control Facility

Maximum Flow	1.120 MGD
Average Flow	0.400 MGD
BOD	600 lbs/day
SS	800 lbs/day
TKN	120 lbs/day

The agreement also states that the capacity set forth is the total capacity available to the City of Robins except that the City of Cedar Rapids reserves the right to sell additional capacity in the future if additional capacity is available. Furthermore, where additional capacities are not readily available, then the City of Robins is required to reduce its loadings or aid the City of Cedar Rapids in water pollution control facility expansion as it benefits City of Robins.

In recent years, the City of Robins has exceeded the limitations of the agreement with the City of Cedar Rapids. (See Table III.C.2) The City of Cedar Rapids is aware of the sanitary sewer flows contributed by the City of Robins to the Water Pollution Control Facility, as Cedar Rapids staff monitors the flow rates on a daily basis and provide the monthly totals to the City of Robins and Snyder & Associates. All parties have recently communicated and agree that there should be some discussions to address and update the agreement and the outdated flow limitations, however that topic is not being addressed within this report.

Table III.C.2 – Robins Actual Sewage Flow to Cedar Rapids Water Pollution Control Facility

	2009	2010	2011	2012	2013 (thru Sept)
Max Day (GPD)	1,262,722	1,009,950	1,632,317	576,000	960,000
Average Day (GPD)	325,310	456,507	497,435	310,652	376,005

D. Indian & Dry Run Creek Trunk Sanitary Sewer Capacity Improvements Study

In 2007, a completed study of the capacity needs of the Indian and Dry Run Creek Trunk Sanitary Sewer was submitted to the Linn County Regional Planning Commission. This study was prepared for the purposes of sizing and prioritizing upgrades to these trunk sewers based on capacity needs and costs. Planning for the future growth of the City of Robins was included within this study, as Robins is located at the most upstream collection point along the Indian Creek Trunk Sanitary Sewer.

This information has been included within this report for the purposes of demonstrating the planning that has already been developed for the trunk sanitary sewer downstream of the Robins NW Lift Station and Sanitary Sewer Improvements.



IV. Recommendations and Conclusions

The City of Robins wishes to begin construction of sewage conveyance improvements in the spring of 2014, such that services will be available for the to-be constructed convenience store. This report has reviewed some of the future design options that would be most suited for the development of this northwestern area of Robins.

Construction of dual parallel 6-inch for mains, as noted in Option 3, would provide the appropriately sized infrastructure for both the 10-Year and 20-Year design conditions. It is recommended that only one of the 6-inch force mains is utilized until the pumping flows exceed the allowable capacity of one 6-inch force main.

Regarding pump sizing, it is recommended that during the initial construction of the Northwest Lift Station that the pumps are sized as necessary for the 10-year design flows. In the future, when flows to the new lift station increase to levels approaching or surpassing the initial design capacity, the lift station pumps shall be upgraded with greater capacity pumps. As such, the proposed configuration for the new lift station should provide space and flexibility for future capacity expansion.

Within the City of Robins developmental growth occurs with some volatility, and while certain estimates are being placed upon future development activities, locations, and schedules, the actual growth of this region will be continuously monitored to avoid any future sanitary sewerage capacity shortfalls.

V. Lift Station Planning and Design Schedule

TASK	TARGET COMPLETION DATES
Facility Plan Submittal to the DNR	November 8, 2013
Soil Borings / Survey	November 1, 2013
Check Plan Submittal (60%) (City & DNR)	November 22, 2013
Check Plan Review Comments	December 6, 2013
Final Plan Submittal (100%)	December 22, 2014
Permit Application Submittal (DNR)	December 22, 2014
Bid Letting	January 29, 2014
Construction	Spring/Summer 2014



VI. Lift Station and Sanitary Sewer Cost Estimate

The estimated cost for the new lift station is detailed in Table VI.A (below). The cost estimate includes construction of new gravity sewer and force main to connect the new lift station to existing collection system.

Table VI.A – Opinion of Probable Cost

ITEM NO.	ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	ITEM TOTAL
1	Sanitary Sewer Main, 12"	2,000	LF	\$40	\$80,000
2	Sanitary Sewer Main, 24"	20	LF	\$75	\$1,500
3	Sanitary Sewer Force Main, 6"	12,600	LF	\$30	\$378,000
4	Sanitary Sewer Casing, 10", Bore	80	LF	\$200	\$16,000
5	Sanitary Sewer Manhole	7	EA	\$3,300	\$23,100
6	Air Release Manhole	1	EA	\$3,300	\$3,300
7	Lift Station, Complete (Temporary)	1	LS	\$115,000	\$115,000
8	Emergency Generator	1	EA	\$20,000	\$20,000
9	Trench Excavation through Rock	400	CY	\$60	\$24,000
10	Seeding	6.0	AC	\$3,000	\$18,000
11	Traffic Control, Mobilization, etc.	1	LS	\$47,500	\$47,500
12	Easement	1.40	AC	\$15,000	\$21,000
13	Design & Construction Engineering	1	LS	\$139,000	\$139,000
	SUBTOTAL				\$886,400
	CONTINGENCIES (20%)				\$177,300
TOTAL OPINION					\$1,064,000

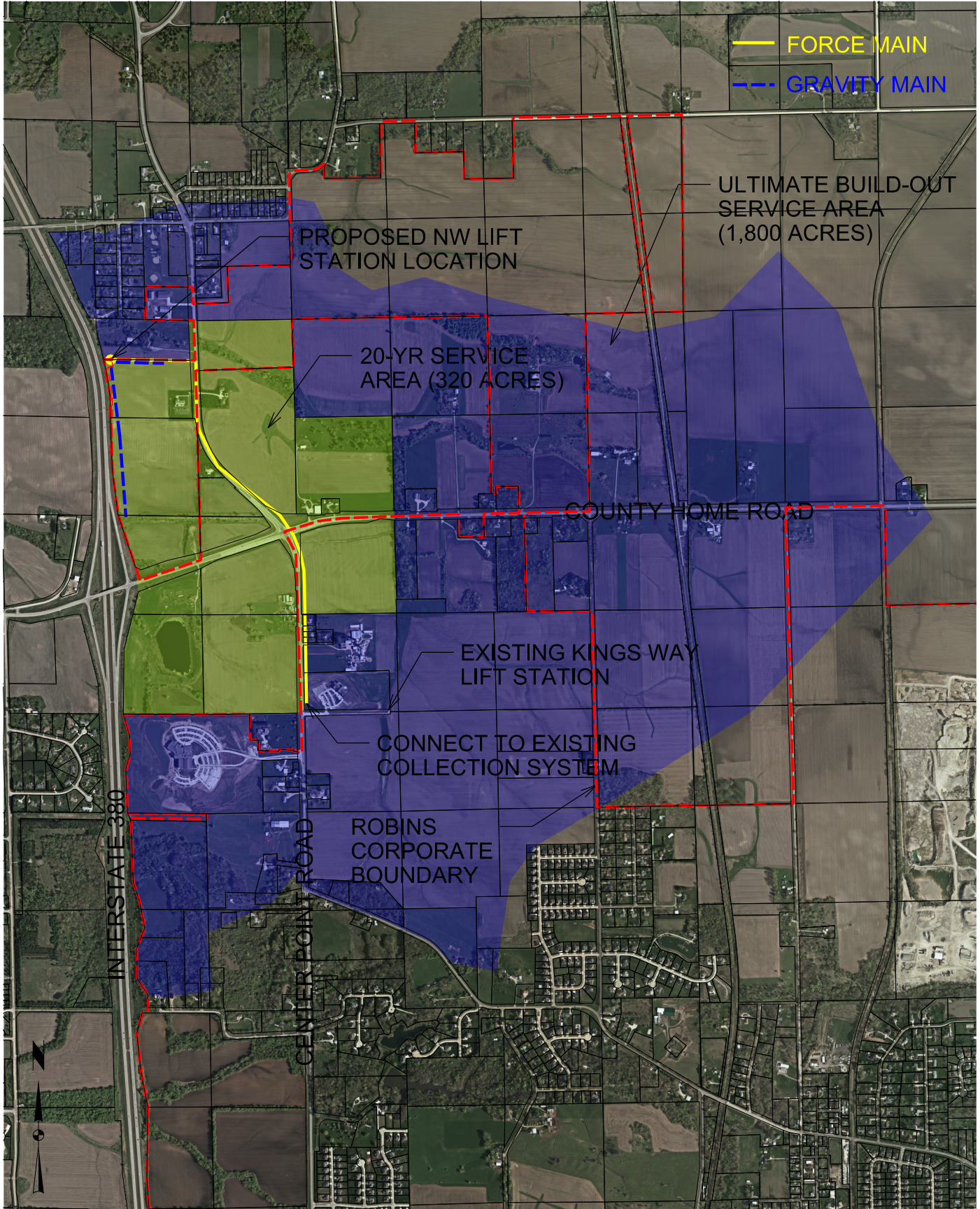
VII. Project Financing

The City of Robins plans to finance this lift station and sanitary sewer improvement process with local City funds.



Appendix

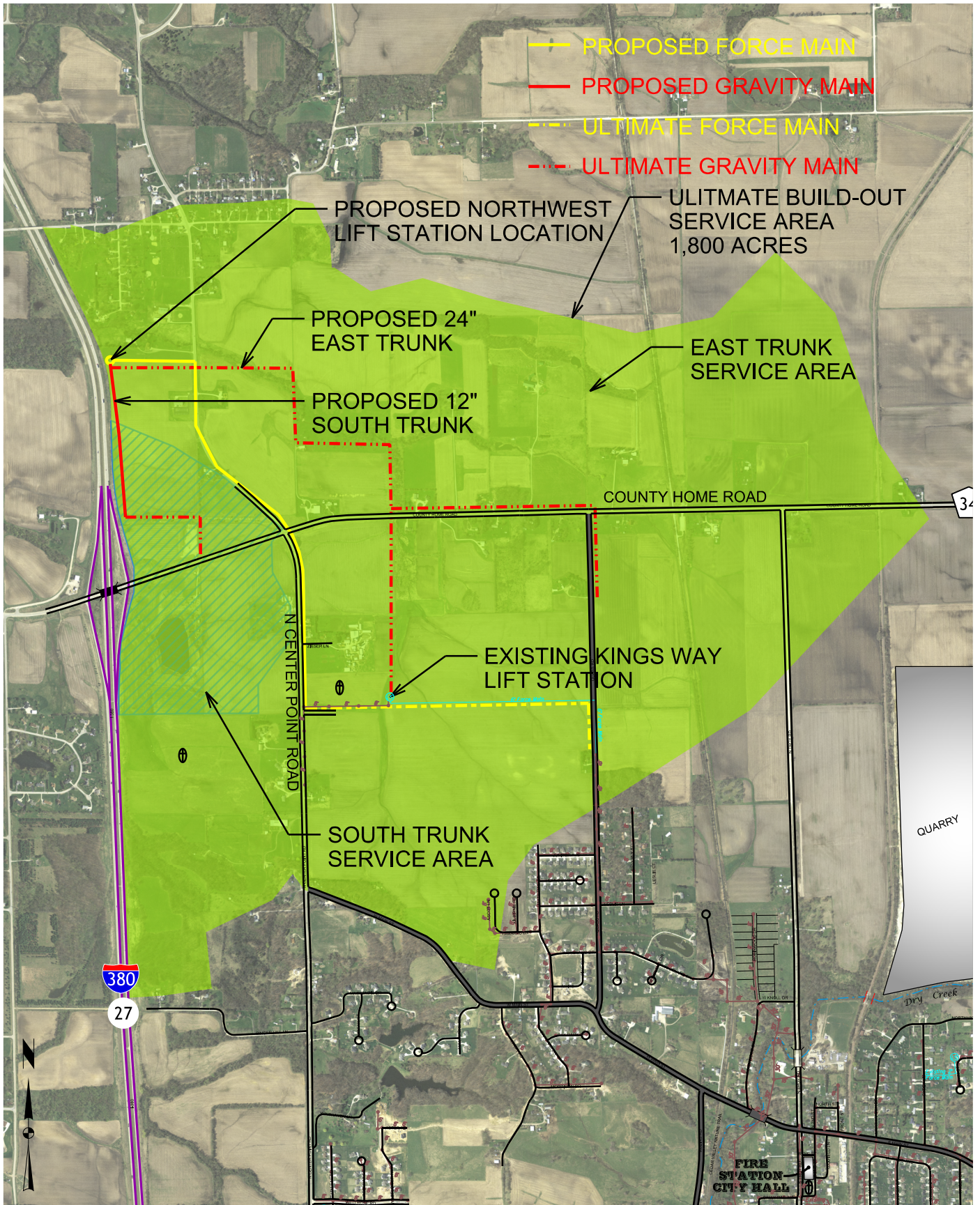




CITY OF ROBINS
 NORTHWEST LIFT STATION AND SANITARY SEWER
 FUTURE SERVICE AREAS

EXHIBIT A

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CITY OF ROBINS
 NORTHWEST LIFT STATION AND SANITARY SEWER
 ULTIMATE BUILD-OUT GRAVITY SEWER

EXHIBIT B

Exhibit C

DESIGN CONCEPT REPORT
ROBINS 1997 TRUNK SEWER EXPANSION
CITY OF ROBINS, IOWA
MAY 5, 1997
SNYDER & ASSOCIATES PROJECT #97-021-G

Prepared For:
City of Robins, Iowa

May 5, 1997
S&A File No.: 97-021-G

DESIGN CONCEPT REPORT
ROBINS 1997 TRUNK SEWER EXPANSION
CITY OF ROBINS, IOWA
MAY 5, 1997
SNYDER & ASSOCIATES PROJECT #97-021-G

I. LAND USE:

- A. Based on the commercial and residential growth projections, the area to be served by the trunk sewer is intended to be primarily residential with some commercial. The area served with flow generating potential is 1,828 acres of which 1,670 is projected to be residential use. See attached Appendix A (Service Area) for the drainage areas used to determine service area and design calculations.
- B. Iowa Department of Natural Resources (IDNR) Minimum Design Equivalents were used to calculate possible flows generated for a given land use. The following design capacities were used single family residential 1,000 gpd/acre, multi-family residential 1,200 gpd/acre, and commercial 5,000 gpd/acre. An IDNR peaking factor ranging between 2.5 and 3.2 was used to determine the design capacities the trunk sewers.
- C. Infiltration - The design allowance for infiltration is 200 gallons per day per inch of pipe diameter per mile of pipe. Flows generated by infiltration are considered negligible.

II. ALIGNMENT ANALYSIS

- A. Utilities - Very few utility conflicts were encountered when researching the proposed construction area, and aren't expected to present significant problems.
- B. Facility Extension Alignments - Please see attached Appendix B (Concept Plan).
- C. Environmental/Territorial Issues.
 - 1. Wetlands - The proposed sewer will parallel Dry Creek for the majority of the project. The proposed alignment will cross Dry Creek in one location. A Joint Application form needs to be filed to IDNR and US Army Corps of Engineers of wetland determination once a route has been selected and plans have been completed. Application review and processing will likely take 60 to 90 days.

Areas disturbed will need to be restored to original contours and vegetation re-established.

2. Erosion Control - The Contractor will be required to use methods and materials to minimize soil erosion. Top soil will be stripped and stored during construction and replaced during final grading.
 3. Cedar Valley Nature Trail - The Linn County Conservation Department (LCCD) has been notified of the project, and have requested a letter describing the project and proposed route. Per Dan Biechler with LCCD, a Construction Agreement will need to be executed between the City and LCCD. Mr. Biechler plans to present the project to the Conservation Board, and if additional permits or agreements need to be addressed he will notify us.
- D. Land Acquisition Issues - Discussions with property owners regarding easements for a sanitary sewer have been started. We are proposing that compensation be made for both permanent easements (\$2,000/acre - residential lawn, \$1,000/acre - agricultural pasture, \$500/acre - densely wooded) and temporary easements (\$1,000/acre - residential lawn, \$500/acre agricultural pasture, \$250/acre - densely wooded). These compensation values are considered above average for normal conditions, but can be adjusted higher in some instances.
- E. Storm Water Drainage and Conveyance - The site will be returned to the original contours following construction of the trunk sewer. Erosion control materials will be installed to protect slopes and drainageways.
- F. Maintenance - Sewer maintenance will be obtained by accessing the sewer through the manholes. A permanent easement will be obtained along the trunk sewer line for future access.
- G. Geotechnical Information - Previous borings and SCS information indicate the area of the proposed sewer has a bedrock depth of 25' or less. Based on previous borings we aren't anticipating a significant amount of bedrock along the recommended route. However, to evaluate the previous soil borings we have made arrangements to perform at least seven soil borings along the proposed route to determine locations of rock deposits and subsoil moisture. Access permits have not yet been obtained at the time of this report. Access to the site will be dependent upon the weather, ground conditions, and land owner notification. Two borings were taken along route SW - 2, based on estimated trench depths bedrock and subsoil moisture would present a construction problem and could add significant costs as indicated in Appendix C.

- H. Permanent Easement Width - We recommend that a 30' wide permanent easement be secured along the chosen route.
- I. Temporary Construction Easement - We recommend that an additional 30' easement be obtained for construction activities.
- J. Pipe Materials - The following is a list of recommended pipe materials suitable for this project. The material list complies with the Metro Area Design Standards and the Robins Standard Specifications. We recommend the following list:
1. Polyvinyl Chloride Pipe (PVC) 4"-15" conform to ASTM D3034.
 2. Polyvinyl Chloride Pipe (PVC) 18"-36" conform to ASTM F679.
 3. Polyvinyl Chloride Composite Pipe (PVC Truss) 8"-15" conform to ASTM D2680.
 4. Lined Reinforced Concrete Pipe (PRCP) 12"-144: conform to ASTM C76.
 5. Ductile Iron Pipe (DI) 8"-54" Carbon to AWWA C151/ANSIA21.4.
- K. Structures - Manhole sizes = 48" and 60".
- L. Opinion of Construction Cost - Please see attached Appendix C (Opinion of Probable Costs).
1. SW - 1 = \$331,066
 2. SW - 2 = \$439,596
 3. NW - 1 = \$171,387
 4. NE - 1 = \$ 92,825
- M. Acres Served By Line Segment:
1. SW - 1 = 1,828 Ac..
 2. SW - 2 = 1,828 Ac.
 3. NW - 1 = 1,088 Ac.
 4. NE - 1 = 607 Ac.
- N. Valuation Based On Cost Of Sewer Installation/Acre Served:
1. SW - 1 = \$181/Ac.
 2. SW - 2 = \$240/Ac.
 3. NW - 1 = \$157/Ac.
 4. NE - 1 = \$153/Ac.

- O. Recommendations - Based on cost of service valuations, we recommend that the City of Robins select line SW-1, NW-1, and NE-1 as the chosen route and concept to be used for the Robins 1997 Trunk Sewer Expansion.

III. SANITARY SEWER POLICY

With this proposed extension and others in the future, new Sewer Connection Service Charges (SCSC) need to be established to recover the indebtedness incurred by the City. A “Guaranteed Payback Agreement” along with the SCSC should be used when extending a sewer to a proposed subdivision. A sewer policy is being drafted which will address the SCSC and the Guaranteed Payback Agreement. Adoption of this policy will be critical upon completion of this project.

IV. ROBINS/CEDAR RAPIDS JOINT PROJECT

The City of Cedar Rapids has shown a desire to make modifications to the proposed sewer project. These modifications would enable Cedar Rapids to service areas north and east of Robins. The desired level of participation by Cedar Rapids, details on ownership, and the breakdown of project costs have not yet been determined. Upon a fair and equitable agreement with Cedar Rapids, we would recommend that Robins and Cedar Rapids enter into a joint project agreement.

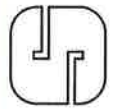
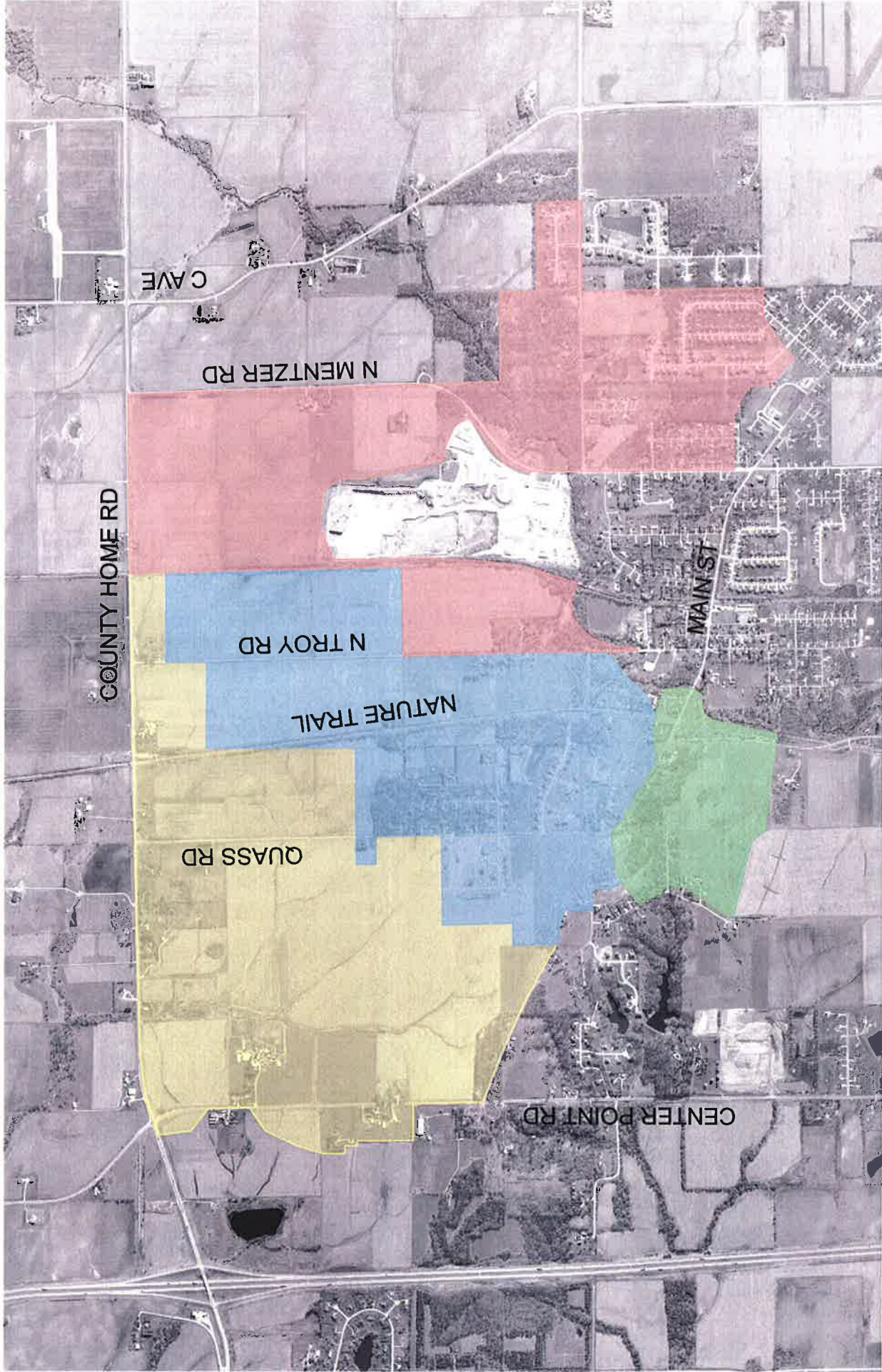
V. DESIGN REQUIREMENTS

- A. Pipe Diameter - Design flow at a depth no more than .67 of pipe diameter for pipe sizes 8” - 15” and .75 of pipe diameter for pipe sizes larger than 15” were used to size pipes. For recommended Line SW-1 there is 1,800 LF of 27” and 2,170 LF of 24”, for Line NW-1 there is 820 LF of 18” and 2,180 LF of 15”, for Line NE-1 there is 1,400 LF of 18”.

MH #1 to MH #6	=	27”
MH #6 to MH #13	=	24”
MH #13 to MH #15	=	18”
MH #16 to MH #22	=	15”
MH #13 to MH #33	=	18”

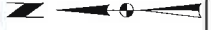
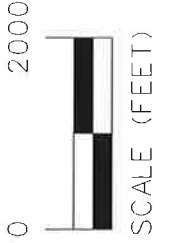
- B. Slopes - Minimum slope on Lines SW-1, NW-1, and NE-1 is .11%.
- C. Criteria for pipe depths - IDNR criteria will be equaled or exceeded.
- D. Downstream pipe size concerns - The capacity of the existing 18” trunk sewer where Line SW-1 ties in will need to be reviewed and updated in

the future. The existing 18" line is not sized large enough to handle the ultimate design flow from SW-1. A future line will need to be extended to the south to handle the ultimate sewer flows. The time schedule for the extension of this line is dependent upon how fast the service area develops.

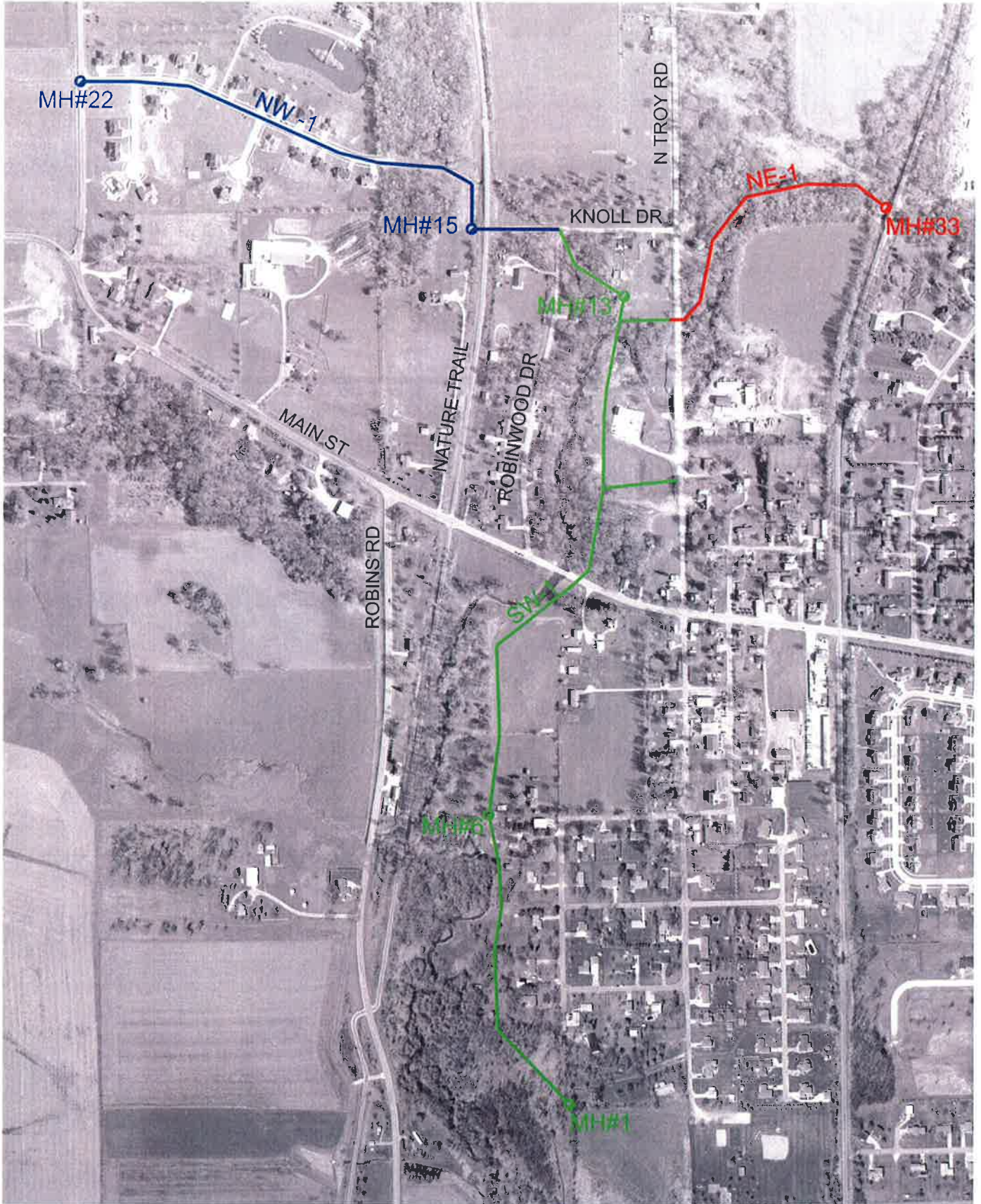


SNYDER & ASSOCIATES
Engineers and Planners

CITY OF ROBINS
TRUNK SEWER EXPANSION
SERVICE AREA



APPENDIX A



CITY OF ROBINS
 REUNK SEWER EXPANSION
 CONCEPT PLAN



APPENDIX C
Robins Trunk Sewer Expansion
Engineer's Opinion of Probable Cost

Line SW-1 (Including Lift Station Elimination)

Item	Description	Quantity/	Unit	Unit Price	Total Price
1	27" Sanitary Sewer	1,800	LF	\$57.00	\$102,600.00
2	24" Sanitary Sewer	2,170	LF	\$53.00	\$115,010.00
3	8" Sanitary Sewer	450	LF	\$17.00	\$7,650.00
4	Concrete Encasement	60	LF	\$100.00	\$6,000.00
5	48" Manhole	12	EA	\$1,900.00	\$22,800.00
6	Main Street Crossing	1	LS	\$24,000.00	\$24,000.00
7	Seed, Fertilizer, Mulch	1	LS	\$3,000.00	\$3,000.00
8	Mobilization	1	LS	\$6,000.00	\$6,000.00
9	Fence Removal & Replacement	200	LF	\$15.00	\$3,000.00
SUBTOTAL =					\$290,060.00
CONTINGENCIES (10%) =					\$29,006.00
LAND ACQUISITION =					\$12,000.00
TOTAL CONSTRUCTION COSTS =					<u>\$331,066.00</u>

Line SW-2 (Including Lift Station Elimination)

Item	Description	Quantity/	Unit	Unit Price	Total Price
1	27" Sanitary Sewer	2,000	LF	\$65.00	\$130,000.00
2	24" Sanitary Sewer	2,170	LF	\$53.00	\$115,010.00
3	8" Sanitary Sewer	450	LF	\$17.00	\$7,650.00
4	Concrete Encasement	60	LF	\$100.00	\$6,000.00
5	48" Manhole	12	EA	\$1,900.00	\$22,800.00
6	Main Street Crossing	1	LS	\$24,000.00	\$24,000.00
7	Rock Excavation	400	CY	\$50.00	\$20,000.00
8	Road Reconstruction	28,600	SF	\$1.50	\$42,900.00
9	Dewatering	1	LS	\$7,000	\$7,000.00
9	Temporary Sewer Service	1	LS	\$5,000.00	\$5,000.00
10	Seed, Fertilizer, Mulch	1	LS	\$3,000.00	\$3,000.00
11	Mobilization	1	LS	\$6,000.00	\$6,000.00
12	Fence Removal & Replacement	200	LF	\$15.00	\$3,000.00
SUBTOTAL =					\$392,360.00
CONTINGENCIES (10%) =					\$39,236.00
LAND ACQUISITION =					\$8,000.00
TOTAL CONSTRUCTION COSTS =					<u>\$439,596.00</u>

Continued Appendix C.

LINE NW-1

Item	Description	Quantity/	Unit	Unit Price	Total Price
1	18" Sanitary Sewer	820	LF	\$42.00	\$34,440.00
2	15" Sanitary Sewer	2,180	LF	\$36.00	\$78,480.00
3	48" Manholes	11	EA	\$1,900.00	\$20,900.00
4	Road Restoration	900	SF	\$1.50	\$1,350.00
5	Seed, Fertilizer, and Mulch	1	LS	\$2,000.00	\$2,000.00
6	Mobilization	1	LS	\$4,000.00	\$4,000.00
7	Rock Excavation	220	CY	\$50.00	\$11,000.00
SUBTOTAL =					\$152,170.00
CONTINGENCIES (10%) =					\$15,217.00
LAND ACQUISITION =					\$4,000.00
TOTAL CONSTRUCTION COSTS =					<u>\$171,387.00</u>

LINE NE-1

Item	Description	Quantity/	Unit	Unit Price	Total Price
1	18" Sanitary Sewer	1,400	LF	\$42.00	\$58,800.00
2	48" Manholes	4	EA	\$1,900.00	\$7,600.00
3	Road Restoration	900	SF	\$1.50	\$1,350.00
4	Seed, Fertilizer, and Mulch	1	LS	\$2,000.00	\$2,000.00
5	Mobilization	1	LS	\$3,000.00	\$3,000.00
6	Rock Excavation	160	CY	\$50.00	\$8,000.00
SUBTOTAL =					\$80,750.00
CONTINGENCIES (10%) =					\$8,075.00
LAND ACQUISITION =					\$4,000.00
TOTAL CONSTRUCTION COSTS =					<u>\$92,825.00</u>

Exhibit D

ARTICLES OF AGREEMENT
BETWEEN
THE CITY OF CEDAR RAPIDS, LINN COUNTY, IOWA
AND
THE CITY OF ROBINS, LINN COUNTY, IOWA
FOR
THE CONSTRUCTION, OPERATION AND MAINTENANCE
OF
WATER POLLUTION CONTROL FACILITIES

WHEREAS, the United States Environmental Protection Agency and the Iowa Department of Environmental Quality have ordered and directed the City of Cedar Rapids to upgrade and/or reconstruct its water pollution control facilities, and

WHEREAS, said Agencies have endorsed the regional concept for the treatment of sanitary and industrial waste, and

WHEREAS, on August 18, 1976 the City of Cedar Rapids began construction on a new Water Pollution Control Facility, hereafter called WPCF, which upon completion will serve certain areas of the Cedar River and Indian Creek drainage basin, including part of the Dry Creek basin, and

WHEREAS, on July 12, 1977, the City of Robins filed with the City of Cedar Rapids a letter of intent agreeing to discharge all the waste collected in its sanitary sewer system into the City of Cedar Rapids interceptor for treatment at the WPCF and further that the City of Robins would share the operation, maintenance and construction costs of the new WPCF constructed by the City of Cedar Rapids and would share in said costs on an equitable basis, and

WHEREAS, the City of Robins desires to purchase and pay for its desired capacity upon execution of this Agreement by both Cities,

NOW THEREFORE, IT IS AGREED THAT:

1. The City of Cedar Rapids will construct at its expense on the Cedar River, southeast of Cedar Rapids and Marion, approximately 0.75 miles downstream from the junction of Indian Creek with the Cedar River, a WPCF with a capacity as follows:

Average Daily Flow	39.0 MGD
Biochemical Oxygen Demand	240,000 #/day
Suspended Solids	125,000 #/day
Total Kjeldahl Nitrogen	19,300 #/day

2. It is agreed that there shall be provided to the City of Robins in said WPCF the following capacity:

Maximum Flow	1.120 MGD
Average Flow	0.400 MGD
BOD	600 #/day
SS	800 #/day
TKN	120 #/day

3. The City of Cedar Rapids has spent \$14.528 million dollars to finance Phase I, II and III of the WPCF. The City of Robins agrees to pay its share of this cost based on the following parameters:

Maximum Flow	\$0.2412/1000 gal/day/mo.
Average Flow	\$0.9522/1000 gal/day/mo.
BOD	\$0.2751/#/day/mo.
SS	\$0.2343/#/day/mo.
TKN	\$1,1641/#/day/mo.

Based on the capacities set out in Item 2 above, this cost would be \$1,143.30 per month for 9 years; however, since the City of Robins desires to make a lump sum payment, the amount of \$94,331.21 (which is the ratio of Robins' monthly cost to the total monthly cost x \$14,528,000 shall be paid to the City of Cedar Rapids upon execution of this Agreement.

4. The City of Robins shall share the operation and maintenance costs of the WPCF constructed by the City of Cedar Rapids. Robins' share in said costs shall be based upon measurements obtained from a sampling manhole, to be constructed by Robins, at the location and of a type approved by the City of Cedar Rapids.

Robins' monthly operation and maintenance charges shall be determined by multiplying the representative quantities determined by said measurements, but not less than quantities for normal domestic sewage, times the operation and maintenance rates established by the City of Cedar Rapids City Ordinance and in effect at that time, said charges shall be calculated as follows:

Flow	MGD	x \$2.342/1000 =		/mo.
BOD	#/day	x 0.944/# =		/mo.
SS	#/day	x 0.639/# =		/mo.
TKN	#/day	s 5.140/# =		/mo.
Total Charges per month \$				

Upon execution of this Agreement and through June 30, 1981, the City of Robins shall pay a rate of \$0.784 per capita per month for the people in the residences connected to the Robins sewer system. Beginning July 1, 1981, the monthly charges will be determined by the formulae in the previous paragraph. Each year prior to January 21, the Director of the WPCF shall recalculate the City of Robins share of operation and maintenance costs of the WPCF and shall present the calculations to the City of Robins. These charges shall then be in effect for one year, beginning the following July 1.

The operation and maintenance formulae presented above shall be used in all recalculations unless the parties mutually agree upon some other equitable method of calculation. To be effective, any such agreement shall be made prior to January 1 with changes in the method of calculation effective the following July 1.

The City of Robins agrees to pay its share of the costs of operation and maintenance of said plant to the City of Cedar Rapids on a monthly basis; on presentation of a statement therefor by the City of Cedar Rapids. The City of Robins also agrees to implement an Environmental Protection Agency approved user-charge system for operation and maintenance costs. In order that operation and maintenance costs may be readily determined, the City of Cedar Rapids, agrees that it will establish and maintain an adequate accounting system for said WPCF and the operation and

maintenance costs thereof and that such records will be audited annually by the agency retained to audit all other municipal accounts of the City of Cedar Rapids. It is further agreed that designated representatives of the City of Robins shall have access to said records for the purpose of inspecting the same at any reasonable time.

5. If further State or Federal treatment requirements, or increased growth of the City of Robins requires expansion or additions to the new WPCF, both parties agree to meet and confer concerning new design allocations and expansion needs. The decision whether or not to make expansion shall be made by the City of Cedar Rapids, and if the expansion is for the benefit of both parties, the parties will share all costs relating thereto in a fair and equitable manner. If the expansion is only for the benefit of the City of Robins, then Robins will pay all costs. Any policies or requirements of the State or Federal authorities will be adhered to by both parties.
6. The City of Robins shall abide by all applicable State and Federal laws, rules and regulations, and the City of Cedar Rapids Ordinances, pertaining to control of sewer usage, including the types of wastes which must be excluded or pretreated, and shall prohibit discharges of types or quantities detrimental to the system. The identification of materials detrimental to the system shall comply with the City of Cedar Rapids determination of materials detrimental to the system. If State or Federal requirements dictate amendment to the City of Cedar Rapids sewer ordinance, then the City of Robins will incorporate these same amendments as part of its sewer ordinance.
7. Robins will not permit any new major contributing industrial hookups or industrial expansion of existing major contributing industrial hookups without an appropriate Iowa Department of Environmental Quality, "Treatment Agreement Major Contributing Industry", Form WQ-150, being first approved by the City of

Cedar Rapids and submitted to the I.D.E.Q. in accordance with Section 19.3(5) of the Iowa Water Quality Regulations, Cedar Rapids shall approve Form WQ-150 unless it causes Robins to exceed its WPCF capacity and Robins has not provided for expansion or purchase of additional capacity as provided in paragraphs 5 and 8 of this Agreement, or it exceeds the level of toxic substances allowed by either party's ordinance or in some other manner violates any provision of either City's ordinances. A major contributing industry shall mean any industry meeting any of the following standards:

- A. Has a flow of 50,000 gallons or more per average work day; or
- B. Has a flow greater than five percent of the flow carried by treatment works receiving the waste; or
- C. Has in its waste a toxic pollutant in toxic amounts as defined in standards issued under Section 307(a) of the Act and adopted by reference in 17.5(455B); or
- D. Is found by the Department to have a significant impact, either singly or in combination with other contributing industries, on that treatment works or upon the quality of effluent from that treatment works, or
- E. Any standard hereafter defined by I.D.E.Q. for major contributing industry.

The City of Robins shall be allowed to contribute quantities of non-designated pollutants in amounts proportional to the ratio of the Robins average flow to the Plant average flow and not in excess of the strength allowable by ordinance of the City Council of the City of Cedar Rapids. Non-designated pollutants are defined herewith as any item of waste not contracted for in this Agreement, and not to include BOD, SS, TKN.

In the event that the City of Cedar Rapids or the I.D.E.Q. fails to approve a WQ-150 form for treatment of wastes by a Major Contributing Industry located in the City of Robins, and the industry is denied permission for treatment of wastes due to the contributing factor of non-designated pollutants as above defined from any other City where other industries are located, the City of Cedar Rapids and the City of Robins shall then confer to determine an equitable adjustment in the quantity of non-designated pollutants to be contributed by Robins as outlined in the preceding paragraph.

8. The City of Cedar Rapids will monitor waste discharges from certain industries within the corporate limits of the City of Robins to comply with EPA Regulations 35.928 "Industrial Cost Recovery." The City of Cedar Rapids shall present to the City of Robins each year a list of industries and their I.C.R. charges which the City of Robins will then collect. The proceeds shall be submitted to the City of Cedar Rapids within 60 days of collection. The 10 percent portion of said ICR charges which belong to the City of Cedar Rapids shall be utilized in accordance with 40 C.F.R. 35.928-2 (a) (iii) dated September 27, 1978.
9. The capacity set forth in this Agreement is the total capacity available to the City of Robins, except, the City of Cedar Rapids reserves the right to sell additional capacity in the future in the WPCF for such amounts and rates as may be mutually agreed between the parties, provided the City Council of the City of Cedar Rapids in its discretion determines that there is additional capacity available in the unallocated reserves which it does not desire to retain for other purposes.

If it is determined that the City of Robins is exceeding the capacity allocated to it in Item No. 2 above, the City of Robins will be required to purchase additional capacity in the WPCF if the City Council of Cedar Rapids in its discretion determines such capacity is available and not needed to be retained for other purposes. If the City Council of the City of Cedar Rapids determines such additional capacity is not available, or decides

to retain the additional capacity for other purposes, then the City of Robins shall be required to reduce its loadings to within those previously authorized, or they have the option to confer with Cedar Rapids for plant expansion in accordance with the provisions of Item 5 above:

10. Any proceeds from the sale of the existing Indian Creek Plant property and equipment shall go into an account for the new WPCF. Any proceeds from the sale of property, equipment, or product from the new WPCF shall remain in an account for said WPCF.
11. Casualty insurance, if available, shall be purchased by the City of Cedar Rapids to cover the WPCF, with premium costs to be divided so that the City of Robins shall pay that proportion of insurance premium equal to the proportion of total operation and maintenance costs of the WPCF paid by the City of Robins. If casualty insurance is not available, or if the City of Cedar Rapids decides to self-insure, then the costs of self-insurance shall be borne in the same proportions as set forth herein for the costs of casualty insurance.
12. If any liability is incurred as a result of the negligence of agents or employees of the City of Cedar Rapids in the operation and use of any of the facilities mentioned herein, the City of Cedar Rapids shall hold harmless and indemnify the City of Robins from any liability therefor. Likewise, if any liability is incurred as a result of the negligence of agents or employees of the City of Robins in the operation and use of any of the facilities mentioned herein, the City of Robins shall hold harmless and indemnify the City Cedar Rapids from any liability therefor. If damage to any person or property, including the WPCF and its fixtures, results from discharges emanating from the sewers of either party hereto, the party from whose sewers the discharges emanated shall indemnify and hold harmless the other party from any liability therefor.

13. It is the purpose and intent of this Agreement to provide for a practical, economical, permanent and equitable solution of the sewage disposal problems of the contracting cities in the Indian Creek and Dry Creek watershed, to promote the orderly growth and development of the cities in this area, and to maintain the existing spirit of cooperation between the contracting cities in solving mutual municipal sewage disposal problems.

To this end the contracting cities agree that each will strive to do equity in all things concerned with this Agreement, and in particular to seek a fair division of the costs of construction and operation of the Water Pollution Control Facilities (WPCF) herein agreed upon.

This Agreement is perpetual unless substantive changes are made and agreed to by both parties.

Dated this 22nd day of October, 1980.

CITY OF CEDAR RAPIDS

By 
Donald L. Canney, Mayor

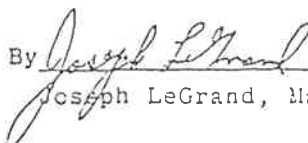
Attest:-

Lois M Keller

Lois M. Keller, City Clerk

By 
Dorothy Shipman
Deputy

CITY OF ROBINS

By 
Joseph LeGrand, Mayor

Attest:-

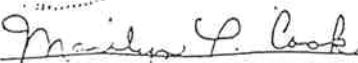

Marilyn P. Cook
City Clerk

Exhibit E

655625

ENG 65572
AUD
AUD FILE
RCR
FILE
LINN COUNTY
HIAWATHA
ROBINS
MARION
655625
655725

RESOLUTION NO. 0120-02-07

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CEDAR RAPIDS, IOWA that the City Manager and City Clerk are authorized to sign a 28E Agreement with the cities of Marion, Hiawatha and Robins and Linn County regarding the planning, construction, and maintenance participation for the Indian Creek and Dry Run Creek Sanitary Sewer System Program (CIP No. 655625 and CIP No. 655725).

Passed this 7th day of February, 2007.

Voting: Council member Podzimek moved the adoption of the resolution; seconded by Council member Henderson. Adopted, Yeas, Council members Fagan, Gulick, Henderson, McGrane, Podzimek, Shey, Shields, and Mayor Halloran.

Kay Halloran, Mayor

Attest:

Ann Ollinger, City Clerk

**28E Agreement Between the City of Cedar Rapids, Iowa (Cedar Rapids),
the City of Marion, Iowa (Marion), the City of Hiawatha, Iowa (Hiawatha), the City of Robins, Iowa
(Robins), and the County of Linn, Iowa (Linn County).**

**Regarding the planning, construction, and maintenance participation for the Indian Creek and Dry
Run Creek Sanitary Sewer System Program.**

January 11th, 2007

Cedar Rapids, Marion, Hiawatha, Robins, and Linn County agree as follows:

Intent

By this agreement the parties hereto intend to establish a Program to jointly plan and share in the cost to replace the existing sanitary sewer system, as shown in Exhibit A, in order to increase capacity and accommodate present needs and future growth (the Program). This Program shall include planning, construction, and maintenance of the Indian Creek / Dry Run Creek sanitary sewer system (the System) in Cedar Rapids, Marion, Hiawatha, Robins, and Linn County.

Duration

The term of this Agreement shall commence on the date of execution by the last signatory party hereto and shall run until completion of all portions of the sanitary sewer system planned and constructed hereunder and shall continue indefinitely for the maintenance of the system, unless a shorter duration is mutually agreed upon by the parties hereto, and subject to provisions in the "Surcharges" section of this Agreement.

Legal or Administrative Entities

An administrative entity is hereby created that will be known as the Indian Creek/Dry Run Creek Sanitary Sewer System Board of Directors (the Board). The Board shall consist of six members with equal voting. The Board shall be comprised of the City Engineers for Cedar Rapids, Marion, Hiawatha, and Robins the Linn County Engineer, and the Cedar Rapids Water Pollution Control facility director; or their designees, hereafter referred to as "Board Members."

Provisions

1. Project Identification

The System shall be constructed in phases (see Exhibits A and B) (all Exhibits referenced are hereby incorporated herein) with increased capacity and shall be planned and constructed to replace the existing system and including the removal or mitigation of the existing system, located generally from the confluence of Indian Creek and the Cedar River along Indian Creek from the Cedar River to Dry Run Creek and along Dry Run Creek from Indian Creek to the southern corporate limits of Robins as shown in Exhibit A. The System shall be designed to provide sufficient capacity to accommodate requested volumes from all parties, adjusted up to the next standard pipe size.

2. Allocation of System Capacity and Proportionality

The design flow capacity in the System will be based on requested peak hourly flow identified by each party as shown on Exhibit C. Any excess capacity in the actual segment due to adjusted pipe size will be proportionally allocated to jurisdictions based on their original requested percentages. As increased capacity becomes available following the planning and construction of each project, this capacity shall be made available to the parties based on the requested peak hourly flow for that program division as shown by Exhibit C.

3. Funding

The Program will be accomplished in multiple phases over a number of years. Program costs are to be allocated by phase proportional to requested capacity within the new system. A project sponsor for each phase will be the party within whose jurisdictional authority all or a majority of the segment lies (“the project sponsor”). The other parties will pay their share of construction costs within 30 days of invoice and 90 days of project acceptance from the sponsoring jurisdiction. The other parties share will be based on their proportion of flow allocation in that particular phase. Phases may include more than one pipe division.

4. Ownership

In incorporated areas, each party will own the portion of the System that lies within their jurisdiction. In unincorporated areas the project sponsor will own the actual portion of the System.

5. Monitoring

Flow monitors shall be installed and maintained as reasonably necessary to facilitate flow measurement within the multi-jurisdictional sanitary sewer system. Cedar Rapids will be the administrator of the monitoring system and is hereby authorized to perform such duties as may be necessary for purchasing, installing, and maintaining flow meters, collecting, storing and distributing data.

A. Meter Location - To facilitate flow measurement within the System, flow monitor locations shall be maintained at or near jurisdictional boundaries. When meter locations at jurisdictional boundaries are not feasible, several options will be used to measure and calculate jurisdiction peak hour, daily maximum, and monthly average flow contributions to the sewer at jurisdictional boundaries. These options could include:

- Short-term monitor installation
- Estimated flows using developed area calculations
- Population equivalent if census data is available
- Grab sample technique using field data based on flow depth and velocity meter

Meter locations will be added or relocated upon agreement between or among the parties, as the case may be, and after they are determined to be necessary to reflect new sewer development connections, annexation boundaries, and other significant events. Cedar Rapids shall be granted reasonable access to these sewer manhole locations as may be necessary to conduct monitoring, sampling, and analysis as deemed necessary to verify compliance with this Agreement.

B. Protection of Jurisdictional Boundary Flow Monitors – Connection to any manhole containing a flow monitor as described in subsection 5A and any point ten (10) pipe diameters upstream or downstream of the said manhole shall be prohibited. Each party hereto will enact such ordinances or regulations to insure this prohibition.

C. Flow Monitor Network Operation – Cedar Rapids will continue to maintain and operate the flow monitors and monitoring equipment to the current standards as set forth in Exhibit D or improved standards as may be hereafter adopted. Cedar Rapids will provide monthly reports conforming substantially to the format shown in Exhibit E to each party generally by the 15th day of the following month. Cedar Rapids may prepare requested data reports (peak hour flow events, rain event summaries, etc.) as its workload circumstances will allow and will be subject to an additional service charge. Each party may install internal or duplicate monitoring at any location in the System provided such monitoring does not impact the Cedar Rapids flow monitor. If internal or duplicate monitoring provides flow monitoring data that differs more than 10 percent from the System flow monitors installed by Cedar Rapids Water Pollution Control then that party and Cedar Rapids shall meet and review respective flow monitor information (such as: calibration records, field notes, O&M records, etc.). If Cedar Rapids and such party cannot agree on a monitored flow level the matter shall be referred to the Board and the Board shall decide which monitored flow level shall be utilized.

D. Flow Monitor Network Service Charges – Each year Cedar Rapids will develop and distribute a budget to all parties that establishes actual costs for operating and maintaining the System flow monitors. Budget calculations for future fiscal years shall be distributed no later than December 1st of the previous year. Each party will pay Cedar Rapids the charges as established by the budget. Flow Monitor Service Charges will be assessed per monitoring location. The charges for special data report preparation by Cedar Rapids will be based on its labor costs plus reasonable overhead and administrative fees. All service charges will be incorporated in the current monthly invoice sent to each party as part of its sewer treatment charges.

6. Adjustment of Capacity

Any party that has excess capacity as determined herein may sell some or all of the excess capacity to another party. If more than one party desires to purchase additional capacity, the amount offered will be split among the parties that desire it in proportion to their original requested capacity amount, as shown in Exhibit C, or as otherwise agreed to by those parties.

The charge for excess capacity will be based on the final project costs adjusted for inflation and depreciation. The inflation adjustment shall be 3% per year based on an approximation of a 20-year average of the Engineering News Record Construction Cost Index and Consumer Price Index. The cost adjusted for inflation will then be multiplied by the percent of remaining service life based on straight-line depreciation for an 80-year service life. As represented by Exhibit F.

7. Maintenance and Repair

Major Maintenance and repair costs for the System developed under this agreement shall be shared among the parties proportionate to the flow allocations. Major Maintenance and Repairs are defined as: Point Repairs, Linings, Replacement, Reconstruction, Televising, and Joint Sealing.

Costs for minor maintenance and repair of sanitary sewers and manholes will be performed and paid for by the party in whose jurisdiction the sewers and manholes are located. Minor maintenance and repair is all maintenance and repair that is not defined herein as “Major.” Each party shall perform such inspections as are reasonably necessary at least every ten years, and also following extraordinary or abnormal conditions such as those that result in dislodging lids or abnormal flow meter readings.

The project sponsor of a particular phase will coordinate maintenance and repair of that phase, with approval of the other participating parties, with the exception of repairs covered in the “Emergency Repairs” section of this agreement. Participating parties will pay their proportional share of these costs within 60 days of receiving invoice from the project sponsor.

8. Emergency Repairs

Emergency repairs shall consist of repairs of an immediate nature, which are required due to a loss of service in the System. Repairs deemed an emergency by the project sponsor jurisdiction do not require the approval of participating parties prior to repairs being performed. Participating parties will pay their proportional share of these costs within 60 days of receiving invoice from the project sponsor.

9. Surcharges

If a party's flow exceeds the flow limitations (hereinafter an “Occurrence”) that are shown on Exhibit C Cedar Rapids shall provide written notice to that party and to the Board. The party whose flow exceeds the flow limitations shall pay a surcharge for each Occurrence. The surcharge shall be the percentage of that party's monthly sanitary sewer charge for the month in which the Occurrence happens and will be paid in addition to the monthly charge.

Each party experiencing an Occurrence shall pay an additional monthly surcharge (on the monthly billing amount) for each month there is an Occurrence in accordance with the following schedule:

- a. For the first month during which there is at least one Occurrence (“First Occurrence”), and any other month within the first 90 days following the First Occurrence, during which there is at least one Occurrence, the party shall pay a 10% monthly surcharge.
- b. For any month during a 2-year period commencing after the 90th day following the First Occurrence, during which there is at least one Occurrence, the party shall pay a 25% monthly surcharge. If there is not an Occurrence during this two-year period, the next Occurrence shall be deemed the First Occurrence and the penalties and time period set forth in subparagraph a. shall apply.
- c. For any month during a one-year period commencing two years after the 90th day following the First Occurrence, during which there is at least one Occurrence, the party shall pay a 50% monthly surcharge. If there is not an Occurrence during this one-year period, the next Occurrence shall be deemed the First Occurrence and the penalties and time period set forth in subparagraph a. shall apply.
- d. For any month after the year period described in Section 9(c), during which there is at least one Occurrence, the party shall pay a 100% surcharge. If there is not an Occurrence during any twelve consecutive month period, the next Occurrence shall be deemed the First Occurrence and the penalties and time period set forth in subparagraph a. shall apply.

The surcharges herein specified shall not apply for an Occurrence as a result of an extraordinary rainfall event, equal or exceeding the rainfall produced by a 100-year storm event.

The surcharges herein specified may, at the discretion of the Board Members be waived if all of the following conditions are met:

- a. The Occurrence did not cause or contribute to a sanitary sewer system overflow, and;
- b. The Occurrence did not cause or contribute to basement backups for homes connected to the downstream sewer segments, and;
- c. The Occurrence did not cause or contribute to any regulatory compliance action by the Environmental Protection Agency, the Iowa Department of Natural Resources, or the Linn County Health Department, and;
- d. The party experiencing the Occurrence implements a program to reduce infiltration and inflow to its sanitary sewer system.

For the purpose of determining a surcharge, each flow measuring location shall be independent from the others for determining the number of Occurrences and the surcharge shall apply only to the flow for that flow measuring location.

Surcharges shall be paid into an account maintained by Cedar Rapids and managed by the Board to be used for future Indian Creek and Dry Run Creek trunk sewer projects or for major maintenance and repair of it. The funds in the account will be used to offset the total costs of future projects or repairs prior to determining the proportionate share for each party.

If an Occurrence results in a fine from a regulatory agency (Environmental Protection Agency or the Iowa Department of Natural Resources) or judgment from a third party lawsuit, the parties hereto shall pay the amount of the fine or judgment or proportionally share in the payment of fine or judgment if more than one party is responsible for the Occurrence. A party that is in compliance with flow limitations will not participate in payment of fines or judgments.

10. Non-Participation

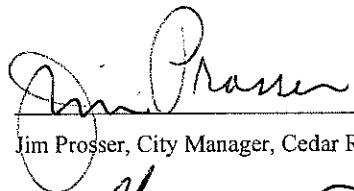
Any party that fails to participate in major maintenance or share in the cost of the System as a whole or in any of the phases of the construction of the System for which it has a proportional share will not be allowed flow in the new System or those segments of the System until said party has paid its proportional share or purchased capacity from another party as per the "Adjustment of Capacity" section of this Agreement. All flows over the purchased amount shall be treated as Occurrences and subject to the "Surcharges" section of this Agreement.

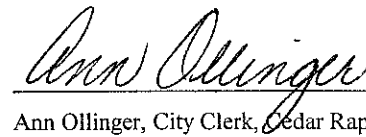
11. Amendment

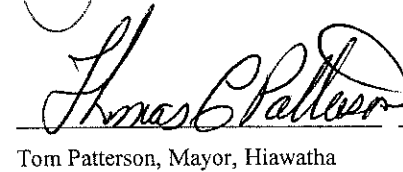
This Agreement may be amended from time to time by the mutual agreement of all parties. All amendments must be in writing and signed by all parties hereto.

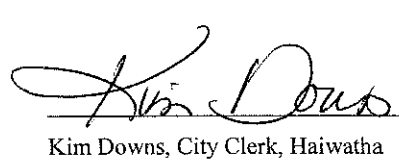
Signed:

Attest:

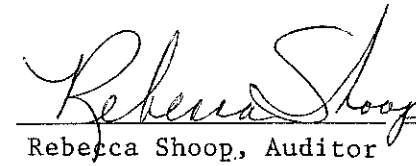

Jim Prosser, City Manager, Cedar Rapids 3-2-07
Date

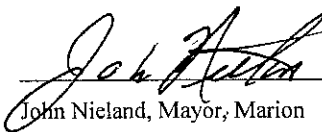

Ann Ollinger, City Clerk, Cedar Rapids 3-2-07
Date

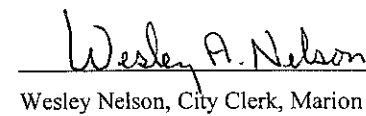

Tom Patterson, Mayor, Hiawatha 3/7/07
Date

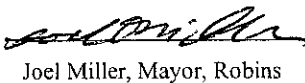

Kim Downs, City Clerk, Haiwatha 3/7/07
Date


Lu Barron, County Supervisor, Linn Co. 1/17/07
Date


Rebecca Shoop, Auditor 1/17/07
Date


John Nieland, Mayor, Marion 3/9/07
Date


Wesley Nelson, City Clerk, Marion 3-12-07
Date


Joel Miller, Mayor, Robins 14 APR 2007
Date

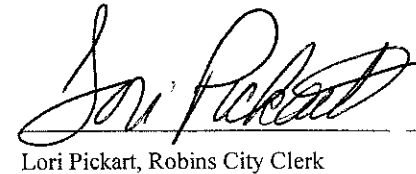

Lori Pickart, Robins City Clerk 4-307
Date

Exhibit A

1. Map
2. Physical location description

LEGEND

- (ss)— SANITARY SEWER
- - - CORPORATE LIMITS
- ① PIPE SEGMENTS

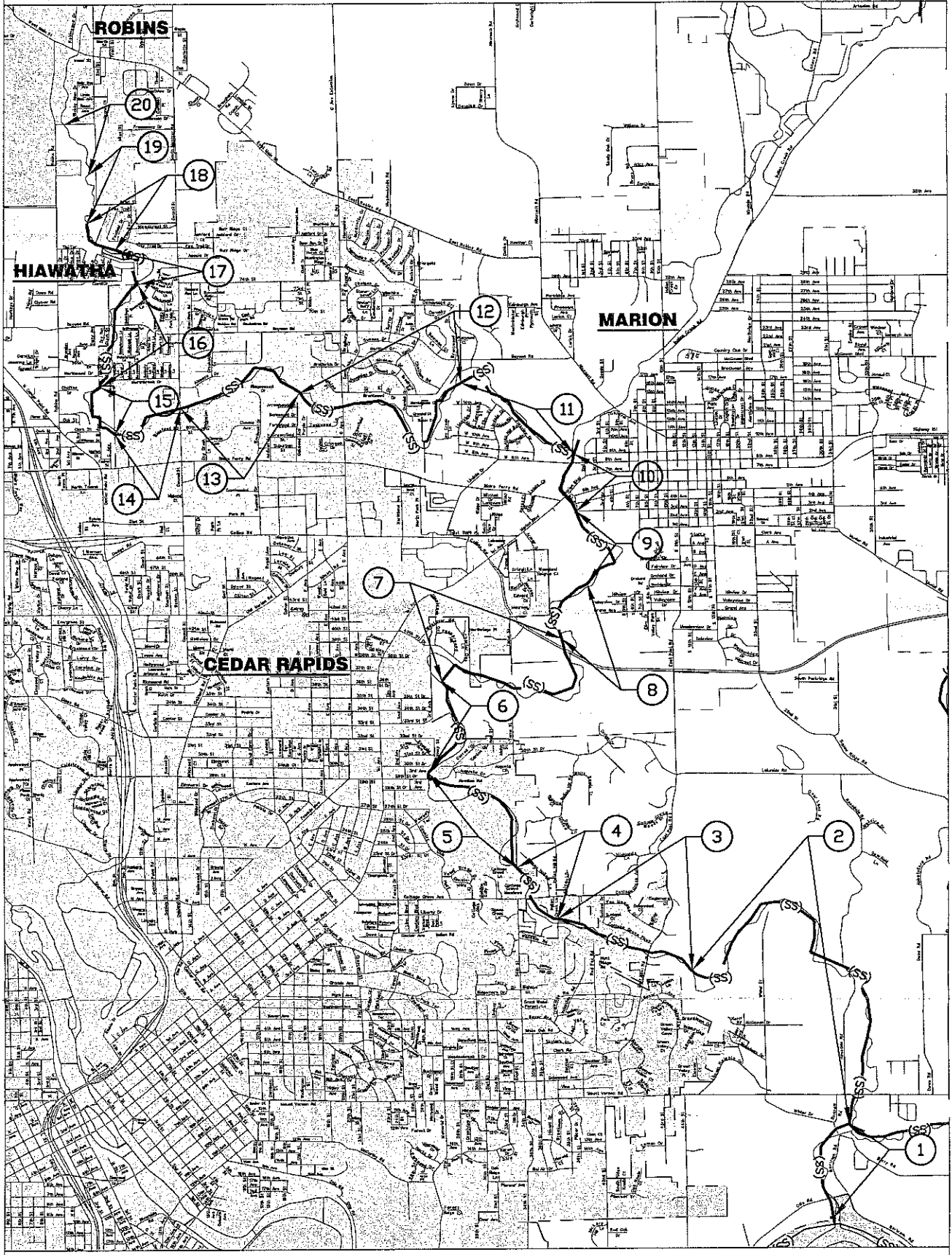


EXHIBIT A
DRY RUN & INDIAN CREEK
TRUNK SEWERS
SANITARY SEWER PIPE SEGMENTS

DATE: 01/10/07
SCALE: 1" = 3000'

Dry Run and Indian Creek Trunk Sewers
Description of Existing System

Segment No.	Pipe Size (inches)	Description
1	48	From confluence of Indian Creek and Cedar River to confluence of Indian Creek and Squaw Creek
2	42	From confluence of Indian Creek and Squaw Creek to approximately 1,500 feet east of East Post Road
3	42	From approximately 1,500 feet east of East Post Road to Tomahawk Trail
4	42	From Tomahawk Trail to approximately 1,000 feet north of Cottage Grove Avenue
5	42	From approximately 1,000 feet north of Cottage Grove Avenue to 29 th Street Drive
6	42	From 29 th Street Drive to 36 th Street Drive (east of)
7	42/36	From 36 th Street Drive (east of) to approximately 300 feet north of Highway 100
8	36	From approximately 300 feet north of Highway 100 to approximately 1,300 feet north of the intersection of Valleyview Drive and Grand Avenue
9	36/33	From approximately 1,300 feet north of the intersection of Valleyview Drive and Grand Avenue to 3 rd Avenue
10	33	From 3 rd Avenue to confluence of Indian Creek and Dry Run Creek
11	27	From confluence of Indian Creek and Dry Run Creek to approximately 700 feet north of intersection of Alpine Road and West 14 th Avenue
12	27	From approximately 700 feet north of intersection of Alpine Road and West 14 th Avenue to Oakwood Avenue
13	24	From Oakwood Avenue to Council Street
14	21	From Council Street to Cedar Rapids/Hiawatha city limits
15	21	From Cedar Rapids/Hiawatha city limits to approximately 200 feet south of Northwood Drive
16	21	From approximately 200 feet south of Northwood Drive to approximately 420 feet west of intersection of Cottonwood Lane and Idledale Road
17	18	From approximately 420 feet west of intersection of Cottonwood Lane and Idledale Road to approximately 300 feet south of the intersection of Foxfield Drive and Fox Trail Drive
18	18	From approximately 300 feet south of the intersection of Foxfield Drive and Fox Trail Drive to approximately 1,300 feet east of the intersection of Tower Terrace Road and Robins Road
19	18	From approximately 1,300 feet east of the intersection of Tower Terrace Road and Robins Road to approximately 1,300 feet east of Stonegate Court and Robins Road
20	18	From approximately 1,300 feet east of Stonegate Court and Robins Road to approximately 500 south of the intersection of Rickey Allen Drive and Reed Avenue

Exhibit B

1. Cost and Construction Schedule

Dry Run and Indian Creek Trunk Sewers
Preliminary Construction Priorities and Schedule
1/10/2007

Phase	Pipe Segment Number(s)	Preliminary Cost Opinion (\$ millions, 2007 costs)	Year 2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
	Modeling	\$0.15	\$0.15																	
1	Design/Easements Construction	\$1.6	\$0.16		\$1.44															
2	Design/Easements Construction	\$1.5		\$0.15																
3	Design/Easements Construction	\$1.4			\$1.35															
	Design/Easements Construction				\$0.14															
4	Design/Easements Construction	\$1.5				\$1.26														
	Design/Easements Construction				\$0.15															
5	Design/Easements Construction	\$2.0				\$1.35														
	Design/Easements Construction					\$0.20														
6	Design/Easements Construction	\$2.3					\$1.80													
	Design/Easements Construction						\$0.23													
7	Design/Easements Construction	\$0.9							\$2.07											
	Design/Easements Construction								\$0.09											
8	Design/Easements Construction	\$2.3								\$0.77										
	Design/Easements Construction									\$0.23										
9	Design/Easements Construction	\$1.9										\$2.07								
	Design/Easements Construction											\$0.19								
10	Design/Easements Construction	\$1.2											\$1.71							
	Design/Easements Construction												\$0.12							
11	Design/Easements Construction	\$2.3												\$1.08						
	Design/Easements Construction													\$0.23						
12	Design/Easements Construction	\$2.4													\$2.07					
	Design/Easements Construction														\$0.24					
13	Design/Easements Construction	\$1.2														\$2.16				
	Design/Easements Construction															\$0.12				
14	Design/Easements Construction	\$1.4															\$1.08			
	Design/Easements Construction																\$0.14			
15	Design/Easements Construction	\$1.5																	\$1.26	
	Design/Easements Construction																		\$0.15	
	Total	\$25.5	\$0.15	\$0.16	\$1.59	\$1.49	\$1.41	\$1.55	\$2.03	\$2.16	\$1.00	\$2.26	\$1.83	\$1.31	\$2.31	\$2.28	\$1.22	\$1.41		\$1.35

Phases, priorities, schedule and costs are preliminary only, are intended to indicate anticipated magnitude and time for construction of Program and are subject to change.

Exhibit C

1. Requested peak flows

Revised 4/27/05

Dry Run and Indian Creek Trunk Sewers
Summary of Design Flow by Jurisdiction

Pipe Segment	Total Requested Peak Flow (mgd)					Total Requested Peak Flow (mgd)
	Robins	Hiawatha	Cedar Rapids	Marion	Linn County	
20	4.90	0.00	3.50	0.00	0.00	8.40
19	4.90	0.01	5.40	0.00	0.00	10.31
18	4.90	0.01	5.50	0.00	0.00	10.41
17	4.90	0.01	5.60	0.00	0.00	10.51
16	4.90	0.40	5.70	0.00	0.00	11.00
15	4.90	3.22	5.70	0.00	0.00	13.82
14	4.90	3.22	6.00	0.00	0.00	14.12
13	4.90	3.22	7.50	0.00	0.00	15.62
12	4.90	3.22	8.00	0.00	0.00	16.12
11	4.90	3.22	10.10	1.14	0.00	19.36
10	4.90	3.22	10.10	6.17	0.00	24.39
9	4.90	3.22	10.10	7.37	0.00	25.59
8	4.90	3.22	10.10	12.33	0.00	30.55
7	4.90	3.22	10.30	12.33	0.00	30.75
6	4.90	3.22	11.00	12.33	0.00	31.45
5	4.90	3.22	12.00	12.33	0.00	32.45
4	4.90	3.22	13.00	12.33	0.00	33.45
3	4.90	3.22	14.00	12.33	0.00	34.45
2	4.90	3.22	15.10	12.33	0.00	35.55
1	4.90	3.22	20.00	17.00	0.152	45.27

Exhibit D

1. Flow monitor maintenance standards

Cedar Rapids Water Pollution Control Facilities Sanitary Sewer Flow Monitoring – SOP

Flow Meter Monthly Operation & Maintenance Procedures:

1. Open manhole lid at flow meter location and retrieve flow meter.
2. Replace desiccant tube bi-monthly or if needed.
3. Replace flow meter batteries on a monthly basis.
4. Connect laptop computer to flow meter and download stored data using FloWare software.
5. Check real time sanitary sewer flow level measurement from flow meter.
6. Manually measure sanitary sewer flow level.
7. Compare real-time level and manual level measurements. If greater than 20% or 0.5 inch difference depending on sewer diameter, then recalibrate level measurement on the flow meter.
8. Observe flow data graph checking for possible probe fouling or probe failure.
9. Clean off probe as needed.
10. Decision point on meter replacement based on field conditions.
11. Lower flow meter back into place in manhole.
12. Close manhole cover.

Flow Meter Data QA/QC Procedures

1. Record date & time of recalibration event and adjust data accordingly.
2. Compare:
 - a. Marsh McBirney Meter measured value (gpm) – Level & Velocity
 - b. Manning Formula calculated value - Level
3. If metered data within +/- 15% of calculated Manning value then use (a) or (b) value in monthly report based on Best Professional Judgment.
4. Decision point on meter replacement based on data results or trends.

Flow Meter Replacement/Repair

1. Marsh-McBirney FloTote Model 264 or Model 260A
 - a. Either decision point identified above can trigger a confined space entry and replacement of meter and probe.
2. Marsh-McBirney FloTote 3 Data Logger with Model 3000-1 depth/velocity probe
 - a. Either decision point identified above can trigger a confined space entry and replacement of probe and connecting cable.

Exhibit E

1. Robins discharge report example
2. Hiawatha discharge report example
3. Marion discharge report example

Exhibit F

1. Inflation / Depreciation Table

Inflation/Depreciation Chart

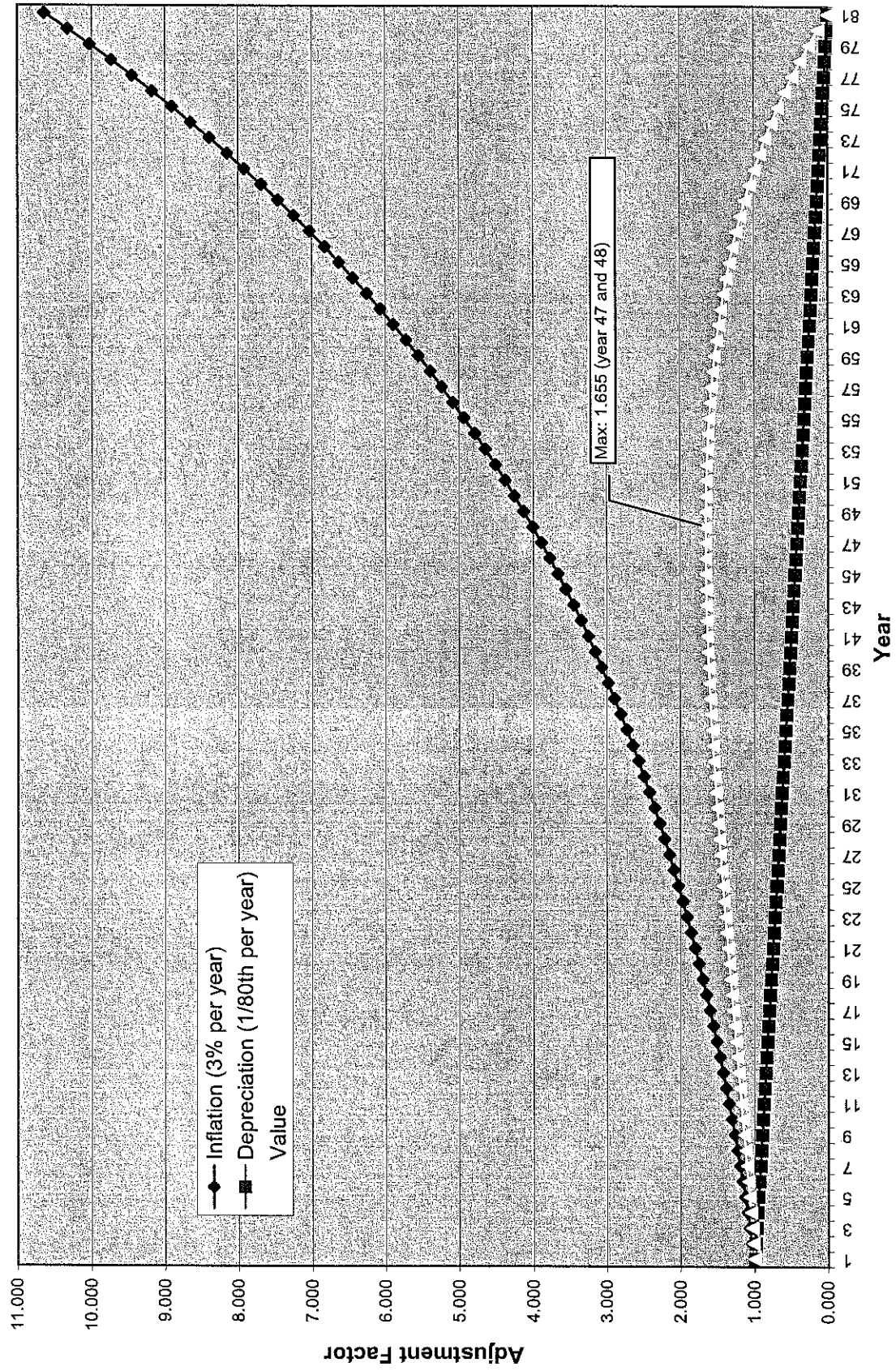


Exhibit F

ENG
FIN
RCR
✓FILE
LINN COUNTY
HIAWATHA
ROBINS
MARION
655625-00
655725-00

RESOLUTION NO. 0826-10-08

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CEDAR RAPIDS, IOWA that the City Manager and City Clerk are authorized to sign Amendment No. 1 to the 28E Agreement with the cities of Marion, Hiawatha and Robins and Linn County regarding the planning, construction, and maintenance participation for the Indian Creek and Dry Run Creek Sanitary Sewer System Program (CIP No. 655625-00 and CIP No. 655725-00).

Passed this 8th day of October, 2008.

Voting: Council member Podzimek moved the adoption of the resolution; seconded by Council member McGrane. Adopted, Ayes, Council members Fagan, Gulick, McGrane, Podzimek, Shey, Shields, Vernon, Wieneke and Mayor Halloran.

Kay Halloran, Mayor

Attest:

Ann Ovinger, City Clerk

Amendment No. 1

to the

**28E Agreement Between the City of Cedar Rapids, Iowa (Cedar Rapids),
the City of Marion, Iowa (Marion), the City of Hiawatha, Iowa (Hiawatha), the City of Robins, Iowa
(Robins), and the County of Linn, Iowa (Linn County).**

**Regarding the planning, construction, and maintenance participation for the Indian Creek and Dry
Run Creek Sanitary Sewer conveyance system.**

August 8, 2008

Cedar Rapids, Marion, Hiawatha, Robins, and Linn County agree to amend the original 28E Agreement dated January 11, 2007 by replacing certain sections and exhibits as follows:

Legal or Administrative Entities

An administrative entity is hereby created that will be known as the Indian Creek/Dry Run Creek Sanitary Sewer System Board of Directors (the Board). The Board shall consist of six members with equal voting. The Board shall be comprised of the City Engineers for Cedar Rapids, Marion, Hiawatha, and Robins, the Linn County Engineer and the Cedar Rapids Utilities Director; or their designees, hereafter referred to as "Board Members". Designees shall be identified in writing to each Board member.

Provisions


5. Monitoring


C. Flow Monitor Network Operation – Cedar Rapids will continue to maintain and operate the flow monitors and monitoring equipment to the current standards as set forth in Exhibit D or improved standards as may be hereafter adopted. Cedar Rapids will provide monthly reports conforming substantially to the format shown in Exhibit E to each party generally by the 15th day of the following month. Cedar Rapids may prepare requested data reports (peak hour flow events, rain event summaries, etc.) as its workload circumstances will allow and will be subject to an additional service charge. Each party may install internal or duplicate monitoring at any location in the System provided such monitoring does not impact Cedar Rapids flow monitor. If internal or duplicate monitoring provides flow monitoring data that differs more than 10 percent from the System flow monitors installed by Cedar Rapids then that party and Cedar Rapids shall meet and review respective flow monitor information (such as: calibration records, field notes, O&M records, etc.). If Cedar Rapids and such party cannot agree on a monitored flow level, the matter shall be referred to the Board and the Board shall decide which monitored flow level shall be utilized.


Exhibit B (see attached)


Exhibit C (see attached)

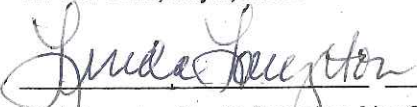
Signed:

 10/9/08
Jim Prosser, City Manager, Cedar Rapids Date


 2/5/09
Paul Rehn, Mayor, Marion Date

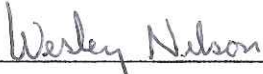
 2/13/09
Tom Theis, Mayor, Hiawatha Date


 2/24/09
Ian G.S. Cullis, Mayor, Robins Date

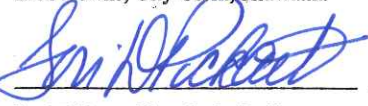
 6/03/09
Linda Langston, County Supervisor, Linn Co. Date

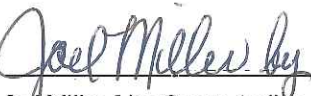
Attest:

 10/9/08
Ann Ollinger, City Clerk, Cedar Rapids Date

 2/5/09
Wes Nelson, City Clerk, Marion Date

 2/13/09
Kim Downs, City Clerk, Hiawatha Date

 2/23/09
Lori Pickart, City Clerk, Robins Date

 6/3/09
Joel Miller, Linn County Auditor Date

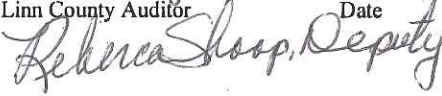

Rebecca Shoop, Deputy

Exhibit B

Dry Run and Indian Creek Trunk Sewers
 Construction Priorities and Schedule
 5/23/2008

Phase	Pipe Segment Number(s)	Project Cost (\$ millions, 2007 costs)	Year 2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
		\$0.15	0.15																				
	Modeling																						
1	Design/Easements	\$3.0		\$2.70																			
	Construction			\$0.30																			
2	Design/Easements	\$3.0			\$2.70																		
	Construction				\$0.20																		
3	Design/Easements	\$2.0				\$1.80																	
4	Design/Easements	\$1.5				\$0.15																	
	Construction					\$1.35																	
5	Design/Easements	\$1.5					\$0.15		\$1.35														
	Construction								\$0.16														
6	Design/Easements	\$1.6								\$1.44													
	Construction									\$0.08													
7	Design/Easements	\$0.8									\$0.72												
	Construction										\$0.18												
8	Design/Easements	\$1.8										\$1.62											
	Construction											\$0.15											
9	Design/Easements	\$1.5											\$1.35										
	Construction												\$0.18										
10	Design/Easements	\$1.8												\$1.62									
	Construction													\$0.20									
11	Design/Easements	\$2.0													\$1.80								
	Construction														\$0.16								
12	Design/Easements	\$1.6														\$1.44							
	Construction															\$0.17							
13	Design/Easements	\$1.7															\$1.53						
	Construction																\$0.26						
14	Design/Easements	\$2.6																\$2.34					
	Construction																	\$0.26					
15	Design/Easements	\$2.6																	\$2.34				
	Construction																		\$0.26				
16	Design/Easements	\$2.6																		\$2.34			
	Construction																			\$0.26			
17	Design/Easements	\$2.7																			\$2.43		
	Construction																				\$0.27		
18	Design/Easements	\$2.2																				\$2.22	
	Construction																					\$0.22	
	Total	\$36.7	\$0.15	\$0.30	\$3.00	\$2.90	\$1.95	\$1.50	\$1.51	\$1.52	\$0.90	\$1.77	\$1.53	\$1.82	\$1.96	\$1.61	\$1.79	\$2.60	\$2.60	\$2.61	\$2.65	\$1.98	\$1.98

Exhibit C

Revised 5/23/08

Dry Run and Indian Creek Trunk Sewers

Summary of Design Flow by Jurisdiction

Pipe Segment	Total Requested Peak Flow (mgd)					Total Requested Peak Flow (mgd)
	Robins	Hiawatha	Cedar Rapids	Marion	Linn County	
20	6.38	0.00	2.70	0.00	0.00	9.08
19	8.22	0.01	2.70	0.00	0.00	10.93
18	8.22	3.20	5.30	0.00	0.00	16.72
17	8.22	3.20	5.42	0.00	0.00	16.84
16	8.22	3.50	5.52	0.00	0.00	17.24
15	8.22	6.41	5.53	0.00	0.00	20.16
14	8.22	6.41	5.85	0.00	0.00	20.48
13	8.22	6.41	6.93	0.00	0.00	21.56
12	8.22	6.41	9.89	0.00	0.00	24.52
11	8.22	6.41	9.89	1.14	0.00	25.66
10	8.22	6.41	9.89	6.28	0.00	30.80
9	8.22	6.41	9.89	7.48	0.00	32.00
8	8.22	6.41	9.98	12.44	0.00	37.05
7	8.22	6.41	10.78	12.44	0.00	37.85
6	8.22	6.41	11.39	12.44	0.00	38.46
5	8.22	6.41	11.59	12.44	0.00	38.66
4	8.22	6.41	11.90	12.44	0.00	38.97
3	8.22	6.41	12.31	12.44	0.00	39.38
2	8.22	6.41	13.58	12.44	0.00	40.65
1	8.22	6.41	15.19	16.75	0.152	46.72