

SANITARY STUDY

Monticello, Lots 1 - 160

PART OF SEC. 4 & 5 - T. 48 N- R. 31 W

DRAINAGE AREA ACREAGE: 67.71 ACRES

LEE'S SUMMIT,
JACKSON COUNTY,
MISSOURI

RECEIVED

MAY 04 2015

Planning & Codes Admin

-2015-066-

PREPARED BY:



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Matthew J. Schlicht, PE

✓ OK as per
Dave Loke

gms
5/14/15

TABLE OF CONTENTS

- 1. REPORT COVER SHEET**
- 2. TABLE OF CONTENTS**
- 3. GENERAL INFORMATION**
- 4. METHODOLOGY**
- 5. EXISTING CONDITION ANALYSIS**
- 6. PROPOSED CONDITION ANALYSIS**
- 7. SUMMARY**
- 8. CONCLUSIONS & RECOMMENDATIONS**
- 9. SUPPORTING CALCULATIONS**
- 10. MAPS & EXHIBITS**

3. GENERAL INFORMATION

- The study is to evaluate residential uses from:
 - i. Monticello of 67.71 Acres
- The site is 67.71 acres more or less
- The site is currently undeveloped land
- The sanitary facilities are located near the Blue Springs Lake and owned by Little Blue Valley Sewer District

The system was analyzed to drain to the east and connect to the existing City of Lee's Summit interceptor. This system has been studied and determined to be at capacity and will not accept the added flows from the proposed subdivision. The system will be designed to drain north to the Little Blue Valley Interceptor.

LIST OF ABBREVIATIONS

Gallons per Day (gpd)

Cubic Feet per Second (cfs)

Acre (ac)

Inch per hour (iph)

Time of Concentrations, T_c (min)

4. METHODOLOGY

The sanitary flows for the proposed developed were determined utilizing Section 6500 of the City of Lee's Summit Design and Construction Manual Revised September 15, 2005.

The sanitary flows for the existing site were determined utilizing Section 5500 of American Public Works Association, Standard Specifications and Design Criteria.

Peak Wastewater Flows (PWF)

Reference: Section 6501.C.1

$$\text{PWF} = \text{PBF} + \text{PIG} + \text{PIF} \text{ (see below for definition of PBF, PIG, \& PIF)}$$

Peak Base Flows (PBF)

Reference: Section 6501.C.1.a.i

- 1,500 gpd/ac

$$\text{PBF} = 1,500 \text{ gpd/ac} * 67.71 \text{ ac} = 101,565 \text{ gpd}$$

Peak Infiltration (PIG)

Reference: Section 6501.C.1.b.i

Peak infiltration to be used for residential land in Lee's Summit is 500 gpd / ac

$$\text{PIG} = 500 \text{ gpd/ac} * 67.71 \text{ ac} = 33,855 \text{ gpd}$$

Peak Inflow (PIF)

Reference: Section 6501.C.1.c

Design for the 50-year storm event

$$Q = Kia$$

Where:

Q = peak inflow, cfs

K = inflow factor, unitless (K = 0.006 as per Design and Construction Manual)

i = rainfall intensity that corresponds to a tributary area's time of concentration, iph

A = tributary area, ac

Time of Concentration, T_c calculated by:

$$T_c (\text{min}) = 18.56 * (\text{Area, ac})^{0.2524}$$

$$T_c(\text{min}) = 18.56 * (67.71)^{0.2524}$$

$$T_c(\text{min}) = 74 \text{ min}$$

$$Q = 0.006 * 2.96 * 67.71$$

$$Q = 1.20 \text{ cfs} = 775,580 \text{ gpd}$$

Rainfall intensity is interpolated by Section 6501.d a figure relating Time of Concentration and Frequency are shown.

$$\text{Total Flow} = 911,000 \text{ gpd}$$

5. Existing Condition Analysis

- a. Downstream pipe system is the Little Blue Valley Interceptor

6. Proposed Condition Analysis

- a. Study is to evaluate the flows to the existing Interceptor

7. Summary

Total site flows generated upstream of the new 10 inch sanitary sewer main located in the draw draining northerly toward the Little Blue Valley Interceptor

8. Conclusion & Recommendations

CONCLUSION

The downstream system has capacity as per a 1998 study of the City of Lee's Summit sanitary sewer system. The proposed development will not create a capacity issue for the downstream interceptor

9. SUPPORTING CALCULATIONS

EXHIBITS:

- Sanitary flow tables

10 . MAPS & EXHIBITS

EXHIBITS:

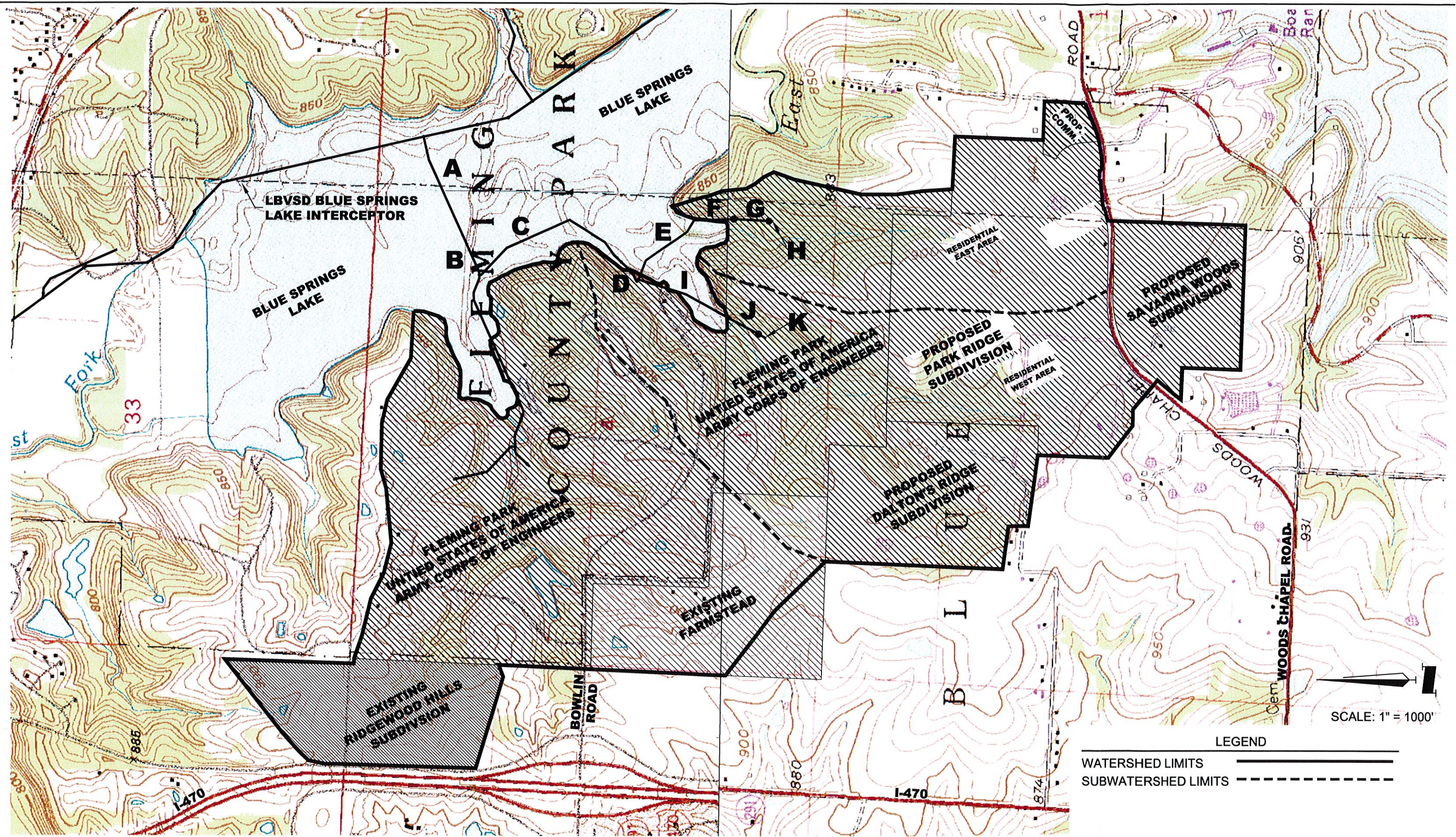
- **FIGURE 1**
 - **SITE PLAN**
 - **STUDY BY HDR FOR PROJECTS TO THE SUBDIVISION**

Line Segment	Gravity Flow Capacity MGD	Segment Flow MGD	Excess Capacity MGD	City of Lee's Summit Criteria (Existing)					
				Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
				Flowline Elev	Flowline Elev.	Ground Elev.	Ground Elev	HGL	HGL
E	1.08	2.03	-0.95	781.55	778.54	802	821	805.12	794.48
K	3.97	2.29	1.68	803	800	815	806	810.43	809.43
J	3.48	2.29	1.19	793	780.93	806	802	809.39	804.17
I	1.08	2.29	-1.21	780.93	778.78	802	821	804.12	794.41
D	1.85	4.32	-2.47	778.44	778.05	821	802	794.01	791.89
C	1.85	4.32	-2.47	778.05	775.28	802	802	791.64	776.61
B	13.53	5.75	7.78	775.28	774.07	802	802	776.33	775.39
A	11.13	5.75	5.38	774.047	772.08	802	802	775.35	773.37
A-1	2.42	2.29	0.13	802.49	804.76	810.21	807.39	812.13	810.05
A-2	2.77	2.29	0.48	804.96	807.87	813.87	810.21	814.17	812.13
A-3	2.4	2.29	0.11	808.07	812.07	819.07	813.87	817.86	814.17
A-4	3.57	2.29	1.28	812.27	818.13	825.78	819.07	820.59	817.86

Line Segment	Gravity Flow Capacity MGD	Segment Flow MGD	Excess Capacity MGD	City of Lee's Summit Criteria (w/ Monticello)					
				Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
				Flowline Elev	Flowline Elev.	Ground Elev.	Ground Elev	HGL	HGL
E	1.08	2.03	-0.95	781.55	778.54	802	821	805.12	793.68
K	3.97	3.26	0.71	803	800	815	806	835.08	833.08
J	3.48	3.26	0.22	793	780.93	806	802	833.08	822.47
I	1.08	3.26	-2.18	780.93	778.78	802	821	822.47	802.8
D	1.85	5.31	-3.46	778.44	778.05	821	802	802.8	791.15
C	1.85	5.31	-3.46	778.05	775.28	802	802	799.15	776.61
B	13.53	6.73	6.8	775.28	774.07	802	802	776.41	775.17
A	11.13	6.73	4.4	774.047	772.08	802	802	775.35	773.37
A-1	2.42	3.26	-0.84	802.49	804.76	810.21	807.39	839.39	835.18
A-2	2.77	3.26	-0.49	804.96	807.87	813.87	810.21	843.53	839.39
A-3	2.4	3.26	-0.86	808.07	812.07	819.07	813.87	851	843.53
A-4	3.57	3.26	0.31	812.27	818.13	825.78	819.07	856.54	855.9

Little Blue Valley Sewer District Criteria (Existing)									
Line Segment	Gravity Flow Capacity MGD	Segment Flow MGD	Excess Capacity MGD	Upstream Flowline Elev	Downstream Flowline Elev.	Upstream Ground Elev.	Downstream Ground Elev	Upstream HGL	Downstream HGL
E	1.08	0.59	0.49	781.55	778.54	802	821	782.02	779.46
K	3.97	0.82	3.15	803	800	815	806	803.48	800.31
J	3.48	0.82	2.66	793	780.93	806	802	793.48	781.63
I	1.08	0.82	0.26	780.93	778.78	802	821	781.57	779.44
D	1.85	1.41	0.44	778.44	778.05	821	802	779.33	779.02
C	1.85	1.41	0.44	778.05	775.28	802	802	778.92	776.15
B	13.53	2.32	11.21	775.28	774.07	802	802	775.84	774.8
A	11.13	2.32	8.81	774.047	772.08	802	802	774.71	773.37
A-1	2.42	0.82	1.6	802.49	804.76	810.21	807.39	805.24	802.89
A-2	2.77	0.82	1.95	804.96	807.87	813.87	810.21	808.35	805.33
A-3	2.4	0.82	1.58	808.07	812.07	819.07	813.87	812.55	808.47
A-4	3.57	0.82	2.75	812.27	818.13	825.78	819.07	818.61	812.6

Little Blue Valley Sewer District Criteria (w/ Monticello)									
Line Segment	Gravity Flow Capacity MGD	Segment Flow MGD	Excess Capacity MGD	Upstream Flowline Elev	Downstream Flowline Elev.	Upstream Ground Elev.	Downstream Ground Elev	Upstream HGL	Downstream HGL
E	1.08	0.59	0.49	781.55	778.54	802	821	802.12	794.48
K	3.97	1.04	2.93	803	800	815	806	810.43	809.43
J	3.48	1.04	2.44	793	780.93	806	802	809.39	804.17
I	1.08	1.04	0.04	780.93	778.78	802	821	804.12	794.41
D	1.85	1.59	0.26	778.44	778.05	821	802	794.01	791.89
C	1.85	1.59	0.26	778.05	775.28	802	802	791.64	776.61
B	13.53	2.5	11.03	775.28	774.07	802	802	776.33	775.39
A	11.13	2.5	8.63	774.047	772.08	802	802	775.35	773.37
A-1	2.42	1.04	1.38	802.49	804.76	810.21	807.39	805.3	802.95
A-2	2.77	1.04	1.73	804.96	807.87	813.87	810.21	808.41	805.39
A-3	2.4	1.04	1.36	808.07	812.07	819.07	813.87	812.61	808.53
A-4	3.57	1.04	2.53	812.27	818.13	825.78	819.07	818.67	812.64



LEGEND

WATERSHED LIMITS —————

SUBWATERSHED LIMITS - - - - -

E. T. ARCHER CORPORATION D.B.A.

Archer

TOTAL PROJECT MANAGEMENT

CORPORATE OFFICE: 3741 NE TROON DRIVE
LEE'S SUMMIT, MO 64064
816-554-3019 • Fax 816-554-3061

OTHER OFFICE LOCATIONS

- 187 E. DAVID, P.O. BOX 959, FORTSMO, MO 65653 • 417-546-3218 • FAX 417-546-5324
- 800 STARKS BUILDING, LOUISVILLE, KY 40202 • 502-581-9484 • FAX 502-581-9485
- 1000 CITY PARKWAY, OSAKE BEACH, MO 65065 • 573-348-3222 • FAX 573-348-3499
- 1051 KINGS HIGHWAY, SUITE 7, P.O. BOX 537, ROLLA, MO 65402 • 573-364-3420 • FAX 573-364-4170
- 8340 MISSION RD, SUITE 240, PRINCE VILLAGE, KS 66206 • 913-852-6757 • FAX 816-347-1399
- 255 SO. UNION, SPRINGFIELD, MO 65802 • 417-865-4083 • FAX 417-865-4085
- 2480 EXECUTIVE DRIVE, SUITE 116, ST. CHARLES, MO 63303 • 636-477-8399 • FAX 636-477-7599

**PARK RIDGE
SANITARY DRAINAGE MAP**

FIGURE 1

SANITARY SEWER EVALUATION

INTRODUCTION

ACH, L.L.C. is proposing a development in northeast Lee's Summit entitled Park Ridge. The proposed project site is located approximately one mile east of Interstate 470 on the north side of Woods Chapel Road. The site contains approximately 180 acres and is proposed to be developed as single-family residential and commercial. The proposed development location is indicated on Figure 1 in Appendix A.

EXISTING FACILITIES

The proposed development is located within the Blue Springs Lake Watershed. Figure 1 depicts the watershed limits and existing wastewater conveyance system for the Blue Springs Lake Watershed. The system available to serve the Park Ridge Development consists of a branch of the Little Blue Valley Sewer District Blue Springs Lake Interceptor within Fleming Park that conveys flows to the Blue Springs Lake Interceptor main line under Blue Springs Lake.

An initial analysis was performed to determine the capacities of the existing branches of Blue Springs Lake Interceptor serving the Park Ridge Development. The capacities of the interceptors are indicated in Table 1 in Appendix B, with segment designations H-E representing the east branch, K-I representing the west branch, and D-A representing the line that connects the east and west branch to the Blue Springs Lake Interceptor main line.

TRIBUTARY AREAS

Lee's Summit sewer maps and USGS maps were used to delineate the tributary areas contributing to each segment. The tributary areas for each segment are depicted on Figure 1.

Approximately 50-percent of this watershed will remain undeveloped since it is within Fleming Park and belongs to the United States Army Corps of Engineers. Presently, one subdivision, Ridgewood Hills, is contributing flows to this branch of the interceptor. Park Ridge, Dalton's Ridge, and Savanna Woods are proposed subdivisions that will be preliminary platted this year. The available development areas within the east and west branch watersheds will be 100-percent developed and the available development areas in the entire watershed, contributing to this branch, will be approximately 80-percent developed when these proposed subdivisions are constructed. As a result, the entire watershed, excluding Fleming Park, was considered as tributary to the interceptor.

The Savanna Woods development is located in a watershed without sanitary sewer service. Savanna Woods is proposing to construct a lift station that will pump flows to the Park Ridge gravity sewers. Savanna Woods is scheduled to be developed when the west half of Park Ridge is developed. The Park Ridge gravity sewers, that convey flows to interceptor Segment H, will be constructed when the east half of Park Ridge is developed. Therefore, it is proposed to build a diversion structure at the intersection of the Savanna Woods force main and Park Ridge gravity sewer system that will divert flows to Park Ridge gravity sewers flowing to interceptor Segment K. Ultimately, when the east half of Park Ridge is developed, all Savanna Woods sewer flows will be diverted to the gravity sewer lines flowing to interceptor Segment H. This sanitary sewer analysis evaluates the ultimate condition. Therefore, the Savanna Woods tributary area is shown contributing to Segment H.

FLOWS

The tributary flows for each branch were determined using two options. Option 1 utilizes the City of Lee's Summit's flow criteria, as specified in the 2004 Lee's Summit Design and Construction Manual. Option 2 utilizes Little Blue Valley Sewer District (LBVSD) peak flow criteria, as established in the 2000 LBVSD Master Plan.

Option 1 Flows

Option 1 peak residential wastewater flows are determined by summing a peak dry weather flow of 1,500 gallons per acre, a peak infiltration of 500 gallons per acre, and a peak inflow that is calculated using the following formula:

$$\text{Peak Inflow} = KiA \times 0.6463167 = \text{million gallons per day}$$

Where: K =dimensionless inflow factor (0.006-residential)
 i =intensity (inches per hour)
 A =tributary area (acres)

The rainfall intensity, i , corresponds to the tributary area's time of concentration for a 50-year storm event. The time of concentration is determined as follows:

$$\text{Time of Concentration} = 18.46 \times \text{Area}^{0.2524}$$

After determining the time of concentration, the intensity is obtained from the table in Section 6501-C of the 2004 Lee's Summit Design and Construction Manual.

Option 1 peak commercial flows are determined by summing a peak dry weather flow, a peak infiltration of 250 gallons per day per acre, and a peak inflow. Peak inflow is determined using the same equation indicated above for residential use, except the K -value is 0.003. The peak dry weather flow is determined by the type of non-residential use, building area, and the equivalent development units (EDU) established in Table 6501-1 of the 2004 Lee's Summit Design and Construction Manual. The peak dry weather flow is determined as follows:

$$\text{Non-residential Peak Dry Weather Flow} = \text{EDU} \times \text{Building Area} \times \text{Stories} \times 300 \text{ GPD}$$

Individual existing and proposed flow contributions and their expected entry points into the Blue Springs Lake Interceptor are indicated on Table 2A and Table 2B in Appendix B.

Option 2 Flows

The Option 2 peak wastewater flows are determined by multiplying average wastewater flows by a peaking factor. The average flow is calculated as follows:

$$\text{Average Flow} = 2.6 \text{ people/home} \times \# \text{ of homes} \times 119 \text{ gallons/capita/day} = \text{gallons per day}$$

The number of homes for the existing and proposed subdivisions was determined from preliminary plats. Since full (ultimate) development is projected in the watershed, Lee's Summit maximum R-1 zoning density (4.0 homes per acre) was used for the existing farmstead. After determining the

average flow, the peak flow is obtained by using a peaking factor of 6.20, which is specified in the 2000 LBVSD Master Plan. Individual existing and proposed flow contributions and their expected entry points into the Blue Springs Lake Interceptor are indicated on Table 3A and Table 3B in Appendix B.

ANALYSIS

A hydraulic analysis was completed for existing and proposed flows contributing to the interceptor. The analysis was completed using Lee's Summit Design Criteria (Option 1 Flows) and using the Little Blue Valley Sewer District Criteria (Option 2 Flows). Table 4A and Table 4B, in Appendix B, provide an individual segment summary utilizing Option 1 Flows. Table 5A and Table 5B, in Appendix B, provide an individual segment summary using Option 2 Flows.

RESULTS

Based on Lee's Summit Design Flow Criteria, Segment E, Segment I, Segment D, and Segment C will have their respective gravity flow capacity exceeded at ultimate development in the watershed. However, each of these segments is a sealed system beneath the normal and full pool of the lake, which contains flows within the segments allowing the system to have pressure capacity. The hydraulic grade line elevations are higher than the manhole located between Segment J and Segment K. Again, the pipe connections within these structures are sealed connections and contain flows within the system allowing the system to have pressure capacity. However, there is a 2-inch air vent within this manhole. Therefore, to ensure the hydraulic grade line remains within the system we recommend the manhole and air vent be raised so the top of the air vent is at least 1-foot above the hydraulic grade line elevation highlighted in Table 5B.

Based on Little Blue Valley Sewer District Flow Criteria, all segments have gravity flow capacity for ultimate development in the watershed.

CONCLUSIONS

Based on an evaluation of the existing system and peak flow rates, this branch of the Blue Springs Lake Interceptor has adequate capacity to serve the Park Ridge Development. Although the hydraulic grade line is above the pipe in some segments, when using Lee's Summit Design Flow Criteria, this system will still convey flows under pressure without adverse effect to public health, safety, and welfare.

RECOMMENDATIONS

As stated in the results, to ensure the hydraulic grade line remains within the system we recommend the manhole and air vent be raised so the top of the air vent is at least 1-foot above the hydraulic grade line elevation highlighted in Table 5B. This modification would increase the Segment J-K manhole rim elevation approximately 6-feet.

Park Ridge and Dalton's Ridge will contribute flows to the west branch. Since each of these developments is contributing to the interceptor we recommend the manhole modification cost be shared between the developments based on the tributary area to the branch.

In addition to the above-described improvements, Archer has made the following recommendation to ACH, L.L.C. to help reduce the peak flows to the Blue Springs Lake Interceptor:

1. Through the Subdivisions Protective Covenants, the Park Ridge Developer should enforce the design of foundation drain systems that minimize the introduction of inflow into the sanitary sewer system. The proposed requirements should include:
 - a. Placement of foundation drain pipe below the basement slab. Normal construction practice is to place this drain at or above basement floor level.
 - b. All foundation drains should be piped to a sump that is located below the lowest end of the drain pipe with a sump pump that is capable of pumping the capacity of the foundation drain. If gravity discharge of the foundation drain is proposed (i.e. walkout basements), the builder should provide the Developers' engineer with elevations and slopes of the pipe from the building to the point of discharge.
 - c. Use of sanitary sewers, via foundation drain taps to basement floor drains or taps to the laterals, should be strictly prohibited. This restriction should be incorporated into the Protective Covenants.
 - d. The Developer will provide engineering inspection of all foundation drains, lateral installation, and connections to the public sewers. This will include an inspection of basement floor drains prior to occupancy of all homes.

TABLE 1
BLUE SPRINGS LAKE INTERCEPTOR SEWER ANALYSIS
FULL FLOW GRAVITY CAPACITY

Line Segment	Length (ft)	Existing Diameter (in)	Slope (ft/ft)	Velocity (fps)	Gravity Flow Capacity (cfs)	Gravity Flow Capacity (MGD)
EAST BRANCH	H	22.00	12	0.0300	7.82	6.14
	G	400.00	12	0.0300	7.82	6.14
	F	425.00	12	0.0300	7.82	6.14
	E	1,368.18	12	0.0022	2.12	1.66
WEST BRANCH	K	100.00	12	0.0300	7.82	6.14
	J	524.78	12	0.0230	6.85	5.38
	I	977.27	12	0.0022	2.12	1.66
	D	278.57	16	0.0014	2.05	2.86
COMBINED	C	1,978.00	16	0.0014	2.05	2.86
	B	484.00	2-18	0.0025	5.92	10.47
	A	1,191.62	2-18	0.0017	4.89	8.63
	Value of .013 used for pipe type					
					11.16	11.16

	Tributary Area	Entering Sewer Segment	Area (acres)	Peak Base Flow (MGD)	Peak Infiltration (MGD)	Total Peak Flow (MGD)
COMB.	Ridgewood Hills	B	67.45	0.10	0.03	0.74

TABLE 2B
LBVSD BLUE SPRINGS LAKE INTERCEPTOR SEWER ANALYSIS
ULTIMATE DEVELOPMENT CONTRIBUTING FLOWS
OPTION 1 FLOWS

	Tributary Area	Entering Sewer Segment	Area (acres)	Peak Base Flow (MGD)	Peak Infiltration (MGD)	Total Peak Flow (MGD)
EAST BRANCH	Park Ridge (Residential-East Area)	H	91.20	0.14	0.05	1.24
	Corps Ground (Undeveloped)	-	63.89	-	-	-
	Park Ridge (Commercial)*	H	6.25	0.0013	0.0016	0.04
	Savanna Woods	H	55.00	0.08	0.03	0.75
WEST BRANCH	Dalton's Ridge	K	76.00	0.11	0.04	0.99
	Corps Ground (Undeveloped)	-	132.27	-	-	-
	Park Ridge (Residential-West Area)	K	88.35	0.13	0.04	1.16
	Existing Farmstead	K	10.75	0.02	0.01	0.14
COMB.	Ridgewood Hills	B	67.45	0.10	0.03	0.74
	Corps Ground (Undeveloped)	-	281.00	-	-	-
	Existing Farmstead	B	62.34	0.09	0.03	0.68

Peak Base Flow = 1,500 GPD/Acre

Peak Infiltration = 500 GPD/Acre

Peak Inflow = KIA (FOR 50-YEAR STORM)

Total Peak Flow = Peak Base + Peak Infiltration + Peak Inflow

*Commercial Flows Calculations Are Shown Below

Non-Residential Source	Building Area (SF)	EDU	Stories	Peak Base Flow (MGD)
Offices	2400	0.3/1000 SF	1	0.0002
Convenience Store	5400	1+0.3/1000 SF	1	0.0008
Retail	5400	0.2/1000 SF	1	0.0003
TOTAL				0.0013

Commercial Peak Base Flow = EDU x Building Area x Stories x 300GPD

Commercial Peak Infiltration = 250 GPD/Acre

Commercial Peak Inflow = KIA (50-YEAR STORM) (K=0.003)

	Tributary Area	Entering Sewer Segment	Homes	Area (acres)	Total Average Flow (MGD)	Total Peak Flow (MGD)
COMB.	Ridgewood Hills	B	224	67.45	0.07	0.43

TABLE 3B
LBVSD BLUE SPRINGS LAKE INTERCEPTOR SEWER ANALYSIS
ULTIMATE DEVELOPMENT CONTRIBUTING FLOWS
OPTION 2 FLOWS

	Tributary Area	Entering Sewer Segment	Homes	Area (acres)	Total Average Flow (MGD)	Total Peak Flow (MGD)
EAST BRANCH	Park Ridge (Residential-East Area)	H	204	91.20	0.063	0.39
	Corps Ground (Undeveloped)	-	-	63.89	-	-
	Park Ridge (Commercial)*	H	25	6.25	0.0077	0.05
	Savanna Woods	H	81	55.00	0.025	0.16
WEST BRANCH	Dalton's Ridge	K	193	76.00	0.060	0.37
	Corps Ground (Undeveloped)	-	-	132.27	-	-
	Park Ridge (Residential-West Area)	K	190	88.35	0.059	0.36
	Existing Farmstead**	K	43	10.75	0.013	0.08
COMB.	Ridgewood Hills	B	224	67.45	0.069	0.43
	Corps Ground (Undeveloped)	-	-	281.00	-	-
	Existing Farmstead**	B	250	62.34	0.077	0.48

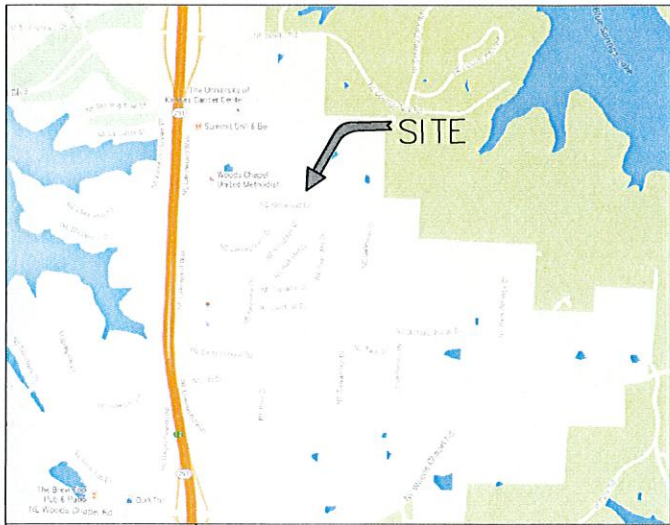
*Used Equivalent Home Count For Stewart Farm Commercial Area with 4.0 homes/acre

**Assumed 4.0 homes/acre For Farmstead

NOTE:

Average Flow = 2.6 People/Home * No. of Homes x 119 Gallons Per Day Per Capita (Specified By 2000 Little Blue Valley Sewer District Facility Plan)

Peak Flow = 6.20 x Average Flow (6.20:1 Peak As Determined By 2000 Little Blue Valley Sewer District Facility Plan)



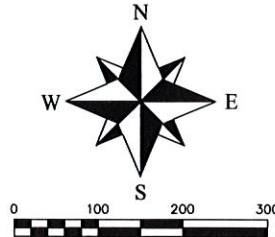
University of Kansas
Hospital Authority
4881 NE Goodview Cir
Lot 9-C, Executive Lakes
Center, Lots 9-C & 9-D

Woods Chapel United
Methodist Church
4725 NE Lakewood Way

LEGEND

These standard symbols will be found in the drawing.

- Set 1/2" Rebar & Cap (LS-2005008319-D)
- ⊙ Found Survey Monument (As Noted)
- ① Exception Document Location
- Existing Fence Line - Chain Link
- Existing Water Line
- Existing Sanitary Sewer Main
- Existing Storm Sewer
- Existing Gas Line
- Existing Underground Telephone
- Existing Underground Electric



Preliminary Plat Monticello Lots 1 - 160 & Tracts A-F Section 4 & 5, Township 48 North, Range 31 West Lee's Summit, Jackson County, Missouri

Legal Description:

A tract of land located in part of Section 4 and Section 5, Township 48 North, Range 31 West, more particularly described as follows: Beginning at the Southwest corner of Section 4, thence North 88° 14' 06" West, a distance of 200.01 feet; thence North 02° 18' 05" East, a distance of 659.95 feet; thence South 87° 58' 48" East, a distance of 1171.74 feet; thence South 02° 12' 15" West, a distance of 20.04 feet; thence South 87° 58' 52" East, a distance of 1073.05 feet; thence South 01° 47' 06" West, a distance of 1298.93 feet; thence North 88° 01' 51" West, a distance of 2057.01 feet, returning to the Point of Beginning. Containing 67.71 acres more or less.

UTILITIES:

THE INFORMATION CONCERNING THE EXISTENCE, LOCATION, SIZE OR TYPE OF MATERIALS OF UNDERGROUND UTILITIES SHOWN HEREON, WHICH ARE NOT VISIBLE FROM THE SURFACE, HAS BEEN COMPILED FROM THE RECORDS OF THE VARIOUS UTILITY COMPANIES OR OTHER SOURCES OF INFORMATION AND HAS NOT BEEN VERIFIED IN THE FIELD BY THIS COMPANY. WHERE RECORD MEASUREMENTS WERE NOT AVAILABLE, THE LOCATION OF THESE UNDERGROUND LINES WAS SCALED FROM THE COMPANY'S RECORDS. THIS INFORMATION IS NOT TO BE CONSIDERED AS ACCURATE, COMPLETE NOR EXHAUSTIVE. ANY INFORMATION CONCERNING UNDERGROUND UTILITIES SHOWN HEREON MUST BE CONFIRMED BY THE DESIGN PROFESSIONAL PRIOR TO DESIGNING ANY IMPROVEMENTS WHICH MAY BE AFFECTED BY THIS INFORMATION OR BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION ACTIVITY.

FEMA Note:

See FEMA Site for Flood Data
Website: www.fema.gov
Panel Number: 29095C0312F

Site Data Table :

Lot Area: 2,949,550.09 Sq. Ft. (67.71 Acres)
Lots: 160
Phase 1: 38 Lots
Phase 2: 32 Lots
Phase 3: 33 Lots
Phase 4: 56 Lots

Density: 2.36 Lots / Acre

Current Zoning: AG, Agricultural
Proposed Zoning: R-1, Single Family Residential

Sanitary Sewer Service

Sanitary sewer main will be extended to the north and connected to the Little Blue Valley Sewer District Interceptor. Following final design a sewer easement will be drafted and dedicated to the City of Lee's Summit by separate document.

Water Service

Water will be extended to the site from the existing City of Lee's Summit water located within the existing subdivisions to the south. The water will be looped in phase 1 to provide water capacity and volume to the subdivision.

Storm Sewer

Storm sewer system will be installed to convey the storm water runoff to the detention facility, which will meet the current standards of APWA Section 5600.

Storm Water Detention

The increase in storm water runoff will be controlled by the proposed detention facility located in the north portion of the site. The flows will be reduced to meet APWA Section 5600 required flow rates. BMP facilities will be provided within the pond system.

SURVEYOR'S GENERAL NOTES:

- This survey is based upon the following information provided by the client or researched by this surveyor:
(A) Ex(B). Final Plat of Woodview Estates
(C) Final Plat of Sunny Brook 1st - 5th Plat
(D) Final Plat of Foxwood East 5th Plat
(E) Final Plat of Foster Addition
(F) Final Plat of J. Robinson Suburban Addition

- This survey meets or exceeds the accuracy standards of a (SUBURBAN) Property Boundary Survey as defined by the Missouri Standards for Property Boundary Survey.

- The Title report was furnished by Kansas City Title Insurance Company, File No. KCT-183642
Dated: January 12, 2015 @ 8:00 A.M.

- Bearings shown hereon are based upon bearings described in the legal description.

- This company assumes no responsibility in the location of existing utilities within the subject premises. This is an above-ground survey. The underground utilities, if shown, are based on information provided by the various utility companies and these locations should be considered approximate. There may be additional underground utilities not shown on this drawing. Dig Risk Ticket #150071203, 150071179, 150071171.

- Subsurface and environmental conditions were not surveyed or examined or considered as a part of this survey. No evidence or statement is made concerning the existence of underground or overhead conditions, containers or facilities that may affect the use or development of this property. No attempt has been made to obtain or show data concerning existence, size, depth, conditions, capacity or location of any utility existing on the site, whether private, municipal or public owned.

OIL - GAS WELLS

ACCORDING TO EDWARD ALTON'S ENVIRONMENTAL IMPACT STUDY OF ABANDONED OIL AND GAS WELLS IN LEE'S SUMMIT, MISSOURI IN 1995, THERE ARE NOT OIL AND GAS WELLS WITHIN 165 FEET OF THE PROPERTY AS SURVEYED HEREON.

REVISIONS

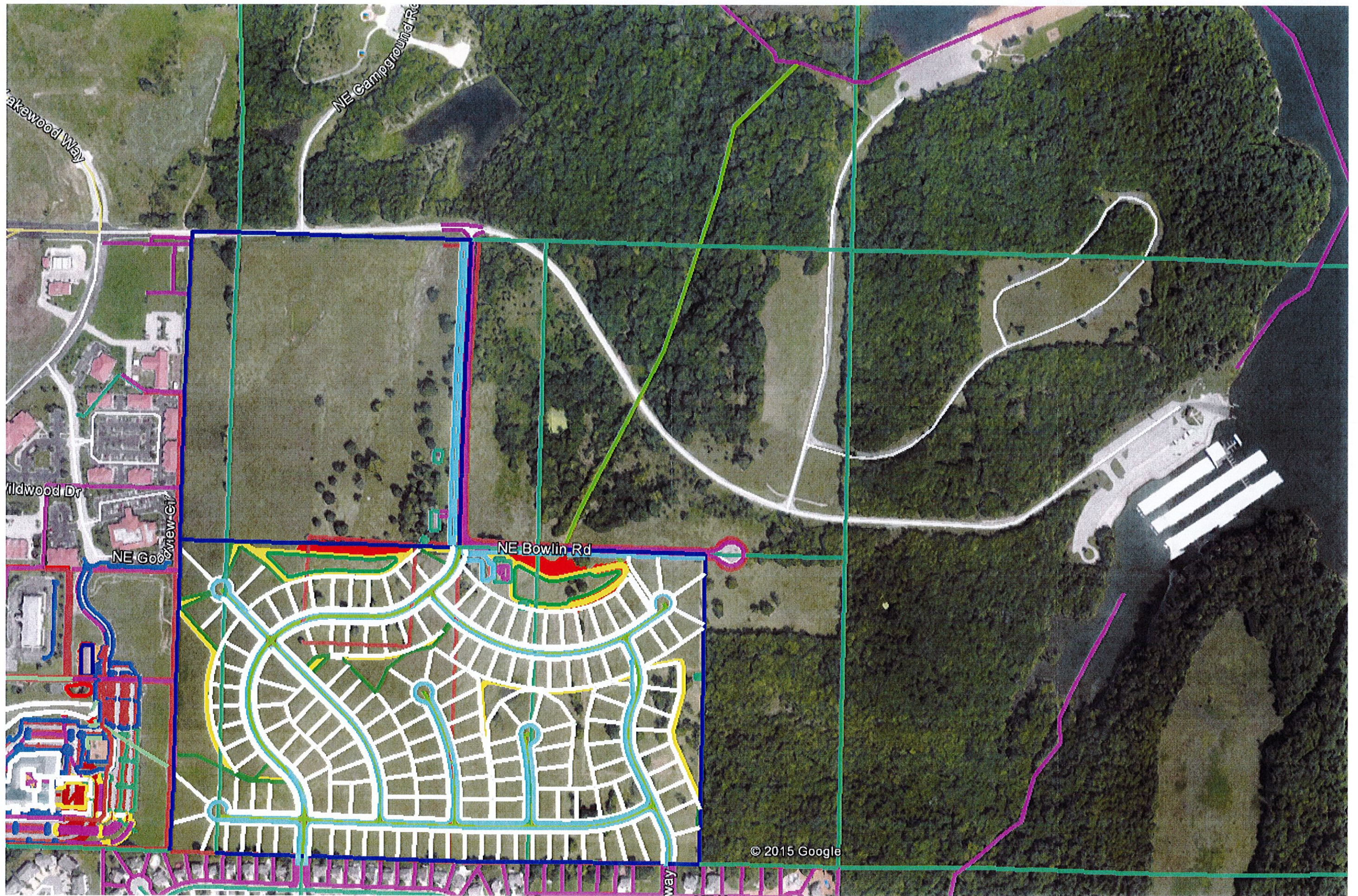
DATE	DESCRIPTION

Preliminary Plat
Monticello - Lots 1 - 160
Section 4 & 5, Township 48 North, Range 31 West
Lee's Summit, Jackson County, Missouri

Preliminary Plat

SHEET	SECTION	TOWNSHIP	RANGE	COUNTY	JOB NO.
1 OF 1	4 / 5	48 N	31 W	Jackson	Monticello
DATE OF PREPARATION	SCALE	DATE OF PREPARATION	SCALE	DATE OF PREPARATION	SCALE
May 1, 2015	1" = 100'	May 1, 2015	1" = 100'	May 1, 2015	1" = 100'

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**SUPPLEMENTAL SANITARY SEWER EVALUATION
PARK RIDGE
LEE'S SUMMIT, JACKSON COUNTY, MO**

August, 2005

Prepared for:

**ACH, L.L.C.
839 NE Woods Chapel Road
Lee's Summit, MO 64064**

PROPOSED INTERCEPTOR EXTENSION

The west and east branches of the Blue Springs Lake Interceptor will be extended to provide service to Dalton's Ridge, Park Ridge, and Savanna Woods. Both branches will be extended using 12-inch diameter PVC, or DIP if underneath a creek crossing. The proposed extensions, lines A and B, are capable of handling Ultimate Development Option 1 and Option 2 flows. Attached Tables 6A and 6B show the capacities and hydraulic grade lines of the proposed segments using the ultimate flows for both options.

The connections to the branches within the Park Ridge Subdivision will consist of 12-inch diameter PVC pipe. These segments will be installed at slopes capable of conveying the Option 1 Ultimate Development flows. The west connection will handle 1.16 MGD, and the east connection will handle 2.03 MGD.