Corporate Reserve of St. Charles

Sanitary Sewer Evaluation

Performed for

The City of St. Charles, Illinois

ST. CHARLES
SINCE 1834

Performed by

Wills Burke Kelsey Associates, Ltd.

WBK

April 24, 2012

INTRODUCTION

On behalf of JCF Real Estate and the City of St. Charles, Wills Burke Kelsey Associates, Ltd. (WBK) has evaluated the impacts of the proposed land use change within the Corporate Reserve of St. Charles project. Impact evaluation is related to the City of St. Charles wastewater collection system. The Corporate Reserve site is located in St. Charles west of Randall Road and north of IL Route 64, near the intersection of Woodward Drive and Corporate Reserve Boulevard. Original development concepts anticipate primarily office use with some commercial use along IL 64. Two single story office buildings have been constructed and a site prepared for a third. JCF is proposing to change a majority of land use from office to high density residential. Based on a Concept Site Plan submitted by JCF Real Estate on March 21, 2012, the proposed development consists of 331 rental units and a club area on approximately twenty acres. JCF Real Estate is interested in connecting to the City of St. Charles wastewater collection system and receiving wastewater treatment service from the City of St. Charles West Side Wastewater Treatment Plant. This report considers existing conditions of the sanitary sewer which includes the potential for future development to be serviced by the existing sanitary system, and assesses the impact to the sanitary sewer as a result of land use changes and increased flows from the proposed Corporate Reserve development.

SCOPE OF EVALUATION

The system components to be evaluated as part of this study include three sanitary sewer pipe networks and the Renaux Manor Lift Station. If it is found that these components can facilitate flows and are within the original design capacities, future evaluation of downstream force main and gravity sewer is not warranted.

The first pipe network is the trunk sanitary sewer that extends from the Renaux Manor Lift Station (just east of the intersection of Peck Road and Campton Hills Road), north along Peck Road to Voltaire Lane. The second pipe network is the existing collection system along Woodward Drive, which begins along Cardinal Drive, flows west along Woodward Drive, and into the Peck Road trunk sewer. A connection into this system from the Corporate Reserve improvements is proposed along Cardinal Drive. The third sanitary sewer pipe network is within the Remington Glen subdivision. This system is tributary to the Woodward Drive collection system and a connection into this system from the Corporate Reserve development is also proposed. This portion of the City's wastewater collection system includes pipe ranging in size from 8 inches to 15 inches in diameter.

All three sanitary sewer systems were evaluated utilizing a simplified approach considering flowing full capacity based on manning's equation. Two different wet weather flow regimes were considered; with and without proposed flows from Corporate Reserve. Conservatively,

we did not evaluate dry weather flows because wet weather conditions will be most critical and the "minimum" flow condition that the system must be able to handle. A spreadsheet was developed to determine the capacity of representative pipe segments in the network and tributary flows to each segment. In addition to existing sites tributary to the system, future development bound by Woodward Drive and IL Route 64 was identified and considered in the evaluation. The collection system to be evaluation also includes the lift station at Renaux Manor. The Renaux Manor Lift Station was initially evaluated based on a comparison of existing and projected flows to the original design flows and calculations. Additionally, pump run time provided by the City of St. Charles was reviewed and compared to flow estimates.

PIPE CAPACITY ANALYSIS

The first component of the evaluation was to determine the capacity of the existing pipe network. All areas tributary to the collection system were identified and considered. Sanitary sewers pipes range in size from 8 to 15 inches in diameter and all sewers were constructed with relatively new subdivisions and commercial developments that were built starting in the mid 1990's. The pipe slopes, sizes, lengths, rim elevations, and invert elevations utilized in the analysis were determined from the following sources:

- Remington Glen Record Drawings, prepared by Cowhey Gudmundson Leder, Ltd., dated 09/20/05
- Record Plans for Final Engineering Renaux Manor and the Towns of Renaux Manor Unit 1, prepared by Wiseman-Hughes Enterprises, dated 08/18/99
- Record Drawings Grading Improvements – Phase II The Corporate Reserve of St. Charles, prepared by Mackie Consultants LLC, dated 03-29-11
- City of St. Charles GIS Data, provided by the City of St. Charles
- Renaux Manor Sanitary Sewer Mains, Lift Station, and Force Main Record Drawings, prepared by Intech Consultants, INC., dated 4/21/97

Detailed sanitary sewer information for all three pipe networks is located on Exhibit 1 in the Appendix.

Design Flow Determination for Capacity Analysis

A capacity analysis was performed for all three sanitary sewer pipe networks. Two wet weather conditions flow regimes were considered:

- Existing (without Corporate Reserve development); and
- Proposed (with Corporate Reserve development)

It should be noted the "Existing" flow regime includes all existing conditions as well as undeveloped parcels which will be served by the system under evaluation. All lots tributary to each network were included and flows were input at select manholes. Inflow and infiltration was added at the upstream manhole of all pipe networks at 500 gal/in/mi/day. Supporting calculations can be found in the Appendix.

Remington Glen subdivision is serviced by a sanitary sewer pipe network with pipe sizes ranging from 8 to 12 inches in diameter. Based on the approved Illinois Environmental Protection Agency (IEPA) Water Pollution Control Permit, a total of 26 multiple dwelling units were estimated to generate a total of 36,050 gallons per day (gpd).

The existing collection system that runs along Cardinal Drive, and extends west along Woodward Drive before connecting to the Peck Road trunk system was evaluated based on the existing development serviced by the system and potential future development on the three vacant lots bound by IL Route 64 to the south and Woodward Drive to the north. Existing development tributary to the system includes office buildings at Corporate Reserve, Main Street Center, Autumn Leaves Assisted Living, and Remington Glen subdivision. Approved IEPA Water Pollution Control permits yielded an average daily flow rate of 6,000 gpd and 3,200 gpd at the assisted living facility and Main Street Center, respectively. Wastewater flows for the Corporate Reserve office buildings were estimated based on a wastewater generation rate of 15 gpd/employee. The number of employees was calculated based on one employee per 250 square feet of office space. Future wastewater generation rates for the three vacant lots were conservatively calculated using a population equivalent (PE) of 20 per acre of land.

Land uses tributary to the trunk system along Peck Road include single family homes (Renaux Manor Unit 1, Renaux Manor Unit 3 and Artesian Springs), multi-family homes (Renaux Manor Unit 2), and commercial space (Valley Springs Auto, Westgate, and Walgreens). Approved IEPA Water Pollution Control permits for Valley Springs Auto, Westgate, and Walgreens were used to estimate the respective wastewater flows. Flows for the single and multi-family homes were estimated using the IEPA waterwater average daily flow generation rates. For single family homes, a rate of 350 gallons/household/day was used. For multi-family homes, all units were conservatively estimated to be 3 bedroom units with a rate of 300 gallons/unit/day. A total of 152 households in Renaux Manor Unit 1 and Artesian Springs are tributary to the system. 117 single family homes in Renaux Manor Unit 3 are also tributary to the system, in addition to the 29 multi-family homes in Renaux Manor Unit 2.

The Renaux Manor Lift Station receives flow from the sanitary sewer trunk line along Peck Road, which is the collector for both the sanitary sewer system that serves the Remington Glen subdivision and the system along Woodward Drive. The lift station also accepts wastewater flow from tributary land uses to the east. These tributary areas include 35 multi-family units

from Renaux Manor Unit 2, Pine Ridge and Regency Estates (includes Aldi), The Bike Rack & adjacent commercial, the assisted living facility and St. Charles Fire Station No. 3. As mentioned above, wastewater generation rates were estimated at 300 gallons/unit/day for the multi-family units. The approved IEPA rate for Pine Ridge and Regency Estates was used, and flow rates for The Bike Rack & adjacent commercial, and the fire station were based on one employee for every 250 square feet of building, with an average daily use of 15 gpd/employee.

Based on the average daily flow, a peaking factor was calculated and applied in accordance with The Ten State Standards. The existing peak wet weather sanitary flow tributary to the Renaux Manor Lift Station is 1.155 cfs. The capacity analysis and peaking factor calculations for each manhole are shown in the Appendix on Exhibits 2 and 3 following this report. An exhibit showing the entire Renaux Manor Lift Station service area is also provided in Appendix A as Drawing OV1.

Results of Capacity Analysis

Based on the results of the capacity analysis, the pipe network can handle the existing condition wet weather flows. The existing conditions wet weather pipe capacity utilization ranges from 1% to 41% flowing full. Please note, our peak flow assumptions are conservative because all future development estimated at 20 PE per acre.

Next we looked at adding flows from the proposed land use changes at Corporate Reserve. Land use for the proposed development includes 15 buildings with a total of 331 rental units ranging from studios to two bedroom apartments. The percentage of studios, one bedroom, and two bedroom apartments in each building was estimated as shown on Exhibit 4 in the Appendix. Based on the calculated percentages, it was estimated that the average building includes 1 studio, 11 one bedroom apartments, and 10 two bedroom apartments. Using the IEPA waterwater average daily flow generation rates, a value of 4750 gpd was calculated for each building. This calculation can be found in Appendix A.

Based on the Preliminary Utility Plan for Corporate Reserve of St. Charles Phase II prepared by Mackie Consultants on 03-09-12, sanitary sewer is proposed to enter the existing pipe network in two locations. The collection system for Remington Glen will accept 0.375 cfs of additional peak flow from 20 buildings at manhole 6.4062. The remaining 0.062 cfs from 2 buildings will discharge into manhole 6.3194 along Cardinal Drive. After including flow from these additional 22 multi-family homes, the pipe utilization for the proposed condition wet weather flow is estimated to range from 1% to 58% flowing full. The proposed capacity analysis and peaking factor calculations for tributary flows into each manhole are shown in the Appendix on Exhibits 5 and 6 following this report. The Preliminary Utility Plan is also in the Appendix and labeled as Exhibit 7.

It is our opinion that the existing system can convey the proposed condition wet weather flows.

RENAUX MANOR LIFT STATION EVALUATION

The second component of the evaluation was to determine the capacity of the Renaux Manor Lift Station. All tributary areas to the Renaux Manor Lift Station were identified and considered. Design flow rate calculations and rates were taken from *"The Renaux Manor Pump Station Calculations,"* prepared by Wiseman-Hughes Enterprises, revised March 16, 1998.

Per the calculations prepared by Wiseman-Hughes Enterprises, the Renaux Manor Lift Station is designed for an average daily flow of 400,000 gallons per day. The associated Renaux Manor Lift Station Calculations are provided in the Appendix as Exhibit 8. Based on a survey conducted by WBK with City of St. Charles Staff, there are no major operational problems associated with the lift station that suggest it cannot handle the existing flow. There are also no indicators that the lift station will not be able to handle an increased flow, as long as its design peak flow capacity is not exceeded.

WBK estimated the existing average daily flow prior to the connection of the proposed improvements at Corporate Reserve to be 316,723 gallons per day. Including proposed improvements at Corporate Reserve would add an additional average daily flow of 71,250 gallons per day, totaling 387,973 gallons per day. A breakdown of the calculated average daily flow rates are on Exhibit 9 in the Appendix. Therefore, since the total estimated average daily flow is less than the average design daily flow, no improvements are necessary.

Furthermore, based on pump run time data from the City, the average pump run time is 1.2 hours a day for the months of January 2012 to March 2012. This equates to an average daily flow of 99,360 gpd which is significantly less than our estimate average daily flow in the proposed condition of 316,723 gpd. Additionally, peak run time from the data is 3.7 hours a day, which equates to a flow of 306,360 gpd. Therefore, since the real time peak run time is also less than the estimate average daily flow in the proposed condition, it is our opinion that the lift station will be able to handle the additional flow.

Further, average daily flow for the existing conditions in addition to the proposed project are less than the design average daily flow at the Renaux Manor Lift Station. An email survey was also conducted by WBK with the City of St. Charles staff to determine operational condition and concerns. Results of the survey indicated that there are no major operational problems with the Renaux Manor lift station (aside from inoperable VFD's that are determined unnecessary, a panel view screen, and control circuit board memory backup battery holder that is loose). In regards to the sanitary sewer system, there are no known trouble spots in the existing collection system, nor are there any issues with the force main along Peck Road.

SUMMARY AND RECOMMENDATIONS

Based on our evaluation, the proposed land use changes in Corporate Reserve can be facilitated by the existing wastewater collection system as shown on the Preliminary Utility Plan submitted by Mackie Consultants on 3/09/12. A conservative approach was made by WBK to analyze the existing pipe system by including future development on vacant lots and estimating flows for unoccupied buildings that are currently connected to the collection system. Adding projected sanitary sewer flows into the existing system will increase the flow, however; in the fullest pipe will still have over 40% capacity available. Therefore, no improvements are necessary.

Since there are no known operational issues with the lift station to date and it has not reached its maximum operational capacity, WBK believes the Renaux Manor Lift Station will be able to handle the additional waterwater flow generated from the proposed land use change at Corporate Reserve.

EXHIBIT 1

Sanitary Sewer - Corporate Reserve to Peck Road

Upstream Manhole	Downstream Manhole	Upstream Manhole Rim	Downstream Manhole Rim	Upstream Invert	DownStream Invert	Pipe Size	Pipe Length	Pipe Slope	Depth	Type
6.3198	6.3198	769.78	768.98	766.10	764.10	8	119	1.68%	3.10	PVC
6.3198	6.3194	768.98	782.80	764.10	762.68	8	329	0.43%	4.88	PVC
6.3194	6.3193	782.80	784.37	762.68	761.87	8	188	0.43%	20.14	PVC
6.3193	6.3189	784.37	784.29	761.87	761.45	8	66	0.64%	22.50	PVC
6.3189	6.3188	784.29	780.48	761.45	761.06	8	119	0.33%	22.84	PVC
6.3188	6.3192	780.48	775.61	761.06	759.49	8	378	0.42%	19.42	PVC
6.3192	6.3190	775.61	772.68	758.49	758.74	8	108	0.40%	16.12	PVC
6.3190	6.3191	772.68	772.98	758.74	758.17	8	95	0.49%	13.94	PVC
6.3191	6.3200	772.98	768.38	758.27	756.90	8	309	0.44%	14.71	PVC
6.3200	6.3105	768.38	766.58	756.90	755.83	8	153	0.71%	11.49	?
6.3105	6.3104	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.38%	10.40	?
6.3104	6.3103	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.12%	10.66	?
6.3103	7.3089	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.21%	10.38	?
7.3089	7.3088	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.95%	10.44	?
7.3088	7.3087	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.83%	9.80	?
7.3087	7.3086	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.95%	10.98	?
7.3086	7.3085	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.80%	10.43	?
7.3085	7.3084	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.17%	11.00	?
7.3084	7.3083	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.62%	14.72	?
7.3083	7.3082	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.41%	17.06	?
7.3082	7.3081	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.38%	15.14	?
7.3081	7.3080	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.51%	14.50	?

Sanitary Sewer - Peck Road to Renaux Manor Lift Station

Upstream Manhole	Downstream Manhole	Upstream Manhole Rim	Downstream Manhole Rim	Upstream Invert	DownStream Invert	Pipe Size	Pipe Length	Pipe Slope	Depth	Type
7.4082	7.4050	740.75	[illegible]	730.08	729.78	8	90	0.33%	9.77	PVC
7.4050	7.3080	733.87	725.57	729.47	[illegible]	15	158	0.35%	17.44	PVC
7.3080	7.3034	[illegible]	744.78	[illegible]	[illegible]	15	242	0.22%	19.05	PVC
7.3034	7.3033	741.78	733.97	724.84	723.47	15	401	0.34%	19.44	PVC
7.3033	7.3032	743.67	735.01	723.47	722.83	15	332	0.19%	20.90	
7.3032	7.3031	739.91	739.96	723.83	722.64	15	261	0.17%	16.72	
7.3031	7.3018	739.96	740.79	723.43	721.96	15	257	0.16%	17.50	
7.3018	7.3017	740.79	735.18	721.93	721.43	15	252	0.20%	18.80	
7.3017	7.3016	739.44	739.44	721.47	720.88	15	295	0.19%	17.72	
7.3016	7.3013	739.44	735.01	720.88	720.33	15	290	0.19%	18.56	
7.3013	7.3012	739.01	744.53	720.33	719.44	15	318	0.28%	19.28	

Sanitary Sewer - Remington Glen system into MH 7.3083 along Woodward Drive

Upstream Manhole	Downstream Manhole	Upstream Manhole Rim	Downstream Manhole Rim	Upstream Invert	DownStream Invert	Pipe Size	Pipe Length	Pipe Slope	Depth	Type
6.3110	6.3109	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.08%	9.46	
6.3109	6.3108	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.10%	9.52	
6.3108	6.3107	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.40%	9.88	
6.3107	6.3106	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.59%	9.15	
6.3106	6.4063	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.94%	9.96	
6.4063	6.4062	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.93%	9.90	
6.4062	7.4049	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.22%	13.49	
7.4049	7.4048	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.38%	14.70	
7.4048	7.4047	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.37%	14.00	
7.4047	7.4046	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.31%	13.29	
7.4046	7.4045	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.33%	13.48	
7.4045	7.3094	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.24%	17.43	
7.3094	7.3093	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.41%	18.94	
7.3093	7.3092	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.97%	9.60	
7.3092	7.3091	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.85%	9.60	
7.3091	7.3090	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.49%	12.13	
7.3090	7.3083	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.36%	20.80	

Green = City of St. Charles GIS
Red = Remington Glen Record Drawings for Sanitary Sewer, Storm Sewer, & Watermain, Datum = NAVD 88
Yellow = Corporate Reserve Phase II plans, Datum = NAVD 88
Purple = Renaux Manor Sanitary Sewer Mains, Lift Station, and Force Main Record Drawings dated 4/21/97, Datum = NGVD 1929, converted to NAVD 88 (1929 ELEV - 0.13)

EXISTING CONDITIONS CAPACITY ANALYSIS - CORPORATE RESERVE TO PECK ROAD

Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Pipe Length	Pipe Diameter	Pipe Slope	Pipe Capacity (CFS)	Cummulative Peak Sanitary Flow (CFS)	Total I & I (CFS)	Cummulative Wet Weather Flow (CFS)	Pipe Capacity (%)
6.3196	6.3198	766.10	764.10	122	8	1.64%	1.551	0.007	0.00360	0.011	0.7
6.3198	6.3194	764.10	762.68	329	8	0.43%	0.796	0.014	0.00360	0.018	2.2
6.3194	6.3193	762.68	761.87	188	8	0.43%	0.795	0.025	0.00360	0.028	3.5
6.3193	6.3189	761.87	761.45	66	8	0.64%	0.967	0.025	0.00360	0.028	2.9
6.3189	6.3188	761.45	761.06	129	8	0.30%	0.666	0.067	0.00360	0.071	10.6
6.3188	6.3192	761.06	759.49	378	8	0.42%	0.781	0.067	0.00360	0.071	9.1
6.3192	6.3190	759.49	758.74	188	8	0.40%	0.765	0.120	0.00360	0.124	16.2
6.3190	6.3191	758.74	758.27	95	8	0.49%	0.852	0.120	0.00360	0.124	14.5
6.3191	6.3200	758.27	756.90	309	8	0.44%	0.807	0.120	0.00360	0.124	15.3
6.3200	6.3105	756.90	755.81	153	8	0.71%	1.023	0.120	0.00360	0.124	12.1
6.3105	6.3104	755.95	754.16	53	8	3.38%	2.227	0.144	0.00360	0.148	6.6
6.3104	6.3103	754.16	752.19	63	8	3.13%	2.143	0.144	0.00360	0.148	6.9
6.3103	7.3089	752.19	748.53	114	8	3.21%	2.171	0.144	0.00360	0.148	6.8
7.3089	7.3088	748.53	746.70	94	8	1.95%	1.691	0.144	0.00360	0.148	8.8
7.3088	7.3087	746.70	745.11	87	8	1.83%	1.638	0.144	0.00360	0.148	9.0
7.3087	7.3086	745.11	742.24	147	8	1.95%	1.693	0.164	0.00360	0.168	9.9
7.3086	7.3085	742.24	740.40	80	8	2.30%	1.838	0.164	0.00360	0.168	9.1
7.3085	7.3084	740.40	736.98	82	8	4.17%	2.475	0.164	0.00360	0.168	6.8
7.3084	7.3083	736.98	731.72	114	8	4.61%	2.603	0.164	0.00360	0.168	6.4
7.3083	7.3082	731.72	731.15	69	12	0.83%	3.247	0.376	0.00590	0.382	11.8
7.3082	7.3081	731.15	730.77	99	12	0.38%	2.213	0.376	0.00590	0.382	17.2
7.3081	7.3080	730.77	730.20	112	12	0.51%	2.549	0.410	0.00590	0.416	16.3

EXISTING CONDITIONS CAPACITY ANALYSIS - REMINGTON GLEN SYSTEM INTO MH 7.3083 ALONG WOODWARD DRIVE

Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Pipe Length	Pipe Diameter	Pipe Slope	Pipe Capacity (CFS)	Cummulative Peak Sanitary Flow (CFS)	Total I & I (CFS)	Cummulative Wet Weather Flow (CFS)	Pipe Capacity (%)
6.3110	6.3109	748.79	747.56	114	8	1.08%	1.259	0.226	0.00230	0.228	18.1
6.3109	6.3108	747.56	746.07	125	8	1.19%	1.323	0.226	0.00230	0.228	17.2
6.3108	6.3107	746.07	745.57	126	8	0.40%	0.763	0.226	0.00230	0.228	29.8
6.3107	6.3106	745.57	742.99	162	8	1.59%	1.529	0.226	0.00230	0.228	14.9
6.3106	6.4063	742.99	741.70	137	8	0.94%	1.176	0.226	0.00230	0.228	19.4
6.4063	6.4062	741.70	740.50	129	8	0.93%	1.169	0.226	0.00230	0.228	19.5
6.4062	7.4049	735.18	734.99	87	12	0.22%	1.669	0.226	0.00230	0.228	13.6
7.4049	7.4048	734.99	734.30	180	12	0.38%	2.212	0.226	0.00230	0.228	10.3
7.4048	7.4047	734.30	734.14	43	12	0.37%	2.179	0.226	0.00230	0.228	10.5
7.4047	7.4046	734.14	733.62	167	12	0.31%	1.993	0.226	0.00230	0.228	11.4
7.4046	7.4045	733.62	733.02	184	12	0.33%	2.040	0.226	0.00230	0.228	11.2
7.4045	7.3094	733.02	732.75	114	12	0.24%	1.739	0.226	0.00230	0.228	13.1
7.3094	7.3090	732.75	732.16	132	12	0.45%	2.388	0.226	0.00230	0.228	9.5
7.3093	7.3092	746.22	745.07	118	8	0.97%	1.196	0.226	0.00230	0.228	19.0
7.3092	7.3091	745.07	740.60	116	8	3.85%	2.379	0.226	0.00230	0.228	9.6
7.3091	7.3090	740.60	737.63	85	8	3.49%	2.265	0.226	0.00230	0.228	10.1
7.3090	7.3083	737.63	731.72	202	12	2.93%	6.111	0.226	0.00230	0.228	3.7

EXISTING CONDITIONS CAPACITY ANALYSIS - PECK ROAD INTO RENAUX MANOR LIFT STATION

Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Pipe Length	Pipe Diameter	Pipe Slope	Pipe Capacity (CFS)	Cummulative Peak Sanitary Flow (CFS)	Total I & I (CFS)	Cummulative Wet Weather Flow (CFS)	Pipe Capacity (%)
7.4002	7.4050	730.98	729.79	307	8	0.39%	0.754	0.255	0.00890	0.263	34.9
7.4050	7.3080	725.47	725.15	108	15	0.30%	3.526	0.255	0.00890	0.263	7.5
7.3080	7.3034	725.15	724.84	142	15	0.22%	3.026	0.636	0.01480	0.651	21.5
7.3034	7.3033	724.84	723.47	401	15	0.34%	3.786	0.636	0.01480	0.651	17.2
7.3033	7.3032	723.47	722.89	320	15	0.18%	2.758	0.636	0.01480	0.651	23.6
7.3032	7.3031	722.89	722.40	281	15	0.17%	2.705	0.671	0.01480	0.686	25.3
7.3031	7.3018	722.40	721.99	257	15	0.16%	2.587	0.671	0.01480	0.686	26.5
7.3018	7.3017	721.99	721.42	292	15	0.20%	2.862	1.126	0.02910	1.155	40.4
7.3017	7.3016	721.42	720.88	291	15	0.19%	2.790	1.126	0.02910	1.155	41.4
7.3016	7.3015	720.88	720.33	290	15	0.19%	2.821	1.126	0.02910	1.155	41.0
7.3015	7.3053	720.33	719.44	312	15	0.29%	3.459	1.126	0.02910	1.155	33.4

Manhole 6.3196 Sanitary Sewer Peak Flow	
PE	10
Peaking Factor	4.41
Peak Flow (Million Gallons Per Day)	**0.005**
Peak Flow (Gallons Per Day)	**4613**
Flow (Gallons Per Minute)	3
Flow (CFS)	0.007

Manhole 6.3198 Sanitary Sewer Peak Flow	
PE	21
Peaking Factor	4.38
Peak Flow (Million Gallons Per Day)	**0.009**
Peak Flow (Gallons Per Day)	**9154**
Flow (Gallons Per Minute)	6
Flow (CFS)	0.014

Manhole 6.3194 Sanitary Sewer Peak Flow	
PE	37
Peaking Factor	4.34
Peak Flow (Million Gallons Per Day)	**0.016**
Peak Flow (Gallons Per Day)	**15881**
Flow (Gallons Per Minute)	11
Flow (CFS)	0.025

Manhole 6.3189 Sanitary Sewer Peak Flow	
PE	103
Peaking Factor	4.24
Peak Flow (Million Gallons Per Day)	**0.044**
Peak Flow (Gallons Per Day)	**43504**
Flow (Gallons Per Minute)	30
Flow (CFS)	0.067

EXISTING PEAK FLOW CALCULATIONS
EXHIBIT 3

Manhole 6.3192 Sanitary Sewer Peak Flow	
PE	187
Peaking Factor	4.16
Peak Flow (Million Gallons Per Day)	**0.078**
Peak Flow (Gallons Per Day)	**77601**
Flow (Gallons Per Minute)	54
Flow (CFS)	0.120

Manhole 6.3105 Sanitary Sewer Peak Flow	
PE	226
Peaking Factor	4.13
Peak Flow (Million Gallons Per Day)	**0.093**
Peak Flow (Gallons Per Day)	**93373**
Flow (Gallons Per Minute)	65
Flow (CFS)	0.144

Manhole 7.3087 Sanitary Sewer Peak Flow	
PE	258
Peaking Factor	4.11
Peak Flow (Million Gallons Per Day)	**0.106**
Peak Flow (Gallons Per Day)	**106000**
Flow (Gallons Per Minute)	74
Flow (CFS)	0.164

Manhole 7.3083 Sanitary Sewer Peak Flow	
PE	619
Peaking Factor	3.92
Peak Flow (Million Gallons Per Day)	**0.243**
Peak Flow (Gallons Per Day)	**242827**
Flow (Gallons Per Minute)	169
Flow (CFS)	0.376

EXISTING PEAK FLOW CALCULATIONS
EXHIBIT 3

Manhole 7.3081 Sanitary Sewer Peak Flow	
PE	679
Peaking Factor	3.90
Peak Flow (Million Gallons Per Day)	**0.265**
Peak Flow (Gallons Per Day)	**264843**
Flow (Gallons Per Minute)	184
Flow (CFS)	0.410

Manhole 7.3080 Sanitary Sewer Peak Flow	
PE	1,088
Peaking Factor	3.78
Peak Flow (Million Gallons Per Day)	**0.411**
Peak Flow (Gallons Per Day)	**410905**
Flow (Gallons Per Minute)	285
Flow (CFS)	0.636

Manhole 7.3032 Sanitary Sewer Peak Flow	
PE	1,153
Peaking Factor	3.76
Peak Flow (Million Gallons Per Day)	**0.433**
Peak Flow (Gallons Per Day)	**433494**
Flow (Gallons Per Minute)	301
Flow (CFS)	0.671

Manhole 7.3018 Sanitary Sewer Peak Flow	
PE	2,033
Peaking Factor	3.58
Peak Flow (Million Gallons Per Day)	**0.728**
Peak Flow (Gallons Per Day)	**727910**
Flow (Gallons Per Minute)	505
Flow (CFS)	1.126

EXISTING PEAK FLOW CALCULATIONS
EXHIBIT 3

Manhole 7.4002 Sanitary Sewer Peak Flow	
PE	410
Peaking Factor	4.02
Peak Flow (Million Gallons Per Day)	**0.165**
Peak Flow (Gallons Per Day)	**164508**
Flow (Gallons Per Minute)	114
Flow (CFS)	0.255

Manhole 6.3110 Sanitary Sewer Peak Flow	
PE	361
Peaking Factor	4.04
Peak Flow (Million Gallons Per Day)	**0.146**
Peak Flow (Gallons Per Day)	**145757**
Flow (Gallons Per Minute)	101
Flow (CFS)	0.226

Sanitary Sewer Peak Flow Tributary to Renaux Manor Lift Staton	
PE	1,134
Peaking Factor	3.76
Peak Flow (Million Gallons Per Day)	**0.427**
Peak Flow (Gallons Per Day)	**426883**
Flow (Gallons Per Minute)	296
Flow (CFS)	0.660

EXHIBIT 4

— = SANITARY SEWER

% studio = 4.8%
% 1BR = 48.3%
% 2BR = 46.8%

average:
22 units/bldg
1.0 studio, say 1
10.6 1BR, say 11
10.3 2BR, say 10

Sheet LP-1
Corporate Reserve of St. Charles
Concept Site Plan
Date: March 21, 2012

JCH REAL ESTATE
BSB DESIGN

PROPOSED CONDITIONS CAPACITY ANALYSIS - CORPORATE RESERVE TO PECK ROAD

Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Pipe Length	Pipe Diameter	Pipe Slope	Pipe Capacity (CFS)	Cummulative Peak Sanitary Flow (CFS)	Total I & I (CFS)	Cummulative Wet Weather Flow (CFS)	Pipe Capacity (%)
6.3196	6.3198	766.10	764.10	122	8	1.64%	1.551	0.007	0.00390	0.011	0.7
6.3198	6.3194	764.10	762.68	329	8	0.43%	0.796	0.014	0.00390	0.022	2.8
6.3194	6.3193	762.68	761.87	188	8	0.43%	0.795	0.087	0.00390	0.095	11.9
6.3193	6.3189	761.87	761.45	66	8	0.64%	0.967	0.087	0.00390	0.095	9.8
6.3189	6.3188	761.45	761.06	129	8	0.30%	0.666	0.130	0.00390	0.138	20.6
6.3188	6.3192	761.06	759.49	378	8	0.42%	0.781	0.130	0.00390	0.138	17.6
6.3192	6.3190	759.49	758.74	188	8	0.40%	0.765	0.183	0.00390	0.190	24.9
6.3190	6.3191	758.74	758.27	95	8	0.49%	0.852	0.183	0.00390	0.190	22.3
6.3191	6.3200	758.27	756.90	309	8	0.44%	0.807	0.183	0.00390	0.190	23.6
6.3200	6.3105	756.90	755.81	153	8	0.71%	1.023	0.183	0.00390	0.190	18.6
6.3105	6.3104	755.95	754.16	53	8	3.38%	2.227	0.207	0.00390	0.215	9.6
6.3104	6.3103	754.16	752.19	63	8	3.13%	2.143	0.207	0.00390	0.215	10.0
6.3103	7.3089	752.19	748.53	114	8	3.21%	2.171	0.207	0.00390	0.215	9.9
7.3089	7.3088	748.53	746.70	94	8	1.95%	1.691	0.207	0.00390	0.215	12.7
7.3088	7.3087	746.70	745.11	87	8	1.83%	1.638	0.207	0.00390	0.215	13.1
7.3087	7.3086	745.11	742.24	147	8	1.95%	1.693	0.226	0.00390	0.234	13.8
7.3086	7.3085	742.24	740.40	80	8	2.30%	1.838	0.226	0.00390	0.234	12.7
7.3085	7.3084	740.40	736.98	82	8	4.17%	2.475	0.226	0.00390	0.234	9.5
7.3084	7.3083	736.98	731.72	114	8	4.61%	2.603	0.226	0.00390	0.234	9.0
7.3083	7.3082	731.72	731.15	69	12	0.83%	3.247	0.438	0.00800	0.450	13.9
7.3082	7.3081	731.15	730.77	99	12	0.38%	2.213	0.438	0.00800	0.454	20.5
7.3081	7.3080	730.77	730.20	112	12	0.51%	2.549	0.847	0.00800	0.863	33.9

PROPOSED CONDITIONS CAPACITY ANALYSIS - REMINGTON GLEN SYSTEM INTO MH 7.3083 ALONG WOODWARD DRIVE

Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Pipe Length	Pipe Diameter	Pipe Slope	Pipe Capacity (CFS)	Cummulative Peak Sanitary Flow (CFS)	Total I & I (CFS)	Cummulative Wet Weather Flow (CFS)	Pipe Capacity (%)
6.3110	6.3109	748.79	747.56	114	8	1.08%	1.259	0.226	0.00410	0.230	18.2
6.3109	6.3108	747.56	746.07	125	8	1.19%	1.323	0.226	0.00410	0.234	17.7
6.3108	6.3107	746.07	745.57	126	8	0.40%	0.763	0.226	0.00410	0.234	30.6
6.3107	6.3106	745.57	742.99	162	8	1.59%	1.529	0.226	0.00410	0.234	15.3
6.3106	6.4063	742.99	741.70	137	8	0.94%	1.176	0.226	0.00410	0.234	19.9
6.4063	6.4062	741.70	740.50	129	8	0.93%	1.169	0.226	0.00410	0.234	20.0
6.4062	7.4049	735.18	734.99	87	12	0.22%	1.669	0.601	0.00410	0.609	36.5
7.4049	7.4048	734.99	734.30	180	12	0.38%	2.212	0.601	0.00410	0.609	27.5
7.4048	7.4047	734.30	734.14	43	12	0.37%	2.179	0.601	0.00410	0.609	27.9
7.4047	7.4046	734.14	733.62	167	12	0.31%	1.993	0.601	0.00410	0.609	30.5
7.4046	7.4045	733.62	733.02	184	12	0.33%	2.040	0.601	0.00410	0.609	29.8
7.4045	7.3094	733.02	732.75	114	12	0.24%	1.739	0.601	0.00410	0.609	35.0
7.3094	7.3090	732.75	732.16	132	12	0.45%	2.388	0.601	0.00410	0.609	25.5
7.3093	7.3092	746.22	745.07	118	8	0.97%	1.196	0.601	0.00410	0.609	50.9
7.3092	7.3091	745.07	740.60	116	8	3.85%	2.379	0.601	0.00410	0.609	25.6
7.3091	7.3090	740.60	737.63	85	8	3.49%	2.265	0.601	0.00410	0.609	26.9
7.3090	7.3083	737.63	731.72	202	12	2.93%	6.111	0.601	0.00410	0.609	10.0

PROPOSED CONDITIONS CAPACITY ANALYSIS - PECK ROAD INTO RENAUX MANOR LIFT STATION

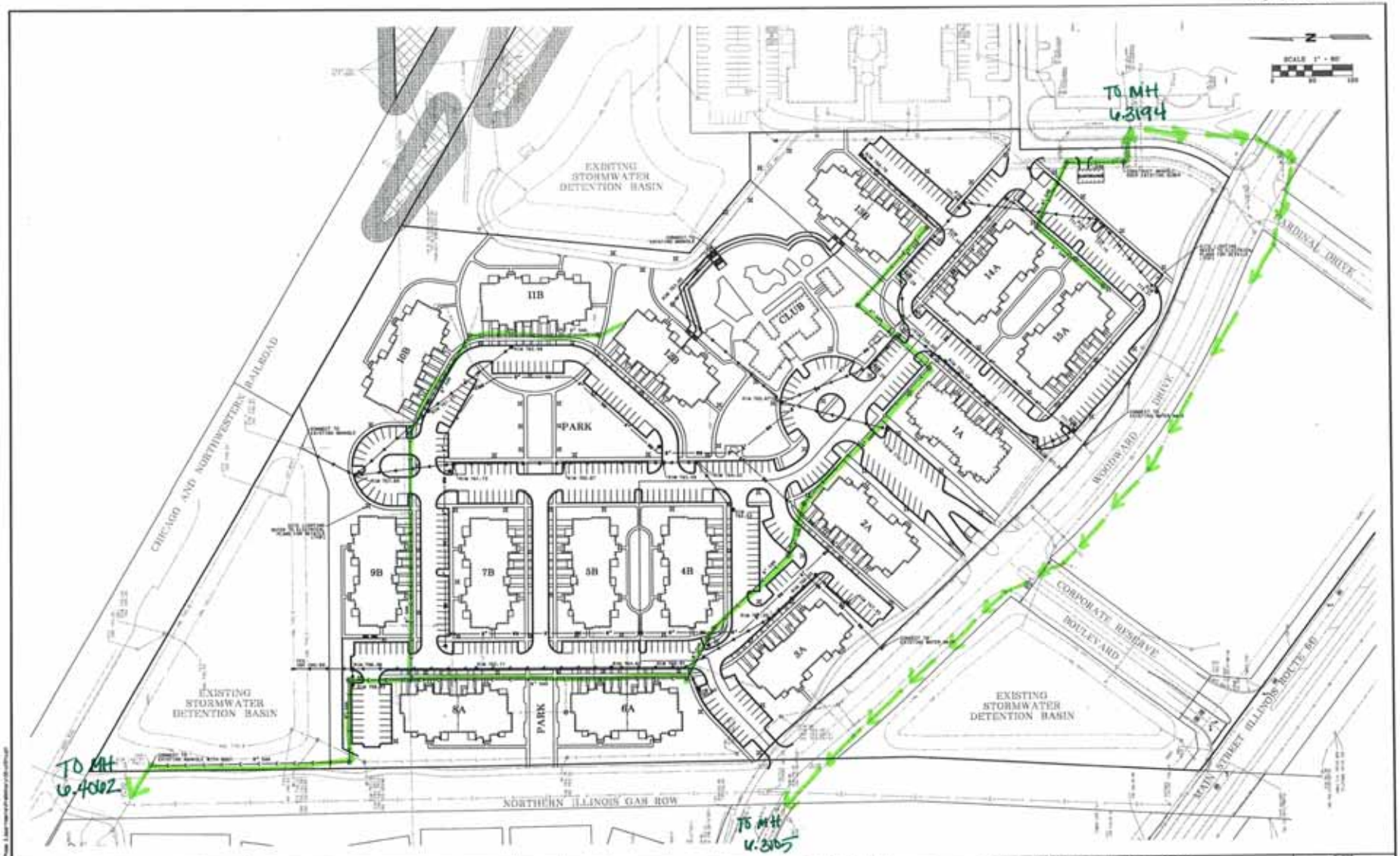
Upstream Manhole	Downstream Manhole	Upstream Elevation	Downstream Elevation	Pipe Length	Pipe Diameter	Pipe Slope	Pipe Capacity (CFS)	Cummulative Peak Sanitary Flow (CFS)	Total I & I (CFS)	Cummulative Wet Weather Flow (CFS)	Pipe Capacity (%)
7.4002	7.4050	730.98	729.79	307	8	0.39%	0.754	0.255	0.00890	0.263	34.9
7.4050	7.3080	725.47	725.15	108	15	0.30%	3.526	0.255	0.00890	0.272	7.7
7.3080	7.3034	725.15	724.84	142	15	0.22%	3.026	1.073	0.01690	1.099	36.3
7.3034	7.3033	724.84	723.47	401	15	0.34%	3.786	1.073	0.01690	1.107	29.2
7.3033	7.3032	723.47	722.89	320	15	0.18%	2.758	1.073	0.01690	1.107	40.1
7.3032	7.3031	722.89	722.40	281	15	0.17%	2.705	1.108	0.01690	1.142	42.2
7.3031	7.3018	722.40	721.99	257	15	0.16%	2.587	1.108	0.01690	1.142	44.1
7.3018	7.3017	721.99	721.42	292	15	0.20%	2.862	1.564	0.03120	1.612	56.3
7.3017	7.3016	721.42	720.88	291	15	0.19%	2.790	1.564	0.03120	1.626	58.3
7.3016	7.3015	720.88	720.33	290	15	0.19%	2.821	1.564	0.03120	1.626	57.6
7.3015	7.3053	720.33	719.44	312	15	0.29%	3.459	1.564	0.03120	1.626	47.0

PROPOSED PEAK FLOW CALCULATIONS
EXHIBIT 6

Manhole 6.3194 Sanitary Sewer Peak Flow	
PE	95
Peaking Factor	4.25
Peak Flow (Million Gallons Per Day)	**0.040**
Peak Flow (Gallons Per Day)	**40371**
Flow (Gallons Per Minute)	28
Flow (CFS)	0.062

Manhole 6.4062 Sanitary Sewer Peak Flow	
PE	618
Peaking Factor	3.93
Peak Flow (Million Gallons Per Day)	**0.242**
Peak Flow (Gallons Per Day)	**242388**
Flow (Gallons Per Minute)	168
Flow (CFS)	0.375

EXHIBIT 1



Mackie Consultants, LLC
9575 W. Higgins Road, Suite 500
Rosemont, IL 60018
(847)696-1400
www.mackieconsult.com

CLIENT:
ST. CHARLES FAIRGROUNDS
OFFICE PARK INVESTORS, LLC
1800 THOREAU DRIVE, SUITE 178
SCHAUMBURG, ILLINOIS 60173
PHONE: (630) 885-7880 FAX: (847) 348-7801

DATE	DESCRIPTION OF REVISION	BY

DESIGNED	K.M./TRB
DRAWN	WHM
APPROVED	DAS
DATE	03-09-15
SCALE	1" = 60'

PRELIMINARY UTILITY PLAN
SUBDIVISION PRELIMINARY PLAN
THE CORPORATE RESERVE OF ST. CHARLES PHASE II
ST. CHARLES, ILLINOIS

SHEET 5 OF 5

PROJECT NUMBER: 1621
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ILLINOIS FIRM LICENSE #184.002664

EXHIBIT 8

RENAUX MANOR

PUMP STATION CALCULATIONS

PREPARED FOR:

WISEMAN-HUGHES ENTERPRISES
975 EAST 22nd STREET
WHEATON, ILLINOIS 60187

PREPARED BY:
INTECH CONSULTANTS, INC.
5413 WALNUT AVENUE
DOWNERS GROVE, ILLINOIS 60515

April 23, 1997
Revised June 27, 1997
Revised January 21, 1998

JOB NO. 95026

EXHIBIT 8

FLOW RATE CALCULATIONS

I. RENAUX MANOR FLOWS

A. SINGLE FAMILY AREA
   1. 265 units * 3.5 PE/unit = 927.5 PE
   2. 927.5 PE * 100 gpcpd = 92,750 gpd (average)

B. MULTI-FAMILY AREA
   1. 238 units * 3.0 PE/unit (assumed all 3 bedroom units) = 714 PE
   2. 714 PE * 100 gpcpd = 71400 gpd (average)

C. COMMERCIAL SITE
   1. 7.6 acres * 15 PE/ acre = 114 PE
   2. 114 PE * 100 gpcpd = 11400 gpd (average)

II. OFFSITE FLOWS

A. AREA TRIBUTARY TO MANHOLE 46 (RHA&A plans) MINUS RENAUX MANOR AREA
   1. 2747 PE (manhole 46) - 612 PE (from Renaux Manor) + 70 PE (from Area 2) = 2205 PE
   2. 2205 PE * 100 gpcpd = 220500 gpd (average)

B. AREA TRIBUTARY TO MANHOLE 33 (RHA&A plans) MINUS RENAUX MANOR AREA
   1. 2422 PE (manhole 33) - 582 PE (from Renaux Manor) - 70 PE (from Renaux Manor) - 1740 PE (from water treatment plant, per Greg Chismark, City of St. Charles) = 30 PE
   2. 30 PE * 100 gpcpd = 3000 gpd (average)

III. TOTAL FLOW TO LIFT STATION

A. [927.5 + 714 + 114 (Renaux Manor)] + [2205 + 30 (offsite area)] = 3990.5 PE
   use **4000 PE**

B. Average flow: 4000 PE * 100 gpcpd = 400,000 gpd = 277.7 gpm

C. Calculated peaking factor = $(18 + (4^{-5}))/(4+(4^{-5}))$ = 3.33

D. Q max. using 3.33 peaking factor = 1,333,333 gpd calculated max = 925 gpm

E. Q max. using 4.0 peaking factor = 1,600,000 gpd design maximum = 1111 gpm
   1111 gpm flow used for lift station design

Tributary To Renoux Manor Lift Station: Existing Condition Residentia					
Area	**Manhole Location**	**Single Family Units**	**Multi Family Units**	**Flow Per Unit (GPD)**	**Total Flow (GPD)**
Renaux Manor Unit 1 & Artesian Springs	7.3018	152	-	350	53,200
Renaux Manor Unit 2[2]	To Lift Station	-	35	1200	42,000
Renaux Manor Unit 2[2]	7.3018	-	29	1200	34,800
Renaux Manor Unit 3	7.4002	117	-	350	40,950
Remington Glen[1]	7.3083	-	26	-	36,050
Autumn Leaves Assisted Living[1]	7.3081	-	1	6000	6,000
Pine Ridge & Regency Estates[1]	To Lift Station	-	-	-	56,900
Assisted Living[3]	To Lift Station	-	1	12000	12,000
Total Daily Flow for Residential					**281,900**

Notes:

1) Total flow value based on information obtained from IEPA permit supplied by the City of St. Charles

2) Renaux Manor Unit 2: 1 Multi Family Unit = 4 3-BR units. See calculation sheet for breakdown of flow per unit (gpd)

3) Assisted Living: Complex located off of IL Rt 64. Estimated flow (gpd) based on two times the value of Autumn Leaves Assisted Living

Tributary To Renoux Manor Lift Station: Existing Condition Non-Residentia						
Building	**Manhole Location**	**Use**	**Acres**	**Employees or PE/acre**	**GPD/Employee (GPD)**	**Total Flow (GPD)**
Walgreens[2,4]	7.3032	Commercial	-	73	15.00	1,095
Corporate Reserve - north[3]	6.3196	Office Buildings	0.4	70	15.00	1,045
Corporate Reserve - central[3]	6.3198	Office Buildings	0.4	70	15.00	1,045
Corporate Reserve - south[3]	6.3194	Office Buildings	0.6	105	15.00	1,568
Corporate Reserve - vacant west[1]	6.3192	Commercial	4.2	20	-	8,400
Corporate Reserve - vacant east[1]	6.3189	Commercial	3.3	20	-	6,600
Vacant Lot[1]	6.3105	Commercial	2.0	20	-	3,960
Valley Springs Auto[2]	7.3032	Commercial	-	-	-	3,000
Main Street Center[2]	7.3087	Office Buildings	-	-	-	3,200
Westgate[2]	7.3032	Commercial	-	-	-	2,400
The Bike Rack & Adjacent Commercial[3]	To Lift Station	Commercial	0.8	132	15	1,986
Fire Station[3]	To Lift Station	-	0.2	35	15	523
Total Daily Flows for Non-Residential						**34,823**

Notes:

1) Area in acres measured by planimeter. 20 PE/acre used as conservative estimate for projected future use

2) PE value taken from issued IEPA permits supplied by the City of St. Charles

3) Number of employees based on 1 person per 250 square feet

4) Total flow based on IEPA permit; 73 estimated employees

Tributary To Renoux Manor Lift Station: Proposed Condition Residential (Corporate Reserve of St. Charles Ph II					
Area	**Manhole Location**	**Single Family Units**	**Multi Family Units**	**Flow Per Unit (GPD)**	**Total Flow (GPD)**
Corporate Reserve - proposed	6.4062	-	13	4750	61,750
Corporate Reserve - proposed	6.3194	-	2	4750	9,500
Total Daily Flow for Residential					**71,250**

Notes:

1) 1 Multi Family Unit = 1 studio, 11-1BR, 10-2BR units. See calculation sheet for breakdown of flow per unit (gpd)

EXHIBIT 9

Summary of Average Daily Flows into Renaux Manor Lift Station	
	GPD
Existing Condition Residential	281,900
Existing Condition Non-Residential	34,823
Proposed Condition Residential	71,250
TOTAL	387,973

SUPPORTING DOCUMENTS

Wills Burke Kelsey Associates, Ltd.
116 West Main Street, Suite 201, St. Charles, Illinois 60174
TEL: (630) 443-7755 FAX: (630) 443-0533
8 East Galena Boulevard, Suite 402, Aurora, Illinois 60506
TEL: (630) 701-2245 FAX: (630) 800-1626

JOB 12-0126
SHEET NO. 1 OF
CALCULATED BY JCG DATE 4/4/12
CHECKED BY DATE
SCALE

Average Flow per Multi Family Bldg @ Corporate Reserve

avg units per building = 22

studio = 1
1 BR = 11
2 BR = 10
22 units

Population Equivalent (PE)
Studio = 1 persons
1 BR = 1.5 persons
2 BR = 3 persons
] 1 PE = 100 gpd

1 studio (1 PE) + 11 1 BRs (1.5 PE) + 10 2 BRs (3 PE) = 41.5 PE

41.5 PE (100 gpd) = 4150 gpd / building

Renaux Manor Unit 2
avg units per building = 4, assume all 3 BR (PE = 3)
3 PE × 4 units = 12 PE
12 PE (100 gpd) = 1200 gpd / building

INSTRUCTIONS FOR SCHEDULE A -- SEWER SERVICE CONNECTIONS
OR SCHEDULE B – PUBLICLY OWNED OR REGULATED SEWER EXTENSIONS
Revised November 2005

Schedule A must be filled out and completed for all sewer connections, which must be covered by a permit in accordance with the Illinois Pollution Control Board Regulations or where the municipality or local public sewer owner will not provide maintenance on said sewer. Sewer extensions which are to be maintained by the municipality or local sewer owner use Schedule B.

When the schedule item is not applicable to your project write "not applicable" or N/A.

1. The name of the project must be the same as the project name indicated on Form WPC-PS-1.

2. The sewer connection or non-public sewer will serve the indicated type of user such as the residential, commercial, light industrial (domestic only), manufacturing, recreational, other. It may be possible that one, two, or all of the appropriate blanks would be checked as well.

3. The nature of the project is intended to be a brief summary description of the type of project covered by the permit application.

4.1. Either submit the required map or a letter from the Illinois Historic Preservation Agency indicating that they have reviewed the project. The Agency has committed to a cooperative effort with the Illinois Historic Preservation Agency (IHPA). Under the provisions of the State Agency Historic Resources Preservation Act, 30 ILCS 605/1, IEPA informs IHPA of construction permit applications shortly after they are received. We would appreciate your submission of location maps and legal descriptions to facilitate this process. IEPA is obligated not to issue the permit until 30 days from the date that IHPA has received the copy of the application or until a letter is received from them. Permit applicants should submit information to IHPA independently from applying for construction permits from IEPA. If the project has previously been reviewed by the Illinois Historic Preservation Agency, inclusion of the sign off letter or approval with your application will enable IEPA to process your application more expeditiously. IHPA contact information is:

ILLINOIS HISTORIC PRESERVATION AGENCY
Division of Review and Compliance
1 Old State Capitol Plaza
Springfield, Illinois 62701

Telephone Number: 217/785-4512
Fax Number: 217/782-8161

4.2. Please submit a sketch of the project. If a suitable clear layout is included on the plan drawings, this request will be considered met.

4.3. A map of the immediate area to be served by the sewer in question must be submitted.

4.4. All potential future service area must also be shown.

It should be emphasized that the loading allocated against the waste treatment facility and intermediate sewer system will be based on the immediate area and population to be served by the permit. Any review fee for this project (see 6.4 below) will be based on the design loading of the sewer.

5. A facilities planning area (FPA) is a defined area that anticipates sewer service to be provided by a specific wastewater treatment facility. This information should be available from the owner/operator of the sewerage system or the owner of the sewage treatment plant. Sewers serving areas not identified in the proper FPA will be denied.

6. The following design criteria should be used in estimating the population equivalent of a residential building:

Efficiency or Studio Apartment	= 1	person
1 Bedroom Apartment	= 1.5	persons
2 Bedroom Apartment	= 3	persons
3 Bedroom Apartment	= 3	persons – ALSO USE FOR TOWNHOME
Single Family Home	= 3.5	persons
Mobile Home	= 2.25	persons

Commonly used quantities of sewage flows from miscellaneous type facilities are listed in Appendix B, Table No. 2 of the Illinois Recommended Standards for Sewage Works.

6.3 Total of Items 6.1 and 6.2.

Wills Burke Kelsey Associates, Ltd.
116 West Main Street, Suite 201, St. Charles, Illinois 60174
TEL: (630) 443-7755 FAX: (630) 443-0533
8 East Galena Boulevard, Suite 402, Aurora, Illinois 60506
TEL: (630) 701-2245 FAX: (630) 800-1626

JOB 12-0126
SHEET NO. 1 OF 1
CALCULATED BY JCG DATE 4/23/12
CHECKED BY _____ DATE _____
SCALE I & I calculations

I & I calculation

I & I rate: 500 gal/in/mi/day
=> for calculation, all pipe size = 8"

CORPORATE RESERVE TO PECK RD, EXISTING:

total pipe length = 3080 LF / 5280 = 0.58 mi

Rate = 500 (8)(0.58) = 2320 gal/day = 0.0036 cfs

CORPORATE RESERVE TO PECK RD, PROPOSED:

add total pipe length of 280 LF / 5280 = 0.053 mi

Rate = 500(8)(.58+.053) = 2532 gal/day = 0.0039 cfs

REMINGTON GLEN, EXISTING

total pipe length = 1970 LF / 5280 = 0.37 mi

Rate = 500 (8)(.37) = 1480 gal/day = 0.0023 cfs

REMINGTON GLEN, PROPOSED

add total pipe length of 1520 LF / 5280 = 0.29 mi

Rate = 500(8)(0.37+0.29) = 2640 gal/day = 0.0041 cfs

PECK RD TRUNK, EXISTING + PROPOSED

total pipe length = 5410 LF (R.M. unit 3 + 1840' (PECK to 7.3018)
= 7580 LF / 5280 = 1.44 mi

Rate = 500(8)(1.44) = 5160 gal/day = 0.0089 cfs

PECK RD TRUNK, EXISTING & PROPOSED

total pipe length = 910' (7.3018 to LS) + 8010 (RM UNIT 1) + 3140 (RM UNIT 2) = 12,180 LF / 5280 = 2.31 mi

Rate = 500(8)(2.31) = 9227 gal/day = 0.0143 cfs

Note: Rate calculated w/ conservative approach. EPA rate = 200 gal/in/mi/day
Flow input at upstream MH.

Wills Burke Kelsey Associates, Ltd.
116 West Main Street, Suite 201, St. Charles, Illinois 60174
TEL: (630) 443-7755 FAX: (630) 443-0533
8 East Galena Boulevard, Suite 402, Aurora, Illinois 60506
TEL: (630) 701-2245 FAX: (630) 800-1626

JOB 12-0126
SHEET NO. _____ OF _____
CALCULATED BY JCG DATE 4/23/12
CHECKED BY _____ DATE _____
SCALE _____

Average Daily Flow per Real time pump data:

Pump Capacity = 690 gpm (per Specs)

average daily pump time = 1.2 hrs (per data from Jan 2012 - Mar 2012)

$\frac{690 \text{ gal}}{\text{min}} \times 1.2 \text{ hrs} \times \frac{60 \text{ min}}{1 \text{ hr}} = 49,680 \text{ gallons}$

2 pumps = 49,680 gal x 2 = 99,360 gal

*third pump run time data suggests it is not utilized.

Average daily flow = 99,360 gal/day

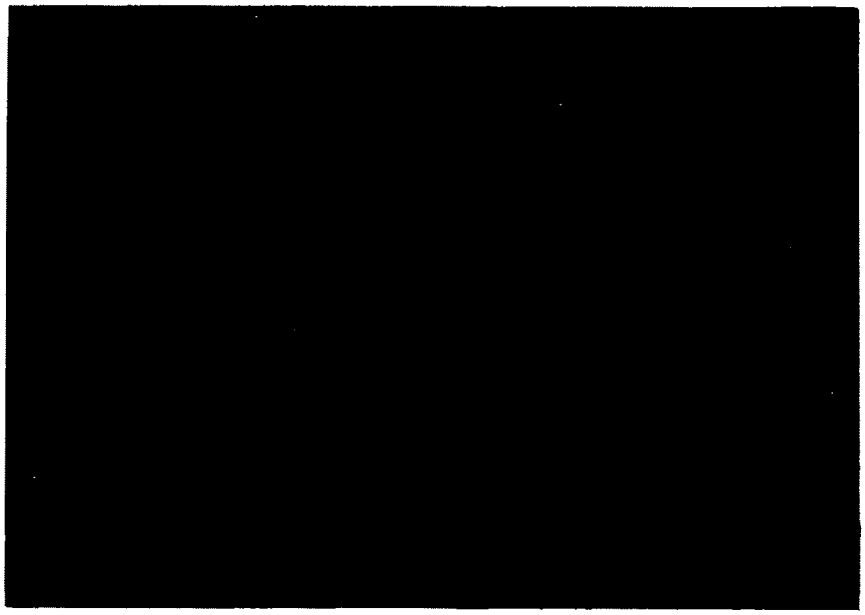
Peak Flow per Real time pump data:

Pump Capacity = 690 gpm

peak pump time = 3.1 hrs (Jan 2012)

$\frac{690 \text{ gal}}{\text{min}} \times 3.1 \text{ hr} \times \frac{60 \text{ min}}{1 \text{ hr}} = 153,180 \text{ gallons}$

2 pumps x 153,180 gal = 306,360 gal/day



Metropolitan Industries, Inc.

Metropolitan Pump Company

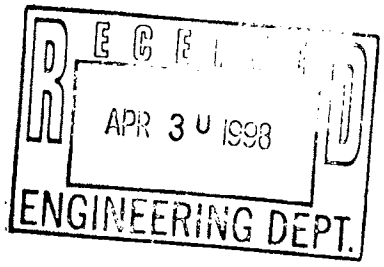
Metropolitan Marketing

Metropolitan Equipment

MANUFACTURERS & DISTRIBUTORS OF QUALITY EQUIPMENT

Metropolitan Industries, Inc.

SUBMISSION FOR APPROVAL



PROJECT
TRIPLEX COMPONENT LIFT STATION

LOCATION
RENAUX MANOR
ST. CHARLES, ILLINOIS

ENGINEER
INTECH CONSULTANTS

CONTRACTOR
DEMPSY ING

REPRESENTATIVE
ROBERT L. WEDELL

DATE
April 28, 1998

Specifications

PROJECT: Sanitary Lift Station
Renaux Manor
St. Charles, Illinois

Application: Triplex Component Lift Station

Model: (3) Hydromatic model S4BX750 submersible non-clog explosion proof sewage pumps with 75' dual cords.

Capacity: 690 GPM @ 29' TDH
3" dia. solids / 4" discharge

Motor(s): (2) 7 ½HP, 1150 RPM, 460 volt, 3 phase 60 Hz., 1.20 service factor
Explosion Proof: Class I, Division I, Group C and or D Locations

Control: (1) Submersible level transducer **(primary)**
(5)Submersible mercury level switches to control on, off, override and alarm levels **(secondary)**. All with 75' cords.

Control Panel: Furnished
Control panel to include magnetic starters, circuit breakers, run lights, H-O-A switches, electric alternator, main disconnect switch, ETM's, heat and seal failure sensors, intrinsically safe relays, automatic transfer switch (by Patton Power), Level Master and variable frequency drives all in a NEMA 3R "traffic box" type enclosure.

Alarm: High water alarm light & ~~AUTOMATIC~~ CONNECTION TO MAIN CONTROL PANEL @ WWTP

Basin: 10' dia. X 33.13' deep with outside valve box
Concrete, piping and valves - by others

Accessories:
- (3) Simplex Aluminum wet well access hatch model: APS300-36x32
- (1) Simplex aluminum valve vault access hatch model APS300-36x36
- (3) 4" M-T-M base elbows
- (3) 4" M-T-M seal flanges
- (3) 33' lengths of 3/16" stainless steel lifting chain
- (12) 17' lengths of 2" sched. 40 stainless steel guide rails
- (3) Sets of lower guide rail supports (located on base elbow)
- (3) Sets of intermediate guide rail supports
- (3) Sets of upper guide rail supports (mounted to wet ell access hatches)
- (1) Stainless steel 5 float mounting bracket
- (2) 10 lbs cast iron anchor and stainless steel chain float mounting system
- (1) Heat and seal failure probes (per pump)

METROPOLITAN PUMP COMPANY
division of Metropolitan Industries, Inc.
37 Forestwood Drive
Romeoville, Illinois 60446
phone: (815)886-9200 fax: (815)886-4573

Renaux Manor							
Jan. 2012	Pump #1		Pump #2		Pump #3		
Date	Hour Meter	Hours Run	Hour Meter	Hours Run	Hour Meter	Hours Run	
1	6169.9	0.0	7994.9	0.0	9294.9	0.0	
2	6169.9	3.4	7994.9	0.0	9294.9	2.6	
3	6173.3	1.4	7994.9	0.0	9297.5	1.1	
4	6174.7	1.2	7994.9	0.0	9298.6	0.9	
5	6175.9	1.4	7994.9	0.0	9299.5	1.1	
6	6177.3	0.0	7994.9	0.0	9300.6	0.0	
7	6177.3	2.5	7994.9	0.0	9300.6	1.9	
8	6179.8	0.0	7994.9	0.0	9302.5	0.0	
9	6179.8	3.3	7994.9	0.0	9302.5	2.6	
10	6183.1	1.4	7994.9	0.0	9305.1	1.1	
11	6184.5	1.1	7994.9	0.0	9306.2	0.8	
12	6185.6	1.5	7994.9	0.0	9307.0	1.2	
13	6187.1	0.0	7994.9	0.0	9308.2	0.0	
14	6187.1	2.4	7994.9	0.0	9308.2	1.9	
15	6189.5	1.4	7994.9	0.0	9310.1	1.6	
16	6190.9	0.0	7994.9	0.0	9311.7	0.0	
17	6190.9	2.2	7994.9	0.0	9311.7	3.1	
18	6193.1	1.0	7994.9	0.0	9314.8	1.3	
19	6194.1	0.9	7994.9	0.0	9316.1	0.0	
20	6195.0	0.0	7994.9	0.0	9316.1	0.0	
21	6195.0	1.8	7994.9	0.0	9316.1	3.7	
22	6196.8	1.4	7994.9	0.0	9319.8	2.0	
23	6198.2	0.0	7994.9	0.0	9321.8	0.0	
24	6198.2	2.4	7994.9	0.0	9321.8	3.3	
25	6200.6	0.8	7994.9	0.0	9325.1	1.0	
26	6201.4	1.1	7994.9	0.0	9326.1	1.6	
27	6202.5	0.0	7994.9	0.0	9327.7	0.0	
28	6202.5	2.5	7994.9	0.0	9327.7	2.0	
29	6205.0	1.9	7994.9	0.0	9329.7	1.5	
30	6206.9	0.0	7994.9	0.0	9331.2	0.0	
31	6206.9	0.0	7994.9	0.0	9331.2	0.0	
Carried Forward	6206.9		7994.9		9331.2		
Total		**37.0**		**0.0**		**36.3**	
Daily Avg.		**1.2**		**0.0**		**1.2**	
Daily Max.		**3.4**		**0.0**		**3.7**	

Renaux Manor							
Feb. 2012	Pump #1		Pump #2		Pump #3		
Date	Hour Meter	Hours Run	Hour Meter	Hours Run	Hour Meter	Hours Run	
1	6209.8	1.2	7994.9	0.0	9333.4	1.0	
2	6211.0	1.5	7994.9	0.0	9334.4	1.2	
3	6212.5	0.0	7994.9	0.0	9335.6	0.0	
4	6212.5	2.6	7994.9	0.0	9335.6	2.0	
5	6215.1	2.0	7994.9	0.0	9337.6	1.6	
6	6217.1	0.0	7994.9	0.0	9339.2	0.0	
7	6217.1	2.7	7994.9	0.0	9339.2	2.2	
8	6219.8	0.9	7994.9	0.0	9341.4	0.8	
9	6220.7	1.8	7994.9	0.0	9342.2	1.5	
10	6222.5	0.0	7994.9	0.0	9343.7	0.0	
11	6222.5	2.5	7994.9	0.0	9343.7	1.9	
12	6225.0	1.4	7994.9	0.0	9345.6	1.8	
13	6226.4	0.0	7994.9	0.0	9347.4	0.0	
14	6226.4	2.2	7994.9	0.0	9347.4	3.0	
15	6228.6	0.8	7994.9	0.0	9350.4	1.1	
16	6229.4	1.1	7994.9	0.0	9351.5	1.5	
17	6230.5	0.0	7994.9	0.0	9353.0	0.0	
18	6230.5	2.1	7994.9	0.0	9353.0	2.9	
19	6232.6	1.7	7994.9	0.0	9355.9	1.3	
20	6234.3	0.0	7994.9	0.0	9357.2	0.0	
21	6234.3	2.4	7994.9	0.0	9357.2	2.5	
22	6236.7	0.9	7994.9	0.0	9359.7	1.2	
23	6237.6	1.4	7994.9	0.0	9360.9	1.6	
24	6239.0	0.0	7994.9	0.0	9362.5	0.0	
25	6239.0	2.8	7994.9	0.0	9362.5	2.8	
26	6241.8	0.5	7994.9	0.0	9365.3	1.8	
27	6242.3	0.0	7994.9	0.0	9367.1	0.0	
28	6242.3	2.2	7994.9	0.0	9367.1	3.1	
29	6244.5	0.0	7994.9	0.0	9370.2	0.0	
Carried Forward	6244.5		7994.9		9370.2		
Total		34.7		0.0		36.8	
Daily Avg.		1.2		0.0		1.3	
Daily Max.		2.8		0.0		3.1	

Renaux Manor							
Mar. 2012	Pump #1		Pump #2		Pump #3		
Date	Hour Meter	Hours Run	Hour Meter	Hours Run	Hour Meter	Hours Run	
1	6245.5	0.8	7994.9	0.0	9371.5	0.7	
2	6246.3	0.0	7994.9	0.0	9372.2	0.0	
3	6246.3	1.9	7994.9	0.0	9372.2	3.0	
4	6248.2	1.4	7994.9	0.0	9375.2	1.9	
5	6249.6	0.0	7994.9	0.0	9377.1	0.0	
6	6249.6	2.2	7994.9	0.0	9377.1	3.1	
7	6251.8	0.7	7994.9	0.0	9380.2	1.0	
8	6252.5	1.2	7994.9	0.0	9381.2	1.6	
9	6253.7	0.0	7994.9	0.0	9382.8	0.0	
10	6253.7	1.8	7994.9	0.0	9382.8	2.8	
11	6255.5	1.4	7994.9	0.0	9385.6	1.6	
12	6256.9	0.0	7994.9	0.0	9387.2	0.0	
13	6256.9	2.2	7994.9	0.0	9387.2	3.0	
14	6259.1	1.1	7994.9	0.0	9390.2	1.6	
15	6260.2	0.8	7994.9	0.0	9391.8	1.2	
16	6261.0	0.0	7994.9	0.0	9393.0	0.0	
17	6261.0	2.0	7994.9	0.0	9393.0	2.7	
18	6263.0	1.3	7994.9	0.0	9395.7	1.8	
19	6264.3	0.0	7994.9	0.0	9397.5	0.0	
20	6264.3	2.0	7994.9	0.0	9397.5	2.8	
21	6266.3	1.3	7994.9	0.0	9400.3	1.7	
22	6267.6	0.8	7994.9	0.0	9402.0	1.1	
23	6268.4	0.0	7994.9	0.0	9403.1	0.0	
24	6268.4	1.8	7994.9	0.0	9403.1	2.6	
25	6270.2	1.3	7994.9	0.0	9405.7	1.8	
26	6271.5	0.0	7994.9	0.0	9407.5	0.0	
27	6271.5	1.8	7994.9	0.0	9407.5	2.5	
28	6273.3	0.9	7994.9	0.0	9410.0	1.2	
29	6274.2	1.0	7994.9	0.0	9411.2	1.4	
30	6275.2	0.0	7994.9	0.0	9412.6	0.0	
31	6275.2	0.0	7994.9	0.0	9412.6	0.0	
Carried Forward	6275.2		7994.9		9412.6		
Total		**29.7**		**0.0**		**41.1**	
Daily Avg.		**1.0**		**0.0**		**1.3**	
Daily Max.		**2.2**		**0.0**		**3.1**	

TITLE: CORPORATE RESERVE SANITARY SEWER EVALUATION

RENAUX MANOR LIFT STATION OVERALL SERVICE AREA

NO.	DATE	NATURE OF REVISION

DSGN. JCG
DWN. EAM
CHKD. GJC
SCALE: 1" = 300'
OV1 20126.MXD

TITLE:
CITY OF ST. CHARLES
2 E. MAIN STREET
ST. CHARLES, IL 60174
(630) 377-4400

WILLS BURKE KELSEY ASSOCIATES LTD.
116 West Main Street, Suite 201
St. Charles, Illinois 60174
(630) 443-7755

PROJECT NO. 12-0126
DATE 04/19/2012
SHEET 1 OF 1
DRAWING NO.
OV1

Map Document: (W:\Projects\2012\12-0126\Revit\Image\Gadd\GISmxd\EExhibitOV1201126.mxd)
04/19/2012 - 11:53:23 AM

116 West Main Street, Suite 201
St. Charles, Illinois 60174
Phone: 630.443.7755
Fax: 630.443.0533
www.wbkengineering.com

WILLS BURKE KELSEY ASSOCIATES

MEMORANDUM

Date: May 7, 2012

To: Chris Tiedt P.E.

CC:

From: Greg Chismark

Subject: Corporate Reserve Sanitary Sewer Study

This memo is a follow up to the subject study at the request of City staff. The purpose is to document the projected wastewater flow from the Corporate Reserve development (former Cardinal Property) comparing several sources. These are:

- Improvements Phasing Plan Update for Fairgrounds / West Gateway Development dated January 1996
- West Side WRF Facility Plan Update dated August 2008
- Corporate Reserve of St. Charles Sanitary Sewer Evaluation dated April 2012

The Corporate Reserve development is located on the former Cardinal Property. Generally, it is located between IL Route 64 (Main Street) and the former UPRR tracks / Great Western Trail and Remington Glen and Regency Estates / Pine Ridge Park. The entire property consists of approximately 50 acres. Find below a table comparing projected wastewater flows.

Source	Est P.E.	Flow gpd	Land Use	Comments
Improvements Phasing Plan Fairgrounds/West Gateway - 1996	903	90,300	Mixed	Significant residential component @ 24 P.E./ac.
West Side WRF Facility Plan Update- 2008	500	50,000		10 P.E./ac.
Corporate Reserve Sanitary Sewer Study - 2012	899	89,908	Mixed	Office/ commercial & proposed multi-unit residential

It is noted that the 2012 flows and the 1996 flows are similar in magnitude. However, the 2008 flows are significantly less. Most likely this is a result of the land use proposed (or approved) at the time the study was prepared and may be based on the assumption that a majority of the property will be an office use.

116 West Main Street, Suite 201
St. Charles, Illinois 60174
Phone: 630.443.7755
Fax: 630.443.0533
www.wbkengineering.com

WILLS BURKE KELSEY ASSOCIATES

MEMORANDUM

Date: May 21, 2012

To: Chris Tiedt P.E.

CC: James Bernahl P.E.

From: Greg Chismark

Subject: Corporate Reserve Sanitary Sewer Study

This memo is in response to City staff comments regarding the sanitary sewer evaluation for the Corporate Reserve project. The goal of this supplement is to take a more refined look at the wastewater flows generated from the Corporate Reserve site. Although we took a conservative approach, City staff is concerned that the clubhouse and pool area has not been specifically accounted for in the analysis. The following documents were utilized:

- Improvements Phasing Plan Update for Fairgrounds / West Gateway Development dated January 1996
- Clubhouse Floor Plan prepared by BSB Design dated March 19, 2012
- Title 35 of the Illinois Administrative Code Part 370 – Recommended Standards for Sewage Works
- Title 15A North Carolina Administrative Code – Wastewater Design Flow Rates

Upon evaluation of the clubhouse floor plan we identified three separate uses. These uses include the pool, the social room/fitness room and the office area. We have assumed these uses would occur daily and throughout the year. This is a very conservative assumption but a good starting point. The flow generate rates were taken from both the Illinois and North Carolina Administrative Codes. The North Carolina Administrative Code was utilized to establish a flow rate for the pool and fitness areas because the Illinois Administrative Code does not address these uses. The estimated flow rate for the clubhouse facility is 2,100 gpd or 21 P.E.

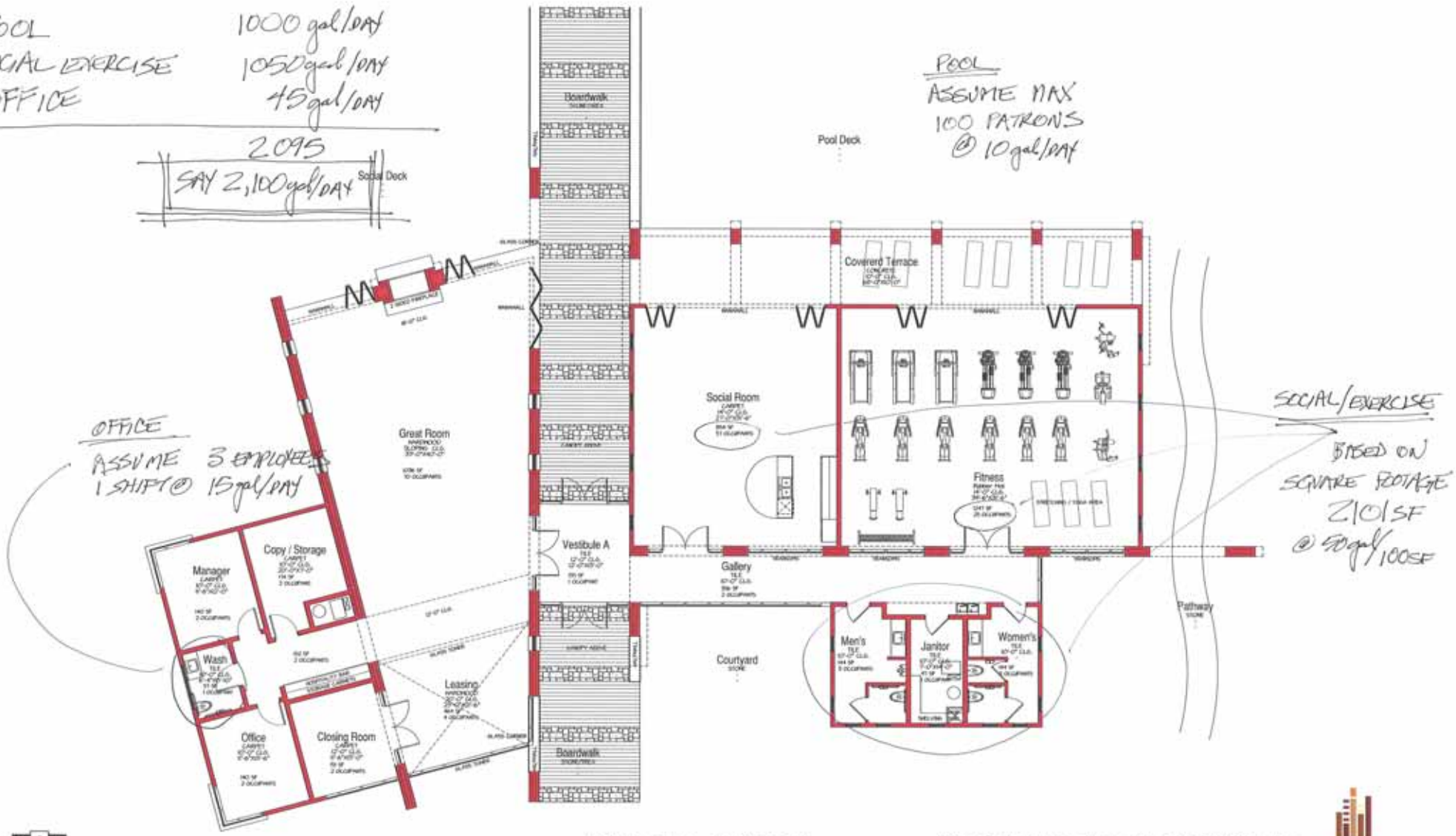
We also verified the residential unit count and flows. Based on a rounding error the entire residential component could generate 72,100 (721 P.E) in comparison to the 71,250 (712.5 P.E.) originally estimated. This is an increase of 850 gpd or 8.5 P.E.

Finally, we re-evaluated the 7.5 acres of vacant commercial land use adjacent to Main Street (IL 64). The original estimate used a very conservative flow generation rate of 20 P.E./acre. This is 5 P.E./acre greater than the rate used in the original Fairgrounds / West Gateway Development Improvements Phasing Plan. It is reasonable to adjust flow rates for the commercial areas utilizing the original flow generation rates. The resultant is a reduction of 3,750 gpd or 37.5 P.E.

Taking into account all the afore-noted adjustments to total flow from the project can be reduced by 800 gpd or 8 P.E. We recommend the originally calculated flow rates and analysis remain unchanged as a conservative approach.

POOL 1000 gal/DAY
SOCIAL EXERCISE 1050 gal/DAY
OFFICE 45 gal/DAY

2095
SAY 2,100 gal/DAY



JCF REAL ESTATE

Clubhouse - 5790 GSF

The Corporate Reserve of St. Charles
St. Charles, Illinois

BSB DESIGN

03-19-2012

© 2012 BSB Design, Inc.

Tributary To Renoux Manor Lift Station: Existing Condition Residential					
Area	Manhole Location	Single Family Units	Multi Family Units	Flow Per Unit (GPD)	Total Flow (GPD)
Renaux Manor Unit 1 & Artesian Springs	7.3018	152	-	350	53,200
Renaux Manor Unit 2[2]	To Lift Station	-	35	1200	42,000
Renaux Manor Unit 2[2]	7.3018	-	29	1200	34,800
Renaux Manor Unit 3	7.4002	117	-	350	40,950
Remington Glen[1]	7.3083	-	26	-	36,050
Autumn Leaves Assisted Living[1]	7.3081	-	1	6000	6,000
Pine Ridge & Regency Estates[1]	To Lift Station	-	-	-	56,900
Assisted Living[3]	To Lift Station	-	1	12000	12,000
Total Daily Flow for Residential					281,900

Notes:

1) Total flow value based on information obtained from IEPA permit supplied by the City of St. Charles

2) Renaux Manor Unit 2: 1 Multi Family Unit = 4 3-BR units. See calculation sheet for breakdown of flow per unit (gpd)

3) Assisted Living: Complex located off of IL Rt 64. Estimated flow (gpd) based on two times the value of Autumn Leaves Assisted Living

Tributary To Renoux Manor Lift Station: Existing Condition Non-Residential						
Building	Manhole Location	Use	Acres	Employees or PE/acre	GPD/Employee (GPD)	Total Flow (GPD)
Walgreens[2,4]	7.3032	Commercial	-	73	15.00	1,095
Corporate Reserve - north[1]	6.3196	Office Buildings	0.4	70	15.00	1,045
Corporate Reserve - central[1]	6.3198	Office Buildings	0.4	70	15.00	1,045
Corporate Reserve - south[1]	6.3194	Office Buildings	0.6	105	15.00	1,568
Corporate Reserve - vacant west[1]	6.3192	Commercial	4.2	~~20~~ 15	-	~~8,400~~ 6,300
Corporate Reserve - vacant east[1]	6.3189	Commercial	3.3	~~20~~ 15	-	~~6,600~~ 4,950
Vacant Lot[1]	6.3105	Commercial	2.0	20	-	3,960
Valley Springs Auto[3]	7.3032	Commercial	-	-	-	3,000
Main Street Center[3]	7.3087	Office Buildings	-	-	-	3,200
Westgate[2]	7.3032	Commercial	-	-	-	2,400
The Bike Rack & Adjacent Commercial[3]	To Lift Station	Commercial	0.8	132	15	1,986
Fire Station[3]	To Lift Station	-	0.2	35	15	523
Total Daily Flows for Non-Residential						34,823

$\Delta = -3750$ gpd/acre

37.5 PE

Notes:

1) Area in acres measured by planimeter. 20 PE/acre used as conservative estimate for projected future use

2) PE value taken from issued IEPA permits supplied by the City of St. Charles

3) Number of employees based on 1 person per 250 square feet

4) Total flow based on IEPA permit; 73 estimated employees

Tributary To Renoux Manor Lift Station: Proposed Condition Residential (Corporate Reserve of St. Charles Ph II)					
Area	Manhole Location	Single Family Units	Multi Family Units	Flow Per Unit (GPD)	Total Flow (GPD)
Corporate Reserve - proposed	6.4062	-	13	4750	61,750
Corporate Reserve - proposed	6.3194	-	2	4750	9,500
Total Daily Flow for Residential					71,250

Notes:

1) 1 Multi Family Unit = 1 studio, 11-1BR, 10-2BR units. See calculation sheet for breakdown of flow per unit (gpd)