A1 SIZE – 594mm x 841mm

	1	2	3	4	5	6	7	8	9		10	11	12	13	14	15	16	17
	Raw Sewage	Screen Influent	Screenings Slurry	Compacted Screenings	Compactor Washwater	Screened Sewage	Grit Slurry	Dewatered Grit	Grit Washwater	Grit Effluent	Primary Influent	Primary Effluent	Primary Sludge	Primary Scum	HRC Influent	HRC Effluent	HRC Sludge	HRC Effluent to BNR
FLOW, m3/d																		
AAF	91,249	91,715	52.60	5.60	47.00	91,662	420	1.5	418.5	91,242	92,694	91,185	1,500	9	0	0	0	0
MMF	156,209	157,572	120.00	12.90	107.10	157,452	1,260	4.5	1,255.5	156,192	131,445	129,931	1,500	13	27,699	27,432	267	0
PHF	407,960	410,237	206.00	22.00	184.00	410,031	2,100	7.5	2,092.5	407,931	147,694	146,179	1,500	15	263,189	260,583	2,606	0
BOD Load, kg/d																		
AVG	19,290	19,290	0	0	0	19,290	0	0	0	19,290	19,672	14,866	4,806	267	0	0	0	0
MM	24,281	24,281	0	0	0	24,281	0	0	0	24,281	24,681	18,641	6,040	379	3,676	2,848	828	0
PKWK	32,106	32,106	0	0	0	32,106	0	0	0	32,106	32,514	25,838	6,676	425	9,943	7,846	2,097	0
TSS Load, kg/d																		
AVG	20,484	20,917	1,302	1,184	118	19,615	2,100	1,785	315	17,515	18,617	7,560	11,057	463	0	0	0	0
MM	37,073	38,288	2,970	2,700	270	35,318	6,300	5,355	945	29,018	30,424	13,270	17,154	657	4,505	904	4,839	0
PKWK	51,980	54,018	5,092	4,629	463	48,926	10,500	8,925	1,575	38,426	40,103	15,563	24,540	738	11,438	2,495	12,275	0
VSS Load, kg/d																		
AVG	15,432	16,297	1,133	1,030	83	15,164	1,050	268	782	14,114	14,818	5,701	9,117	371	0	0	0	0
MM	21,044	23,580	2,584	2,349	189	20,996	3,150	803	2,347	17,846	18,748	9,134	9,614	526	2,287	473	2,488	0
PKWK	27,913	32,148	4,430	4,027	324	27,718	5,250	1,339	3,911	22,468	23,467	10,326	13,141	591	5,346	1,271	6,260	0
TN Load, kg/d																		
AVG	3,545	3,545	0	0	0	3,545	0	0	0	3,545	3,744	3,013	731	51	0	0	0	0
MM	4,216	4,216	0	0	0	4,216	0	0	0	4,216	4,410	3,824	586	60	512	412	100	0
PKWK	4,663	4,663	0	0	0	4,663	0	0	0	4,663	4,857	4,270	587	66	1,293	1,037	256	0
TP Load, kg/d																		
AVG	587	587	0	0	0	587	0	0	0	587	633	466	167	9	0	0	0	0
MM	728	728	0	0	0	728	0	0	0	728	780	632	148	11	103	23	80	0
PKWK	918	918	0	0	0	918	0	0	0	918	971	651	320	13	283	61	222	0

18	19	20	21	22	23	24	25	28	29	30	31	32	33	34	35	37
HRC Effluent to Disinf	Bioreactor Influent	Mixed Liquor - aerobic zone	Secondary Effluent	RAS and Int. Recycle	Secondary Scum	Final Effluent	Prim Sludge to Fermenter	Fermented Sludge to RDT	WAS	TWAS	WAS RDT Filtrate	Thickened Fermented Sludge	Fermentate	Sludge Storage - Solids	Centrifuge Dewatering - Cake to NEWPCC	Centrifuge Dewatering - Centrate
0	91,185	370,605	91,105	278,000	4	91,105	1,500	1,500	1,500	360	1,140	80	1,420	440	128	312
27,432	129,931	409,618	130,118	278,000	5	157,550	1,500	1,767	1,500	360	2,640	80	1,687	440	128	312
260,583	146,179	428,205	148,705	278,000	6	409,288	1,500	4,106	1,500	360	2,640	80	4,026	440	128	312
0	14,866	287,936	187	273,070	105	187	4,806	4,806	2,245	2,175	70	3,884	922	6,431	6,119	312
2,848	18,641	392,015	386	373,374	150	3,234	6,040	6,868	2,838	2,750	88	5,337	1,531	8,615	8,303	312
7,846	25,838	451,467	545	425,629	168	8,391	6,676	8,773	3,085	2,989	96	4,664	4,109	8,247	7,935	312
0	7,560	1,173,797	528	1,166,237	182	528	11,057	11,057	9,550	9,236	314	9,809	1,248	19,691	18,903	788
904	13,270	1,572,232	1,114	1,558,962	260	2,018	17,154	21,993	11,781	11,428	353	13,988	8,005	26,333	25,280	1,053
2,495	15,563	1,706,548	1,436	1,690,985	292	3,931	24,540	36,815	12,437	12,064	373	19,514	17,301	32,609	31,304	1,304
0	5,701	714,894	317	709,193	146	317	9,117	9,117	5,818	5,644	174	6,559	2,558	12,720	12,190	530
473	9,134	956,188	649	947,054	208	1,122	9,614	12,102	7,216	6,999	217	8,716	3,386	16,449	15,763	685
1,271	10,326	1,046,305	859	1,035,979	234	2,130	13,141	19,401	7,586	7,358	228	10,314	9,087	18,497	17,726	771
0	3,013	67,683	802	64,670	25	802	731	731	541	498	43	400	331	973	817	156
412	3,824	87,193	1,004	83,369	32	1,416	586	686	644	606	38	494	192	1,192	1,036	156
1,037	4,270	95,354	1,244	91,084	35	2,281	587	843	674	636	38	448	395	1,185	1,029	156
0	466	57,680	66	57,214	21	66	167	167	471	456	15	41	126	527	495	31
23	632	78,667	127	78,035	29	150	148	228	638	617	21	164	64	821	789	31
61	651	81,068	223	80,417	30	284	320	542	658	636	22	288	254	967	936	31

NOTES:

1. RAW SEWAGE LOADINGS BASED ON REVISED DYNAMIC BIOWIN SCENARIO 14.03.2014 PLUS SCREENINGS AND GRIT QUANTITIES.
2. ASSUMES BOD, TN AND TP OF SCREENINGS, GRIT AND ASSOCIATED WASHWATERS ARE NEGLIGIBLE.
3. ASSUMES THE SG OF SCREENINGS SLURRY IS 900 KG/M3 AND SOLIDS CONCENTRATION IS 2.5 PERCENT.
4. ASSUMES THE SG OF COMPACTED SCREENINGS IS 600 KG/M3 SOLIDS CONCENTRATION IS 35 PERCENT, AND VS IS 87% OF TS.
5. ASSUMES THE SG OF GRIT SLURRY IS 1000 KG/M3 AND SOLIDS CONCENTRATION IS 1 PERCENT.
6. ASSUMES THE SG OF DEWATERED GRIT IS 1400 KG/M3, SOLIDS CONCENTRATION IS 85 PERCENT, AND VS IS 15 PERCENT OF TS.
7. ASSUMES GRIT SLURRY CONSISTS OF 50 PERCENT GRIT AND 50 PERCENT ORGANICS THAT IS RECIRCULATED TO THE WASTEWATER.
8. INFLUENT TO PRIMARY CLARIFIERS IS LIMITED TO APPROXIMATELY 150,000 M3/D
9. PRIMARY SLUDGE PRODUCTION : TSS, VSS, CBOD,TKN, TP LOAD VALUES DERIVED FROM CALCULATION PRIMARY INFLUENT (BIOWIN) MINUS PRIMARY EFFLUENT (BIOWIN)
10. ASSUMES PRIMARY SCUM IS GENERATED AT A RATE OF 5 MG/L, VS IS 80 PERCENT OF TS, AND WITHDRAWN AT 5 PERCENT CONCENTRATION.
11. HRC SLUDGE DERIVED FROM BIOWIN MODEL
12. MIXED LIQUOR AND SECONDARY EFFLUENT CONCENTRATIONS TAKEN FROM BIOWIN – SIMPLIFIED
13. ASSUMES SECONDARY SCUM IS GENERATED AT A RATE OF 2 MG/L, VS IS 80 PERCENT OF TS, AND WITHDRAWN AT 5 PERCENT CONCENTRATION.
14. NO HRC RETURN TO BNR – THIS MASS BALANCE COVERS PERIOD NOVEMBER TO JULY
15. TWAS AND WAS FILTRATE TAKEN FROM BIOWIN.
16. DEWATERING ASSUMPTIONS : CAKE : 18% DS; CAKE DENSITY: 1100 KG/M3; SOLIDS CAPTURE 96%
17. CENTRATE RETURN ASSUMPTIONS: BOD: 1000MG/L; VSS AND TSS: CALCULATED VIA CAPTURE RATE ASSUMPTION; TN: 500 MG/L; TP : 100 MG/L; RETURN LOADS ARE INCLUDED IN PRIMARY SLUDGE/FERMENTATE
18. WAS CHANGED TO 1500m³/d – TO REPRESENT RAS MLSS CONCENTRATION (2016/10/27)

APEGM
Certificate of Authorization
CH2M HILL Canada Ltd.
No. 1441

NO.	REVISIONS	DATE	DESIGN	CHECK
00	ISSUED FOR CONSTRUCTION – 976–2016	2017/04/05	J.C.	J.C.

CH2MHILL. SNC·LAVALIN KGS GROUP

DESIGNED BY: H.T. FREIHAMMER
CHECKED BY: L. SEAMAN
DRAWN BY: J. CORTEZ
APPROVED BY: F. ABSI
SCALE: NTS
ISSUED FOR CONSTRUCTION BY: J. SHUMKA
DATE: 2017/04/05
DATE: 2017/04/05
CONSULTANT NO.: 474248

ENGINEER'S SEAL
PROVINCE OF MANITOBA
H. T. FREIHAMMER
Member 31467
REGISTERED PROFESSIONAL ENGINEER
2017-03-30

Winnipeg
THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

SOUTH END WATER POLLUTION CONTROL CENTRE
SEWPCC UPGRADING/EXPANSION PROJECT
PROCESS
MASS BALANCE DRAWING (6) INCLUDING DEWATERING
NOVEMBER TO JULY SCENARIO

CITY DRAWING NUMBER	SHEET	REV.	SIZE
1–0102–PBDG–A001	006	00	A1

PLOT DATE: 2017\03\30
FILE NAME:

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