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	92,382	90,873	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	131,133	129,619	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	147,382	145,867	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	19,360	14,866	4,494	266	0	0	0	0
MM	24,281	24,281	0	0	0	24,281	0	0	0	24,281	24,369	18,641	5,728	378	3,676	2,848	828	0
PKWK	32,106	32,106	0	0	0	32,106	0	0	0	32,106	32,202	25,838	6,364	424	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	17,829	7,560	10,269	462	0	0	0	0
MM	37,073	38,288	2,970	2,700	270	35,318	6,300	5,355	945	29,018	29,371	13,270	16,101	656	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	38,799	15,563	23,236	737	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	14,288	5,701	8,587	370	0	0	0	0
MM	21,044	23,580	2,584	2,349	189	20,996	3,150	803	2,347	17,846	18,063	9,134	8,929	525	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	22,696	10,326	12,370	590	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	3,588	3,013	575	49	0	0	0	0
MM	4,216	4,216	0	0	0	4,216	0	0	0	4,216	4,254	3,824	430	58	512	412	100	0
PKWK	4,663	4,663	0	0	0	4,663	0	0	0	4,663	4,701	4,270	431	65	1,293	1,037	256	0
TP Load, kg/d																		
AVG	587	587	0	0	0	587	0	0	0	587	602	466	136	8	0	0	0	0
MM	728	728	0	0	0	728	0	0	0	728	749	632	117	10	103	23	80	0
PKWK	918	918	0	0	0	918	0	0	0	918	940	651	289	13	283	61	222	0

18	19	20	21	22	23	24	25	28	29	30	31	32	33	34		
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 to NEWPCC		
0	90,873	370,293	90,793	278,000	4	90,793	1,500	1,500	1,500	360	1,140	80	1,420	440		
27,432	129,619	409,306	129,806	278,000	5	157,238	1,500	1,767	1,500	360	2,640	80	1,687	440		
260,583	145,867	427,893	148,393	278,000	6	408,976	1,500	4,106	1,500	360	2,640	80	4,026	440		
0	14,866	287,936	187	273,070	105	187	4,494	4,494	2,245	2,175	70	3,884	610	6,430		
2,848	18,641	392,015	386	373,374	149	3,234	5,728	6,556	2,838	2,750	88	5,337	1,219	8,614		
7,846	25,838	451,467	545	425,629	168	8,391	6,364	8,461	3,085	2,989	96	4,684	3,777	8,266		
0	7,560	1,173,797	528	1,166,237	182	528	10,269	10,269	9,550	9,236	314	9,809	460	19,689		
904	13,270	1,572,232	1,114	1,558,962	259	2,018	16,101	20,940	11,781	11,428	353	13,988	6,952	26,331		
2,495	15,563	1,706,548	1,436	1,690,985	292	3,931	23,236	35,511	12,437	12,064	373	19,514	15,997	32,607		
0	5,701	714,894	317	709,193	145	317	8,587	8,587	5,818	5,644	174	6,559	2,028	12,718		
473	9,134	956,188	649	947,054	207	1,122	8,929	11,417	7,216	6,999	217	8,716	2,701	16,447		
1,271	10,326	1,046,305	859	1,035,979	233	2,130	12,370	18,630	7,586	7,358	228	10,314	8,316	18,495		
0	3,013	67,683	802	64,670	25	802	575	575	541	498	43	400	175	972		
412	3,824	87,193	1,004	83,369	32	1,416	430	530	644	606	38	405	125	1,101		
1,037	4,270	95,354	1,244	91,084	35	2,281	431	687	674	636	38	380	307	1,116		
0	466	57,680	66	57,214	21	66	136	136	471	456	15	41	95	526		
23	632	78,667	127	78,035	29	150	117	197	638	617	21	150	47	806		
61	651	81,068	223	80,417	29	284	289	511	658	636	22	283	228	961		

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. 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 CONSULTING ENGINEERS

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

Winnipeg
THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

SOUTH END WATER POLLUTION CONTROL CENTRE
SEWPCC UPGRADING/EXPANSION PROJECT
PROCESS
MASS BALANCE DRAWING (4)
NOVEMBER TO JULY SCENARIO

CITY DRAWING NUMBER	SHEET	REV.	SIZE
1-0102-PBDG-A001	004	00	A1

PLOT DATE: 2017\03\30
FILE NAME:

©CH2M HILL 2017. ALL RIGHTS RESERVED.