City of Winnipeg Nitrification Study
Conceptual Design Report

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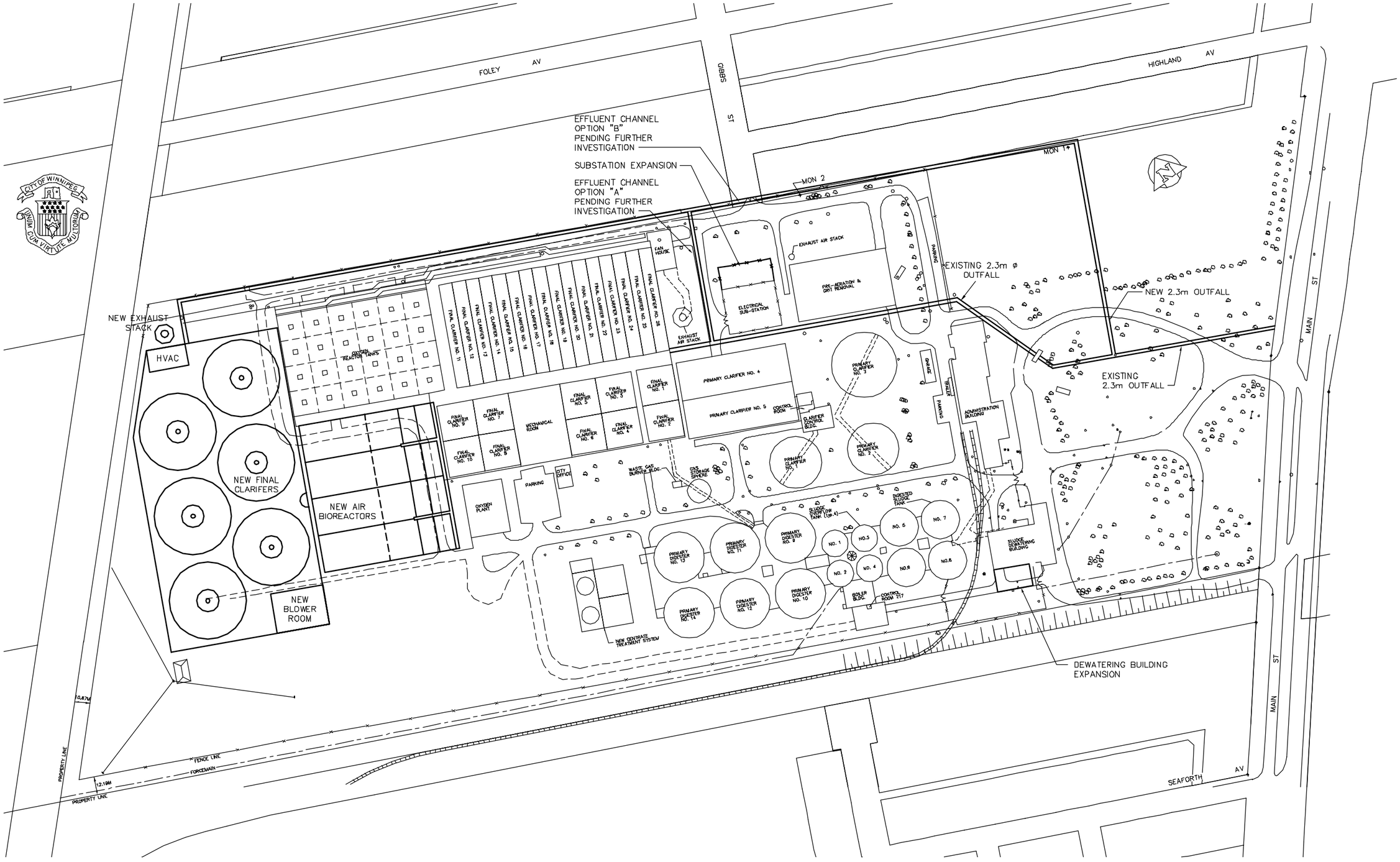
WE-14.1	WEWPCC Biological Nutrient Removal Plant Layout
WE-14.2	WEWPCC Biological Nutrient Removal Process Flow Diagram



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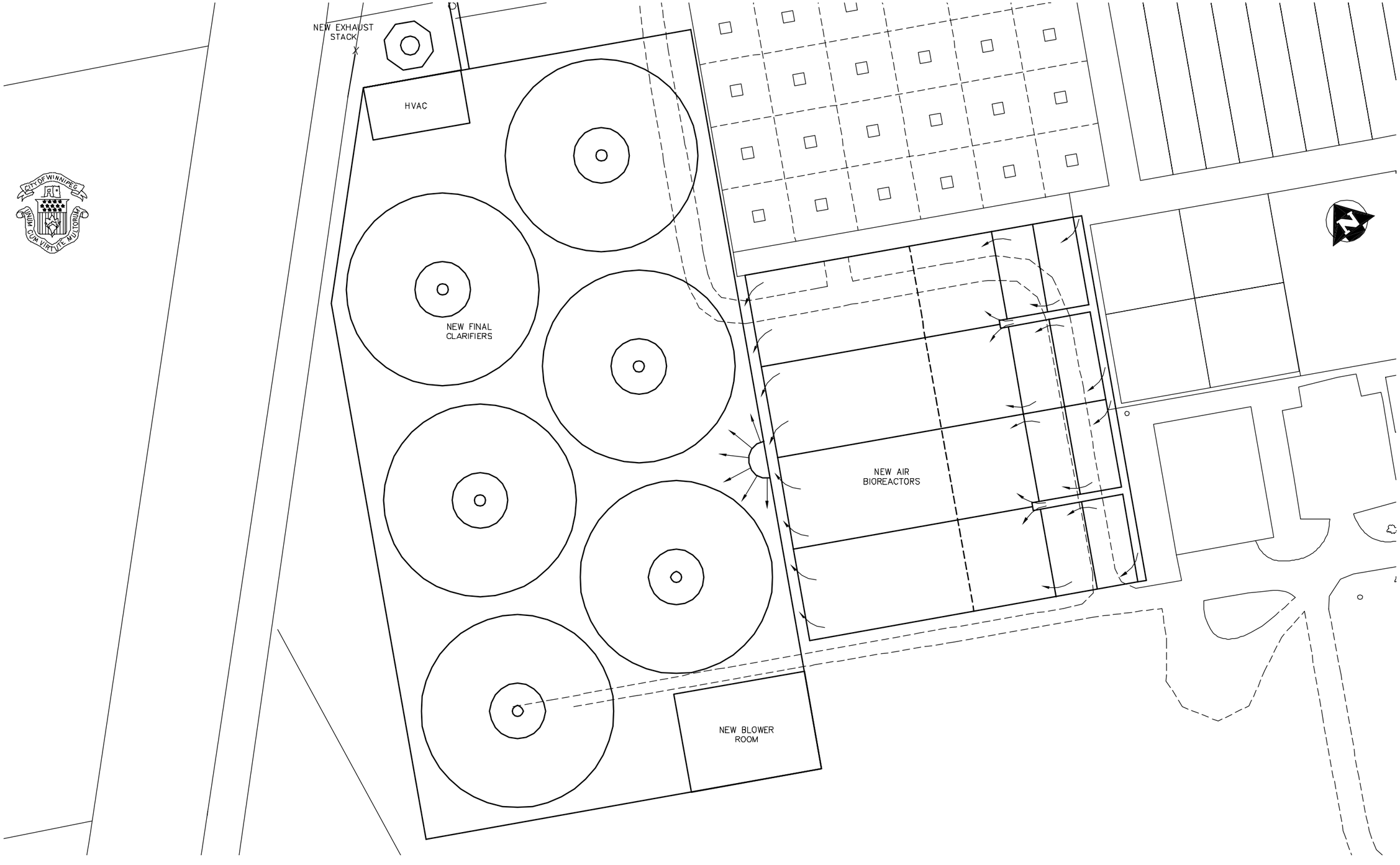
NEWPCC
Best Practicable Level of Control
Site Plan
DWG. NE - 4.1



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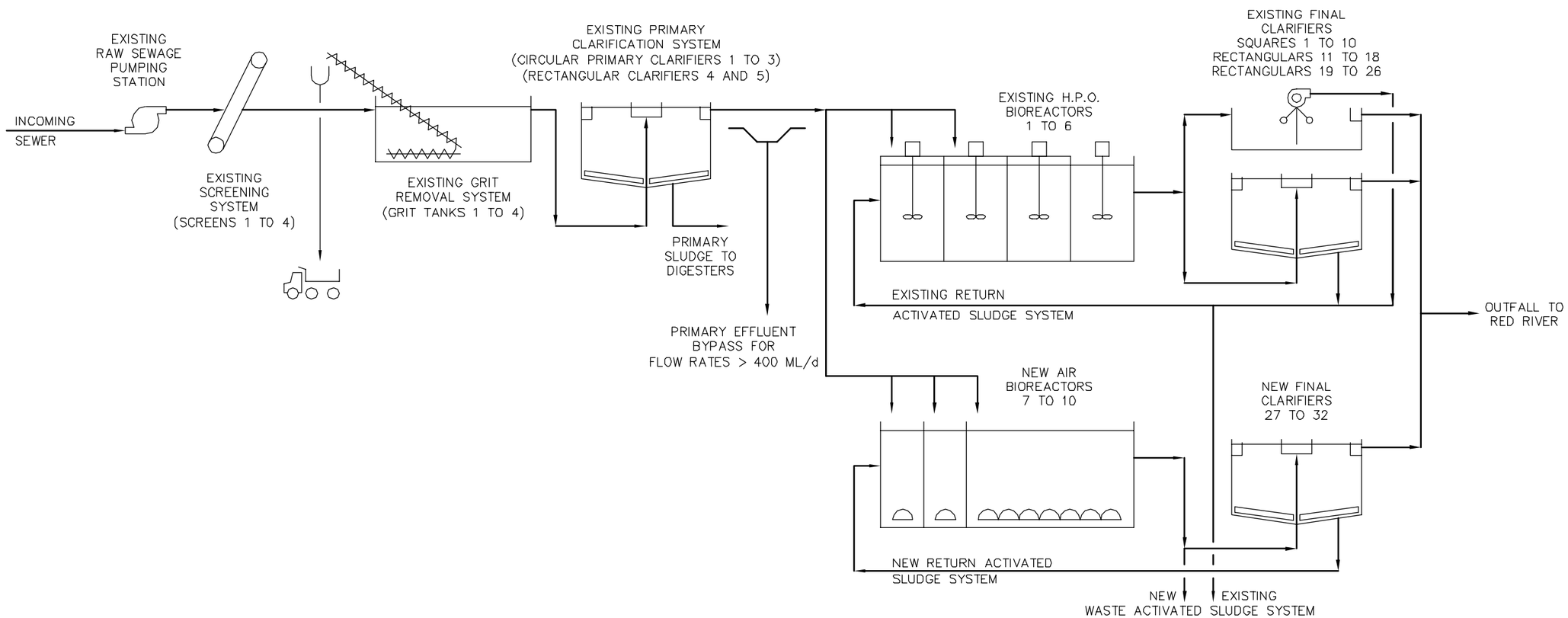
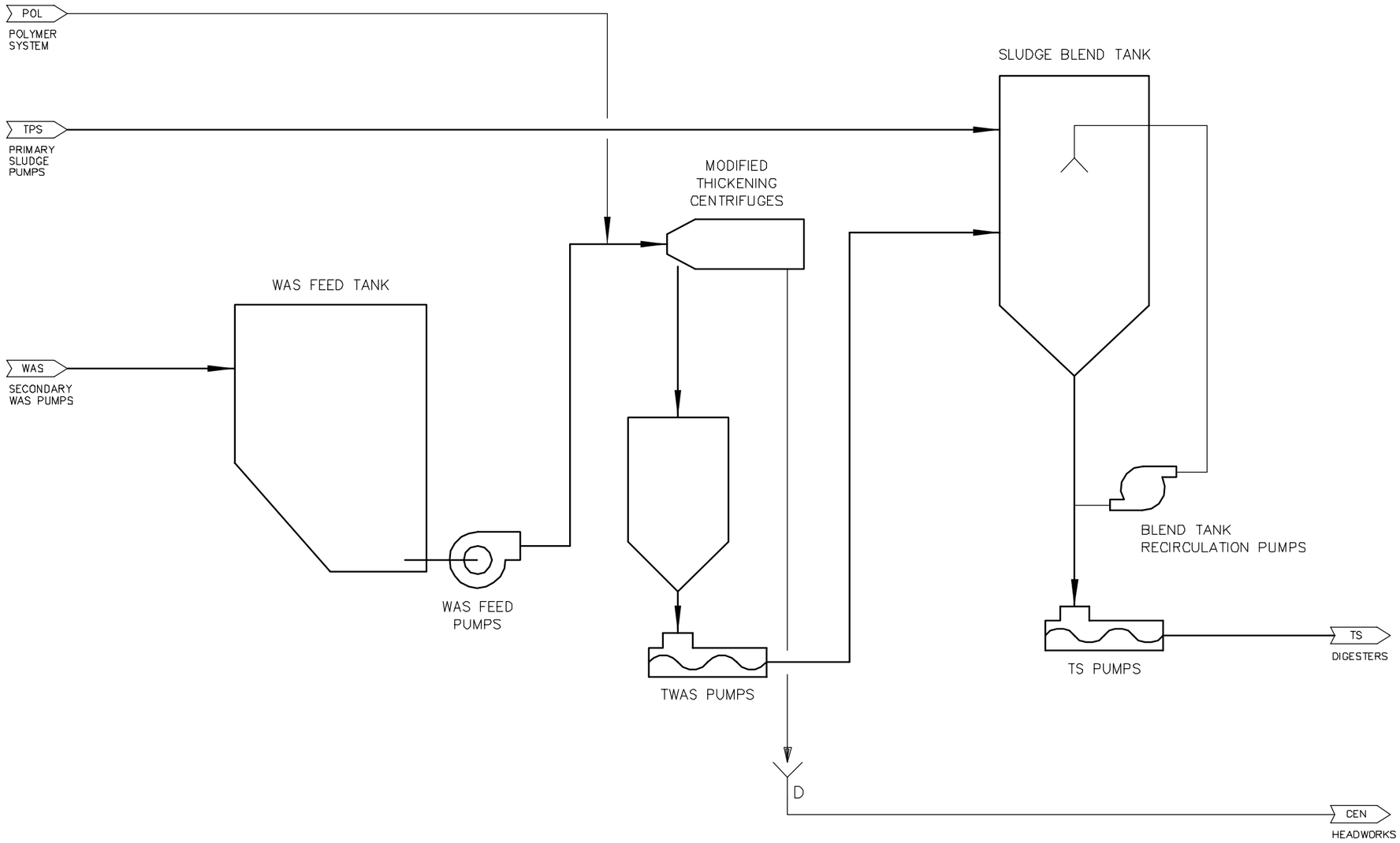
NEWPCC
Best Practicable Level of Control
Plant Layout
DWG. NE - 4.2



SCREENS	GRIT REMOVAL	PRIMARY CLARIFIERS	H.P.O. BIOREACTORS	AIR BIOREACTORS	FINAL CLARIFIERS
No. = 4	No. = 4 DIM = 46 m x 9.1 m x 4.6 m	No. = 5 No. 1 & 2 = 35ø m No. 3 = 44ø m No. 4 & 5 = 66.5 m x 23 m	No. = 6 VOL/UNIT = 5022 m^3	No. = 4 VOL/UNIT = 12,5000 m^3	No. = 32 No. 1–10 = 24.4 m x 24.4 m x 3.7 m No. 11–26 = 70.5 m x 9.1 m x 3.6 m No.27–32 = 52ø m, 6m SWD

NEWPCC
Best Practicable Level of Control
Process Flow Diagram
DWG. NE - 4.3



WAS FEED TANK
V = 120.0 m³
HRT = 30 min

WAS FEED PUMPS
No. = 3
CAP'Y = 30 L/S
TDH = 30 m

MODIFIED THICKENING CENTRIFUGES
No. = 3
CAP'Y = 27 L/S

TWAS PUMPS
No. = 3
CAP'Y = 5 L/S
TDH = 30 m

SLUDGE BLEND TANK
V = 300.0 m³
HRT = 8 hours

TS PUMPS
No. = 3
CAP'Y = 8 L/S
TDH = 30 m

BLEND TANK RECIRCULATION PUMPS
No. = 2
CAP'Y = 80 L/S

NEWPCC
Waste Activated Sludge Thickening
Process Flow Diagram
DWG. NE - 4.4

CITY OF WINNIPEG

UNUM CUM VIRTUTE MILITORUM

N

NEW SECONDARY CLARIFIER

NEW AIR BIOREACTORS

MECHANICAL ROOM

SECONDARY CLARIFIER NO. 1

RS PUMP ROOM

SCREEN ROOM

GRIT REMOVAL

PRIMARY CLARIFIER No. 1

PRIMARY CLARIFIER No. 2

PRIMARY CLARIFIER No. 3

EXIST. CHLORINE CONTACT CHAMBER

EFFLUENT CHAMBER

EFFLUENT CHANNEL

DISINFECTION FACILITY

MECHANICAL ROOM

CHANNEL

SECONDARY CLARIFIER No. 3

SECONDARY CLARIFIER NO. 2

FAN HOUSE

FOUL AIR DUCT

DAF THICKENING

BLOWER ROOM

NEW AIR BIOREACTORS

STORAGE/ TRUCK BAY

WOODED AREA

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SEWPCC
Best Practicable Level of Control
Site Plan
DWG. SE - 4.1

HANICAL
M

NEW AIR
BIOREACTOR 2B

NEW AIR
BIOREACTOR 1B

SECONDARY
CLARIFIER
No. 1

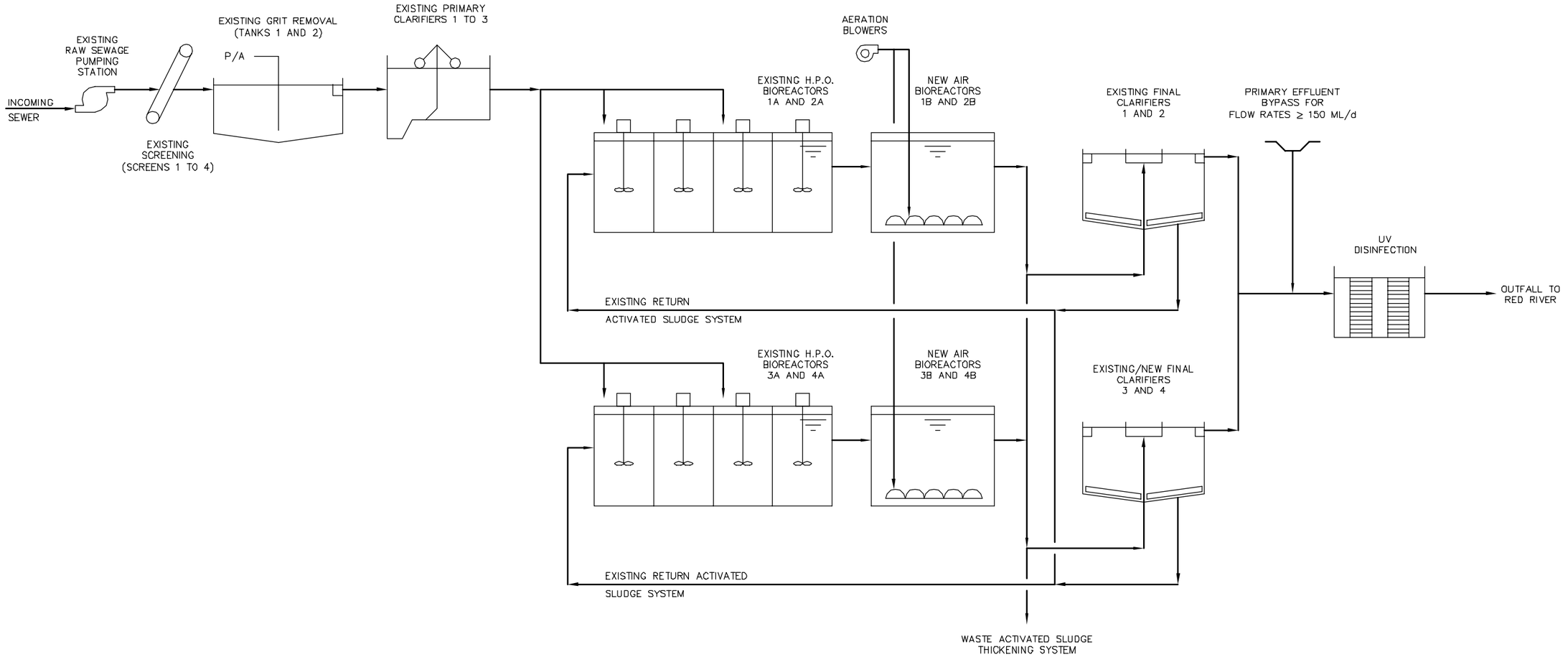
EXISTING HPO
BIOREACTOR 2A

EXISTING HPO
BIOREACTOR 1A

PRIMARY CLARIFIER No.1

PRIMARY CLARIFIER No.2

SEWPCC
Best Practicable Level of Control
Single Stage Nitrification Layout
DWG. SE - 4.2



SCREENS
No. = 4

GRIT REMOVAL TANKS
No. = 2

PRIMARY CLARIFIERS
No. = 3

H.P.O. BIOREACTORS
No. = 8
VOL/UNIT = 810 m

AIR BIOREACTORS
No. = 4
VOL/UNIT = 4005 m^3

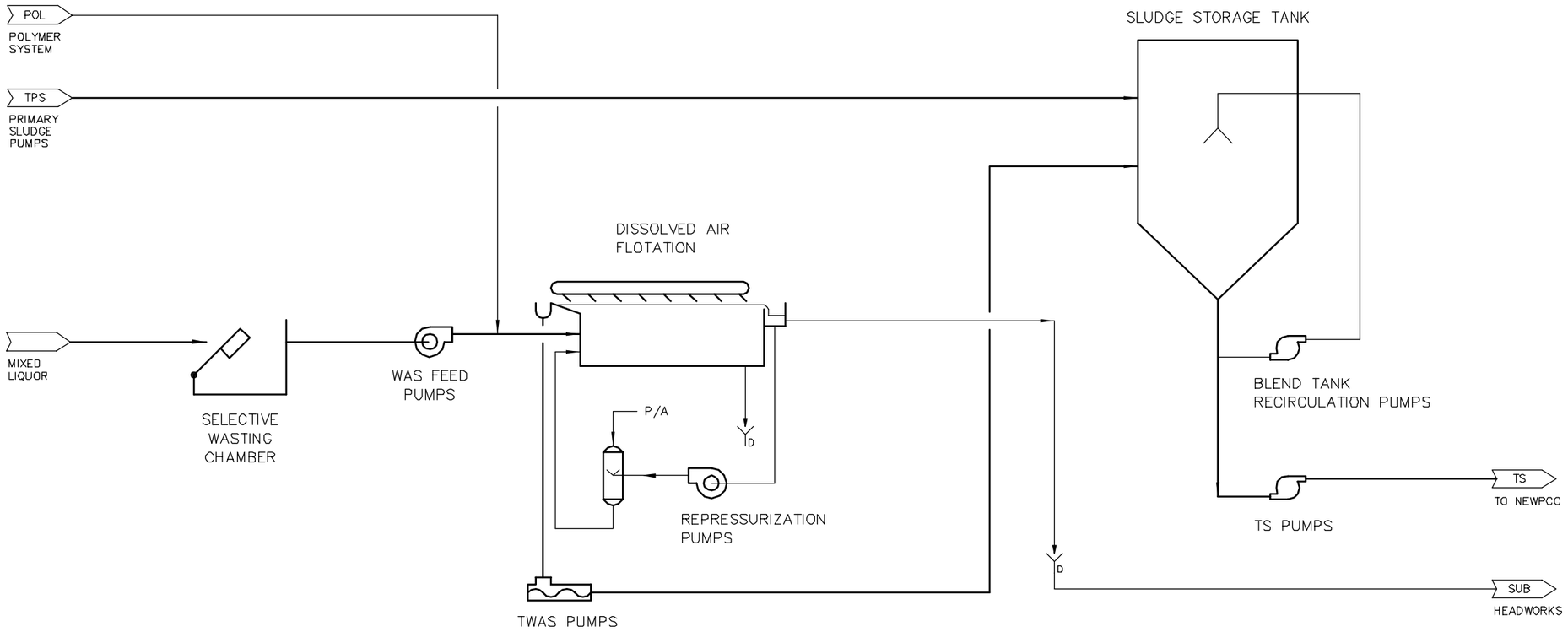
AIR BIOREACTORS
No. = 4
CAP'Y/BLOWER = 135 m^3/min.

FINAL CLARIFIERS 1 & 2
No. = 2
DIA. = 33.5 m

FINAL CLARIFIERS 3 & 4
No. = 2
DIA. = 45.7 m

UV DISINFECTION
TYPE = MEDIUM PRESSURE UV
LAMPS = 120

SEWPCC
Best Practicable Level of Control
Process Flow Diagram
DWG. SE - 4.3



WAS FEED TANK
V = 120.0 m^3
HRT = 30 min

WAS FEED PUMPS
No. = 3
CAP'Y = 12 L/S
TDH = 10 m

DISSOLVED AIR FLOTATION THICKENING
No. = 3
SURFACE AREA/UNIT = 24 m^3

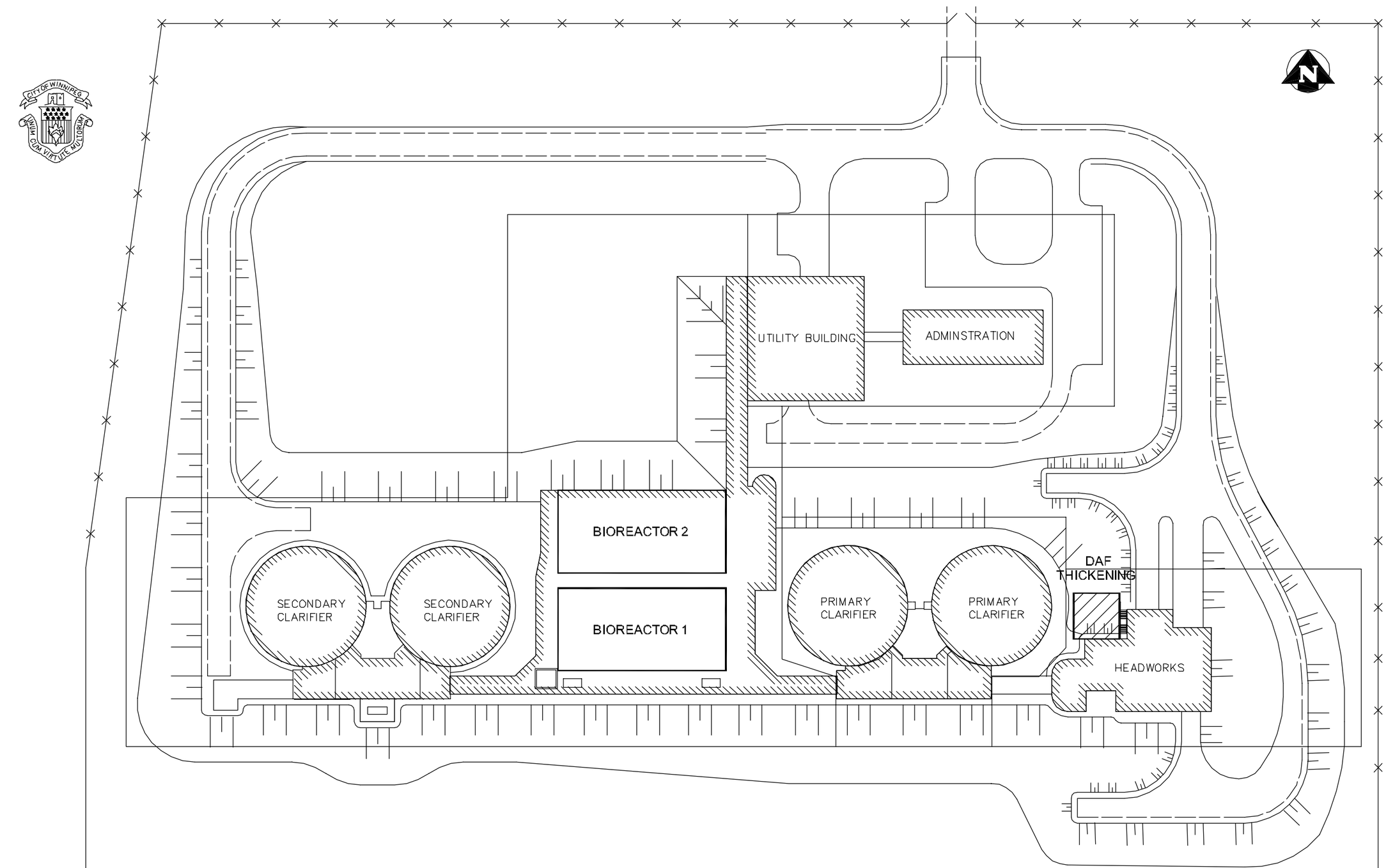
TWAS PUMPS
No. = 3
CAP'Y = 3 L/S

SLUDGE STORAGE TANK
V = 300 m^3
HRT = 24 L

TS PUMPS
No.= 3
CAP'Y = 15 L/S
EXISTING

BLEND TANK RECIRCULATION PUMPS
No. = 2
EXISTING

SEWPCC
Waste Activated Sludge Thickening
Process Flow Diagram
DWG. SE - 4.4



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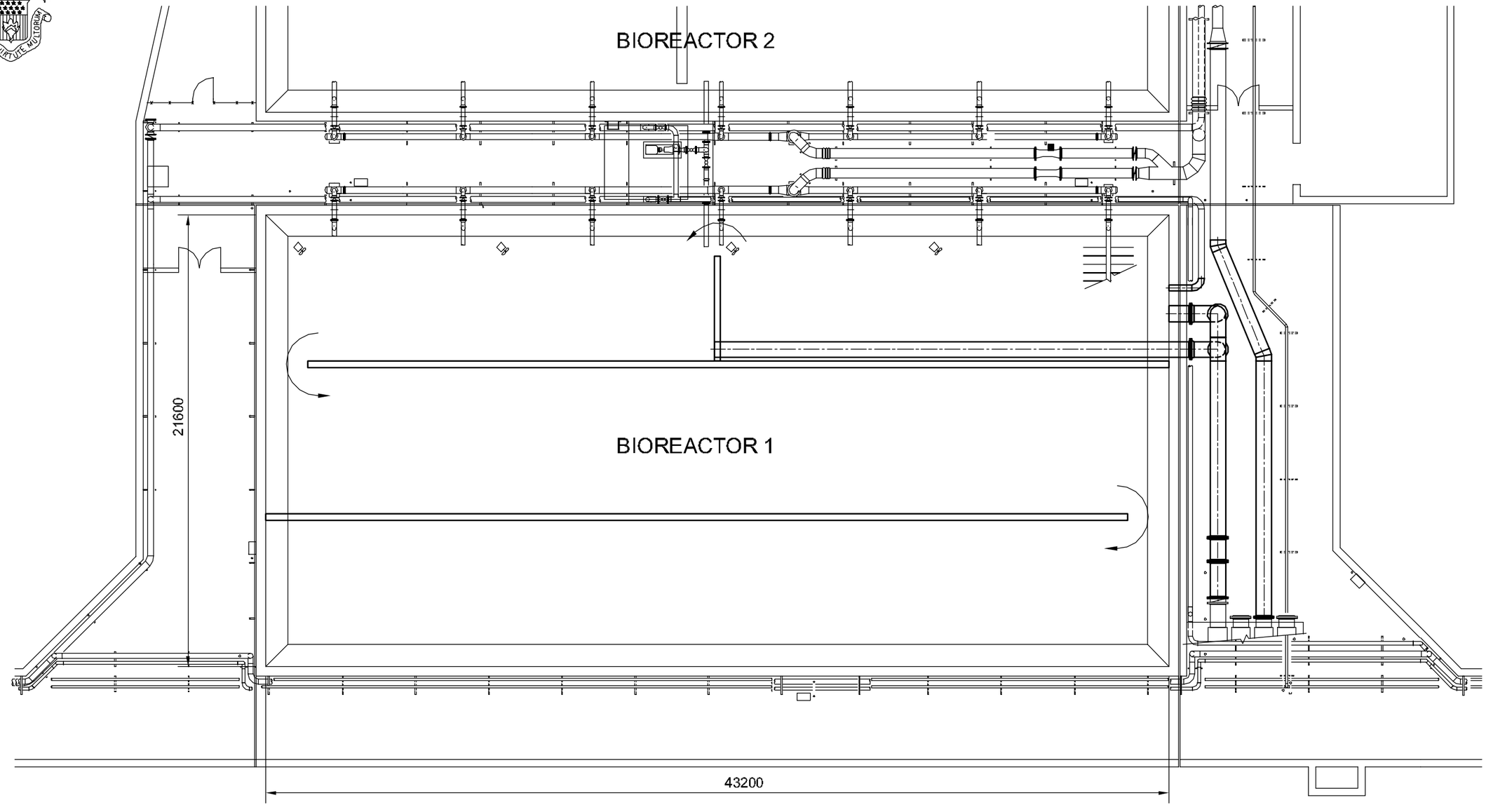
WEWPCC
Best Practicable Level of Control
Site Plan
DWG. WE - 4.1



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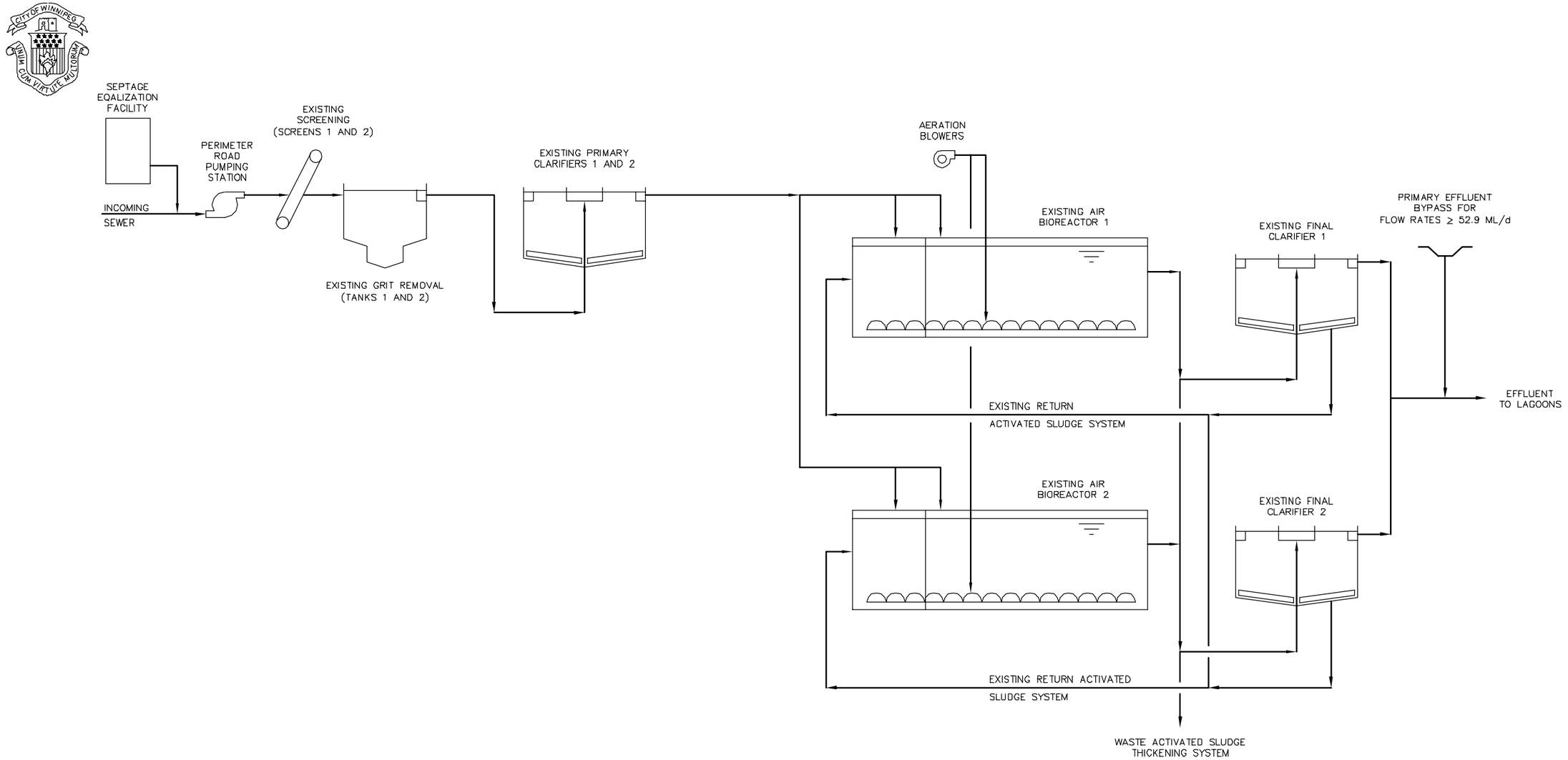
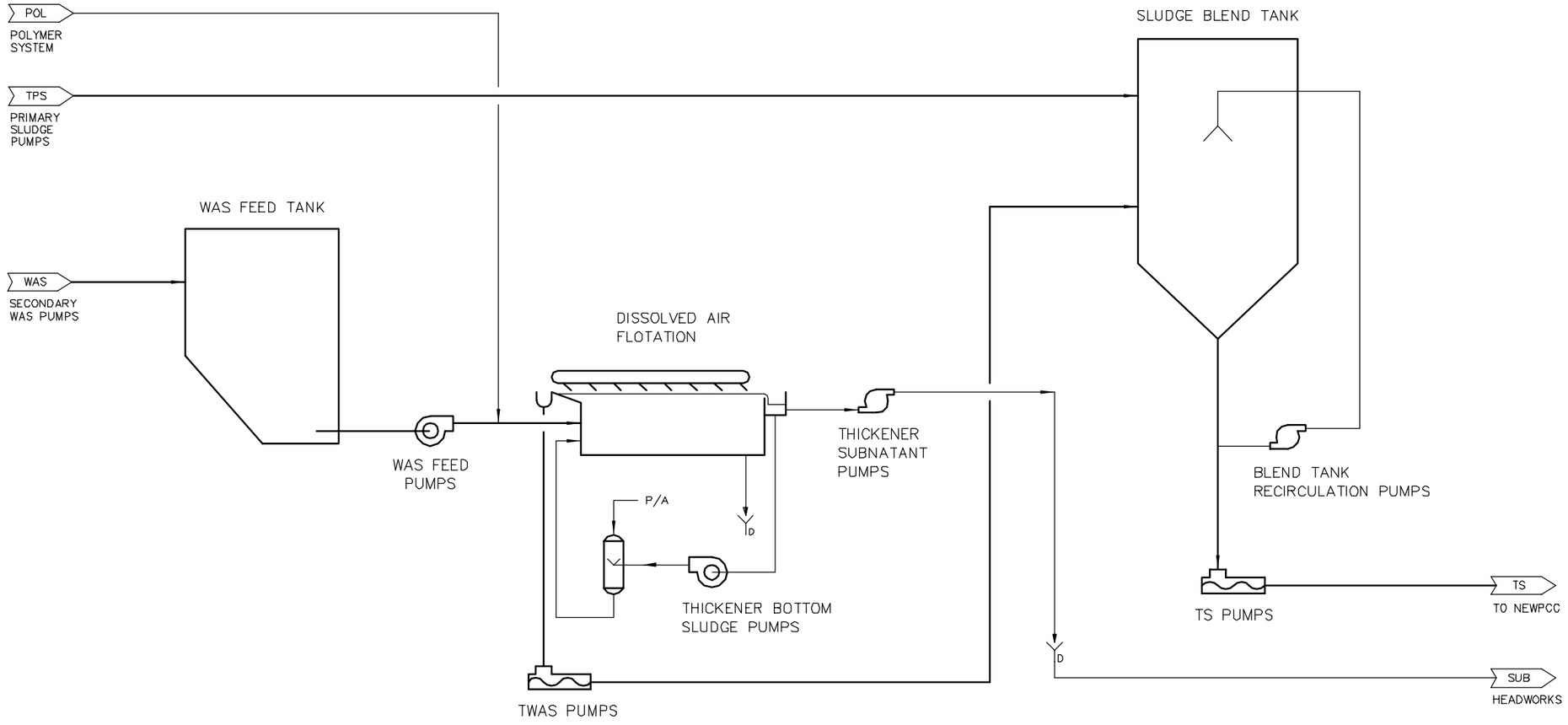
WEWPCC
Best Practicable Level of Control
Single Stage Nitrification Bioreactor Layout
DWG. WE - 4.2



RAW SEWAGE PUMPS	SCREENS	GRIT REMOVAL TANKS	PRIMARY CLARIFIERS	AIR BIOREACTORS	FINAL CLARIFIERS
No. = 4	No. = 2	No. = 2	No. = 2	No. = .	No. = .

WEWPCC
Best Practicable Level of Control
Process Flow Diagram
DWG. WE - 4.3



WAS FEED TANK
V = 120.0 m^3
HRT = 30 min

WAS FEED PUMPS
No. = 3
CAP'Y = 30 L/S
TDH = 30 m

DISSOLVED AIR FLOTATION THICKENING
No. = 3
CAP'Y = 27 L/S

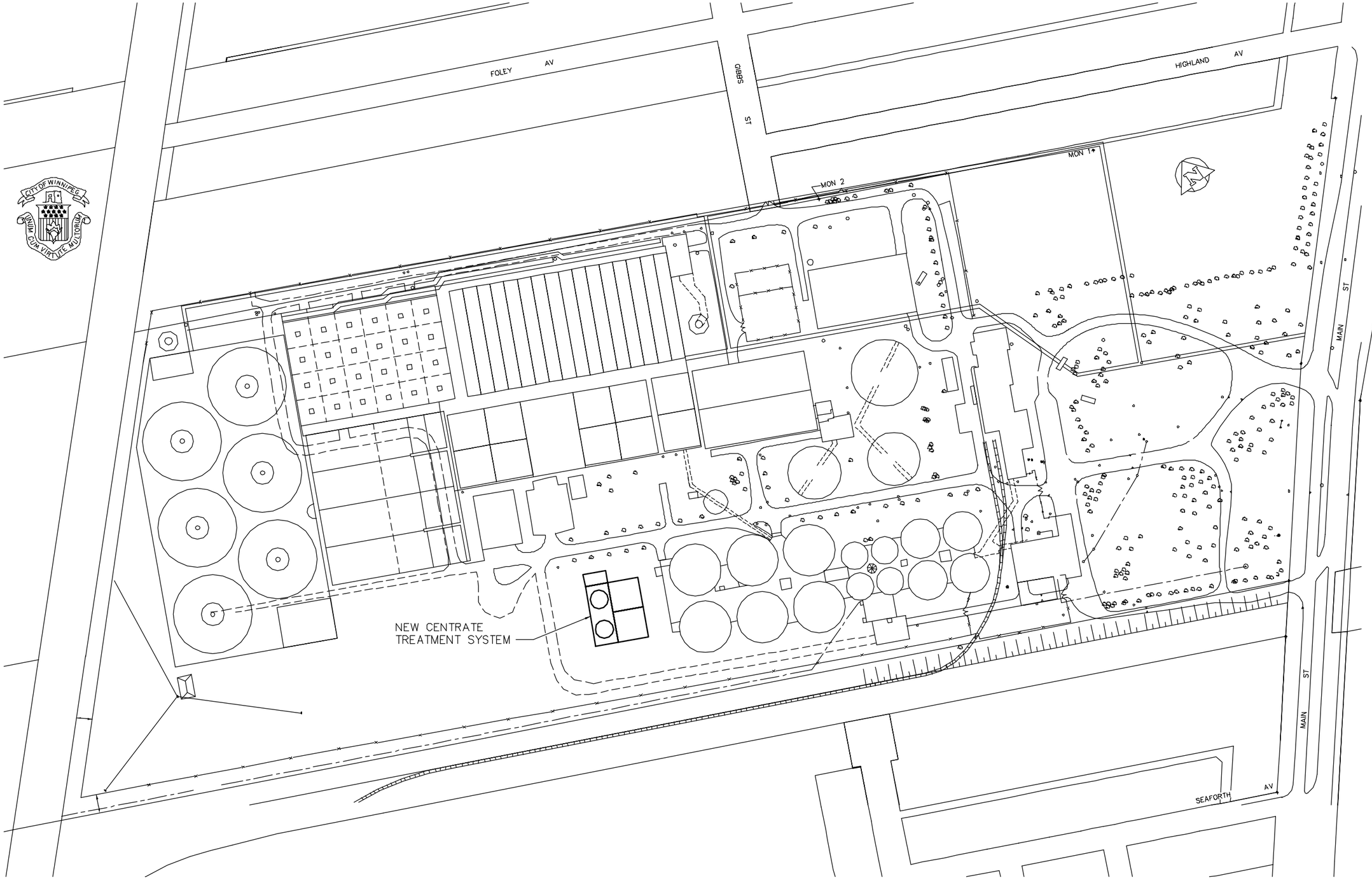
TWAS PUMPS
No. = 3
CAP'Y = 5 L/S
TDH = 30 m

SLUDGE STORAGE TANK
V = 300.0 m^3
HRT = 8 hours

TS PUMPS
No. = 3
CAP'Y = 8 L/S
TDH = 30 m

BLEND TANK RECIRCULATION PUMPS
No. = 2
CAP'Y = 80 L/S

WEWPCC
Waste Activated Sludge Thickening
Process Flow Diagram
DWG. WE - 4.4



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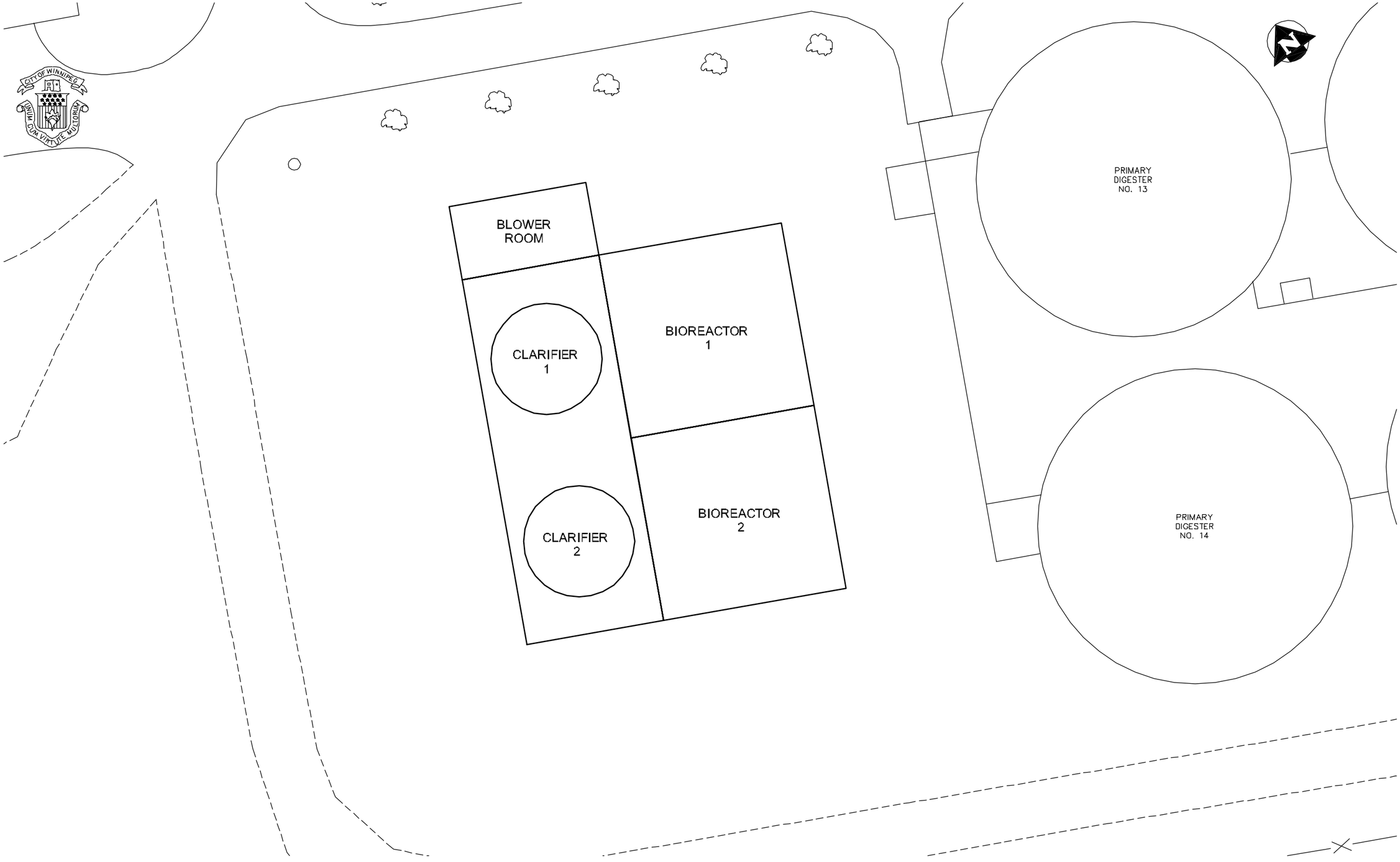
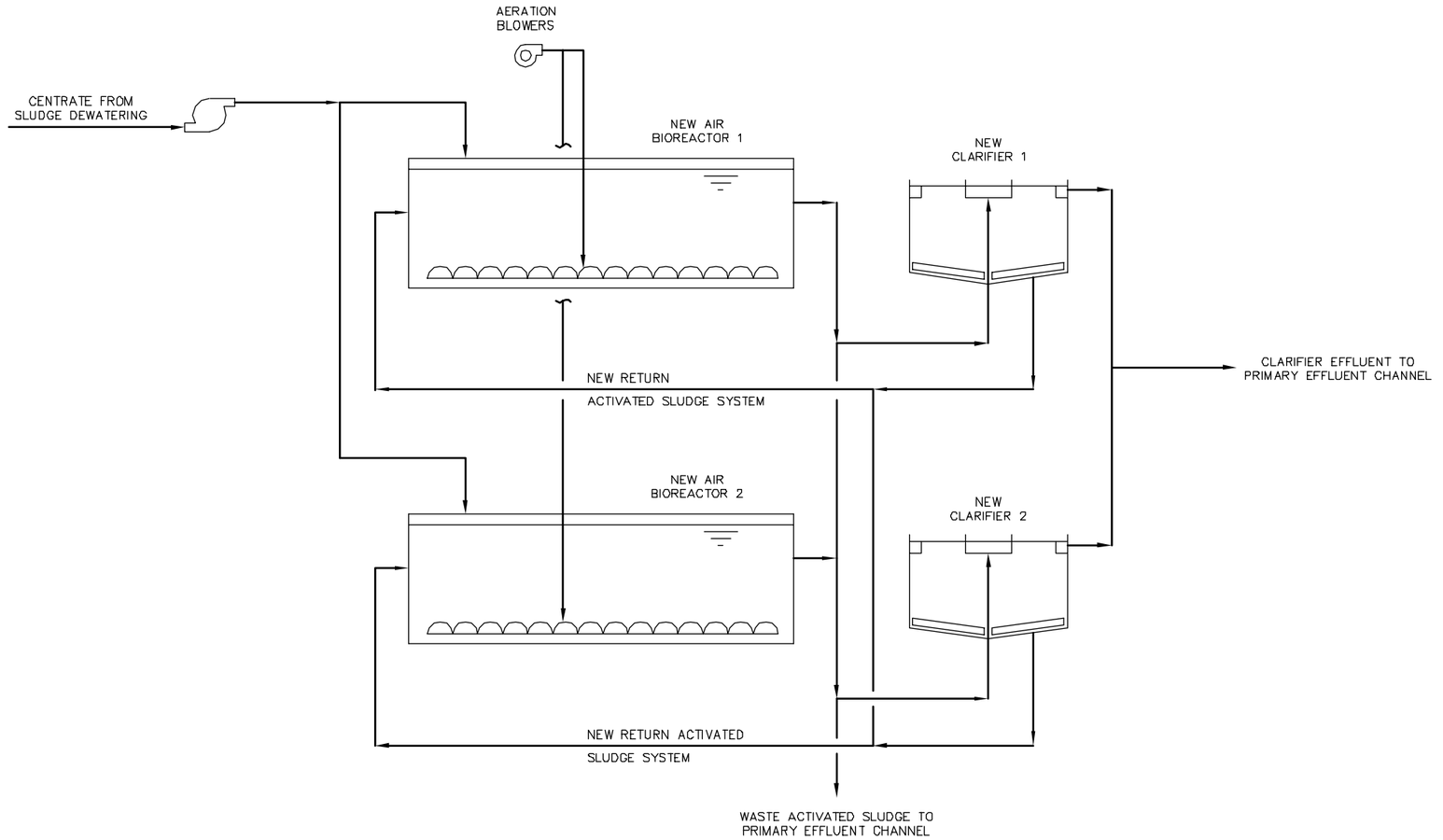
NEWPCC
Centrate Treatment System
Site Location
DWG. CE - 6.1



NEWPCC
Centrate Treatment System
Layout
DWG. CE - 6.2



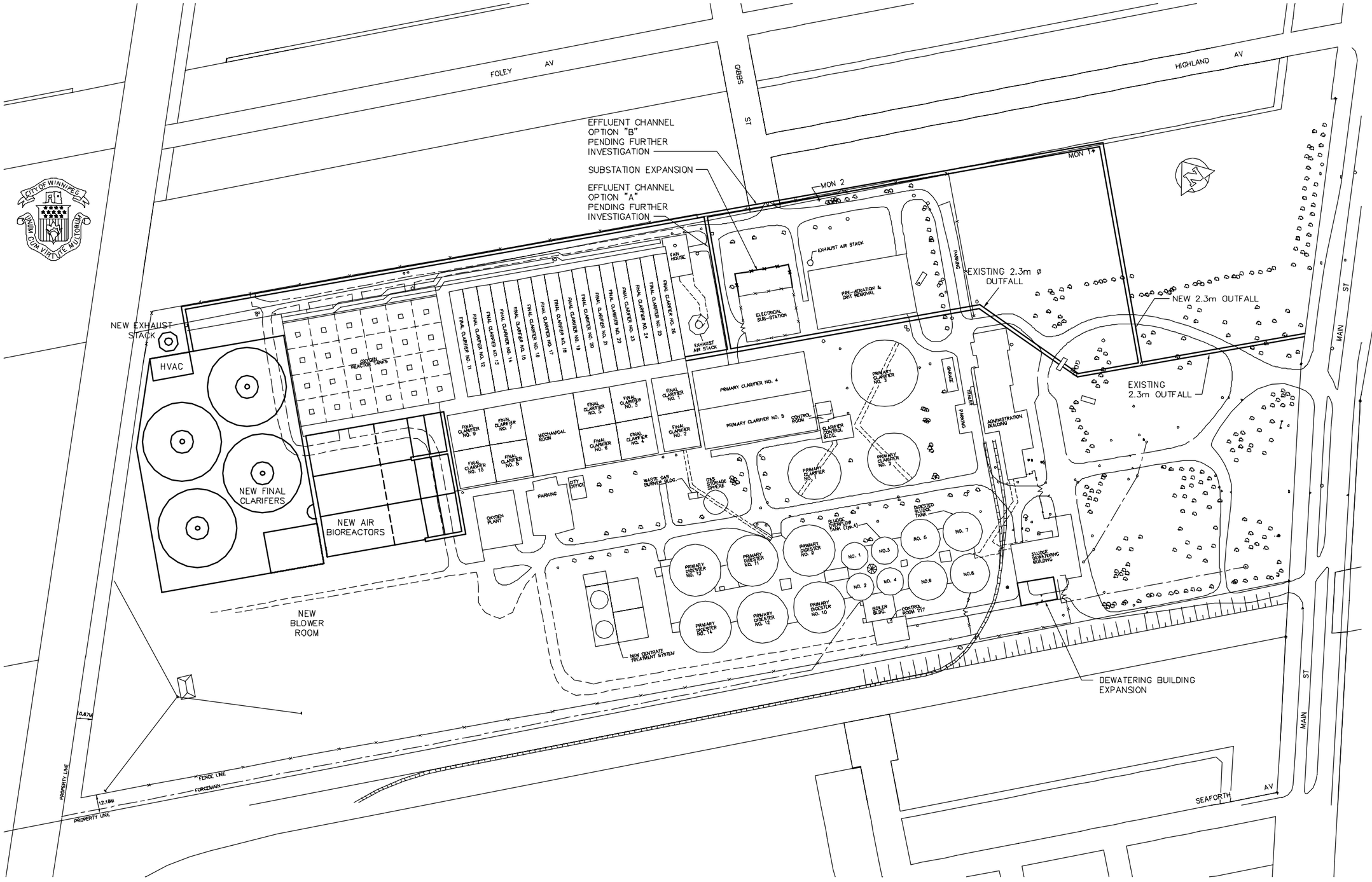
AIR
BIOREACTORS

No. = .
XX = .

FINAL
CLARIFIERS

No. = .
XX = .

NEWPCC
Centrate Treatment System
Process Flow Diagram
DWG. CE - 6.3



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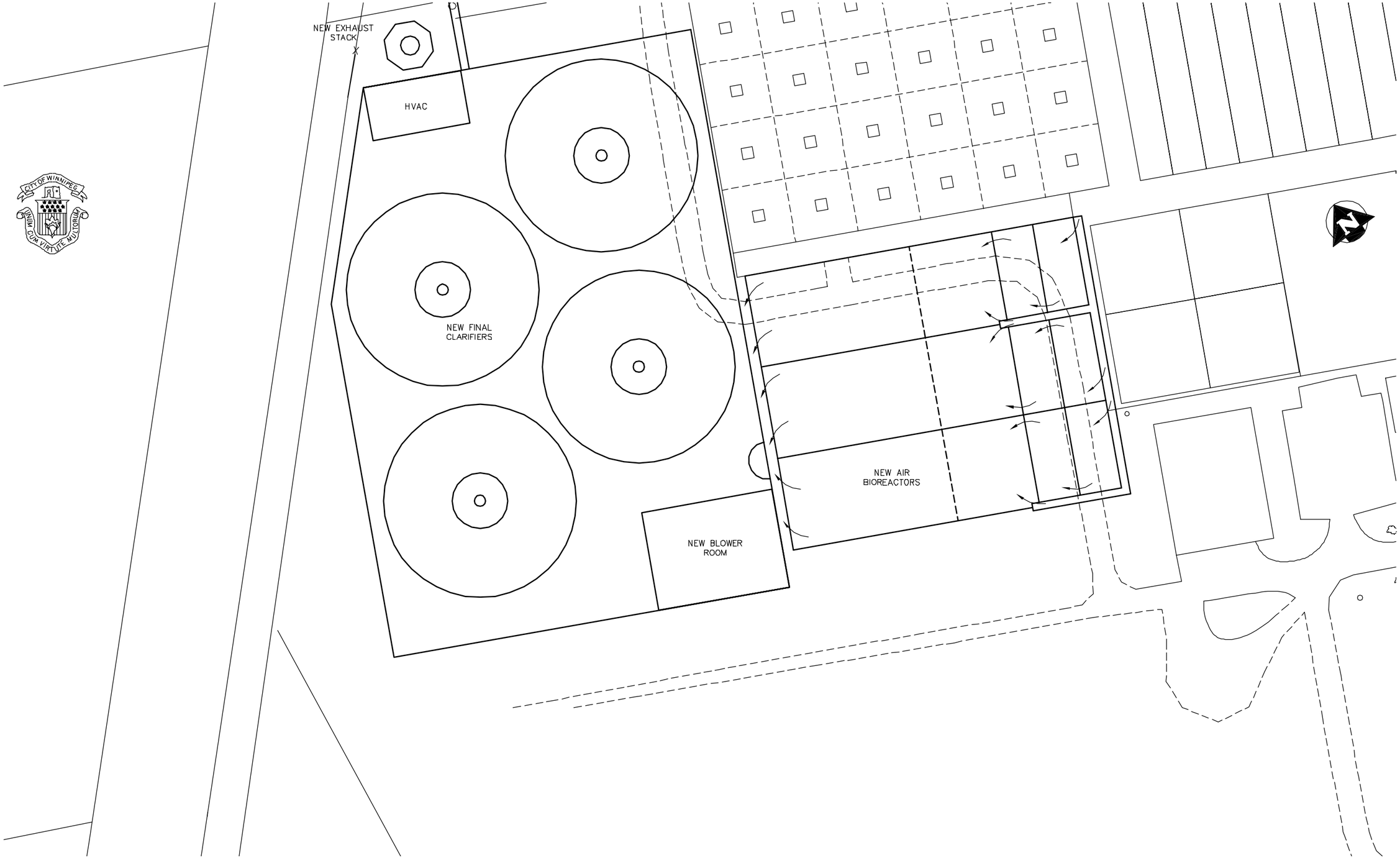
NEWPCC
High Level of Control - Parallel Train with Centrate Treatment
Site Plan
DWG. NE - 8.1



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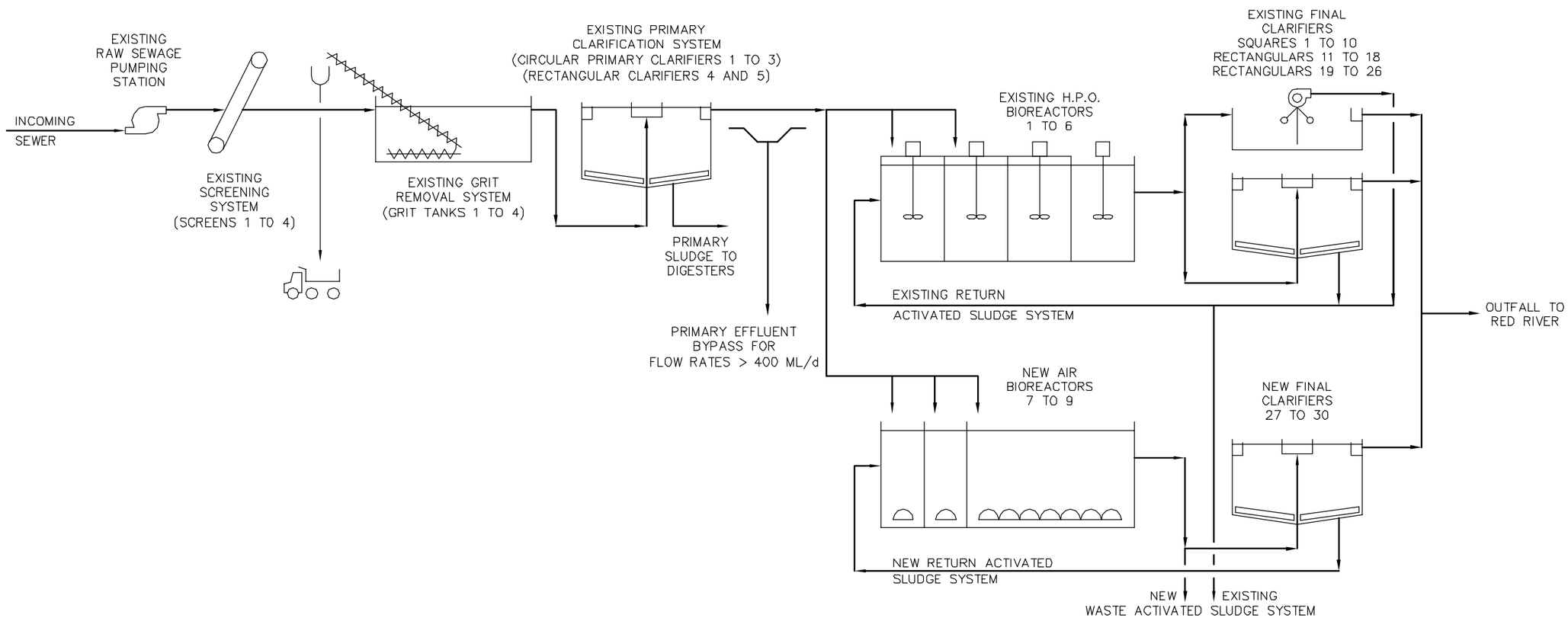
NEWPCC
High Level of Control - Parallel Train with Centrate Treatment
Plant Layout
DWG. NE - 8.2



SCREENS

No. = 4

GRIT REMOVAL

No. = 4
DIM = 46 m x 9.1 m x 4.6 m

PRIMARY CLARIFIERS

No. = 5
No. 1 & 2 = 35ø m
No. 3 = 44ø m
No. 4 & 5 = 66.5 m x 23 m

H.P.O. BIOREACTORS

No. = 6
VOL/UNIT = 5022 m^3

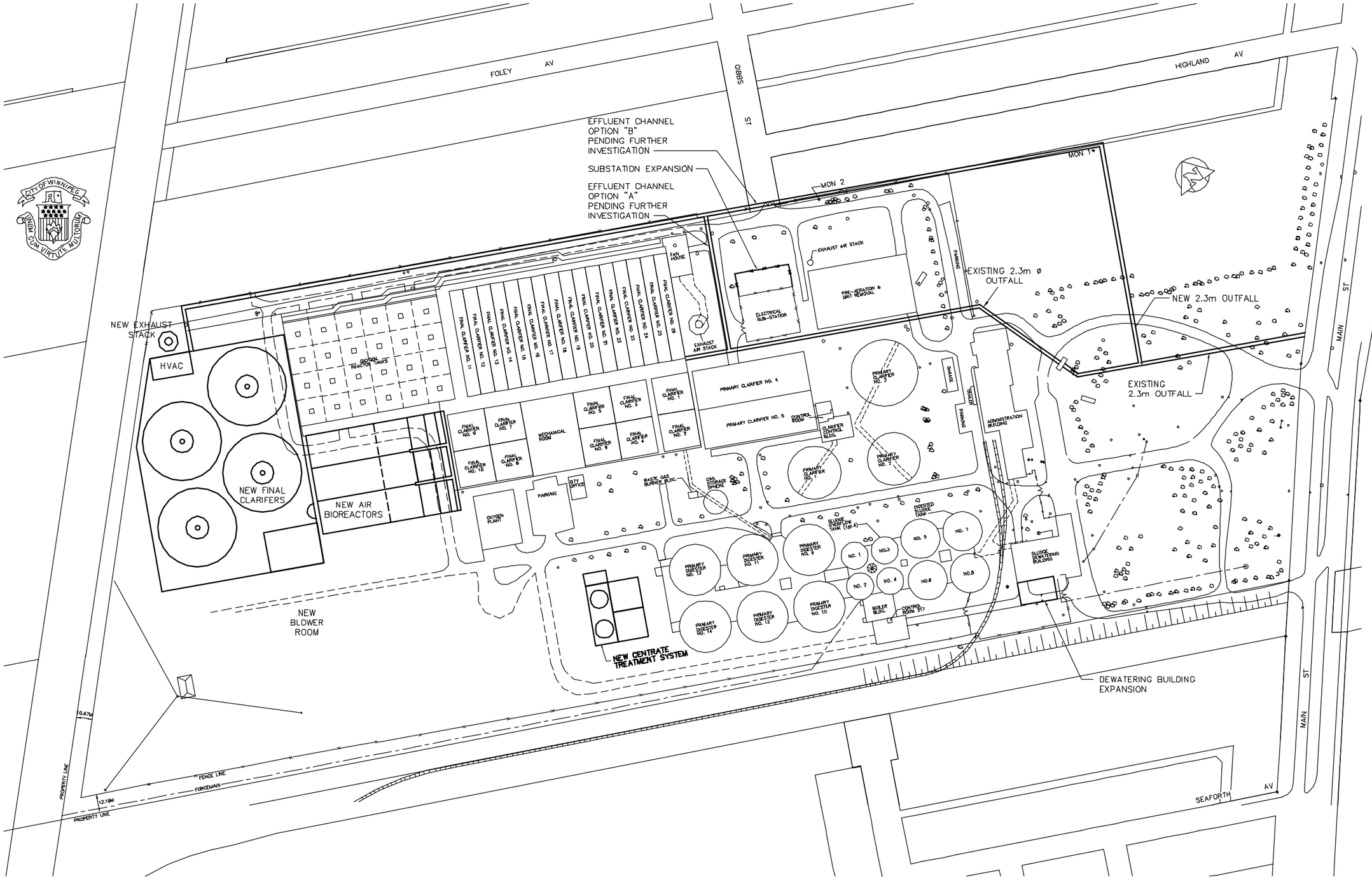
AIR BIOREACTORS

No. = 4
VOL/UNIT = 12,5000 m^3

FINAL CLARIFIERS

No. = 32
No. 1–10 = 24.4 m x 24.4 m x 3.7 m
No. 11–26 = 70.5 m x 9.1 m x 3.6 m
No.27–30 = 52ø m, 6m SWD

NEWPCC
High Level of Control - Parallel Train with Centrate Treatment
Process Flow Diagram
DWG. NE - 8.3



NEWPCC
Modest Level of Control - Parallel Train with Centrate Treatment
Site Plan
DWG. NE - 8.4

NEW EXHAUST STACK

HVAC

NEW FINAL CLARIFIERS

NEW AIR BIOREACTORS

NEW BLOWER ROOM

N

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NEWPCC
Modest Level of Control - Parallel Train with Centrate Treatment
Plant Layout
DWG. NE - 8.5

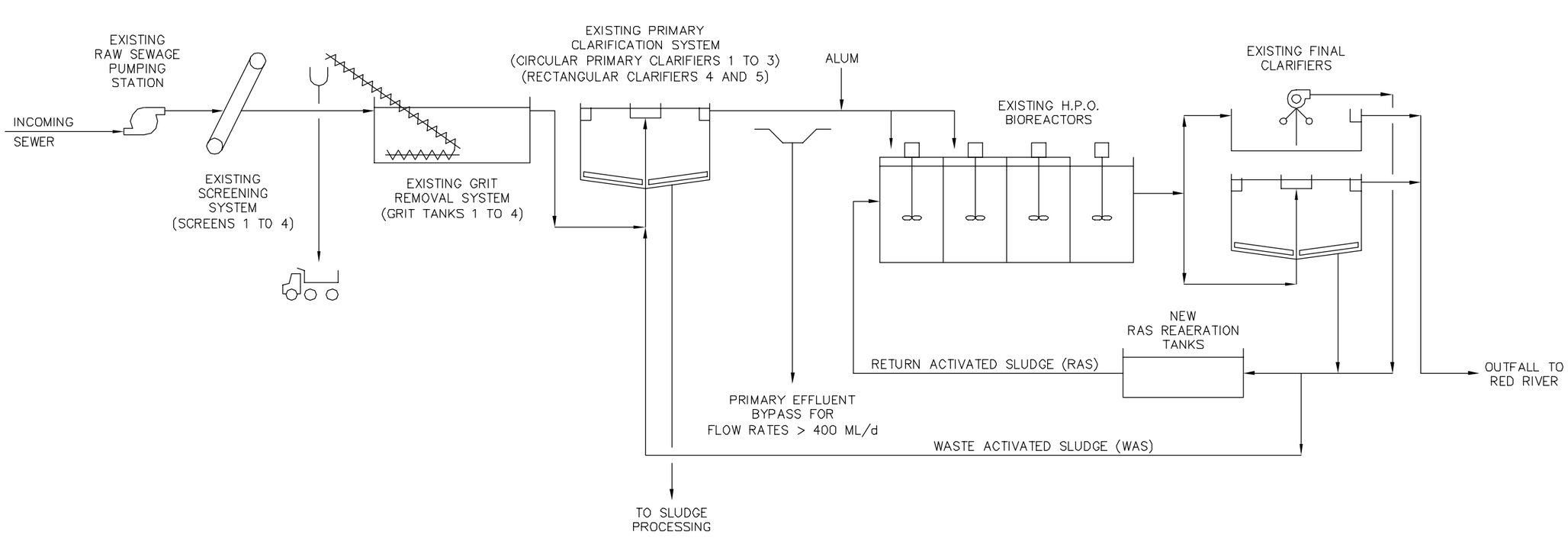
CITY OF WINNIPEG
MUNUM CUM VIRTUTE MULTORUM

RAS
REAERATION
TANKS

FOLEY AV
GIBBS ST
HIGHLAND AV
MAIN ST
SEAFORTH AV
MON 1
MON 2
N

FIRE HOUSE
OXIDATION TANKS
FINAL CLARIFIER NO. 11
FINAL CLARIFIER NO. 12
FINAL CLARIFIER NO. 13
FINAL CLARIFIER NO. 14
FINAL CLARIFIER NO. 15
FINAL CLARIFIER NO. 16
FINAL CLARIFIER NO. 17
FINAL CLARIFIER NO. 18
FINAL CLARIFIER NO. 19
FINAL CLARIFIER NO. 20
FINAL CLARIFIER NO. 21
FINAL CLARIFIER NO. 22
FINAL CLARIFIER NO. 23
FINAL CLARIFIER NO. 24
FINAL CLARIFIER NO. 25
FINAL CLARIFIER NO. 26
EXHAUST AIR STACK
ELECTRICAL SUB-STATION
EXHAUST AIR STACK
PRE-AERATION & GRIT REMOVAL
PARKING
PRIMARY CLARIFIER NO. 4
PRIMARY CLARIFIER NO. 5
CONTROL ROOM
PRIMARY CLARIFIER NO. 3
GARAGE
TRAILER PARKING
ADMINISTRATION BUILDING
CLARIFIER CONTROL BLDG.
PRIMARY CLARIFIER NO. 1
PRIMARY CLARIFIER NO. 2
FINAL CLARIFIER NO. 9
FINAL CLARIFIER NO. 8
FINAL CLARIFIER NO. 7
FINAL CLARIFIER NO. 6
FINAL CLARIFIER NO. 5
FINAL CLARIFIER NO. 4
FINAL CLARIFIER NO. 3
FINAL CLARIFIER NO. 2
FINAL CLARIFIER NO. 10
FINAL CLARIFIER NO. 1
MECHANICAL ROOM
OXYGEN PLANT
PARKING
CITY OFFICE
WASTE GAS BURNER BLDG.
GAS STORAGE SPHERE
DIGESTED SLUDGE TANK
PRIMARY DIGESTER NO. 13
PRIMARY DIGESTER NO. 11
PRIMARY DIGESTER NO. 9
PRIMARY DIGESTER NO. 14
PRIMARY DIGESTER NO. 12
PRIMARY DIGESTER NO. 10
NO. 1
NO. 2
NO. 3
NO. 4
NO. 5
NO. 6
NO. 7
NO. 8
BOILER BLDG.
CONTROL ROOM 317
SLUDGE DEWATERING BUILDING
SLUDGE OVERFLOW TANK (OP-4)
0.67M
12.19M
PROPERTY LINE
FENCE LINE
FORCEMAIN
PROPERTY LINE

NEWPCC
High Level of Control - RAS Reaeration
Site Plan
DWG. NE - 8.6



SCREENS	GRIT REMOVAL	PRIMARY CLARIFIERS	H.P.O. BIOREACTORS	FINAL CLARIFIERS	REAERATION TANKS
EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	NEW
No. = 4	No. = 4	No. = 5	No. = 6	No. = 26	No. = 2
	DIM = 46 m x 9.1 m x 4.6 m	No. 1 & 2 = 35ø m	DIM = 68.3 m x 17.1 m	No. 1–10 = 24.4 m x 24.4 m x 3.7 m	LENGTH = 80 m
		No. 3 = 44ø m	SWD = 4.3 m	No. 11–26 = 70.5 m x 9.1 m x 3.6 m	WIDTH = 26 m
		No. 4 & 5 = 66.5 m x 23 m			DEPTH = 6 m
		SWD = 3.6 m FOR ALL			

NEWPCC
High Level of Control - RAS Reaeration
Process Flow Diagram
DWG. NE - 8.7

CITY OF WINNIPEG

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N

NEW AIR BIOREACTORS

MECHANICAL ROOM

SECONDARY CLARIFIER NO. 1

RS PUMP ROOM

SCREEN ROOM

GRIT REMOVAL

PRIMARY CLARIFIER No. 1

PRIMARY CLARIFIER No. 2

PRIMARY CLARIFIER No. 3

EXIST. CHLORINE CONTACT CHAMBER

EFFLUENT CHAMBER

EFFLUENT CHANNEL

DISINFECTION FACILITY

MECHANICAL ROOM

CHANNEL

SECONDARY CLARIFIER No. 3

SECONDARY CLARIFIER NO. 2

FAN HOUSE

FOUL AIR DUCT

DAF THICKENING

BLOWER ROOM

NEW AIR BIOREACTORS

STORAGE/ TRUCK BAY

WOODED AREA

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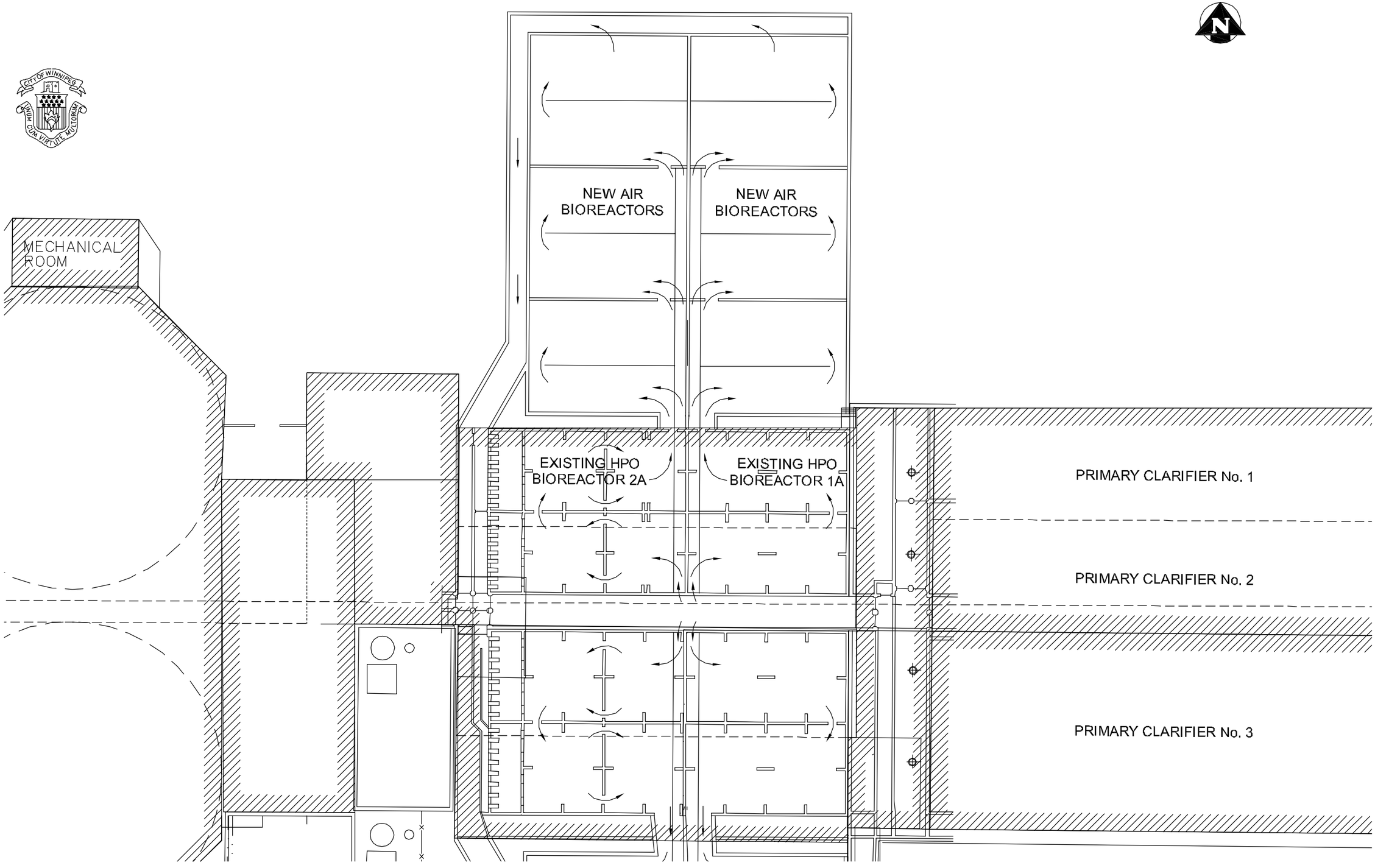
SEWPCC
High Level of Control - Step Feed
Site Plan
DWG. SE - 9.1



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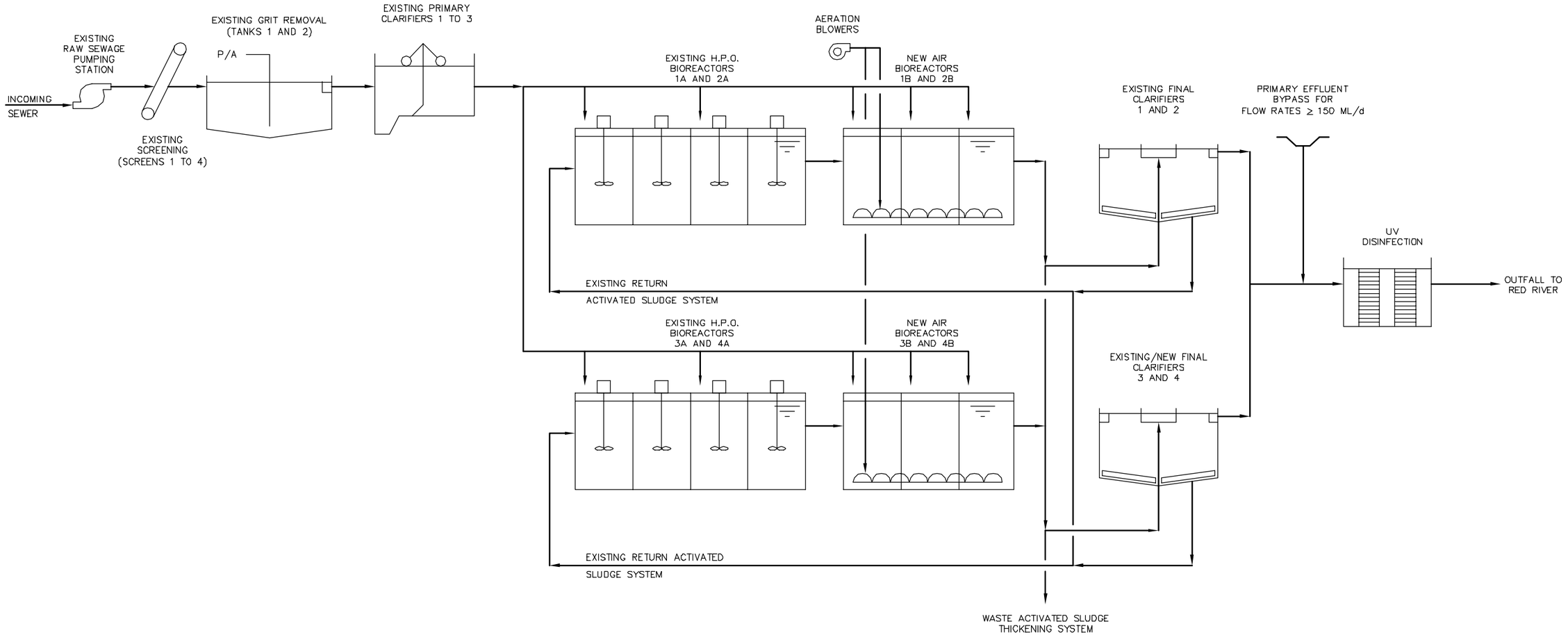
SEWPCC
High Level of Control - Step Feed
Expanded Site Plan
DWG. SE - 9.2



SCREENS
No. = 4

GRIT REMOVAL TANKS
No. = 2

PRIMARY CLARIFIERS
No. = 3

H.P.O. BIOREACTORS
No. = 8
VOL/UNIT = 810 m

AIR BIOREACTORS
No. = 4
VOL/UNIT = 4005 m^3

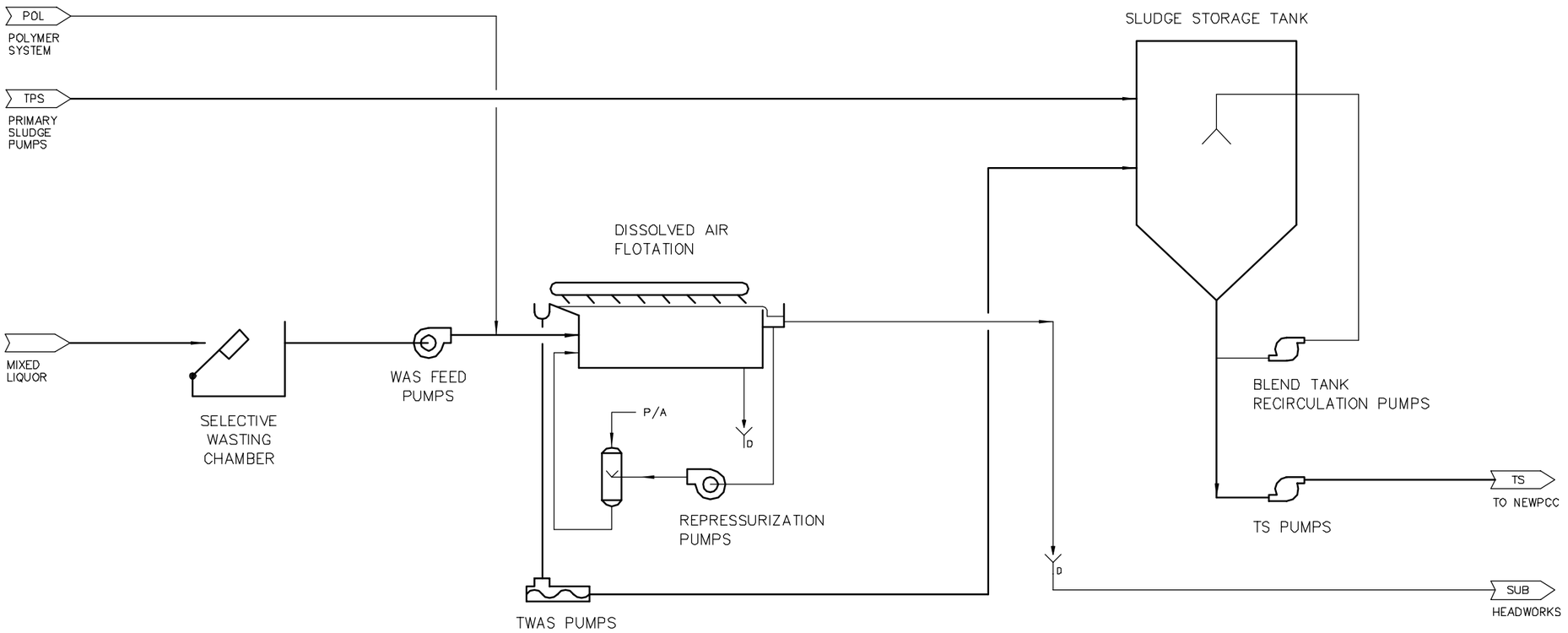
AIR BIOREACTORS
No. = 4
CAP'Y/BLOWER = 135 m^3/min.

FINAL CLARIFIERS 1 & 2
No. = 2
DIA. = 33.5 m

FINAL CLARIFIERS 3 & 4
No. = 2
DIA. = 45.7 m

UV DISINFECTION
TYPE = MEDIUM PRESSURE UV
LAMPS = 120

SEWPCC
High Level of Control - Step Feed
Process Flow Diagram
DWG. SE - 9.3



WAS FEED TANK
V = 120.0 m^3
HRT = 30 min

WAS FEED PUMPS
No. = 3
CAP'Y = 12 L/S
TDH = 10 m

DISSOLVED AIR FLOTATION THICKENING
No. = 3
SURFACE AREA/UNIT = 24 m^3

TWAS PUMPS
No. = 3
CAP'Y = 3 L/S

SLUDGE STORAGE TANK
V = 300 m^3
HRT = 24 L

TS PUMPS
No.= 3
CAP'Y = 15 L/S
EXISTING

BLEND TANK RECIRCULATION PUMPS
No. = 2
EXISTING

SEWPCC
Sludge Thickening
Process Flow Diagram
DWG. SE - 9.4

CITY OF WINNIPEG

UNUM CUM VIRTUTE MILITORUM

N

EXIST. CHLORINE CONTACT CHAMBER

EFFLUENT CHAMBER

EFFLUENT CHANNEL

DISINFECTION FACILITY

MECHANICAL ROOM

SECONDARY CLARIFIER No. 3

SECONDARY CLARIFIER NO. 2

SECONDARY CLARIFIER NO. 1

MECHANICAL ROOM

NEW AIR BIOREACTORS

CHANNEL

PRIMARY CLARIFIER No. 1

PRIMARY CLARIFIER No. 2

PRIMARY CLARIFIER No. 3

RS PUMP ROOM

SCREEN ROOM

GRIT REMOVAL

FAN HOUSE

FOUL AIR DUCT

DAF THICKENING

BLOWER ROOM

NEW AIR BIOREACTORS

STORAGE/ TRUCK BAY

WOODED AREA

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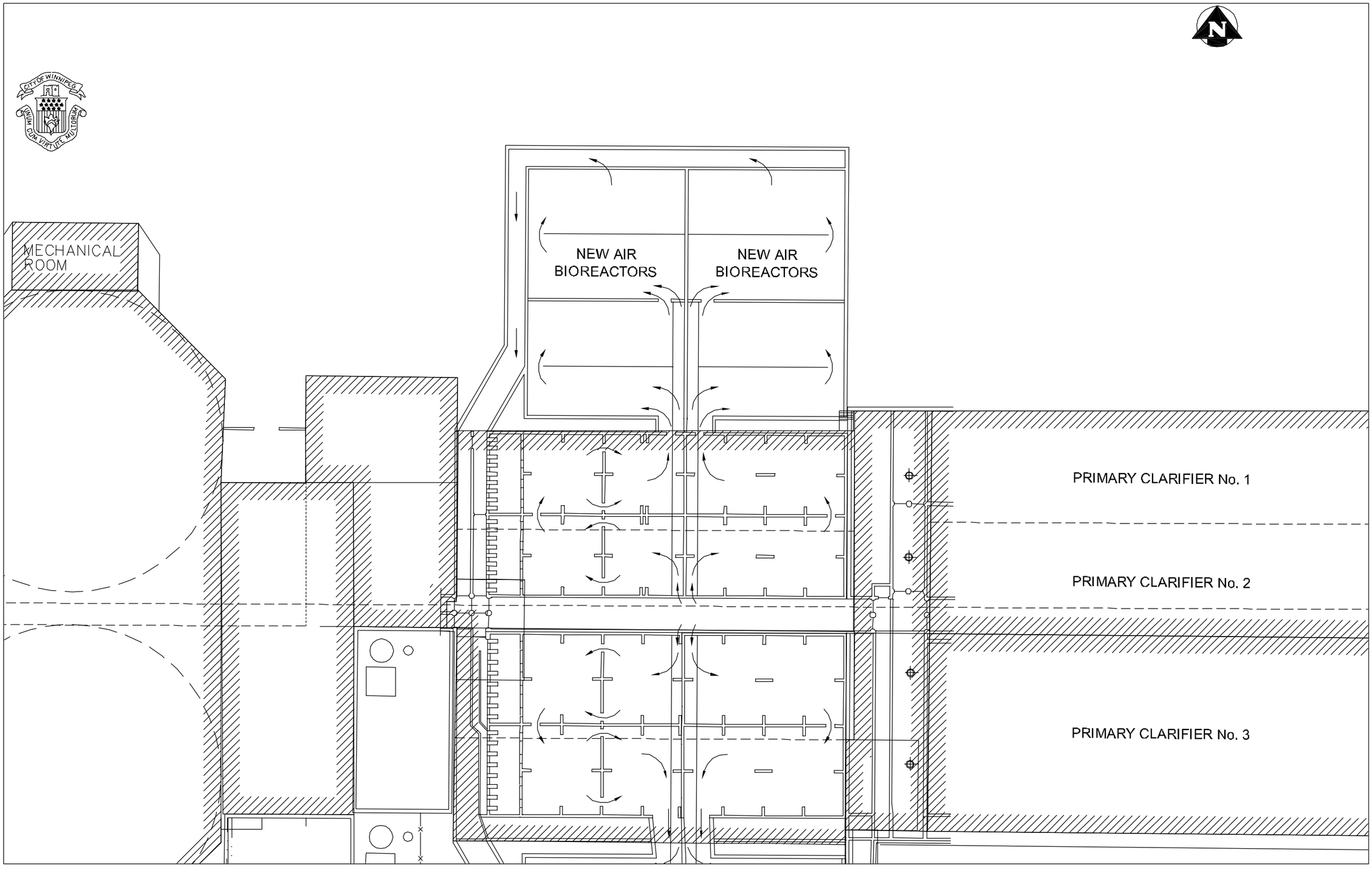
SEWPCC
Modest Level of Control - Step Feed
Site Plan
DWG. SE - 9.5



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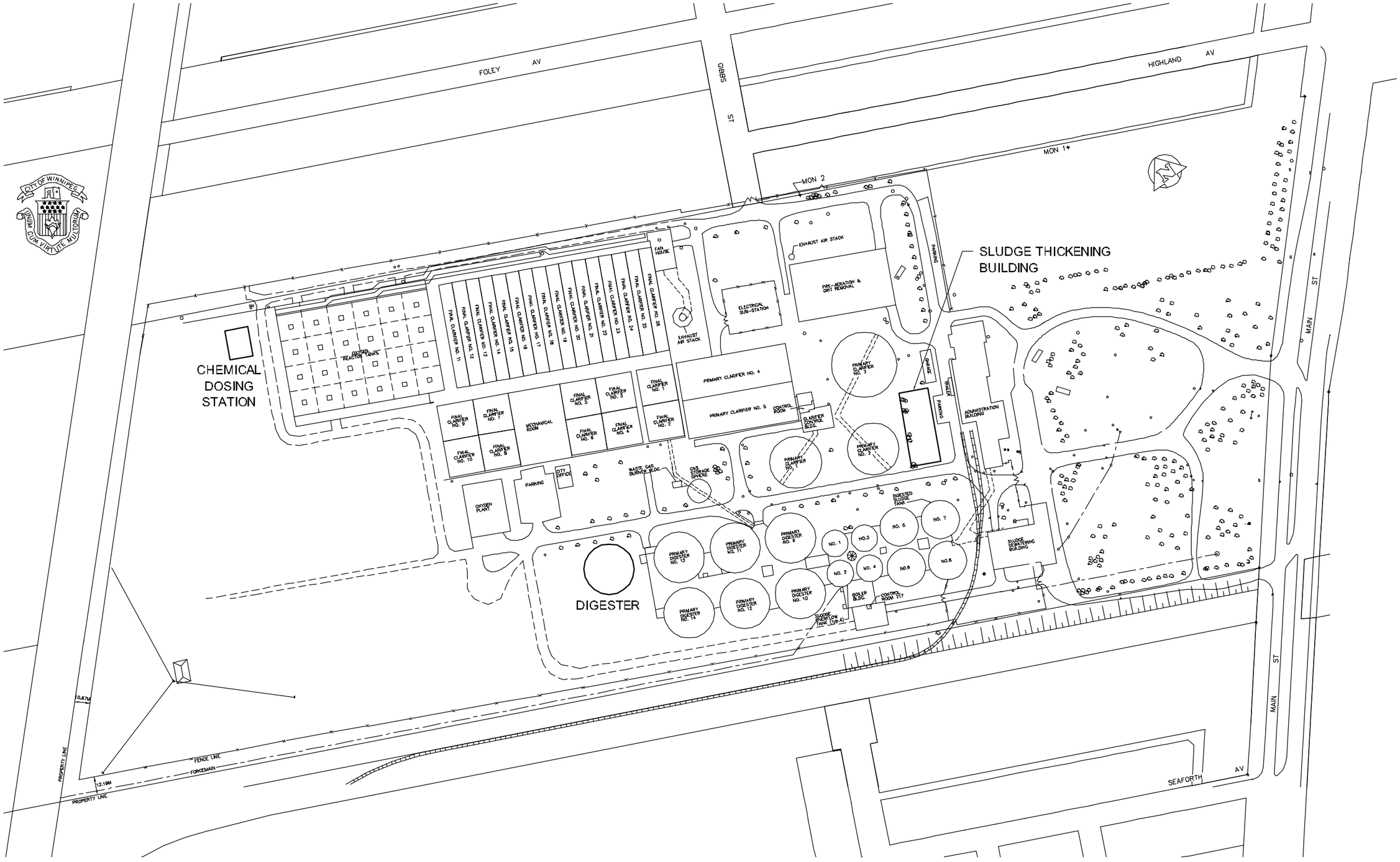
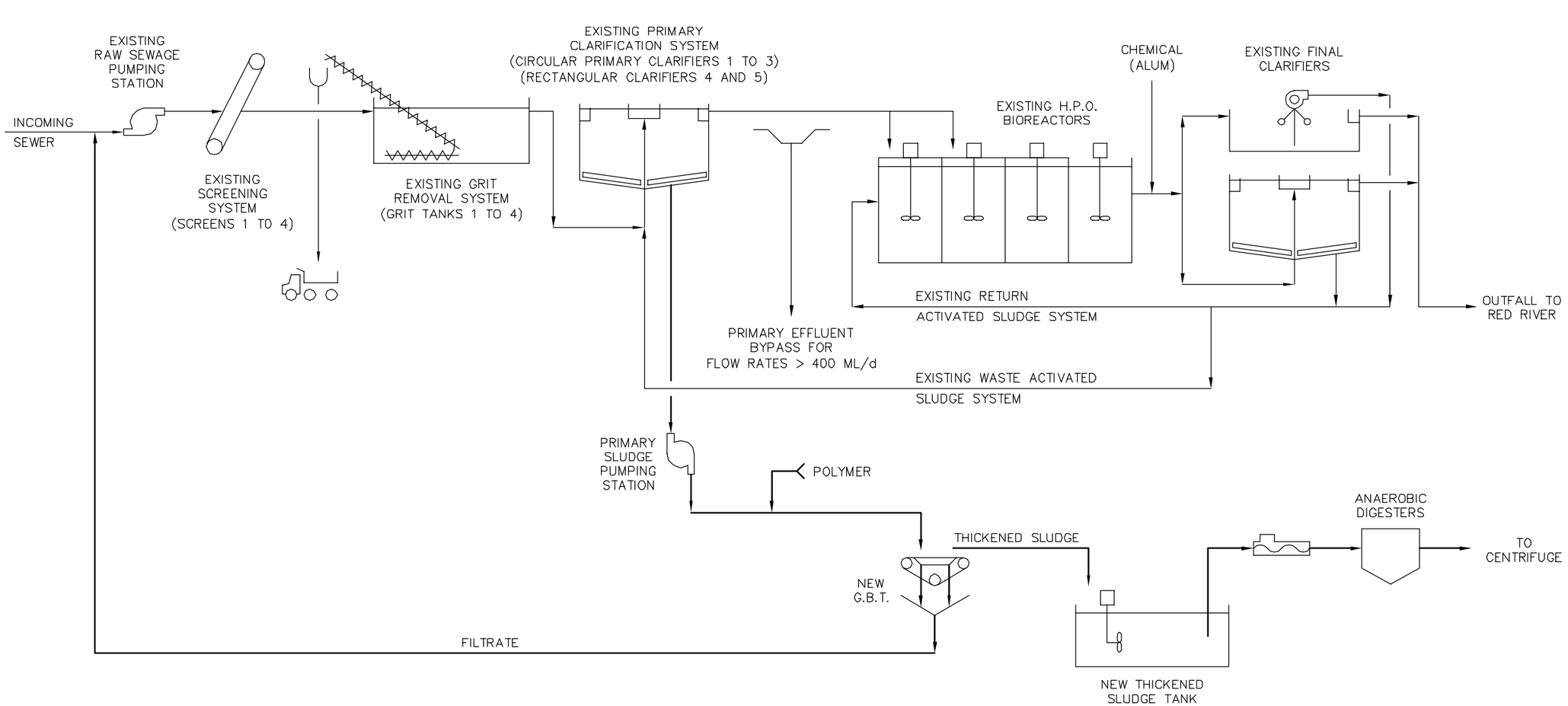
SEWPCC
Modest Level of Control - Step Feed
Expanded Site Plan
DWG. SE - 9.6



NEWPCC
Chemical Phosphorus Removal
Site Plan
DWG. NE - 13.1



SCREENS

EXISTING
No. = 4

GRIT REMOVAL

EXISTING
No. = 4
DIM = 46 m x 9.1 m x 4.6 m

PRIMARY CLARIFIERS

EXISTING
No. = 5
No. 1 & 2 = 35ø m
No. 3 = 44ø m
No. 4 & 5 = 66.5 m x 23 m
SWD = 3.6 m FOR ALL

H.P.O. BIOREACTORS

EXISTING
No. = 6
DIM = 68.3 m x 17.1 m
SWD = 4.3 m

FINAL CLARIFIERS

EXISTING
No. = 26
No. 1–10 = 24.4 m x 24.4 m x 3.7 m
No. 11–26 = 70.5 m x 9.1 m x 3.6 m

GRAVITY BELT THICKENERS

NEW
No. = 5
SIZE = 3 m

THICKENED SLUDGE TANK

NEW
No. = 1
LENGTH = 6 m
WIDTH = 6 m
DEPTH = 4 m

PRIMARY DIGESTERS EXISTING AND NEW

EXISTING
No. = 6
DIAMETER= 33.6 m
DEPTH = 7.6 m

NEW
No. = 1
DIAMETER= 33.6 m
DEPTH = 7.6 m

NEWPCC
Year 2041 - Chemical Phosphorus Removal
Process Flow Diagram
DWG. NE - 13.2

CITY OF WINNIPEG

UNUM CUM VIRTUTE MILITORUM

N

NEW SECONDARY CLARIFIER

MECHANICAL ROOM

SECONDARY CLARIFIER NO. 1

RS PUMP ROOM

SCREEN ROOM

GRIT REMOVAL

BIOREACTOR No. 1

BIOREACTOR No. 2

BIOREACTOR No. 3

BIOREACTOR No. 4

PRIMARY CLARIFIER No. 1

PRIMARY CLARIFIER No. 2

PRIMARY CLARIFIER No. 3

EXIST. CHLORINE CONTACT CHAMBER

EFFLUENT CHAMBER

EFFLUENT CHANNEL

DISINFECTION FACILITY

MECHANICAL ROOM

CHANNEL

SECONDARY CLARIFIER No. 3

SECONDARY CLARIFIER NO. 2

FAN HOUSE

FOUL AIR DUCT

CHEMICAL DOSING STATION

SLUDGE THICKENING BUILDING

WOODED AREA

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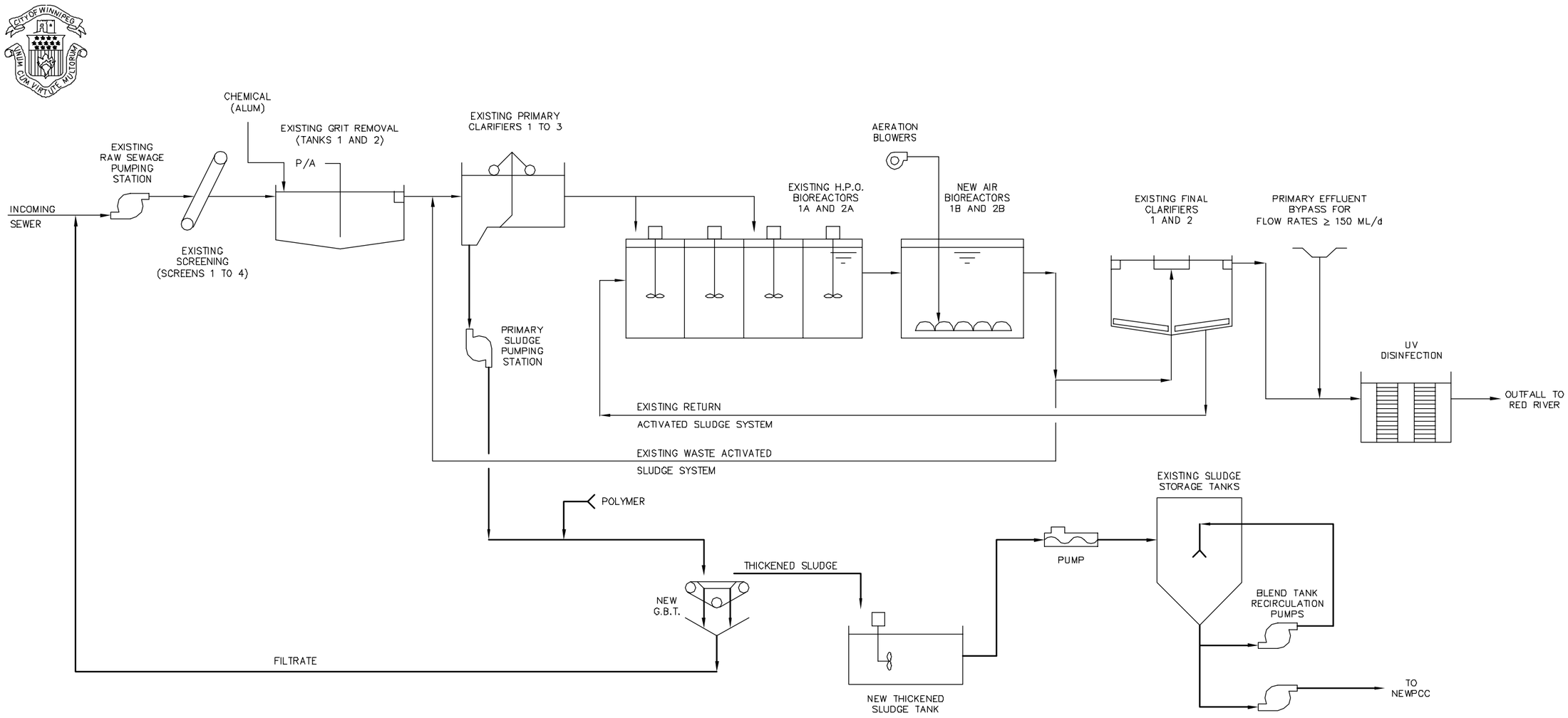
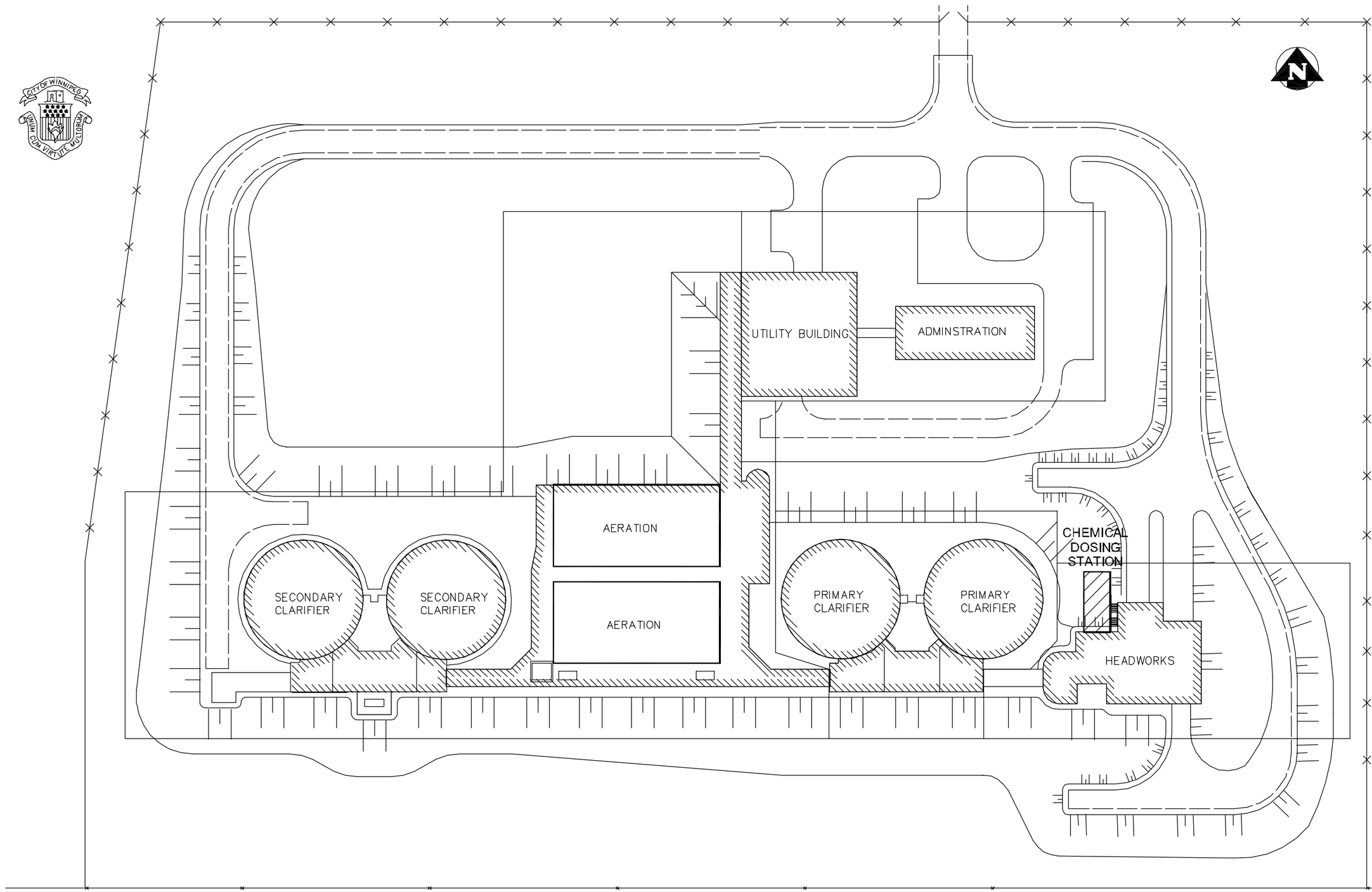
SEWPCC
Chemical Phosphorus Removal
Site Plan
DWG. SE - 13.1



SCREENS	GRIT REMOVAL TANKS	PRIMARY CLARIFIERS	H.P.O. BIOREACTORS	FINAL CLARIFIERS	UV DISINFECTION	GRAVITY BELT THICKENERS	THICKENED SLUDGE TANK	SLUDGE STORAGE TANKS
EXISTING No. = 4	EXISTING No. = 2 DIM = 9.1 m x 9.1 m x 4.4 m	EXISTING No. = 3 DIM OF No. 1 & 2 = 51.8 m x 9.1 m x 4.3 m DIM OF No. 3 = 51.8 m x 19.2 m x 4.3 m	EXISTING No. = 4 DIM = 18.2 m x 18.2 m x 4.9 m	No. EXISTING = 3 No. NEW = 1 DIM OF No. 1 & 2 = 33.5ø m DIM OF No. 3 & 4 = 45.7ø m	EXISTING TYPE = MEDIUM PRESSURE UV LAMPS = 120	NEW No. = 3 SIZE = 3 m	NEW No. = 1 DIM = 6 m x 6 m x 4 m	EXISTING

SEWPCC
Year 2041 - Chemical Phosphorus Removal
Process Flow Diagram
DWG. SE - 13.2



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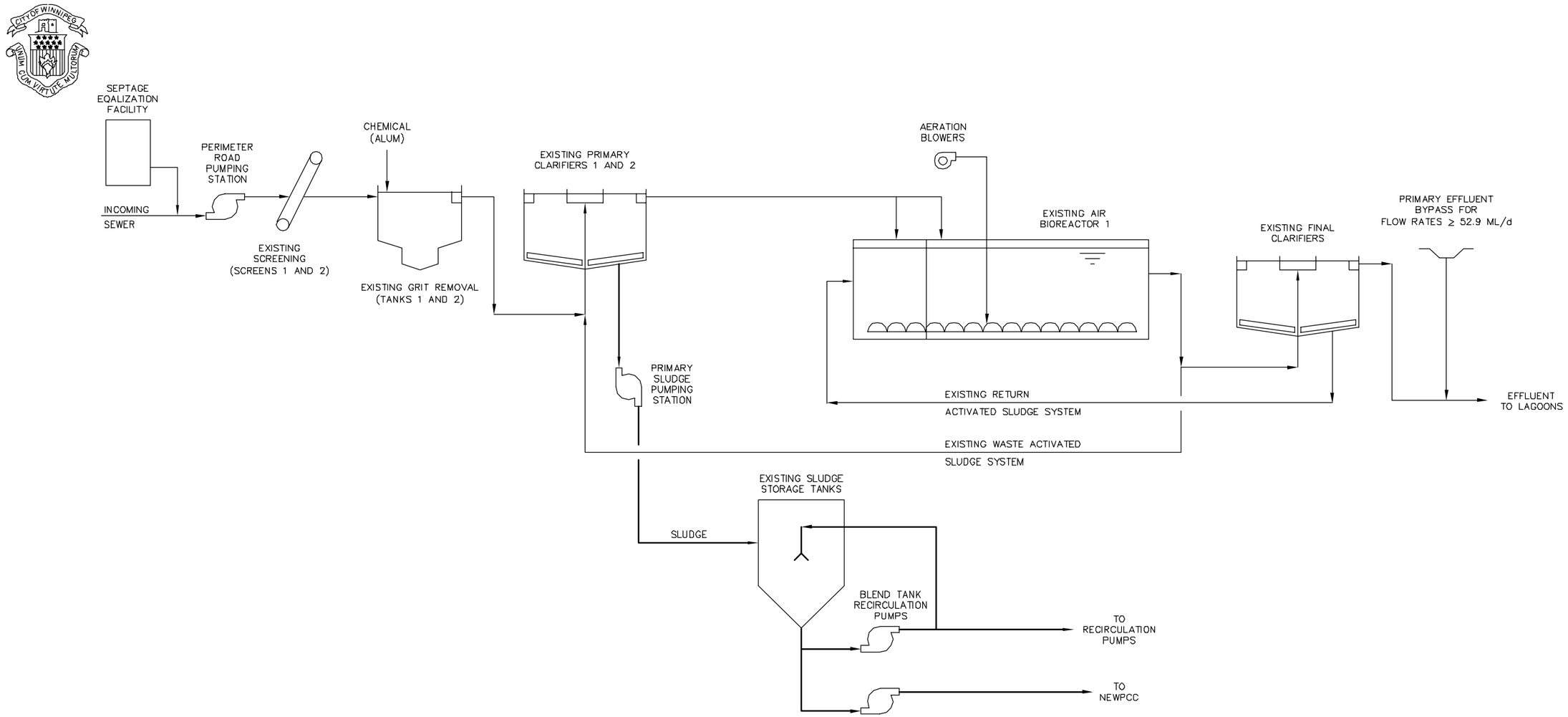
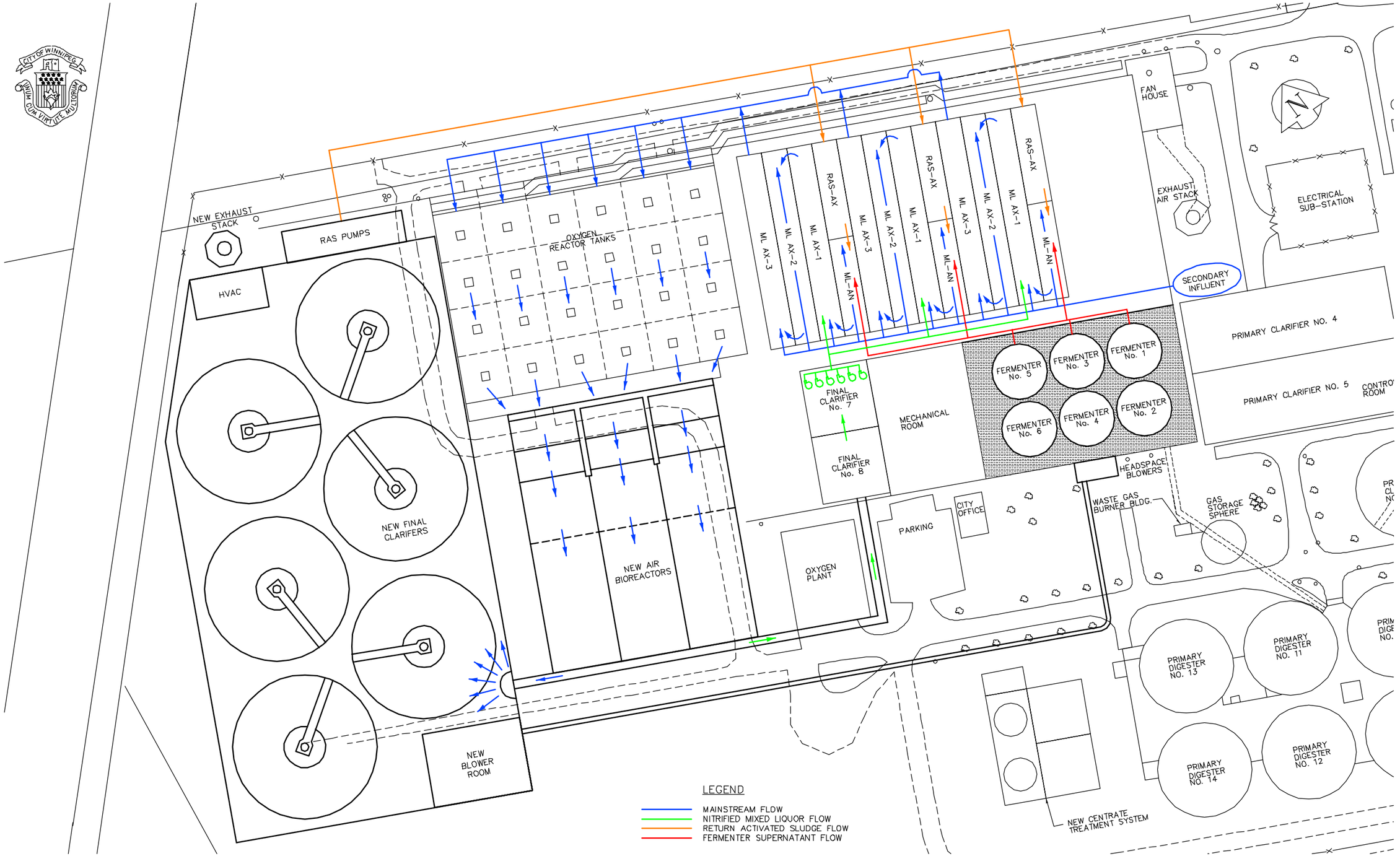
WEWPCC
Chemical Phosphorus Removal
Site Plan
DWG. WE - 13.1



RAW SEWAGE PUMPS	SCREENS	GRIT REMOVAL TANKS	PRIMARY CLARIFIERS	AIR ACTIVATED SLUDGE BIOREACTORS	FINAL CLARIFIERS
EXISTING No. = 4	EXISTING No. = 2	EXISTING No. = 2	EXISTING No. = 2 DIA. = 30 m SWD = 4.5 m	EXISTING No. = 2 DIM = 43.2 m x21.6 m x 5.5 m	EXISTING No. = 2 DIA. = 30 m SWD = 4 m

WEWPCC
Year 2041 - Chemical Phosphorus Removal
Process Flow Diagram
DWG. WE - 13.2



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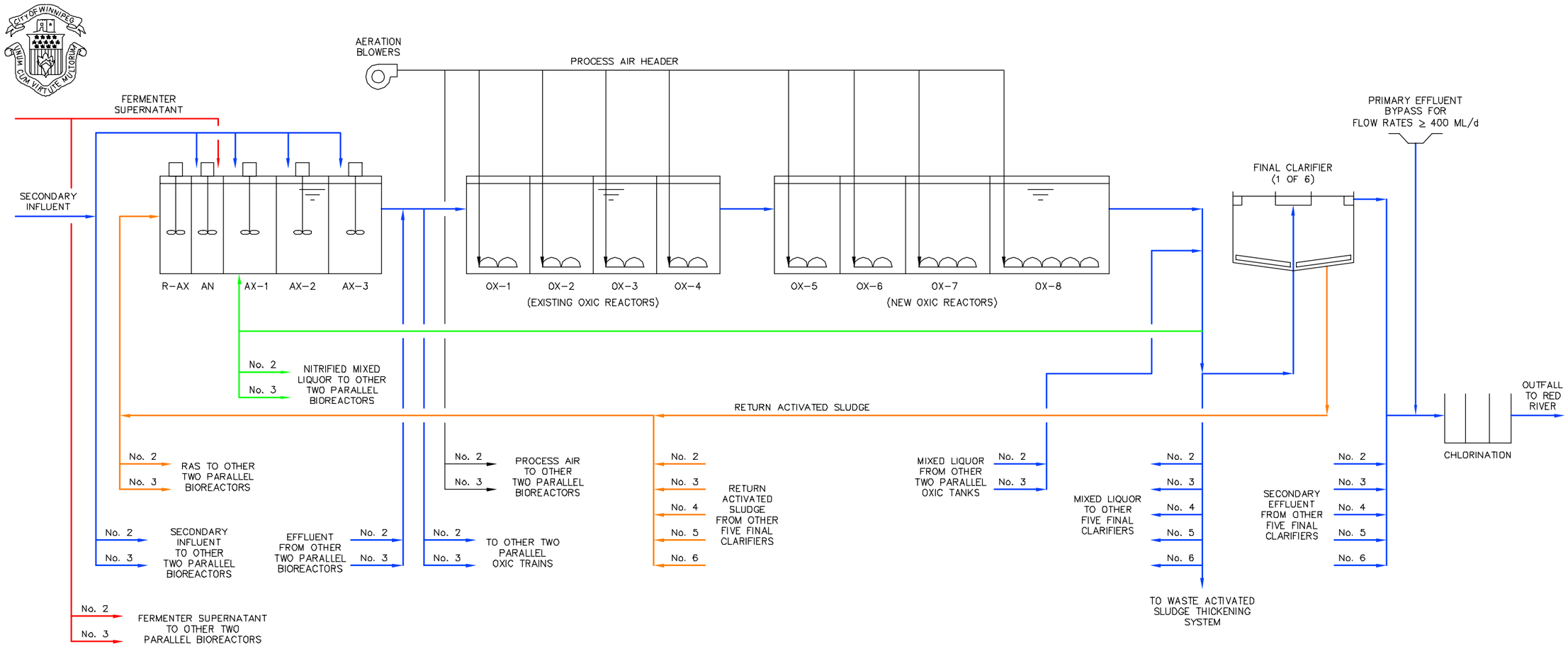
NEWPCC
Biological Nutrient Removal
Plant Layout
DWG. NE - 14.1



ANAEROBIC/ANOXIC REACTORS

EXISTING TANKAGE

No. OF UNITS = 3

SIDE WALL DEPTH = 3.65 m

TOTAL EXISTING VOLUME PER UNIT = 8333 m^3

ZONE VOLUME PER UNIT

R-AX = 1042 m^3 MIXED
AN = 1042 m^3 MIXED
AX-1 = 2083 m^3 MIXED
AX-2 = 2083 m^3 MIXED
AX-3 = 2083 m^3 MIXED

AEROBIC REACTORS

EXISTING BIOREACTOR TANKAGE

No. OF UNITS = 6

SIDE WALL DEPTH = 4.30 m

TOTAL NEW VOLUME PER UNIT = 5022 m^3

ZONE VOLUME PER UNIT

OX-1 = 1255.5 m^3 AERATED
OX-2 = 1255.5 m^3 AERATED
OX-3 = 1255.5 m^3 AERATED
OX-4 = 1255.5 m^3 AERATED

NEW BIOREACTOR TANKAGE

No. OF UNITS = 3

SIDE WALL DEPTH = 6.0 m

TOTAL NEW VOLUME PER UNIT = 12480 m^3

ZONE VOLUME PER UNIT

OX-5 = 1560 m^3 AERATED
OX-6 = 1560 m^3 AERATED
OX-7 = 3120 m^3 AERATED
OX-8 = 6240 m^3 AERATED

NEW FINAL CLARIFIERS

No. OF UNITS = 6

DIAMETER = 52.0 m

SIDE WALL DEPTH = 5.0 m

LEGEND

- MAINSTREAM FLOW
- NITRIFIED MIXED LIQUOR FLOW
- RETURN ACTIVATED SLUDGE FLOW
- FERMENTER SUPERNATANT FLOW

NEWPCC
Biological Nutrient Removal
Process Flow Diagram
DWG. NE - 14.2

NEW AIR BNR BIOREACTORS No.2

NEW AIR BNR BIOREACTORS No.1

4 – NEW PRIMARY SLUDGE FERMENTERS (17.1m ø x 3.0m SWD)

No.2

No.1

No.3

No.4

NEW SECONDARY CLARIFIER No. 4

MECHANICAL ROOM

EXISTING SECONDARY CLARIFIER NO. 1

EXIST. CHLORINE CONTACT CHAMBER

EFFLUENT CHAMBER

EFFLUENT CHANNEL

DISINFECTION FACILITY

MECHANICAL ROOM

CHANNEL

EXISTING SECONDARY CLARIFIER No. 3

EXISTING SECONDARY CLARIFIER NO. 2

FAN HOUSE

FOUL AIR DUCT

WOODED AREA

EX. BIOREACTOR No. 1

EX. BIOREACTOR No. 2

EX. BIOREACTOR No. 3

EX. BIOREACTOR No. 4

EX. PRIMARY CLARIFIER No. 1

EX. PRIMARY CLARIFIER No. 2

EX. PRIMARY CLARIFIER No. 3

RS PUMP ROOM

SCREEN ROOM

GRIT REMOVAL

NEW AIR BNR BIOREACTORS No.4

NEW AIR BNR BIOREACTORS No.3

LEGEND

- MAINSTREAM FLOW
- NITRIFIED MIXED LIQUOR FLOW
- RETURN ACTIVATED SLUDGE FLOW
- FERMENTER SUPERNATANT FLOW

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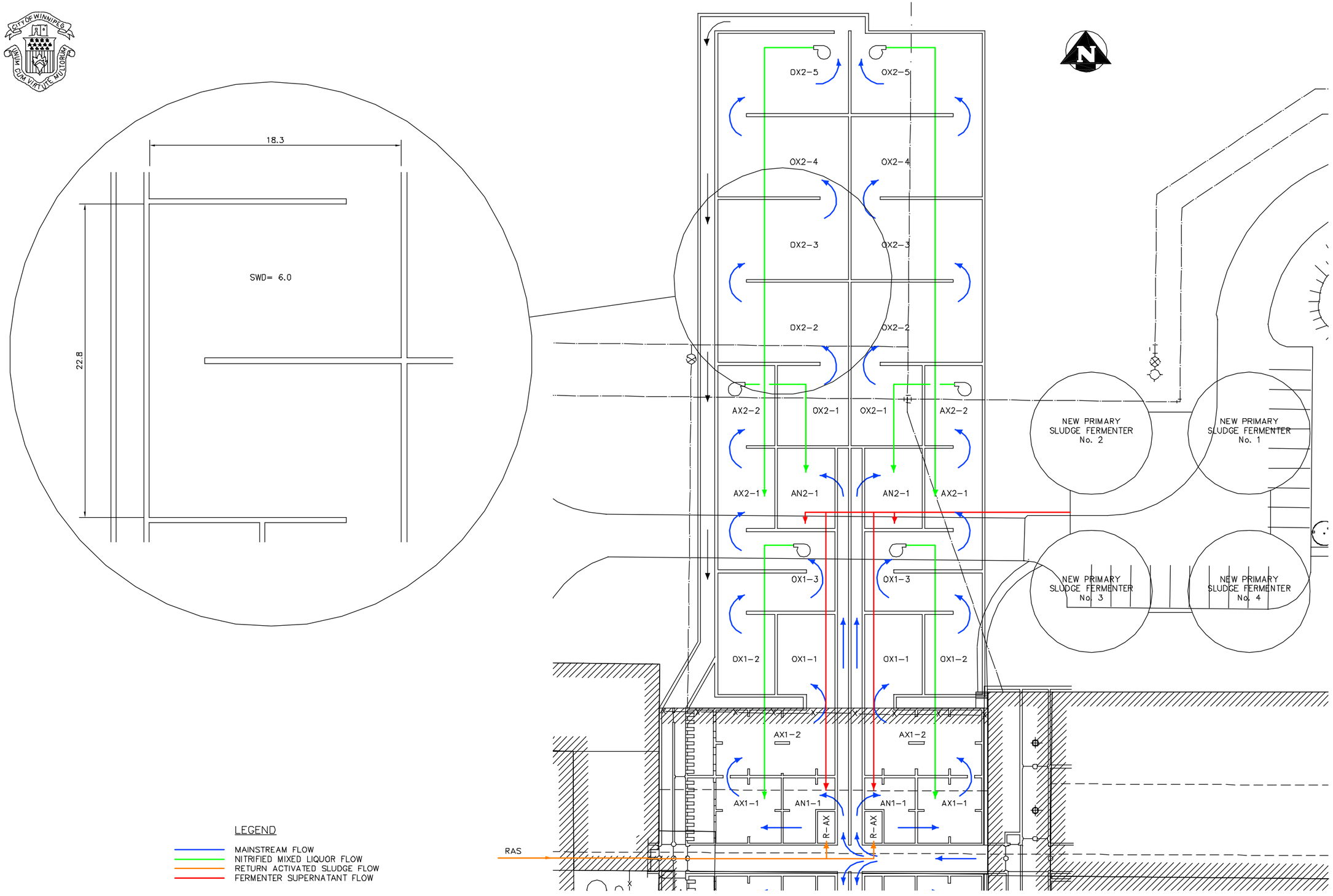
SEWPCC
Biological Nutrient Removal
Site Layout
DWG. SE - 14.1



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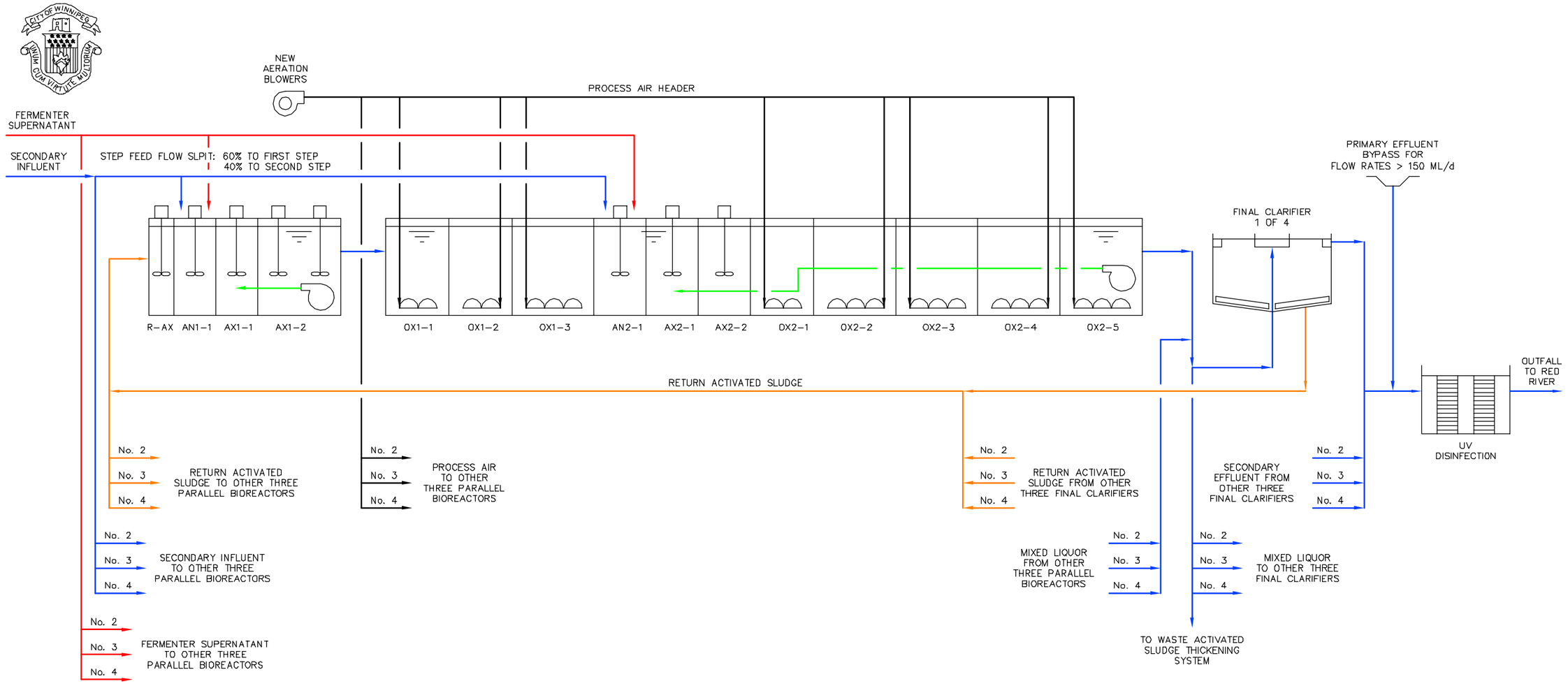
SEWPCC
Biological Nutrient Removal
Bioreactor Layout
DWG. SE - 14.2



EXISTING BIOREACTOR TANKAGE

No. OF UNITS = 4

SIDE WALL DEPTH = 4.9 m

TOTAL EXISTING VOLUME PER UNIT = 1640 m^3

ZONE VOLUME PER UNIT

R-AX = 100 m^3 MIXED
AN1-1 = 310 m^3 MIXED
AX1-1 = 410 m^3 MIXED
AX1-2 = 820 m^3 MIXED

NEW BIOREACTOR TANKAGE

No. OF UNITS = 4

SIDE WALL DEPTH = 6.0 m

TOTAL NEW VOLUME PER UNIT = 10000 m^3

ZONE VOLUME PER UNIT

OX1-1 = 625 m^3 AERATED
OX1-2 = 625 m^3 AERATED
OX1-3 = 1250 m^3 AERATED
AN2-1 = 625 m^3 MIXED
AX2-1 = 625 m^3 MIXED
AX2-2 = 625 m^3 MIXED
OX2-1 = 625 m^3 AERATED
OX2-2 = 1250 m^3 AERATED
OX2-3 = 1250 m^3 AERATED
OX2-4 = 1250 m^3 AERATED
OX2-5 = 1250 m^3 AERATED

NEW FINAL CLARIFIERS No.1 & No.2

No. OF UNITS = 2

DIAMETER = 33.5 m

SIDE WALL DEPTH = 4.55 m

FINAL CLARIFIERS No.3 (Existing) & No.4 (New)

No. OF UNITS = 2

DIAMETER = 45.7 m

SIDE WALL DEPTH = 4.55 m

EXISTING UV DISINFECTION

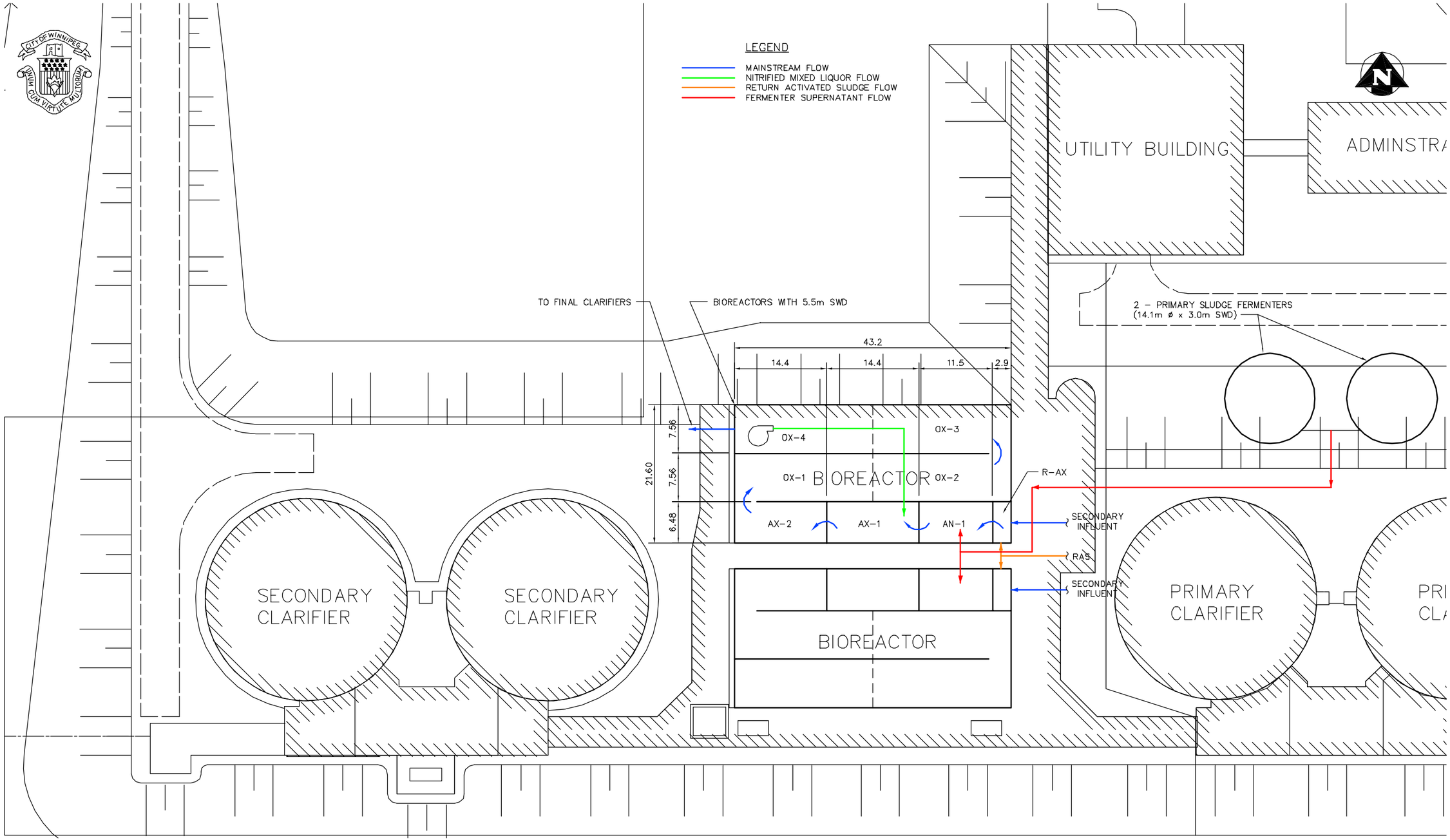
TYPE = MEDIUM PRESSURE UV

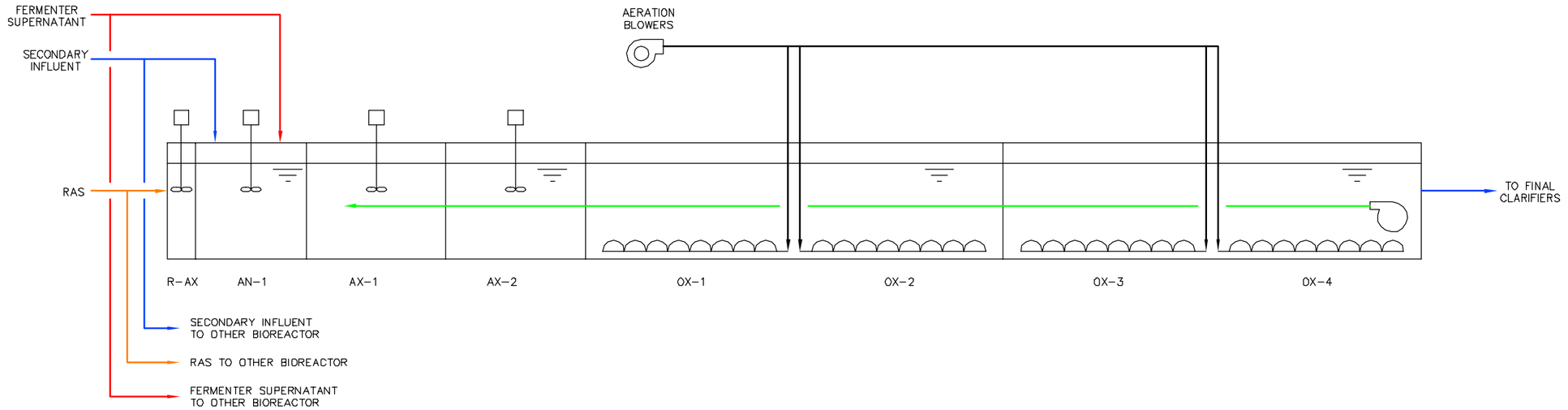
No. OF LAMPS = 120

LEGEND

- MAINSTREAM FLOW
- NITRIFIED MIXED LIQUOR FLOW
- RETURN ACTIVATED SLUDGE FLOW
- FERMENTER SUPERNATANT FLOW

SEWPCC
Biological Nutrient Removal
Process Flow Diagram
DWG. SE - 14.3


CITY OF WINNIPEG
UNUM CUM VIRTUTE MULTORUM
LEGEND
MAINSTREAM FLOW
NITRIFIED MIXED LIQUOR FLOW
RETURN ACTIVATED SLUDGE FLOW
FERMENTER SUPERNATANT FLOW
TO FINAL CLARIFIERS
BIOREACTORS WITH 5.5m SWD
UTILITY BUILDING
ADMINSTRA
2 – PRIMARY SLUDGE FERMENTERS
(14.1m ø x 3.0m SWD)
43.2
14.4
14.4
11.5
2.9
21.60
7.56
7.56
6.48
OX-4
OX-3
OX-1
BIOREACTOR
OX-2
AX-2
AX-1
AN-1
R-AX
SECONDARY INFLUENT
RAS
SECONDARY INFLUENT
SECONDARY CLARIFIER
SECONDARY CLARIFIER
BIOREACTOR
PRIMARY CLARIFIER
PRI
CL



EXISTING
BIOREACTORS

No. OF UNITS = 2

SIDE WALL DEPTH = 5.5 m

TOTAL BIOREACTOR
VOLUME PER UNIT = 5132 m^3

AN-1

ZONE VOLUME
PER UNIT = 410 m^3

AX-2

ZONE VOLUME
PER UNIT = 513 m^3

OX-1 & OX-2

ZONE VOLUME
PER UNIT = 1796 m^3

OX-3 & OX-4

ZONE VOLUME
PER UNIT = 1796 m^3

R-AX

ZONE VOLUME
PER UNIT = 104 m^3

AX-1

ZONE VOLUME
PER UNIT = 513 m^3

LEGEND

- MAINSTREAM FLOW
- NITRIFIED MIXED LIQUOR FLOW
- RETURN ACTIVATED SLUDGE FLOW
- FERMENTER SUPERNATANT FLOW

WEWPCC
Biological Nutrient Removal
Process Flow Diagram
DWG. WE - 14.2