

3.3 MAIN EQUIPMENT MANUFACTURERS

The following table shows the list of suppliers preliminarily selected for your project, subject to "or equal" substitution, where applicable, during the detailed engineering phase of the project.

Equipment Description	Manufacturer
1st Stage Feed Pumps	Goulds
Sand Separators	Lakos
Automatic Backwash Strainers	Amiad
UF Membranes	Toray
Backwash Pumps	Goulds
2 nd Stage Feed Pumps	Sulzer
CIP/Neutralization Pumps	Grundfos
Air Blower	Aerzen GM Series
Air Compressor	Quincy Compressors Series
Air Dryer	Quincy Compressors QPNC Series
High Performance Butterfly Valves	Keystone K-Lok
Lugged Style Butterfly Valves	Keystone 222
Swing Check Valves	Con-Val
Actuators	K-tork
Couplings	Piedmont Pacific Corporation
XLPE Tanks	ATCO
Instruments –	
Pressure Transmitters	Endress & Hauser Cerebar
Magnetic Flowmeters	M55
	Endress & Hauser Promag 53
Thermal Mass Flow Meters	FCI
Pressure Gauges	Ashcroft
Ultrasonic Level Transmitter	Endress & Hauser
Laser Turbidimeters	Hach FilterTrak 660 with SC 200 controller
Turbidimeters	Hach 1720E with SC 200
	controller
Temperature Gauges	Ashcroft
Temperature Transmitters	Endress & Hauser
Temperature/pH Transmitters	Hach, Model EC310
Chlorine Residual Transmitters	Hach/ATI
Diaphragm Seal	Matching supplier of instrument
Dew Point Analyzer	GE Panametrics; Model MMY31
PLC	Allen Bradley ControlLogix
HMI	Allen Bradley PanelView +
Solenoids	Asco

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It is worth highlighting that our offer includes the use of stainless steel couplings that will ensure years of trouble free operation as well as a system that is aesthetically pleasing to look at (i.e., no rusted couplings).

3.4 SCOPE OF SUPPLY

Please refer to the table below for clarity on the scope of supply we have proposed for the UF system. Each piece of equipment as referenced on the P&IDs included in Appendix D of the proposal document. If there are discrepancies between the scope of supply table below and the P&IDs, the scope of supply table takes precedence. All equipment not described below is entirely by others.

1 st Stage UF Feed Pumps P-14030-C01-0003	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Skids/Frames	N/A	N/A		
Vertical Turbine Feed Pump 1 & 2 (each capable of 100% of the initial flowrate) c/w motor and Can, loose shipped		2	V	
Vertical Turbine Feed Pumps 1 & 2 VFDs		2		\checkmark
Vertical Turbine Pumps 1 & 2 Discharge Check Valve, loose shipped		2	V	
Vertical Turbine Pumps 1 & 2 Discharge Hand Isolation Valve, loose shipped		2	V	
Vertical Turbine Pumps 1 & 2 Discharge Pressure Gauge c/w isolation valve, loose shipped		2	V	
Vertical Turbine Pumps 1 & 2 Discharge Air Release Valve, loose shipped		2	V	
Common discharge temperature transmitter, loose shipped		1	$\sqrt{}$	
Common discharge pressure transmitter with, loose shipped		1	$\sqrt{}$	
Common discharge magnetic flow transmitter, loose shipped		1	$\sqrt{}$	
Common discharge sample valve, loose shipped		1	$\sqrt{}$	
Common discharge pH transmitter, loose shipped		1	$\sqrt{}$	

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Common discharge high range turbidimeter, loose shipped	1	V	
Installation of equipment	-		$\sqrt{}$
Associated interconnecting piping	-		

1 st Stage Feed Sand Separators P-14030-C01-0004	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Skids/Frames	N/A	N/A		
Sand Separators 1, 2 & 3 (each capable of 50% of the initial flowrate), loose shipped ¹		3	V	
Bypass hand isolation valves, loose shipped		2		V
Sand Separators 1, 2 & 3 Suction Hand Isolation Valve, loose shipped		3	V	
Sand Separators 1, 2 & 3 Discharge Hand Isolation Valve, loose shipped		2	$\sqrt{}$	
Sand Separators Waste Discharge Automatic Valve, loose shipped		3	V	
Coagulant Dosing Injection Check Valve, loose shipped		1	V	
Coagulant Dosing Injection Hand Valve, loose shipped		1	√	
Installation of equipment		-		√ V
Associated interconnecting piping		-		

Notes:

¹ See Section 6.5 for clarification on Sand Separators.

UF Strainers P-14030-C01-0300	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Skids/Frames	N/A	N/A		
Common Influent Sample Valve, loose shipped		1	$\sqrt{}$	
Automatic Strainers, loose shipped		2		
Differential pressure transmitter, loose shipped		2	$\sqrt{}$	
Automatic Strainer Suction Isolation Valve, loose shipped		2	V	
Automatic Strainer Discharge Isolation Valve, loose shipped		2	$\sqrt{}$	
External backwash automatic valve, loose shipped		2	$\sqrt{}$	
Backwash automatic drain valve, loose shipped		2	$\sqrt{}$	
Common Discharge Sample Valve, loose shipped		1	$\sqrt{}$	
Influent high range turbidimeter c/w isolation valve, loose shipped		1	V	

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Feed pump, sand separators, and filter screens solenoid rack in a NEMA 4 box, loose shipped	1	√	
External Backwash Water Source	-		
Installation of equipment	-		
Associated interconnecting piping	-		$\sqrt{}$

1 st Stage UF Train P-14030-C01-0310	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
UF Membrane Train Frame	4 (1 per train)		$\sqrt{}$	
On-Skid Equipment Per Frame:				
UF Membranes – Toray HFU-2020N		45	V	
Associated on-skid HDPE Headers ¹		10	$\sqrt{}$	
Installation of skid		-		$\sqrt{}$
Associated off-skid piping		-		V
UF Membrane Train Valve Skid Frame	4 (1 per train)		√	
Inlet Block Flow Valve with limit switches		1	$\sqrt{}$	
Inlet Block Flow Control Valve with limit switches		1	$\sqrt{}$	
Inlet Bleed Flow Valve with limit switches		1	$\sqrt{}$	
Inlet Pressure Gauge with isolation valve		1	$\sqrt{}$	
Inlet Pressure Transmitter		1	V	
Inlet Feed Magnetic Flow Transmitter		1	V	
Air Scour Flow Valve		1	V	
MIT Air Flow Valve		1	V	
Backpulse Inlet Block Flow Valve with limit switches		1	$\sqrt{}$	
Backpulse Inlet/Permeate Discharge Block Flow Valve with limit switches		1	$\sqrt{}$	
Backpulse Inlet/Permeate Discharge Bleed Flow Valve with limit switches		1	√	
Backpulse Reject Flow Valve with limit switches		1	$\sqrt{}$	
Backpulse Reject Block Flow Valve with limit switches		1	$\sqrt{}$	
Backpulse Reject Bleed Flow Valve with limit switches		1	$\sqrt{}$	
Backpulse Reject Pressure Gauge with isolation valve		1	$\sqrt{}$	
Backpulse Reject Sample Valve		1	V	
Backpulse Reject Air Release Flow Valve (with silencer)		1	$\sqrt{}$	
Permeate Discharge Flow Valve		1	V	
Permeate Discharge Pressure Gauge		1	V	



Permeate Discharge Pressure Transmitter	1	$\sqrt{}$	
Permeate Discharge Low Range Laser Turbidimeter with inlet sample isolation valve	1	V	
CIP Inlet Block Flow Valve with limit switches	1	$\sqrt{}$	
CIP Inlet Bleed Flow Valve with limit switches	1	$\sqrt{}$	
CIP to Discharge of Membranes Block Flow Valve with limit switches	1	$\sqrt{}$	
CIP Inlet to Membranes/Discharge Block Flow Valve with limit switches	1	$\sqrt{}$	
CIP Discharge Block Flow Valve with limit switches	1	$\sqrt{}$	
CIP Discharge Bleed Flow Valve with limit switches	1	$\sqrt{}$	
Solenoid rack inside NEMA 4 box	1		
Associated on-skid sch 80 PVC piping	-	$\sqrt{}$	
Installation of skid	-		
Associated off-skid piping	-		V

2 nd Stage UF Train P-14030-C01-0320	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
UF Membrane Train Frame	1		$\sqrt{}$	
On-Skid Equipment Per Frame:				
UF Membranes – Toray HFU-2020N		10	$\sqrt{}$	
Associated on-skid HDPE Headers ¹		4	$\sqrt{}$	
Installation of skid		-		V
Associated off-skid piping		-		V
UF Membrane Train Valve Skid Frame	1		V	
Inlet Block Flow Valve with limit switches		1	$\sqrt{}$	
Inlet Block Flow Control Valve with limit switches		1	$\sqrt{}$	
Inlet Bleed Flow Valve with limit switches		1	$\sqrt{}$	
Inlet Pressure Gauge with Isolation valve		1	$\sqrt{}$	
Inlet Pressure Transmitter		1	$\sqrt{}$	
Inlet Feed Magnetic Flow Transmitter		1	V	
Air Scour Flow Valve		1	V	
MIT Air Flow Valve		1	V	
Backpulse Inlet Block Flow Valve with limit switches		1	$\sqrt{}$	
Backpulse Inlet/Permeate Discharge Block Flow Valve with limit switches		1	√	
Backpulse Inlet/Permeate Discharge Bleed Flow Valve with limit switches		1	$\sqrt{}$	

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Backpulse Reject Flow Valve with limit	1	V	
switches			
Backpulse Reject Pressure Gauge with	1	$\sqrt{}$	
isolation valve	•	<u>'</u>	
Backpulse Reject Sample Valve	1	√	
Backpulse Reject Air Release Flow	1	V	
Valve (with silencer)	1	V	
Permeate Discharge Flow Valve	1	$\sqrt{}$	
Permeate Discharge Pressure Gauge	1	$\sqrt{}$	
Permeate Discharge Pressure	1	J	
Transmitter	1	v	
Permeate Discharge Low Range Laser			
Turbidimeter with inlet sample isolation	1	\checkmark	
valve			
CIP Inlet Block Flow Valve with limit	1	V	
switches	1	V	
CIP Inlet Bleed Flow Valve with limit	1	V	
switches	1	V	
CIP to Discharge of Membranes Block	1	V	
Flow Valve with limit switches	1	V	
CIP Inlet to Membranes/Discharge	1	ما	
Block Flow Valve with limit switches	1	V	
CIP Discharge Block Flow Valve with	1	ما	
limit switches	1	V	
CIP Discharge Bleed Flow Valve with	1	ما	
limit switches	1	V	
Solenoid rack in NEMA 4 box	1	$\sqrt{}$	
Associated on-skid sch 80 PVC piping	-		
Installation of skid	-		
Associated off-skid piping	-		

Blower P-14030-C01-0350	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Skids/Frames	N/A	N/A		
Air Blower including inlet air filter, inlet and discharge silencers, pressure gauge, pressure relief valve, discharge check valve all within an acoustic enclosure, loose shipped		2	V	
Blower Discharge Hand Isolation Valve, loose shipped		2	\checkmark	
Blower Discharge Thermal Flow Transmitter, loose shipped		1	√	
Installation of equipment	•	-		
Associated interconnecting piping		<u>-</u>		



Common Backwash System P-14030-C01-0360	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Skids/Frames	N/A	N/A		
Witch hat strainer, loose shipped		2	\checkmark	
Vertical Turbine Backwash Pumps c/w motor, loose shipped		2	$\sqrt{}$	
Vertical Turbine Backwash Pump VFDs		2		V
Vertical Turbine Backwash Pump Discharge Check Valve, loose shipped		2	$\sqrt{}$	
Vertical Turbine Backwash Pump Discharge Hand Isolation Valve, loose shipped		2	√	
Vertical Turbine Backwash Pump Discharge Pressure Gauge c/w isolation valve, loose shipped		2	√	
Vertical Turbine Backwash pump Discharge Air Release Valve, loose shipped		2	V	
Common discharge pressure transmitter, loose shipped		1	$\sqrt{}$	
Common discharge magnetic flow transmitter, loose shipped		1	$\sqrt{}$	
Level Switches (high, low), loose shipped		2	$\sqrt{}$	
Sodium hypochlorite injection check valve, loose shipped		1	√	
Sodium hypochlorite injection hand isolation valve, loose shipped		1	√	
Chlorine Contact Tank Fill Automatic Valve, loose shipped		1		$\sqrt{}$
Below-grade Concrete Chlorine Contact Tank and Reservoir		1		$\sqrt{}$
Post-sodium hypochlorite injection check valve, loose shipped		1	√	
Post-sodium hypochlorite injection hand isolation valve, loose shipped		1	$\sqrt{}$	
Post-sodium hydroxide injection check valve, loose shipped		1	V	
Post-sodium hydroxide injection hand isolation valve, loose shipped		1	√	
Chlorine contact tank discharge sample valve, loose shipped		1	$\sqrt{}$	
Chlorine Contact Tank Discharge Temperature/pH transmitter, loose shipped		1	√	
Chlorine Contact Tank Discharge Chlorine Analyzer, loose shipped		1	$\sqrt{}$	



High Lift Pump Station, including all pumps, valves, instrumentation, and	-		√
piping			
High Lift Pump Station Discharge			
Temperature/pH transmitter, loose	1	$\sqrt{}$	
shipped			
High Lift Pump Station Discharge	1	ما	
Chlorine Analyzer, loose shipped	Ī	٧	
Installation of equipment	-		V
Associated interconnecting piping	-		V

UF CIP System P-14030-C01-370	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Skids/Frames	N/A	N/A		
UF CIP Tank A Discharge Flow Valve, loose shipped		1	V	
UF CIP Tank A Fill Flow Valve, loose shipped		1	V	
UF CIP Tank A Fill/Recirculation Flow Valve, loose shipped		1	$\sqrt{}$	
UF CIP Tank B Discharge Flow Valve, loose shipped		1	$\sqrt{}$	
UF CIP Tank B Fill Flow Valve, loose shipped		1	$\sqrt{}$	
UF CIP Tank B Fill/Recirculation Flow Valve, loose shipped		1	\checkmark	
UF CIP Tank A, loose shipped		1		
UF CIP Tank B, loose shipped		1		
UF CIP Tank A Ultrasonic Level		1	√	
Transmitter, loose shipped		1	V	
UF CIP Tank B Ultrasonic Level Transmitter, loose shipped		1	V	
UF CIP Tank A hand isolation drain valve, loose shipped		1	V	
UF CIP Tank B hand isolation drain valve, loose shipped		1	V	
CIP Pump suction pressure gauge c/w hand isolation valve loose shipped		4	$\sqrt{}$	
CIP Pump Suction Hand Isolation Valve, loose shipped		4	$\sqrt{}$	
CIP Pump c/w motor		4		
CIP Pump VFDs		4		V
CIP Pump Discharge Check Valve, loose shipped		4	V	
CIP Pump Discharge Hand Isolation Valve, loose shipped		4	$\sqrt{}$	
CIP Pump Discharge Pressure Gauge c/w hand isolation valve, loose shipped		4	V	

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Common CIP Pump discharge pressure			
transmitter, loose shipped	2	$\sqrt{}$	
Analyzer sample flow valve, loose	2	V	
shipped		<u>'</u>	
pH Transmitter c/w inlet needle valve,	2	$\sqrt{}$	
loose shipped Chlorine Analyzer c/w inlet needed			
valve, loose shipped	2	$\sqrt{}$	
Discharge magnetic flow transmitter,	•	1	
loose shipped	2	$\sqrt{}$	
CIP Pump discharge recirculation flow	2	V	
valve, loose shipped		V	
Sodium hypochlorite cleaning chemical	2	$\sqrt{}$	
injection check valve, loose shipped		<u> </u>	
Sodium hypochlorite cleaning chemical	2	-1	
injection automated isolation valve, loose shipped	2	V	
Citric acid cleaning chemical injection			
check valve, loose shipped	2	$\sqrt{}$	
Citric acid cleaning chemical injection			
automated isolation valve, loose	2	\checkmark	
shipped			
Sulfuric acid cleaning chemical	2	$\sqrt{}$	
injection check valve, loose shipped		<u> </u>	
Sulfuric acid cleaning chemical	2	.1	
injection automated isolation valve, loose shipped	2	V	
Sodium bisulfite neutralization			
chemical injection check valve, loose	2	$\sqrt{}$	
shipped		,	
Sodium bisulfite neutralization			
chemical injection automated isolation	2	\checkmark	
valve, loose shipped			
Sodium hydroxide neutralization	_	1	
chemical injection check valve, loose	2	V	
shipped Sodium hydroxide neutralization			
chemical injection automated isolation	2	$\sqrt{}$	
valve, loose shipped	2	•	
CIP Pump discharge to UF Trains,	1	1	
loose shipped	1	√	
Neutralized Solution discharge to	1	J	
waste flow valve, loose shipped	1	٧	
Common CIP/neutralization solenoid	1	$\sqrt{}$	
rack in NEMA 4 box, loose shipped	-	•	-1
Installation of equipment	-		N N
Associated interconnecting piping			V



Coagulant Chemical Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
PACl Dosing Pump HDPE Skid	1			
Inlet Hand Isolation Valve		2		
In-line Wye strainer		2		
Solenoid Dosing Pumps		2		
Solenoid Dosing Pump sample valves		2		
Inlet to calibration column hand isolation valve		2	$\sqrt{}$	
Calibration Column		2		
Isolation Valves		5		
Drain Valves		3		
Pressure Relief Valves		2		
Pulsation Dampener		2	$\sqrt{}$	
Pressure Gauge with diaphragm seal		2		
Pressure Switch High with diaphragm seal		2	$\sqrt{}$	
Backpressure valve		2	√	
Associated chemical panel piping constructed of PVC sch 80		-	$\sqrt{}$	
Chemical Storage Basins		-		V
Chemical		-		$\sqrt{}$
Installation of skid, if applicable to		_		V
contractor design				<u> </u>
Installation of loose shipped equipment		-		√
Associated off-skid piping		-		$\sqrt{}$

Sodium Hypochlorite Membrane Cleaning Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Sodium Hypochlorite Dosing Pump HDPE Skid	1		$\sqrt{}$	
Inlet Hand Isolation Valve		2	$\sqrt{}$	
In-line Wye strainer		2	V	
Solenoid Dosing Pumps		2	V	
Solenoid Dosing Pump sample valves		2	V	
Inlet to calibration column hand isolation valve		2	$\sqrt{}$	
Calibration Column		2	V	
Isolation Valves		5	V	
Drain Valves		3	V	
Pressure Relief Valves		2	V	
Pulsation Dampener		2		
Pressure Switch High with diaphragm seal		2	$\sqrt{}$	
Pressure Gauge with diaphragm seal		2	V	



Associated chemical panel piping constructed of PVC sch 80	-	√
Chemical Storage Basins	-	$\sqrt{}$
Chemical	-	$\sqrt{}$
Installation of skid, if applicable to contractor design	-	\checkmark
Installation of loose shipped equipment	-	V
Associated off-skid piping	-	V

Citric Acid Membrane Cleaning Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Citric Acid Dosing Pump HDPE Skid	1		$\sqrt{}$	
Inlet Hand Isolation Valve		2	$\sqrt{}$	
In-line Wye strainer		2	$\sqrt{}$	
Solenoid Dosing Pumps		2	$\sqrt{}$	
Solenoid Dosing Pump sample valves		2	$\sqrt{}$	
Inlet to calibration column hand isolation valve		2	$\sqrt{}$	
Calibration Column		2	V	
Isolation Valves		5	V	
Drain Valves		3	V	
Pressure Relief Valves		2	$\sqrt{}$	
Pulsation Dampener		2	V	
Pressure Gauge with diaphragm seal		2	V	
Pressure Switch High with diaphragm seal		2	V	
Associated chemical panel piping constructed of PVC sch 80		-	$\sqrt{}$	
Chemical Storage Basins		-		V
Chemical		-		
Installation of skid, if applicable to contractor design		-		\checkmark
Installation of loose shipped equipment		-		$\sqrt{}$
Associated off-skid piping		-		$\sqrt{}$

Sulfuric Acid Membrane Cleaning Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Sulfuric Acid Dosing Pump HDPE Skid	1			
Inlet Hand Isolation Valve		2	$\sqrt{}$	
In-line Wye strainer		2	$\sqrt{}$	
Solenoid Dosing Pumps		2	$\sqrt{}$	
Solenoid Dosing Pump sample valves		2	$\sqrt{}$	
Inlet to calibration column hand isolation valve		2	√	_
Calibration Column		2	V	



Isolation Valves	5	V	
Drain Valves	3	V	
Pressure Relief Valves	2	$\sqrt{}$	
Pulsation Dampener	2	V	
Pressure Gauge with diaphragm seal	2	V	
Pressure Switch High with diaphragm seal	2	$\sqrt{}$	
Associated chemical panel piping constructed of PVC sch 80	-	V	
Chemical Storage Basins	-		1
Chemical	-		$\sqrt{}$
Installation of skid, if applicable to contractor design	-		V
Installation of loose shipped equipment	-		√
Associated off-skid piping	-		$\sqrt{}$

Sodium Bisulfite Neutralization Chemical Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Sodium Bisulfite Dosing Pump HDPE Skid	1		$\sqrt{}$	
Inlet Hand Isolation Valve		2	$\sqrt{}$	
In-line Wye strainer		2	$\sqrt{}$	
Solenoid Dosing Pumps		2	$\sqrt{}$	
Solenoid Dosing Pump sample valves		2	$\sqrt{}$	
Inlet to calibration column hand isolation valve		2	√	
Calibration Column		2	V	
Isolation Valves		5	$\sqrt{}$	
Drain Valves		3	V	
Pressure Relief Valves		2	$\sqrt{}$	
Pulsation Dampener		2	V	
Pressure Gauge with diaphragm seal		2	V	
Pressure Switch High with diaphragm seal		2	$\sqrt{}$	
Associated chemical panel piping constructed of PVC sch 80		-	$\sqrt{}$	
Chemical Storage Basins		-		
Chemical				√
Installation of skid, if applicable to contractor design		-		√
Installation of loose shipped equipment		-		√
Associated off-skid piping		-		V

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Sodium Hydroxide Neutralization Chemical Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Sodium Hydroxide Dosing Pump HDPE Skid	1		$\sqrt{}$	
Inlet Hand Isolation Valve		2	$\sqrt{}$	
In-line Wye strainer		2	V	
Solenoid Dosing Pumps		2	V	
Solenoid Dosing Pump sample valves		2	V	
Inlet to calibration column hand isolation valve		2	√	
Calibration Column		2		
Isolation Valves		5	V	
Drain Valves		3	V	
Pressure Relief Valves		2	$\sqrt{}$	
Pulsation Dampener		2	$\sqrt{}$	
Pressure Gauge with diaphragm seal		2	V	
Pressure Switch High with diaphragm seal		2	$\sqrt{}$	
Associated chemical panel piping constructed of PVC sch 80		-	√	
Chemical Storage Basins		-		$\sqrt{}$
Chemical		-		V
Installation of skid, if applicable to contractor design		-		$\sqrt{}$
Installation of loose shipped equipment		-		$\sqrt{}$
Associated off-skid piping		-		V

Sodium Hypochlorite For Combined Filtrate Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Sodium Hypochlorite Dosing Pump HDPE Skid	1		$\sqrt{}$	
Inlet Hand Isolation Valve		2		
In-line Wye strainer		2	V	
Peristaltic Dosing Pumps		2		
Peristaltic Dosing Pump VFDs		2		
Peristaltic Dosing Pump sample valves		2	V	
Inlet to calibration column hand isolation valve		2	$\sqrt{}$	
Calibration Column		2	V	
Isolation Valves		5		
Drain Valves		3	V	
Pressure Relief Valves		2	V	
Pulsation Dampener		2	$\sqrt{}$	
Pressure Gauge with diaphragm seal		2	1	
Pressure Switch High with diaphragm seal		2	√	



Associated chemical panel piping constructed of PVC sch 80	-	V
Chemical Storage Basins	-	
Chemical	-	$\sqrt{}$
Installation of skid, if applicable to contractor design	-	$\sqrt{}$
Installation of loose shipped equipment	-	√
Associated off-skid piping	-	$\sqrt{}$

Sodium Hypochlorite For Finished Water Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Sodium Hypochlorite Dosing Pump HDPE Skid	1		$\sqrt{}$	
Inlet Hand Isolation Valve		2	$\sqrt{}$	
In-line Wye strainer		2	$\sqrt{}$	
Peristaltic Dosing Pumps		2	$\sqrt{}$	
Peristaltic Dosing Pump VFDs		2	$\sqrt{}$	
Peristaltic Dosing Pump sample valves		2	V	
Inlet to calibration column hand isolation valve		2	$\sqrt{}$	
Calibration Column		2	V	
Isolation Valves		5	V	
Drain Valves		3	V	
Pressure Relief Valves		2	$\sqrt{}$	
Pulsation Dampener		2	V	
Pressure Gauge with diaphragm seal		2	V	
Pressure Switch High with diaphragm seal		2	$\sqrt{}$	
Associated chemical panel piping constructed of PVC sch 80		-	$\sqrt{}$	
Chemical Storage Basins		-		
Chemical		-		
Installation of skid, if applicable to contractor design		-		\checkmark
Installation of loose shipped equipment		-		$\sqrt{}$
Associated off-skid piping		-		√

Sodium Hydroxide for Post-Chlorine Contact Basin Duplex Pump Skid	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Sodium Hydroxide Dosing Pump HDPE Skid	1		$\sqrt{}$	
Inlet Hand Isolation Valve		2	$\sqrt{}$	
In-line Wye strainer		2		
Peristaltic Dosing Pumps		2		
Peristaltic Dosing Pump VFDs		2	V	
Peristaltic Dosing Pump sample valves		2		



Inlet to calibration column hand isolation valve	2	V	
Calibration Column	2	V	
Isolation Valves	5	V	
Drain Valves	3		
Pressure Relief Valves	2	V	
Pulsation Dampener	2	V	
Pressure Gauge with diaphragm seal	2	$\sqrt{}$	
Pressure Switch High with diaphragm seal	2	V	
Associated chemical panel piping constructed of PVC sch 80	-	V	
Chemical Storage Basins	-		V
Chemical	-		V
Installation of skid, if applicable to contractor design	-		√
Installation of loose shipped equipment	-		√
Associated off-skid piping	-		V

2nd Stage UF Feed Pumps P-14030-C01-0920	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Skids/Frames	N/A	N/A		
2 nd Stage Submersible Feed Pumps c/w motors, loose shipped		2	V	
2 nd Stage Submersible Feed Pump VFDs		2		√
Submersible 2 nd Stage Feed Pump Discharge Check Valve, loose shipped		2	$\sqrt{}$	
Submersible 2 nd Stage Feed Pump Discharge Hand Isolation Valve, loose shipped		2	V	
Submersible 2 nd Stage Feed Pump Discharge Pressure Gauge c/w isolation valve, loose shipped		2	V	
Submersible 2 nd Stage Feed Pump Air Release Valve, loose shipped		2	$\sqrt{}$	
Common discharge pressure transmitter, loose shipped		1	$\sqrt{}$	
Common discharge magnetic flow transmitter, loose shipped		1	$\sqrt{}$	
Common discharge sample valve, loose shipped		1	$\sqrt{}$	
Common discharge high range turbidimeter, loose shipped		1	$\sqrt{}$	
Ultrasonic Level Transmitter, loose shipped		1	$\sqrt{}$	
Level Switches (high, low), loose shipped		2	$\sqrt{}$	
Below-grade Concrete Basin		1		V



Installation of equipment	-	V
Associated interconnecting piping	-	V

Instrument & MIT Air P-13049-C01-950	Quantity of Skids	Quantity of Equipment Per Skid	By H ₂ O	By Contractor
Air Compressor, loose shipped		2		
1" Discharge Air Compressor Check		2	V	
Valve, loose shipped			V	
1" Discharge Air Compressor Hand		2	$\sqrt{}$	
Isolation Valve, loose shipped			,	
Pressure Relief Valve, loose shipped		2	1	
Air Receiver Tank Inlet Hand Valve,		2	$\sqrt{}$	
loose shipped				
1,500 L Receiver Tank with pressure relief valve and local GFCI receptacle		2	$\sqrt{}$	
drain valve, loose shipped		2	V	
Air Receiver Tank Discharge Hand				
Valve, loose shipped		2	$\sqrt{}$	
Coalescing Filter Inlet Hand Valve,			1	
loose shipped		2	$\sqrt{}$	
Coalescing Filter, loose shipped		2	V	
Coalescing Filter Discharge Hand		2	1	
Valve, loose shipped		2	V	
Desiccant Air Dryer (Instrument air)		1		
Air Dryers Inlet Isolation Valve, loose		2	-1	
shipped		2	V	
Air Dryer, loose shipped		2		
Air Dryers Discharge Isolation Valve,		2	V	
loose shipped		۷	V	
Instrument Air Pressure Gauge c/w		1	V	
isolation valve, loose shipped		1	<u> </u>	
Instrument Air Pressure Control Valve,		1	$\sqrt{}$	
loose shipped				
Instrument Air Pressure Relief Valve,		1	$\sqrt{}$	
loose shipped				
Instrument Air Pressure Transmitter,		1	$\sqrt{}$	
loose shipped		1	1	
MIT Air Oil Filter, loose shipped		1	٧	
MIT Air Oil Filter Hand Isolation		2	$\sqrt{}$	
Valve, loose shipped				
MIT Air Pressure Gauge c/w isolation		1	$\sqrt{}$	
valve, loose shipped				
MIT Air Pressure Regulating Valve, loose shipped		1	$\sqrt{}$	
MIT Air Pressure Discharge Isolation				
Valves, loose shipped		1	\checkmark	
MIT Air Pressure Relief Valve, loose				
shipped		1	$\sqrt{}$	
Installation of equipment		-		V
Associated interconnecting piping		_		√ √
rissociated interconfidenting piping		-		٧



Additional Equipment	Quantity of Equipment	By H ₂ O	By Contractor
Installation of equipment	-		$\sqrt{}$
Supply of chemicals	-		$\sqrt{}$
Associated interconnecting piping between loose shipped equipment and inlets/common connections to membrane valve skids ¹	-		$\sqrt{}$
Supply of all other common filtrate equipment	-		
Installation of equipment	-		$\sqrt{}$

Note:

In addition to the equipment provided on the P&IDs, we are also providing the following:

Electrical System	Quantity of Equipment	By H ₂ O	By Contractor
NEMA 4X Main Control Panel with ControlLogix PLC, loose shipped	1	$\sqrt{}$	
NEMA 4X UF 1 st Stage Feed Pumps Remote I/O Panel, loose shipped	1	√	
NEMA 4X UF Train Remote I/O Panel (mounted on each UF train valve skid)	5	$\sqrt{}$	
NEMA 4X UF 2 nd Stage Feed Pumps Remote I/O Panel, loose shipped	1	V	
NEMA 4X UF Backwash System Remote I/O Panel, loose shipped	1	V	
NEMA 4X UF CIP System Remote I/O Panel, loose shipped	1	$\sqrt{}$	
NEMA 4X UF Blower/Air Compressor Remote I/O Panel, loose shipped	1	V	
Installation of MCP and remote I/O panels that are not frame mounted	-		V

General	By H ₂ O	By Contractor
One (1) Custom Made Module Removal Device	$\sqrt{}$	
Operation and Maintenance Manuals	$\sqrt{}$	
Commissioning start-up, support assistance, and operator training (see Section 4.8)	$\sqrt{}$	

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¹ H2O Innovation will supply the spool pieces between the membrane valve skid and its designated membrane rack, but will not supply interconnecting piping between different trains or anything beyond the flange connections on the valve skids.



The following visits to site for the following people:

- Project manager to visit site for one (1) day, 7 days after notice of award
- Project manager, mechanical engineer, and field service representative (note that field service representative visit to site is listed in Section 4.8) for two (2) days for project kickoff meeting
- Project Manager, Mechanical Engineer, and Electrical Engineer for two (2) days for Engineer's 30% design submittal
- Project Manager and Process Engineer for two (2) days for Engineer's 60% design submittal
- Project Manager, Mechanical Engineer, and Electrical Engineer for two (2) days during Engineer's 90% design submittal

Note: The designated persons per trip can be adjusted as desired, provided the total number of trips and persons remains the same.

Spare Parts (see Section 4.12)	$\sqrt{}$
Shipping DDP from Ham-Nord, QC to site	

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