Precious Metals Recovery LLC
RCRA Permit Application
Dry Hills Facility | EPA ID# NVR000088542
Eureka County, Nevada

Prepared for:
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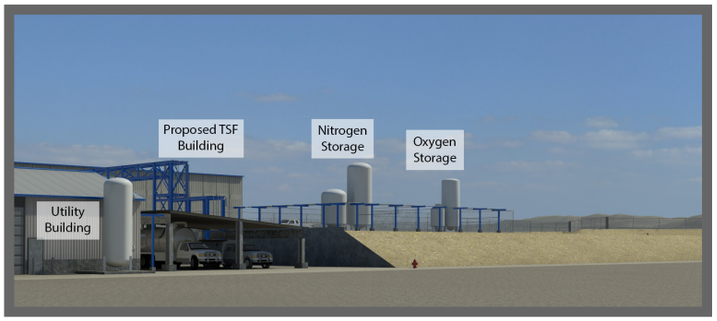

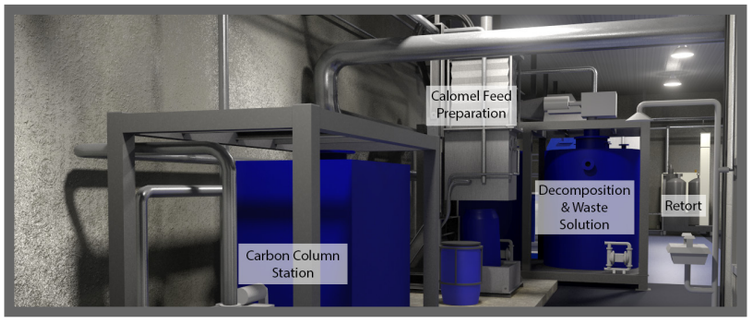

Prepared by: JBR Environmental Consultants, Inc.
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Mississauga, Ontario, Canada
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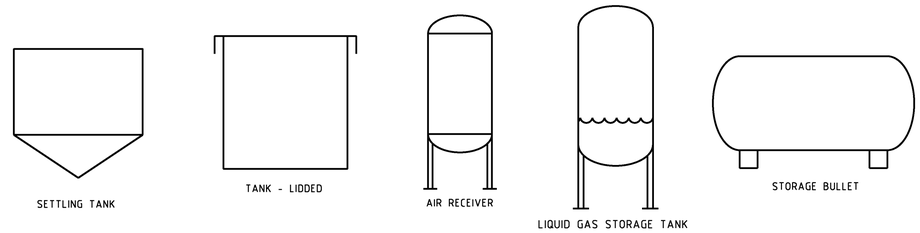
APPENDIX 1-C

Process Flow Diagrams

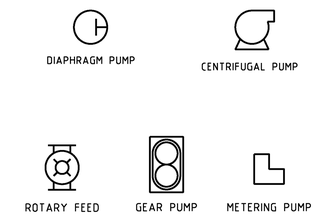
Process Flow Diagrams are attached under separate cover in Volumes 3 and 4

DWG. NO. H340940-0000-05-030-0001

TANKS



PUMPS



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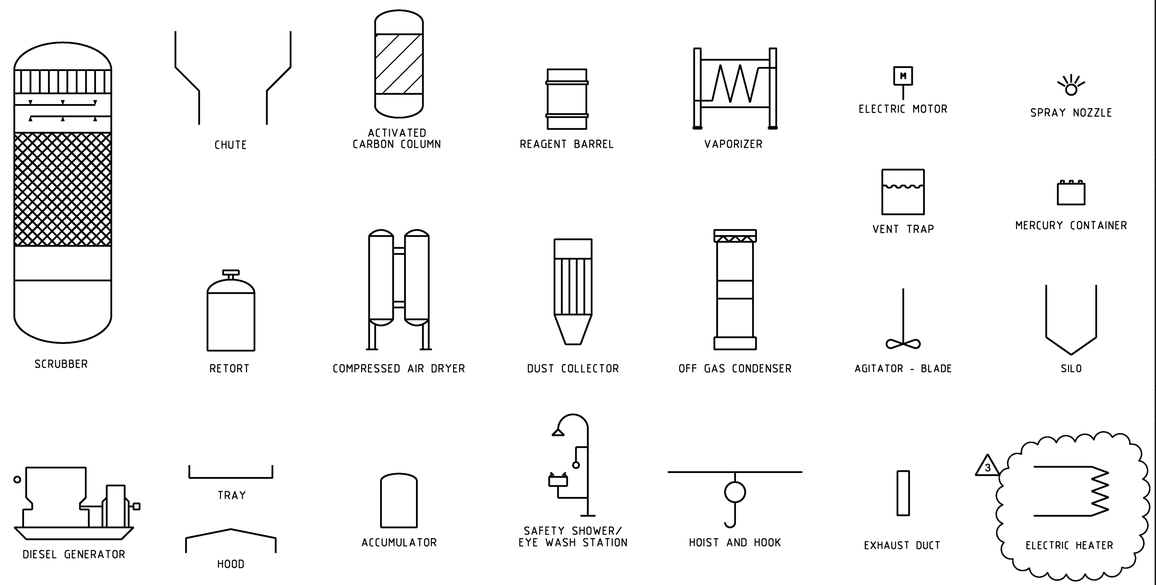
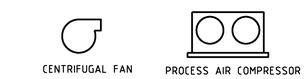
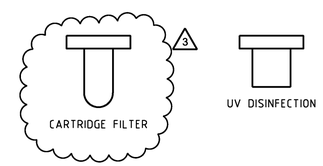


FANS & BLOWERS

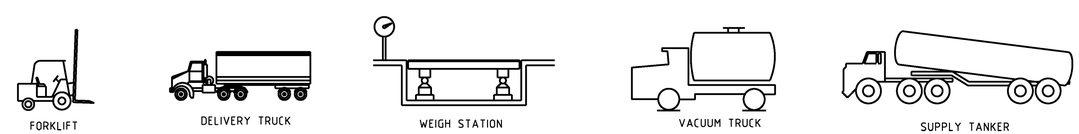


FILTERS

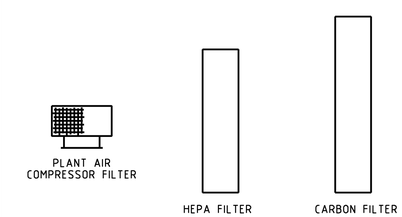
WATER FILTERS



MOBILE EQUIPMENT/SITE MACHINERY



AIR FILTERS



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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

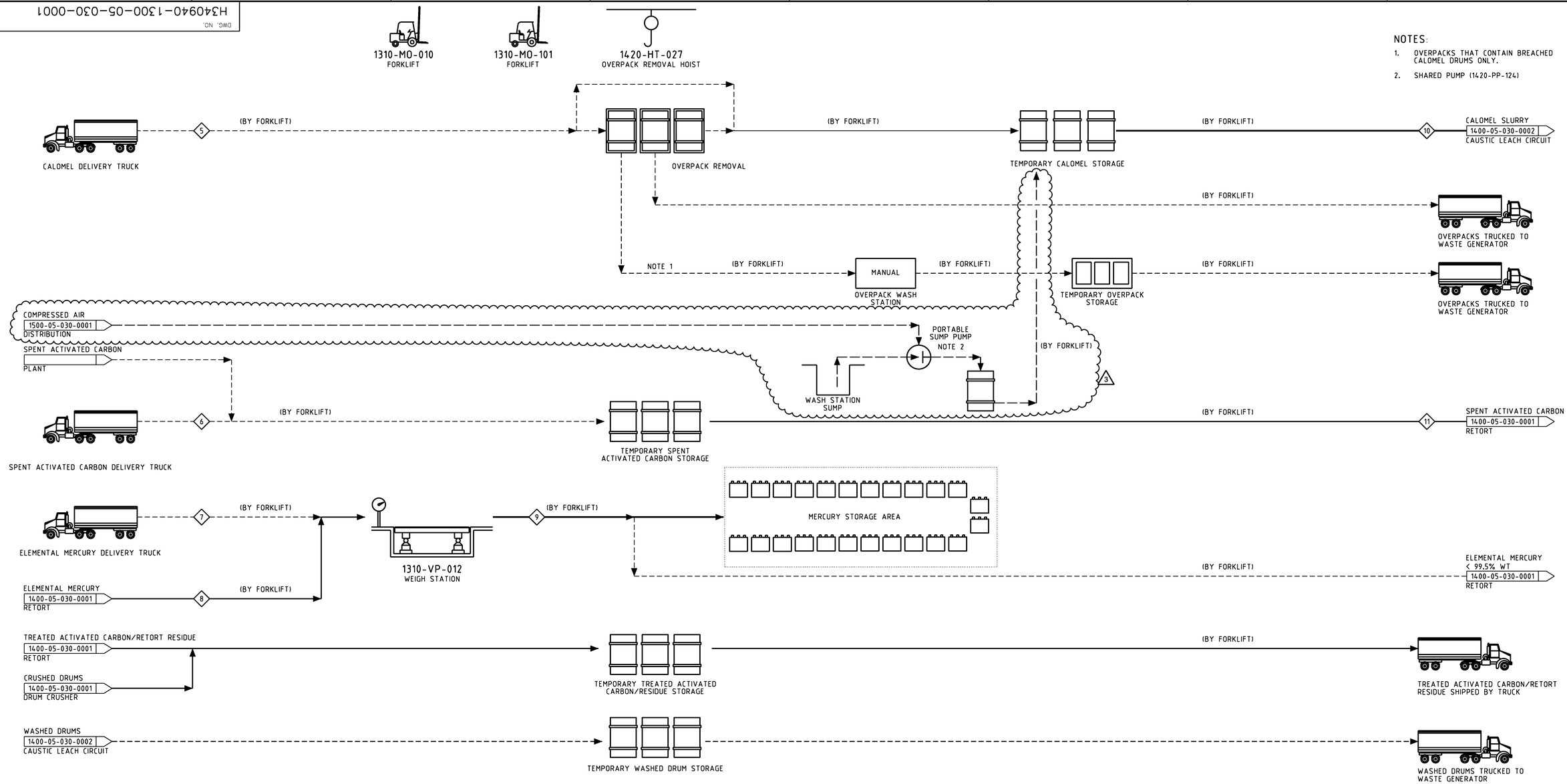
LEGEND SHEET
PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-0000-05-030-0001

REV. 3

DWG. NO. H340940-1300-05-030-0001



NOTES:

1. OVERPACKS THAT CONTAIN BREACHED CALOMEL DRUMS ONLY.
2. SHARED PUMP (1420-PP-124)

LEGEND

- MAJOR PROCESS
- SECONDARY PROCESS
- INTERMITTENT PROCESS
- VENDOR SUPPLY LIMIT
- DUST PICKUP POINTS

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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

RECEIVING & STORAGE 1

PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1300-05-030-0001

REV. 3

Flowsheet 1300-05-030-0001

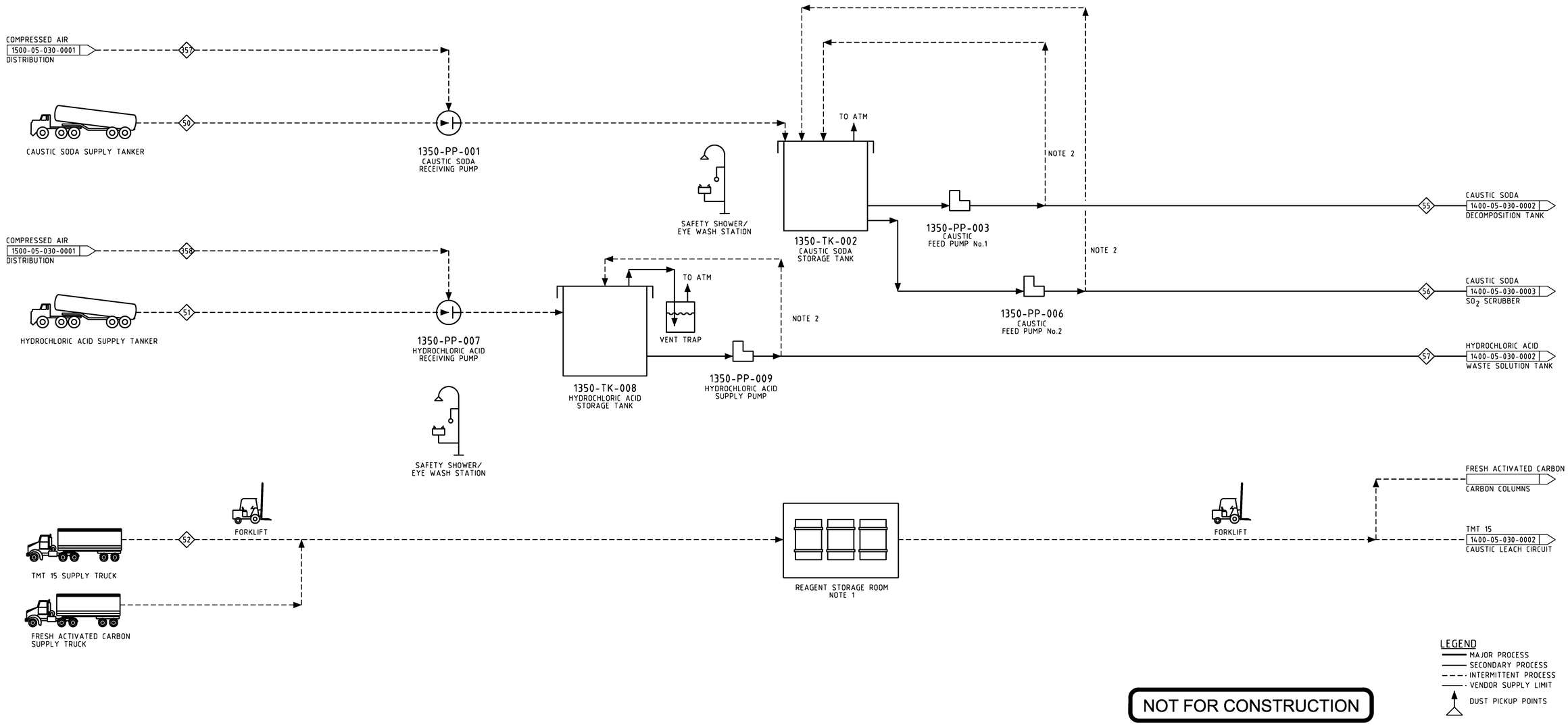
		Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
Stream Number		5	6	7	8	10	11
Stream Name		Calomel Delivered	Spent Activated Carbon Delivered	Elemental Mercury Delivered	Elemental Mercury from Retort	Calomel Slurry to Caustic Leach Circuit	Spent Activated Carbon to Retort
Annual Throughput	lb/yr	612,000	240,000	62,000	389,000	612,000	240,000
Slurry	lb/yr	612,000		0	0	612,000	
% Solids	wt%	70%		--	--	70%	
Solids	lb/yr	428,400	240,000	0	0	428,400	240,000
Hg_2Cl_2	wt%	100%	0%	--	--	100%	0%
HgO	wt%	0%	0%	--	--	0%	0%
HgS	wt%	0%	23%	--	--	0%	23%
S	wt%	0%	8%	--	--	0%	8%
Solution	lb/yr	183,600	0	0	0	183,600	0
Hg^{2+}	g/L	2.7	--	--	--	2.7	--
NaOH	g/L	0.0	--	--	--	0.0	--
HCl	g/L	7.8	--	--	--	7.8	--
Cl^-	g/L	8.8	--	--	--	8.8	--
pH		-0.2	--	--	--	-0.2	--
Elemental Mercury	lb/yr	0	0	62,000	389,000	0	0
Gas (Annual Average)	scfm	0	0	0	0	0	0
N_2	vol%	--	--	--	--	--	--
O_2	vol%	--	--	--	--	--	--
Hg (v)	vol%	--	--	--	--	--	--
H_2O (v)	vol%	--	--	--	--	--	--
SO_2	vol%	--	--	--	--	--	--

Notes:
1 - Maximum annual throughput

DWG. NO. H340940-1300-05-030-0002

NOTES:

1. INCLUDES TMT 15 AND FRESH ACTIVATED CARBON.
2. RUPTURE DISC RELIEF LINE.



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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

RECEIVING & STORAGE 2

PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1300-05-030-0002

REV. 2

Flowsheet 1300-05-030-0002

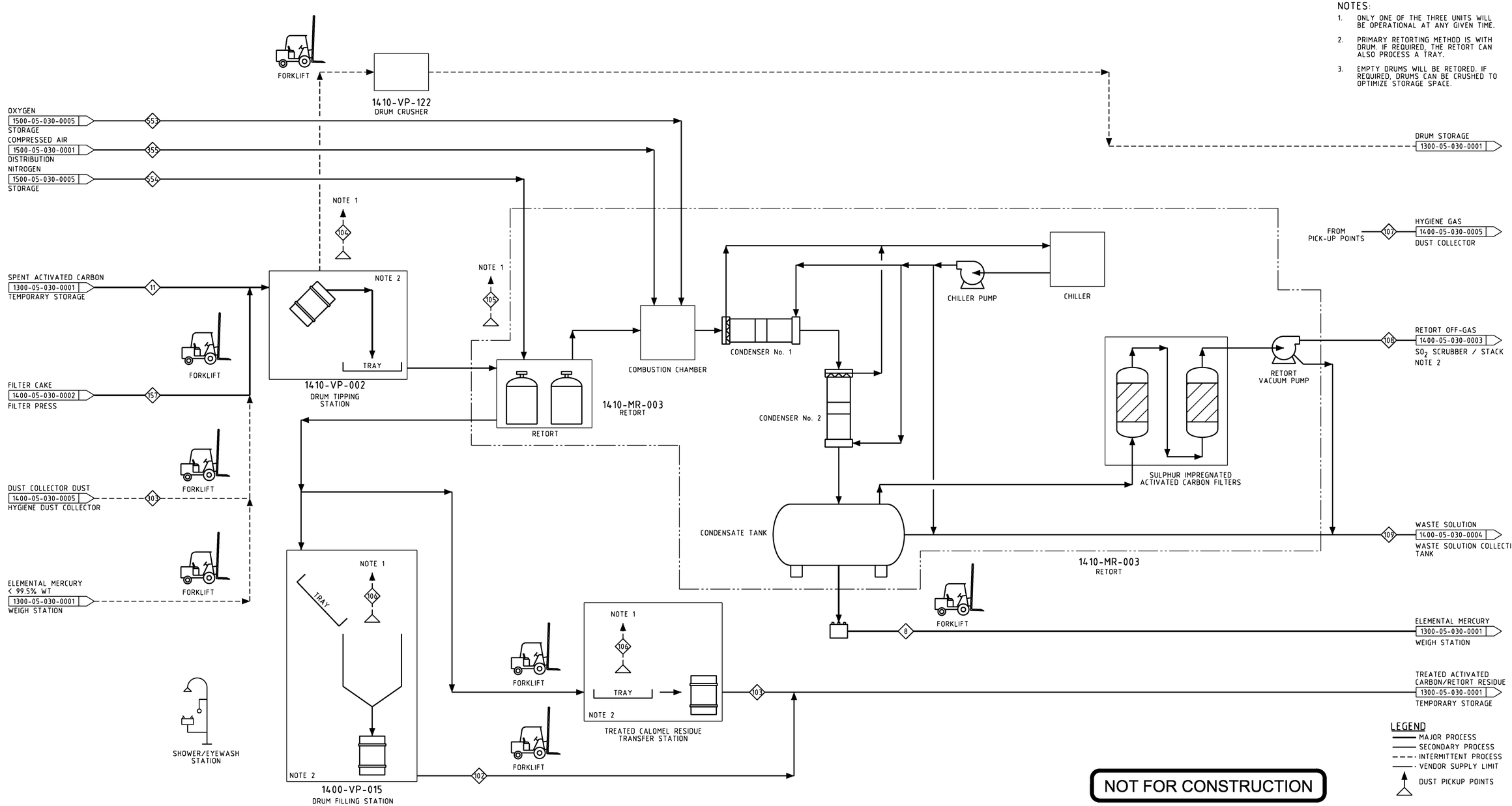
								Note 1	Note 1
Stream Number		50	51	52	55	56	57	357	358
Stream Name		Caustic Soda Delivered	Hydrochloric Acid Delivered	TMT 15 Delivered	Caustic Soda to Decomposition Tank	Caustic Soda to SO2 Scrubber	Hydrochloric Acid to Waste Solution Tank	Compressed Air to Caustic Soda Receiving Pump	Compressed Air to Hydrochloric Acid Receiving Pump
Annual Throughput	lb/yr	259,838	13,000	19,970	115,518	144,320	13,000	TBD	TBD
Slurry	lb/yr							0	0
% Solids	wt%							--	--
Solids	lb/yr	0	0	0	0	0	0	0	0
Hg_2Cl_2	wt%	--	--	--	--	--	--	--	--
HgO	wt%	--	--	--	--	--	--	--	--
HgS	wt%	--	--	--	--	--	--	--	--
S	wt%	--	--	--	--	--	--	--	--
Solution	lb/yr	259,838	13,000	19,970	115,518	144,320	13,000	0	0
Hg^{2+}	g/L	0.0	0.0	0.0	0.0	0.0	0.0	--	--
NaOH	g/L	766.2	0.0	1.3	766.2	766.2	0.0	--	--
HCl	g/L	0.0	356.4	0.0	0.0	0.0	356.4	--	--
Cl^-	g/L	0.0	346.6	0.0	0.0	0.0	346.6	--	--
pH		13.7	-1.0	12.5	13.7	13.7	-1.0	--	--
Elemental Mercury	lb/yr	0	0	0	0	0	0	0	0
Gas (Annual Average)	scfm	0	0	0	0	0	0	TBD	TBD
N_2	vol%	--	--	--	--	--	--	78.0%	78.0%
O_2	vol%	--	--	--	--	--	--	21.0%	21.0%
Hg (v)	vol%	--	--	--	--	--	--	0.0%	0.0%
H_2O (v)	vol%	--	--	--	--	--	--	0.0%	0.0%
SO_2	vol%	--	--	--	--	--	--	0.0%	0.0%

Notes:
1 - Compressed air requirements for equipment to be determined in detailed engineering when vendor data becomes available.

DWG. NO. H340940-1400-05-030-0001

NOTES:

1. ONLY ONE OF THE THREE UNITS WILL BE OPERATIONAL AT ANY GIVEN TIME.
2. PRIMARY RETORTING METHOD IS WITH DRUM. IF REQUIRED, THE RETORT CAN ALSO PROCESS A TRAY.
3. EMPTY DRUMS WILL BE RETORED. IF REQUIRED, DRUMS CAN BE CRUSHED TO OPTIMIZE STORAGE SPACE.



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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

SPENT CARBON AND DECOMPOSED CALOMEL FILTER CAKE TREATMENT PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1400-05-030-0001

REV. 2

Flowsheet 1400-05-030-0001

		Note 1		Note 2		Note 3		Note 1	Notes 1, 4	Notes 5, 6	Notes 5, 6	Notes 5, 6	Note 7		Note 8	Note 1
Stream Number		11	157	303	553	355	554	102	103	104	105	106	107	108	109	8
Stream Name		Spent Activated Carbon from Temporary Storage	Filter Cake from Filter Press	Dust Collector Dust	Oxygen to Retort	Compressed Air to Retort	Nitrogen to Retort	Retorted Activated Carbon Residue	Retorted Calomel Residue	Drum Tipping Station Ventilation Hood	Retort Loading Ventilation	Drum Filling Station Ventilation Hood	Hygiene Gas - Retort Area	Retort Off-gas to Scrubber or Stack	Waste Solution to Waste Solution Collection Tank	Elemental Mercury to Weigh Station
Annual Throughput	lb/yr	240,000	421,587	6,285	--	TBD	--	121,367	28,000	--	--	--	6,616	--	8,000	389,000
Slurry	lb/yr	0	421,587	0	0	0	0	0	28,000	0	0	0	0	0	0	0
% Solids	wt%	0	50%	--	--	--	--	--	93%	--	--	--	--	--	--	--
Solids	lb/yr	240,000	210,794	6,285	0	0	0	121,367	26,000	0	0	0	6,616	0	0	0
Hg_2Cl_2	wt%	0%	12%	4%	--	--	--	0%	100%	--	--	--	4%	--	--	--
HgO	wt%	0%	88%	28%	--	--	--	0%	0%	--	--	--	28%	--	--	--
HgS	wt%	23%	0%	8%	--	--	--	0%	0%	--	--	--	8%	--	--	--
S	wt%	8%	0%	3%	--	--	--	0%	0%	--	--	--	3%	--	--	--
Solution	lb/yr	0	39,688	0	0	0	0	0	0	0	0	0	0	0	8,000	0
Hg^{2+}	g/L	--	0.3	--	--	--	--	--	--	--	--	--	--	--	TBD	--
NaOH	g/L	--	12.6	--	--	--	--	--	--	--	--	--	--	--	TBD	--
HCl	g/L	--	0.0	--	--	--	--	--	--	--	--	--	--	--	TBD	--
Cl^-	g/L	--	139.2	--	--	--	--	--	--	--	--	--	--	--	TBD	--
pH		--	13.5	--	--	--	--	--	--	--	--	--	--	--	TBD	--
Elemental Mercury	lb/yr	0	171,106	0	0	0	0	0	2,000	0	0	0	0	0	0	389,000
Gas (Annual Average)	scfm	0	0	0	0.93	TBD	0.93	0	0	2,200	2,200	2,200	2,200	300	0	0
N_2	vol%	--	--	--	0.0%	78.0%	100.0%	--	--	78.2%	78.2%	78.2%	78.2%	75.1%	--	--
O_2	vol%	--	--	--	100.0%	21.0%	0.0%	--	--	20.8%	20.8%	20.8%	20.8%	23.1%	--	--
Hg (v)	vol%	--	--	--	0.0%	0.0%	0.0%	--	--	0.0%	0.0%	0.0%	0.0%	0.0%	--	--
H_2O (v)	vol%	--	--	--	0.0%	0.0%	0.0%	--	--	1.0%	1.0%	1.0%	1.0%	1.4%	--	--
SO_2	vol%	--	--	--	0.0%	0.0%	0.0%	--	--	0.0%	0.0%	0.0%	0.0%	0.4%	--	--

Notes:
1 - Maximum annual throughput
2 - Assume 1% entrainment of solids to the ventilation system and 95% removal by dust collector
3 - Compressed air requirements for equipment to be determined in detailed engineering when vendor data becomes available.
4 - To be confirmed once vendor information is available. Assume 99.5% of mercury recovery from HgO and Hg in the retort. The residue solids are to undergo TCLP test for hazardous waste characterization.
5 - Primary retorting method is with drums. If required, the retort can also process a tray.
6 - Assume operating 30 minutes per batch of retort and mercury level to be at 0.1 mg/Nm^3 (OSHA level) for design purposes.
7 - Stream 107 is equal to Stream 104, 105 or 106 because only one of the three units will be operational at any given time.
8 - To be confirmed once vendor information is available. Shown here is waste solution when treating calomel filter cake in retort.

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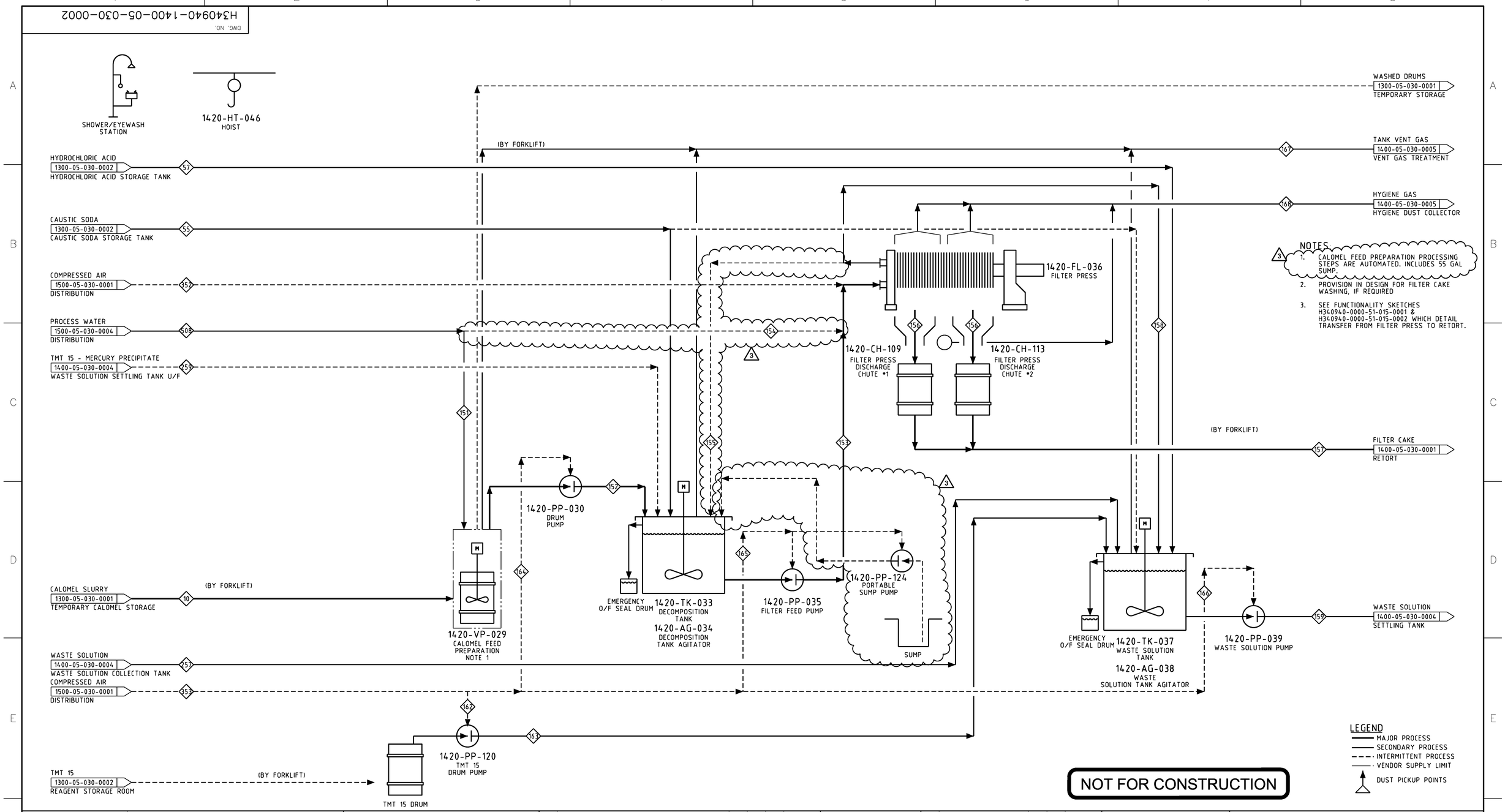

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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

CALOMEL CAUSTIC
LEACH CIRCUIT
PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1400-05-030-0002

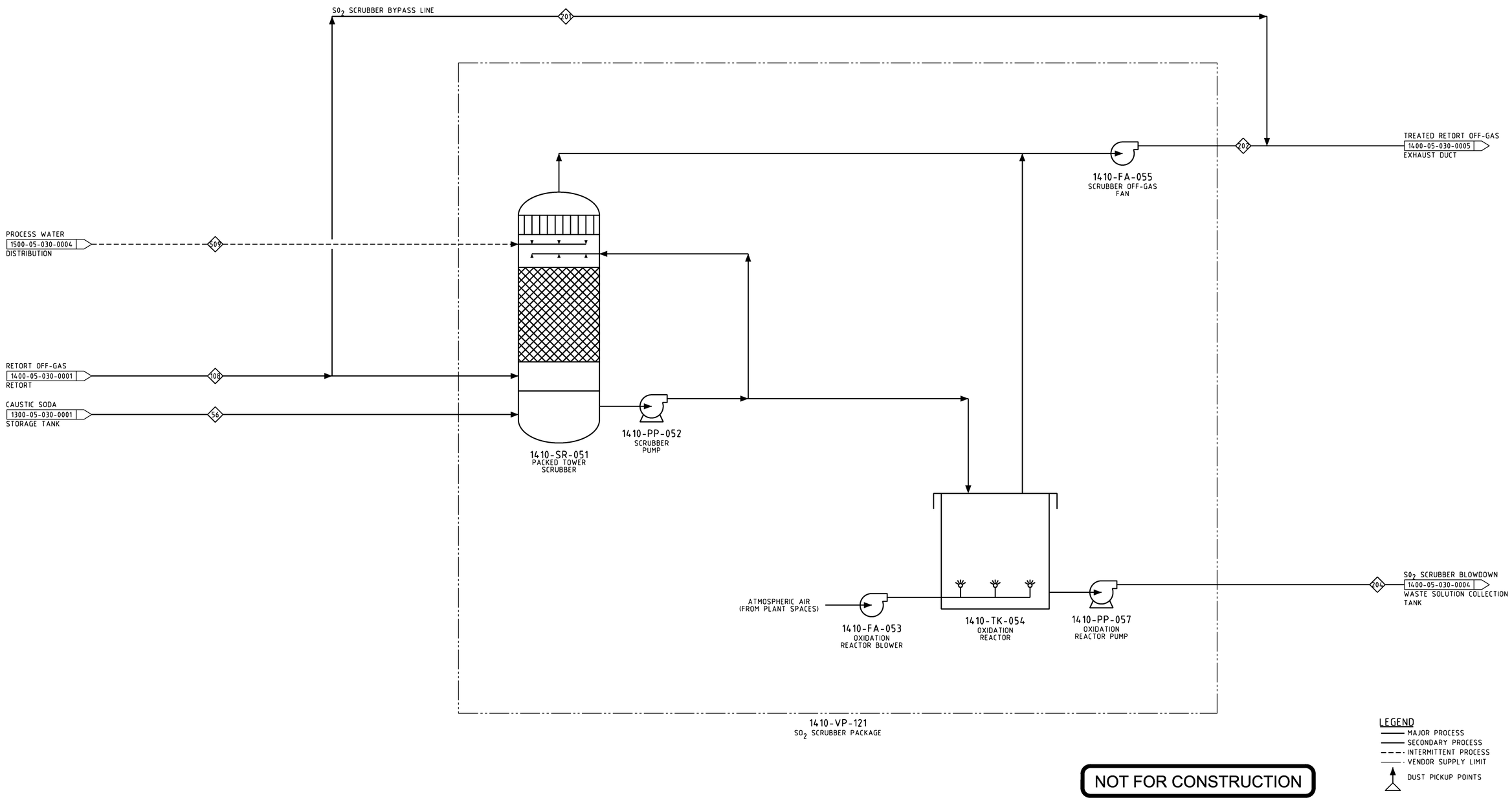
REV. 3

Flowsheet 1400-05-030-0002

		Note 1							Note 2					Note 3	Note 4		Note 4	Note 4	Note 4	Notes 5, 6	Note 5	Note 3	Note 7	Note 4	Note 4	Note 2
Stream Number		10	55	57		151	152	153	154	155	156	157	158	159	162	163	164	165	166	167	168	257	259	352	353	508
Stream Name		Calomel Slurry	Caustic Solution to Decomposition Tank	HCl (Primary Neutralization)	HCl (Secondary Neutralization)	Process (Rinse) Water to Calomel Drum	Calomel Slurry to Decomposition Tank	Decomposed Slurry to Filter Press	Rinse Water to Filter Press	Filter Press Recycle	Filter Cake to Retort Drum	Filter Cake to Retort	Filtrate to Waste Solution Tank	Waste Solution to Settling Tank	Compressed Air to TMT15 Drum Pump	Precipitant (TMT 15)	Compressed Air to Drum Pump	Compressed Air to Filter Feed Pump	Compressed Air to Waste Solution Pump	Tank Off-gas - Caustic Leach Circuit	Hygiene Gas - Caustic Leach Area	Waste Solution from Waste Solution Collection Tank	Mercury Precipitate	Compressed Air to Filter Press	Compressed Air to Caustic Leach Circuit Pumps	Process Water Distribution to Casutic Leach Circuit
Annual Throughput	lb/yr	612,000	168,721	15,292	21	127,685	739,684	905,563	TBD	905,563	421,587	421,587	483,976	734,195	TBD	6,292	TBD	TBD	TBD	--	--	229,000	TBD	TBD	TBD	63,842
Slurry	lb/yr	612,000					739,684	905,563		905,563	421,587	421,587		734,195	0		0	0	0	0	0		TBD	0	0	
% Solids	wt%	70.0%					57.9%	23.3%		23.3%	50.0%	50.0%		0.0%	--		--	--	--	--	--		30.0%	--	--	
Solids	lb/yr	428,400	0	0	0	0	428,400	210,794	0	210,794	210,794	210,794	0	195	0	0	0	0	0	0	0	0	TBD	0	0	0
Hg_2Cl_2	wt%	100%	--	--	--	--	100%	12%	--	12%	12%	12%	--	0%	--	--	--	--	--	--	--	--	TBD	--	--	--
HgO	wt%	0%	--	--	--	--	0%	88%	--	88%	88%	88%	--	0%	--	--	--	--	--	--	--	--	TBD	--	--	--
HgS	wt%	0%	--	--	--	--	0%	0%	--	0%	0%	0%	--	0%	--	--	--	--	--	--	--	--	TBD	--	--	--
S	wt%	0%	--	--	--	--	0%	0%	--	0%	0%	0%	--	0%	--	--	--	--	--	--	--	--	TBD	--	--	--
Solution	lb/yr	183,600	168,721	15,292	21	127,685	311,284	523,664	TBD	523,664	39,688	39,688	483,976	734,000	0	6,292	0	0	0	0	0	229,000	TBD	0	0	63,842
Hg^{2+}	g/L	2.7	0.0	0.0	0.0	0.0	1.5	0.3	0.0	0.3	0.3	0.3	0.3	TBD	--	0.0	--	--	--	--	--	TBD	TBD	--	--	0.0
NaOH	g/L	0.0	766.2	0.0	0.0	0.0	0.0	12.6	0.0	12.6	12.6	12.6	12.6	TBD	--	1.3	--	--	--	--	--	TBD	TBD	--	--	0.0
HCl	g/L	7.8	0.0	356.4	356.4	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	TBD	--	0.0	--	--	--	--	--	TBD	TBD	--	--	0.0
Cl^-	g/L	8.8	0.0	346.6	346.6	0.0	4.8	139.2	0.0	139.2	139.2	139.2	139.2	TBD	--	0.0	--	--	--	--	--	TBD	TBD	--	--	0.0
pH		-0.2	13.7	-1.0	-1.0	7.0	0.1	13.5	7.0	13.5	13.5	13.5	13.5	TBD	--	12.5	--	--	--	--	--	TBD	7.0	--	--	7.0
Elemental Mercury	lb/yr	0	0	0	0	0	0	171,106	0	171,106	171,106	171,106	0	0	0	0	0	0	0	0	0	0.0	TBD	0	0	0
Gas (Annual Average)	scfm	0	0	0	0	0	0	0	0	0	0	0	0	0	TBD	0	TBD	TBD	TBD	150	6,000	0	0	TBD	TBD	0
N_2	vol%	--	--	--	--	--	--	--	--	--	--	--	--	--	78.0%	--	78.0%	78.0%	78.0%	74.0%	78.2%	--	--	78.0%	78.0%	--
O_2	vol%	--	--	--	--	--	--	--	--	--	--	--	--	--	21.0%	--	21.0%	21.0%	21.0%	19.7%	20.8%	--	--	21.0%	21.0%	--
Hg (v)	vol%	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0%	--	0.0%	0.0%	0.0%	0.0%	0.0%	--	--	0.0%	0.0%	--
H_2O (v)	vol%	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0%	--	0.0%	0.0%	0.0%	6.3%	1.0%	--	--	0.0%	0.0%	--
SO_2	vol%	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0%	--	0.0%	0.0%	0.0%	0.0%	0.0%	--	--	0.0%	0.0%	--

Notes:
1 - Maximum annual throughput
2 - Assume no wash water required for the filter press. To be confirmed during detailed engineering.
3 - Stream properties to be determined once vendor process data from retort and SO_2 scrubber suppliers becomes available.
4 - Compressed air requirements for equipment to be determined in detailed engineering when vendor data becomes available.
5 - Assume mercury level to be at 0.1 mg/Nm^3 (OSHA level) for design purposes.
6 - Assume tank ventilation gas to have a relative humidity of 50%
7 - To be determined in detailed engineering

DWG. NO. H340940-1400-05-030-0003



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B	ISSUED FOR CLIENT REVIEW	KM		AO	2012-06-19
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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

RETORT OFF-GAS

PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1400-05-030-0003

REV. 2

Flowsheet 1400-05-030-0003

				Note 1		Note 2	Note 1
Stream Number		56	108	509	201	202	204
Stream Name		Caustic Soda from Storage Tank	Retort Off-gas	Process Water to Scrubber	Retort Off-gas Bypass	Scrubber Outlet Gas	Waste Solution from Scrubber
Annual Throughput	lb/yr	144,320	--	TBD	--	--	217,000
Slurry	lb/yr		0		0	0	
% Solids	wt%		--		--	--	
Solids	lb/yr	0	0	0	0	0	0
Hg_2Cl_2	wt%	--	--	--	--	--	--
HgO	wt%	--	--	--	--	--	--
HgS	wt%	--	--	--	--	--	--
S	wt%	--	--	--	--	--	--
Solution	lb/yr	144,320	0	TBD	0	0	217,000
Hg^{2+}	g/L	0.0	--	0.0	--	--	0.0
NaOH	g/L	766.2	--	0.0	--	--	TBD
HCl	g/L	0.0	--	0.0	--	--	0.0
Cl^-	g/L	0.0	--	0.0	--	--	0.0
pH		13.7	--	7.0	--	--	TBD
Elemental Mercury	lb/yr	0	0	0	0	0	0
Gas (Annual Average)	scfm	0	300	0	300	300	0
N_2	vol%	--	75.1%	--	75.1%	75.8%	--
O_2	vol%	--	23.1%	--	23.5%	22.8%	--
Hg (v)	vol%	--	0.0%	--	0.0%	0.0%	--
H_2O (v)	vol%	--	1.4%	--	1.4%	1.4%	--
SO_2	vol%	--	0.4%	--	0.0%	0.0%	--

Notes:

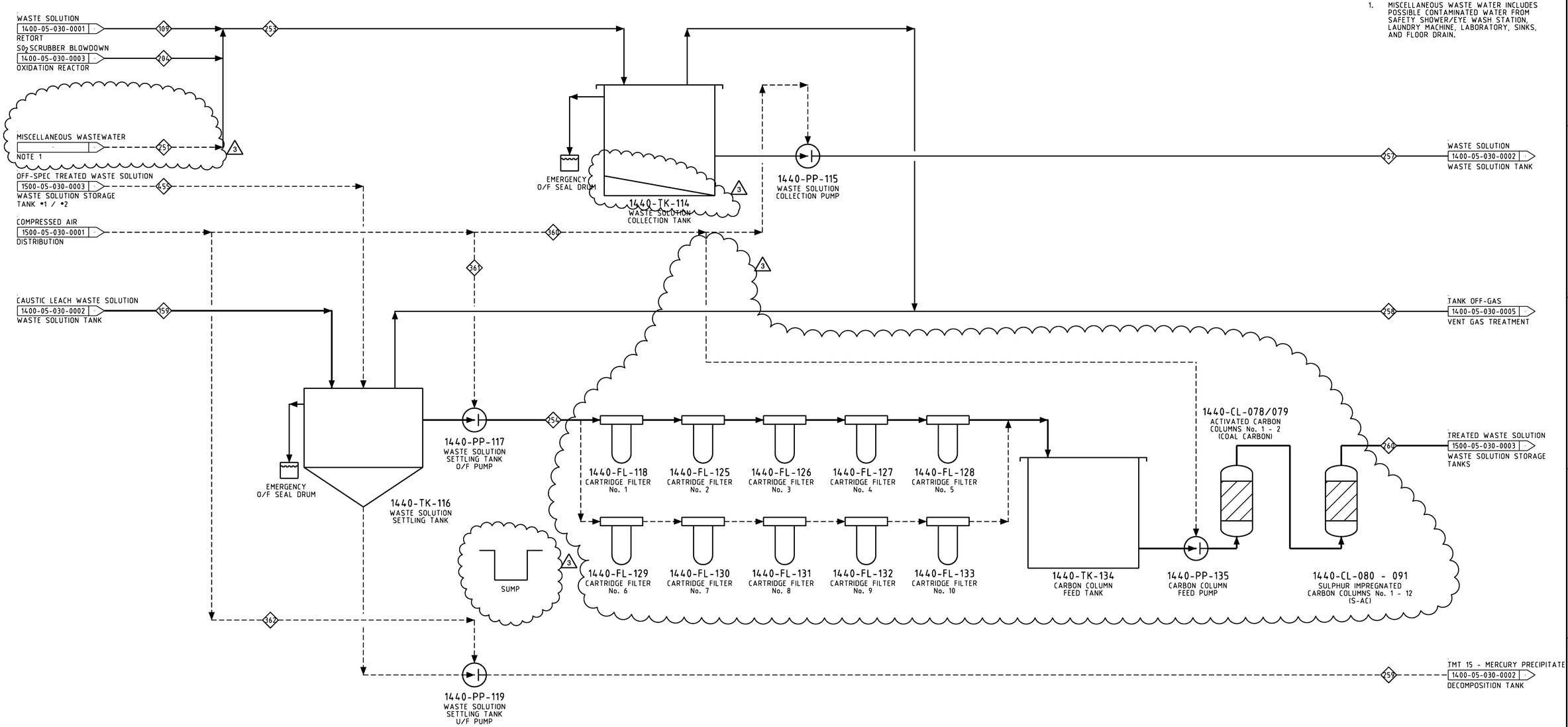
1 - To be confirmed once vendor data is available.

2 - To be confirmed once vendor data is available. Assume 99% removal of SO_2 on an annual basis.

DWG. NO. H340940-1400-05-030-0004

NOTES:

1. MISCELLANEOUS WASTE WATER INCLUDES POSSIBLE CONTAMINATED WATER FROM SAFETY SHOWER/EYE WASH STATION, LAUNDRY MACHINE, LABORATORY, SINKS, AND FLOOR DRAIN.



LEGEND
- MAJOR PROCESS
- SECONDARY PROCESS
- INTERMITTENT PROCESS
- VENDOR SUPPLY LIMIT
- DUST PICKUP POINTS

NOT FOR CONSTRUCTION

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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

WASTE SOLUTION
COLLECTION AND TREATMENT
PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1400-05-030-0004

REV. 3

Flowsheet 1400-05-030-0004

		Note 1	Note 1	Note 1	Note 2		Note 1	Note 1	Note 1	Notes 3, 4	Note 2	Note 1	Note 5	Note 5	Note 5	Note 2
Stream Number		109	159	204	251	252	253	254	257	258	259	260	360	361	362	455
Stream Name		Waste Solution from Retort	Caustic Leach Waste Solution	Waste Solution from Oxidation Reactor	Waste Solution from Laboratory	Waste Water from Open Sumps	Combined Waste Solution To Collection Tank	Decanted Waste Solution from Settling Tank	Waste Solution to Waste Solution Treatment Tank	Tank Off-gas - Waste Solution Treatment	Mercury Precipitate	Treated Waste Solution from Activated Carbon Columns	Compressed Air to Waste Solution Collection Pump	Compressed Air to Decanted Waste Solution Pump	Compressed Air to Waste Solution Settling Tank U/F Pump	Off-Spec Treated Waste Solution - Waste Solution Settling Tank
Annual Throughput	lb/yr	8,000	734,195	217,000	TBD	3,831	229,000	734,000	229,000	--	TBD	734,000	TBD	TBD	TBD	TBD
Slurry	lb/yr	0	734,195							0	TBD		0	0	0	TBD
% Solids	wt%	--	0.0%							--	30.0%		--	--	--	TBD
Solids	lb/yr	0	195	0	0	0	0	0	0	0	TBD	0	0	0	0	TBD
Hg_2Cl_2	wt%	--	0.0%	--	--	--	--	--	--	--	TBD	--	--	--	--	TBD
HgO	wt%	--	0.0%	--	--	--	--	--	--	--	TBD	--	--	--	--	TBD
HgS	wt%	--	0.0%	--	--	--	--	--	--	--	TBD	--	--	--	--	TBD
S	wt%	--	0.0%	--	--	--	--	--	--	--	TBD	--	--	--	--	TBD
Solution	lb/yr	8,000	734,000	217,000	TBD	3,831	229,000	734,000	229,000	0	TBD	734,000	0	0	0	TBD
Hg^{2+}	g/L	TBD	TBD	0.0	TBD	0.0	TBD	TBD	TBD	--	TBD	0.001	--	--	--	TBD
NaOH	g/L	TBD	TBD	TBD	TBD	0.0	TBD	TBD	TBD	--	TBD	TBD	--	--	--	TBD
HCl	g/L	TBD	TBD	0.0	TBD	0.0	TBD	TBD	TBD	--	TBD	TBD	--	--	--	TBD
Cl^-	g/L	TBD	TBD	0.0	TBD	0.0	TBD	TBD	TBD	--	TBD	TBD	--	--	--	TBD
pH		TBD	TBD	TBD	TBD	7.0	TBD	TBD	TBD	--	7.0	TBD	--	--	--	TBD
Elemental Mercury	lb/yr	0	0	0	0	0	0	0	0	0	TBD	0	0	0	0	TBD
Gas (Annual Average)	scfm	0	0	0	0	0	0	0	0	20	0	0	TBD	TBD	TBD	0
N_2	vol%	--	--	--	--	--	--	--	--	78.1%	--	--	78.0%	78.0%	78.0%	--
O_2	vol%	--	--	--	--	--	--	--	--	20.8%	--	--	21.0%	21.0%	21.0%	--
Hg (v)	vol%	--	--	--	--	--	--	--	--	0.0%	--	--	0.0%	0.0%	0.0%	--
H_2O (v)	vol%	--	--	--	--	--	--	--	--	1.2%	--	--	0.0%	0.0%	0.0%	--
SO_2	vol%	--	--	--	--	--	--	--	--	0.0%	--	--	0.0%	0.0%	0.0%	--

Notes:

1 - Stream properties to be determined once vendor process data from retort and SO_2 scrubber suppliers becomes available.

2 - To be determined in detailed engineering.

3 - Assume mercury level to be at 0.1 mg/Nm^3 (OSHA level) for design purposes.

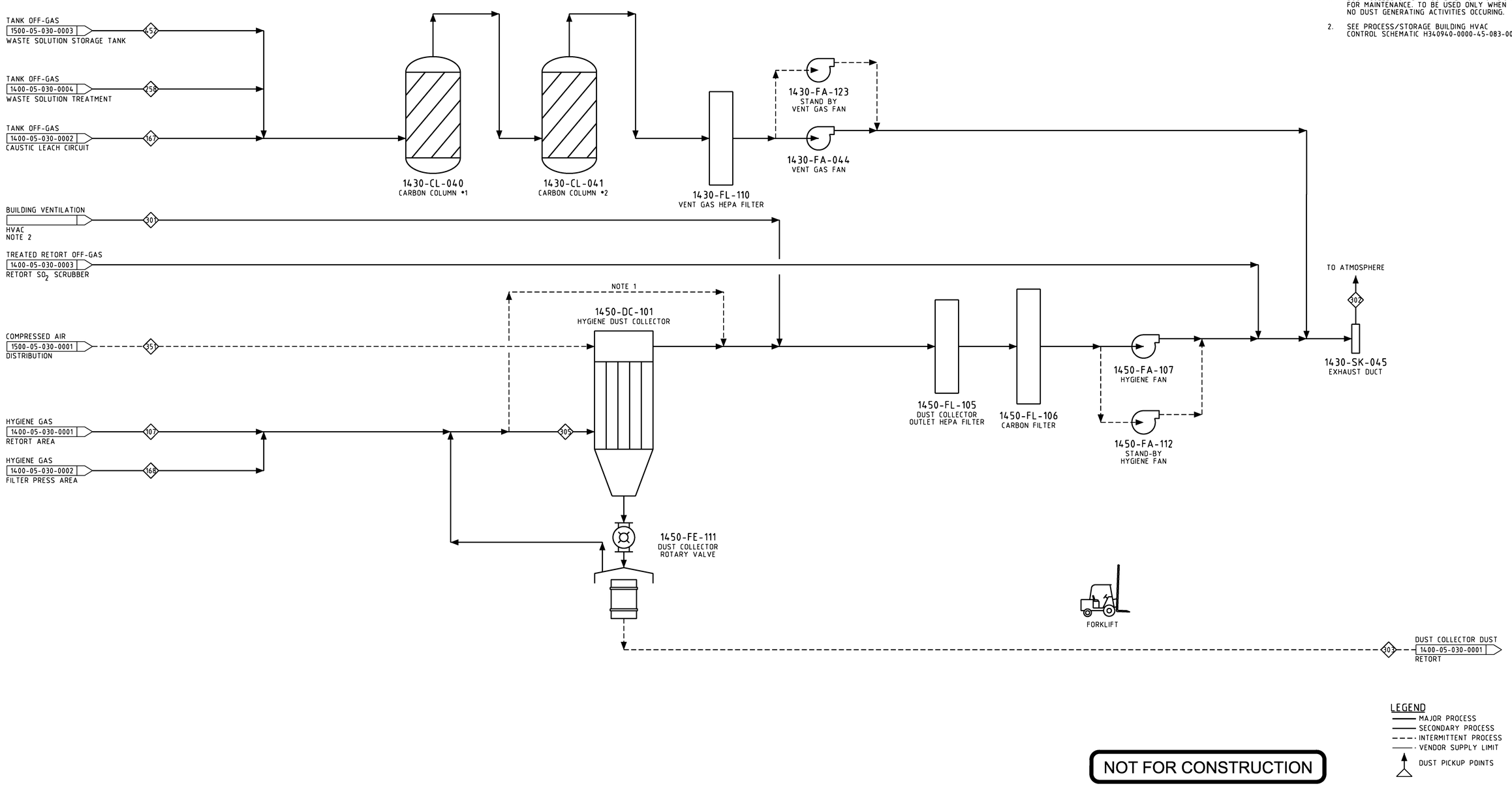
4 - Assume tank ventilation gas to have a relative humidity of 50%

5 - Compressed air requirements for equipment to be determined in detailed engineering when vendor data becomes available.

DWG. NO. H340940-1400-05-030-0005

NOTE:

1. DUST COLLECTOR BYPASS LINE AS PROVISION FOR MAINTENANCE. TO BE USED ONLY WHEN NO DUST GENERATING ACTIVITIES OCCURING.
2. SEE PROCESS/STORAGE BUILDING HVAC CONTROL SCHEMATIC H340940-0000-45-083-0001.



LEGEND

- MAJOR PROCESS
- SECONDARY PROCESS
- INTERMITTENT PROCESS
- VENDOR SUPPLY LIMIT
- DUST PICKUP POINTS

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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

HYGIENE & VENT GAS
TREATMENT AND EXHAUST
PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1400-05-030-0005

REV. 2

Flowsheet 1400-05-030-0005

		Note 1	Notes 1, 2	Note 1	Notes 1, 2	Note 1	Note 3			Note 4	Notes 1, 2
Stream Number		107	167	168	258	301	302	303	305	351	452
Stream Name		Hygiene Gas - Retort Area	Tank Off-gas - Caustic Leach Circuit	Hygiene Gas - Caustic Leach Area	Tank Off-gas - Waste Solution Treatment	Building Ventilation - HVAC	Hygiene Off-gas to Atmosphere	Dust Collector Dust to Retort	Hygiene Gas to Dust Collector	Compressed Air - Distribution	Tank Off-gas - Waste Solution Storage Tank
Annual Throughput	lb/yr	6,616	--	--	--	--	--	6,285	6,616	TBD	--
Slurry	lb/yr	0	0	0	0	0	0	0	0	0	0
% Solids	wt%	--	--	--	--	--	--	--	--	--	--
Solids	lb/yr	6,616	0	0	0	0	331	6,285	6,616	0	0
Hg_2Cl_2	wt%	3.9%	--	--	--	--	3.9%	3.9%	3.9%	--	--
HgO	wt%	28.0%	--	--	--	--	28.0%	28.0%	28.0%	--	--
HgS	wt%	8.4%	--	--	--	--	8.4%	8.4%	8.4%	--	--
S	wt%	2.8%	--	--	--	--	2.8%	2.8%	2.8%	--	--
Solution	lb/yr	0	0	0	0	0	0	0	0	0	0
Hg^{2+}	g/L	--	--	--	--	--	--	--	--	--	--
NaOH	g/L	--	--	--	--	--	--	--	--	--	--
HCl	g/L	--	--	--	--	--	--	--	--	--	--
Cl^-	g/L	--	--	--	--	--	--	--	--	--	--
pH		--	--	--	--	--	--	--	--	--	--
Elemental Mercury	lb/yr	0	0	0	0	0	0	0	0	0	0
Gas (Annual Average)	scfm	2,200	150	6,000	20	2,000	10,800	0	8,200	TBD	100
N_2	vol%	78.2%	74.0%	78.2%	78.1%	78.2%	78.1%	--	78.2%	78.0%	78.1%
O_2	vol%	20.8%	19.7%	20.8%	20.8%	20.8%	20.7%	--	20.8%	21.0%	20.8%
Hg (v)	vol%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	--	0.0%	0.0%	0.0%
H_2O (v)	vol%	1.0%	6.3%	1.0%	1.2%	1.0%	1.2%	--	1.0%	0.0%	1.2%
SO_2	vol%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	--	0.0%	0.0%	0.0%

Notes:

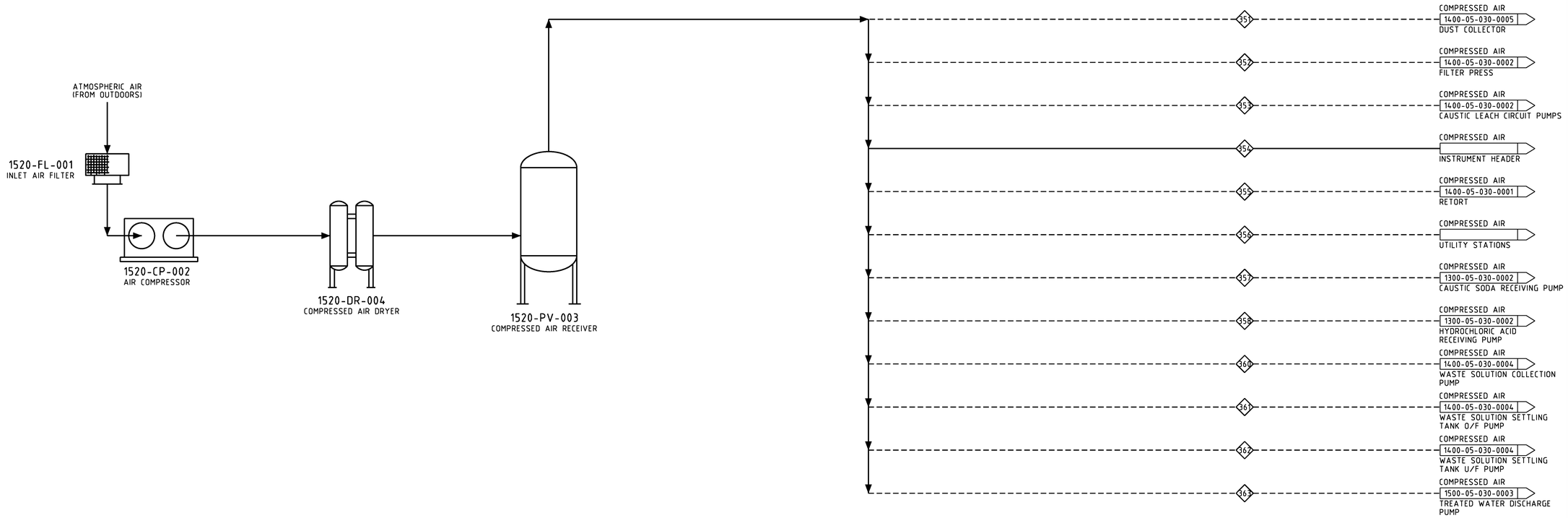
1 - Assume mercury level to be at 0.1 mg/Nm^3 (OSHA level) for design purposes.

2 - Assume tank ventilation gas to have a relative humidity of 50%

3 - Design dust emission limit is 0.02 gr/dscf. Design mercury emission limit is 1.0 x 10^{-5} gr/dscf.

4 - Compressed air requirements for equipment to be determined in detailed engineering when vendor data becomes available.

DWG. NO. H340940-1500-05-030-0001



LEGEND

- MAJOR PROCESS
- SECONDARY PROCESS
- INTERMITTENT PROCESS
- VENDOR SUPPLY LIMIT
- DUST PICKUP POINTS

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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

COMPRESSED AIR SYSTEM

PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1500-05-030-0001

REV. 2

Flowsheet 1500-05-030-0001

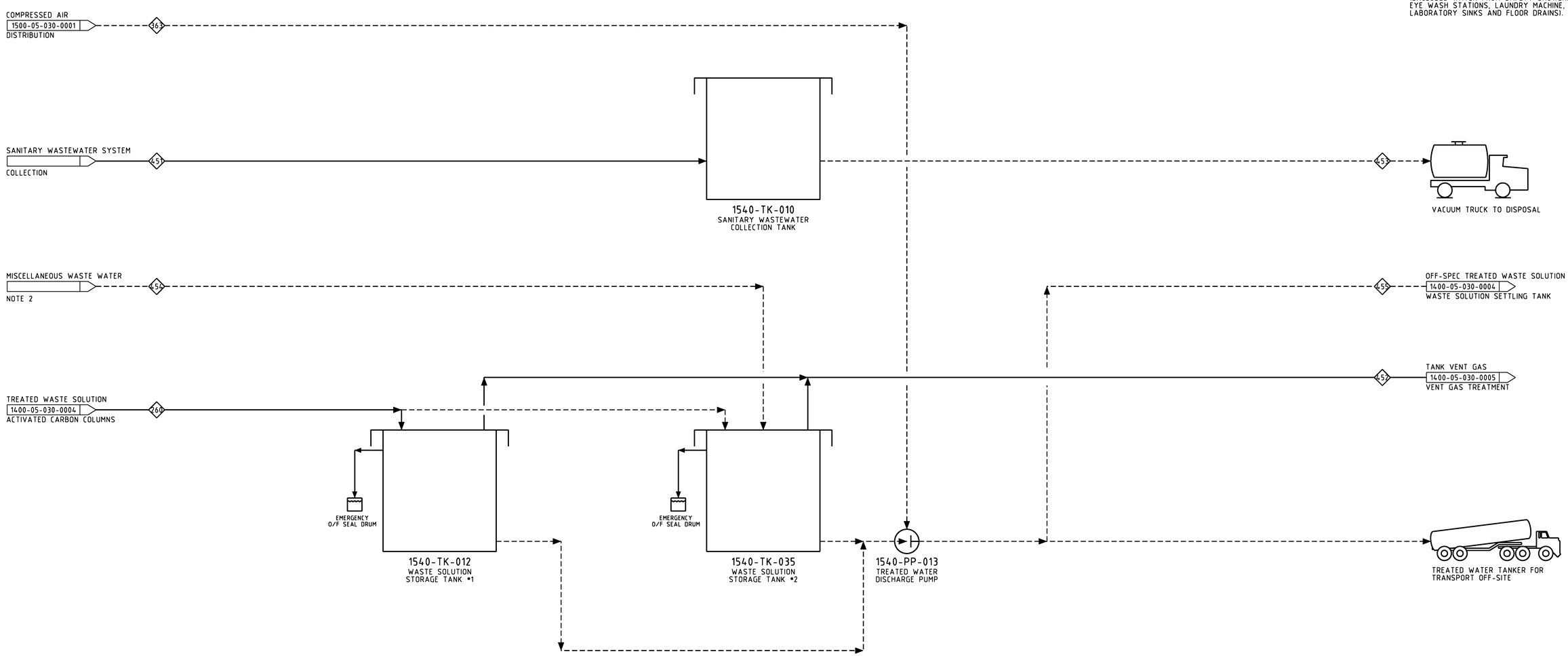
		Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
Stream Number		351	352	353	354	355	356	357	358	360	361	362	363
Stream Name		Compressed Air - Dust Collector	Compressed Air - Filter Press	Compressed Air - Caustic Leach Circuit Pumps	Compressed Air - Instrument Header	Compressed Air - Retort	Compressed Air - Utility Stations	Compressed Air - Caustic Soda Receiving Pump	Compressed Air - Hydrochloric Acid Receiving Pump	Compressed Air - Waste Solution Collection Pump	Compressed Air - Waste Solution Settling Tank O/F Pump	Compressed Air - Waste Solution Settling Tank U/F Pump	Compressed Air - Treated Water Discharge Pump
Annual Throughput	lb/yr	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Slurry	lb/yr	0	0	0	0	0	0	0	0	0	0	0	0
% Solids	wt%	--	--	--	--	--	--	--	--	--	--	--	--
Solids	lb/yr	0	0	0	0	0	0	0	0	0	0	0	0
Hg_2Cl_2	wt%	--	--	--	--	--	--	--	--	--	--	--	--
HgO	wt%	--	--	--	--	--	--	--	--	--	--	--	--
HgS	wt%	--	--	--	--	--	--	--	--	--	--	--	--
S	wt%	--	--	--	--	--	--	--	--	--	--	--	--
Solution	lb/yr	0	0	0	0	0	0	0	0	0	0	0	0
Hg^{2+}	g/L	--	--	--	--	--	--	--	--	--	--	--	--
NaOH	g/L	--	--	--	--	--	--	--	--	--	--	--	--
HCl	g/L	--	--	--	--	--	--	--	--	--	--	--	--
Cl^-	g/L	--	--	--	--	--	--	--	--	--	--	--	--
pH		--	--	--	--	--	--	--	--	--	--	--	--
Elemental Mercury	lb/yr	0	0	0	0	0	0	0	0	0	0	0	0
Gas (Annual Average)	scfm	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
N_2	vol%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%
O_2	vol%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%
Hg (v)	vol%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
H_2O (v)	vol%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SO_2	vol%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:
1 - Compressed air requirements for equipment to be determined in detailed engineering when vendor data becomes available.

DWG. NO. H340940-1500-05-030-0003

NOTES:

1. SEPTIC STORAGE TANK EMPTIED WITH VACUUM TRUCK FOR OFFSITE DISPOSAL.
2. MISCELLANEOUS WASTE WATER INCLUDES WATER FROM SINKS AND SHOWERS (EXCLUDES WATER FROM SAFETY SHOWER/ EYE WASH STATIONS, LAUNDRY MACHINE, LABORATORY SINKS AND FLOOR DRAINS).



LEGEND
- MAJOR PROCESS
- SECONDARY PROCESS
- INTERMITTENT PROCESS
- VENDOR SUPPLY LIMIT
- DUST PICKUP POINTS

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B	ISSUED FOR CLIENT REVIEW	KM		AO	2012-06-19
A	ISSUED FOR INFORMATION	KM		AO	

REVISIONS

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PROJ. MGR. M. SUCHARDA DATE	

PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

SANITARY AND WASTE SOLUTION STORAGE PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1500-05-030-0003

REV. 2

Flowsheet 1500-05-030-0003

		Note 1	Note 2	Note 3		Note 3	Note 3	Note 3
Stream Number		260	363	451	452	453	454	455
Stream Name		Treated Waste Solution from Activated Carbon Columns	Compressed Air - Distribution	Sanitary Waste Water System Collection	Tank Vent Gas to Vent Gas Treatment	Vacuum Truck to Disposal	Miscellaneous Waste Water	Off-Spec Treated Waste Solution - Waste Solution Settling Tank
Annual Throughput	lb/yr	734,000	TBD	1,085,085	--	1,085,085	TBD	TBD
Slurry	lb/yr		0	TBD	0	TBD	TBD	TBD
% Solids	wt%		--	TBD	--	TBD	TBD	TBD
Solids	lb/yr	0	0	TBD	0	TBD	TBD	TBD
Hg_2Cl_2	wt%	--	--	TBD	--	TBD	TBD	TBD
HgO	wt%	--	--	TBD	--	TBD	TBD	TBD
HgS	wt%	--	--	TBD	--	TBD	TBD	TBD
S	wt%	--	--	TBD	--	TBD	TBD	TBD
Solution	lb/yr	734,000	0	TBD	0	TBD	TBD	TBD
Hg^{2+}	g/L	0.001	--	TBD	--	TBD	TBD	TBD
NaOH	g/L	TBD	--	TBD	--	TBD	TBD	TBD
HCl	g/L	TBD	--	TBD	--	TBD	TBD	TBD
Cl^-	g/L	TBD	--	TBD	--	TBD	TBD	TBD
pH		TBD	--	TBD	--	TBD	TBD	TBD
Elemental Mercury	lb/yr	0	0	0	0	TBD	TBD	TBD
Gas (Annual Average)	scfm	0	TBD	0	100	0	0	0
N_2	vol%	--	78.0%	--	78.1%	--	--	--
O_2	vol%	--	21.0%	--	20.8%	--	--	--
Hg (v)	vol%	--	0.0%	--	0.0%	--	--	--
H_2O (v)	vol%	--	0.0%	--	1.2%	--	--	--
SO_2	vol%	--	0.0%	--	0.0%	--	--	--

Notes:

1 - Stream properties to be determined once vendor process data from retort and SO_2 scrubber suppliers becomes available.

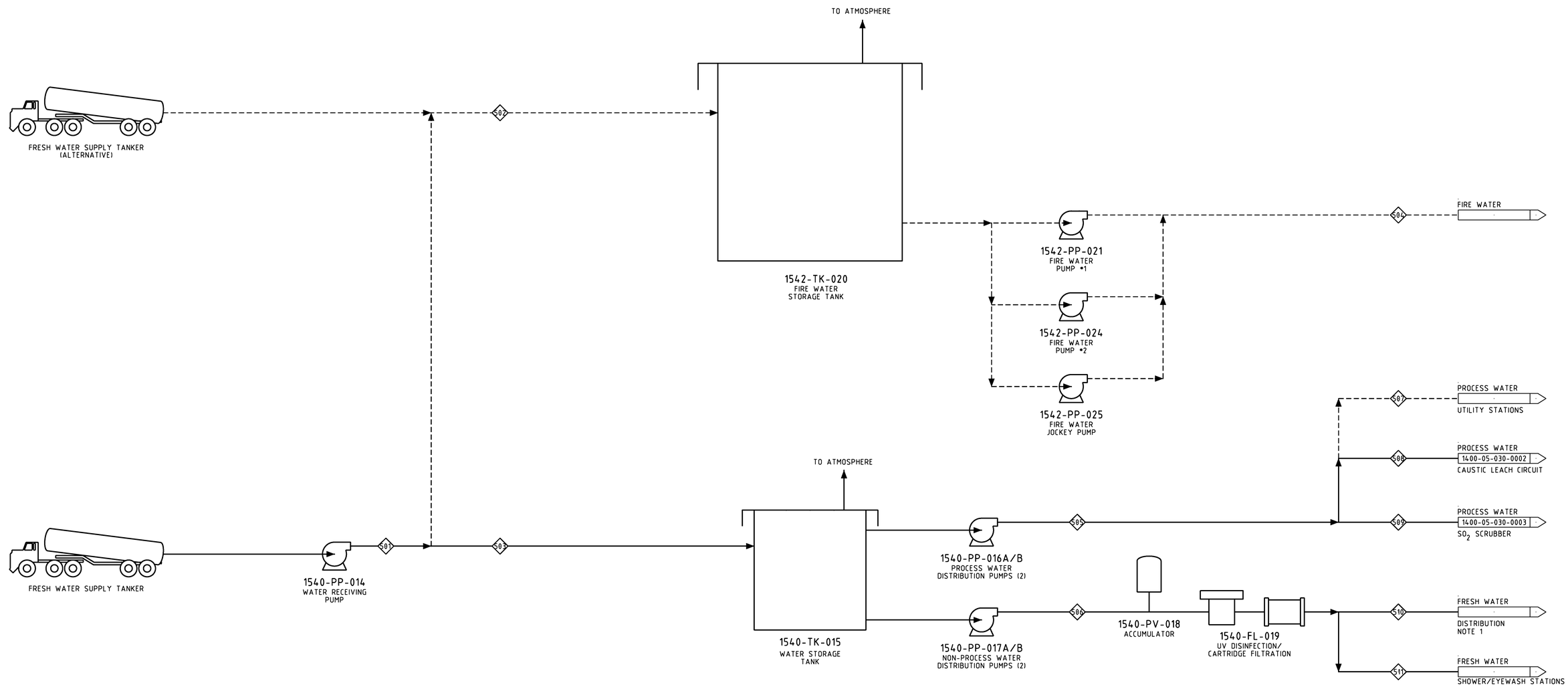
2 - Compressed air requirements for equipment to be determined in detailed engineering when vendor data becomes available.

3 - To be determined in detailed engineering.

DWG. NO. H340940-1500-05-030-0004

NOTES:

1. DISTRIBUTION TO TOILETS, SHOWERS, SINKS, ETC.



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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

WATER SUPPLY

PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1500-05-030-0004

REV. 2

Flowsheet 1500-05-030-0004

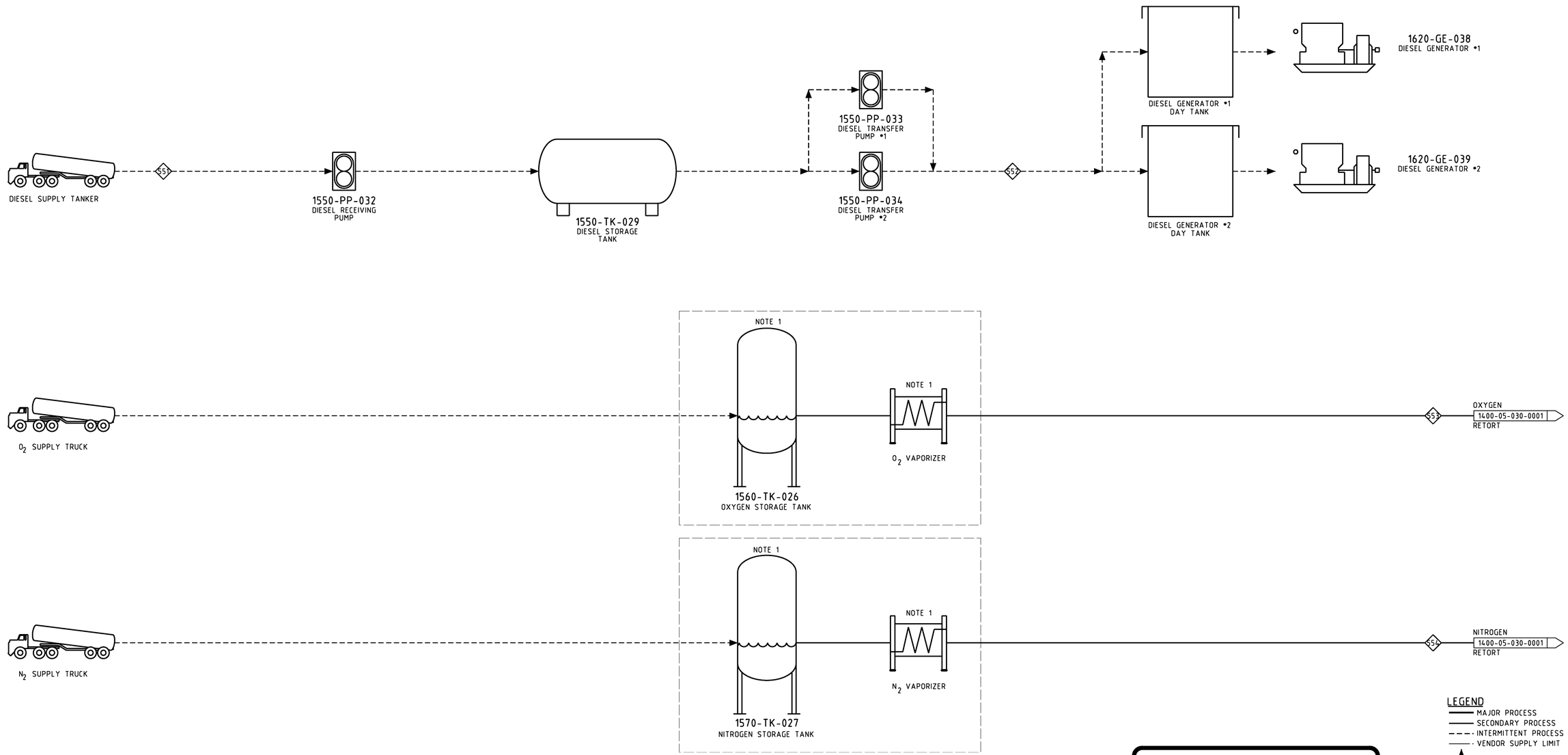
			Note 1		Note 1			Note 1	Note 1	Note 1	Note 1	Note 1
Stream Number		501	502	503	504	505	506	507	508	509	510	511
Stream Name		Fresh Water Supply	Received Fire Water	Received Process and Non-process Water	Fire Water	Process Water Distribution	Non-process Water Distribution	Process Water to Utility Stations	Process Water to Caustic Leach Circuit	Process Water to SO2 Scrubber	Fresh Water Distribution	Fresh Water to Shower / Eye Wash Stations
Annual Throughput	lb/yr	2,504,000	TBD	2,504,042	TBD	1,419,000	1,085,000	TBD	TBD	TBD	TBD	TBD
Slurry	lb/yr	0	0	0	0	0	0	0	0	0	0	0
% Solids	wt%	--	--	--	--	--	--	--	--	--	--	--
Solids	lb/yr	0	0	0	0	0	0	0	0	0	0	0
Hg_2Cl_2	wt%	--	--	--	--	--	--	--	--	--	--	--
HgO	wt%	--	--	--	--	--	--	--	--	--	--	--
HgS	wt%	--	--	--	--	--	--	--	--	--	--	--
S	wt%	--	--	--	--	--	--	--	--	--	--	--
Solution	lb/yr	2,504,000	TBD	2,504,042	TBD	1,419,000	1,085,000	TBD	TBD	TBD	TBD	TBD
Hg^{2+}	g/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NaOH	g/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HCl	g/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cl^-	g/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
pH		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Elemental Mercury	lb/yr	0	0	0	0	0	0	0	0	0	0	0
Gas (Annual Average)	scfm	0	0	0	0	0	0	0	0	0	0	0
N_2	vol%	--	--	--	--	--	--	--	--	--	--	--
O_2	vol%	--	--	--	--	--	--	--	--	--	--	--
Hg (v)	vol%	--	--	--	--	--	--	--	--	--	--	--
H_2O (v)	vol%	--	--	--	--	--	--	--	--	--	--	--
SO_2	vol%	--	--	--	--	--	--	--	--	--	--	--

Notes:
1 - To be determined in detailed engineering when vendor information becomes available.

DWG. NO. H340940-1500-05-030-0005

NOTES:

1. SUPPLIED AND OWNED BY N_2/O_2 SUPPLIER.



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PRECIOUS METALS RECOVERY LLC

PRECIOUS METALS RECOVERY LLC
DRY HILLS FACILITY PROJECT

DIESEL AND GAS SYSTEMS

PROCESS FLOW DIAGRAM

SCALE NTS OR AS NOTED

DWG. NO. H340940-1500-05-030-0005

REV. 2

Flowsheet 1500-05-030-0005

Stream Number		551	552	553	554
Stream Name		Diesel Supply	Diesel Distribution	Oxygen to Retort	Nitrogen to Retort
Annual Throughput	lb/yr	1,043,000	1,043,000	--	--
Slurry	lb/yr	0	0	0	0
% Solids	wt%	--	--	--	--
Solids	lb/yr	0	0	0	0
Hg_2Cl_2	wt%	--	--	--	--
HgO	wt%	--	--	--	--
HgS	wt%	--	--	--	--
S	wt%	--	--	--	--
Solution	lb/yr	1,043,000	1,043,000	0	0
Hg^{2+}	g/L	0	0	--	--
NaOH	g/L	0	0	--	--
HCl	g/L	0	0	--	--
Cl^-	g/L	0	0	--	--
pH		--	--	--	--
Elemental Mercury	lb/yr	0	0	0	0
Gas (Annual Average)	scfm	0	0	0.93	0.93
N_2	vol%	--	--	0.0%	100.0%
O_2	vol%	--	--	100.0%	0.0%
Hg (v)	vol%	--	--	0.0%	0.0%
H_2O (v)	vol%	--	--	0.0%	0.0%
SO_2	vol%	--	--	0.0%	0.0%