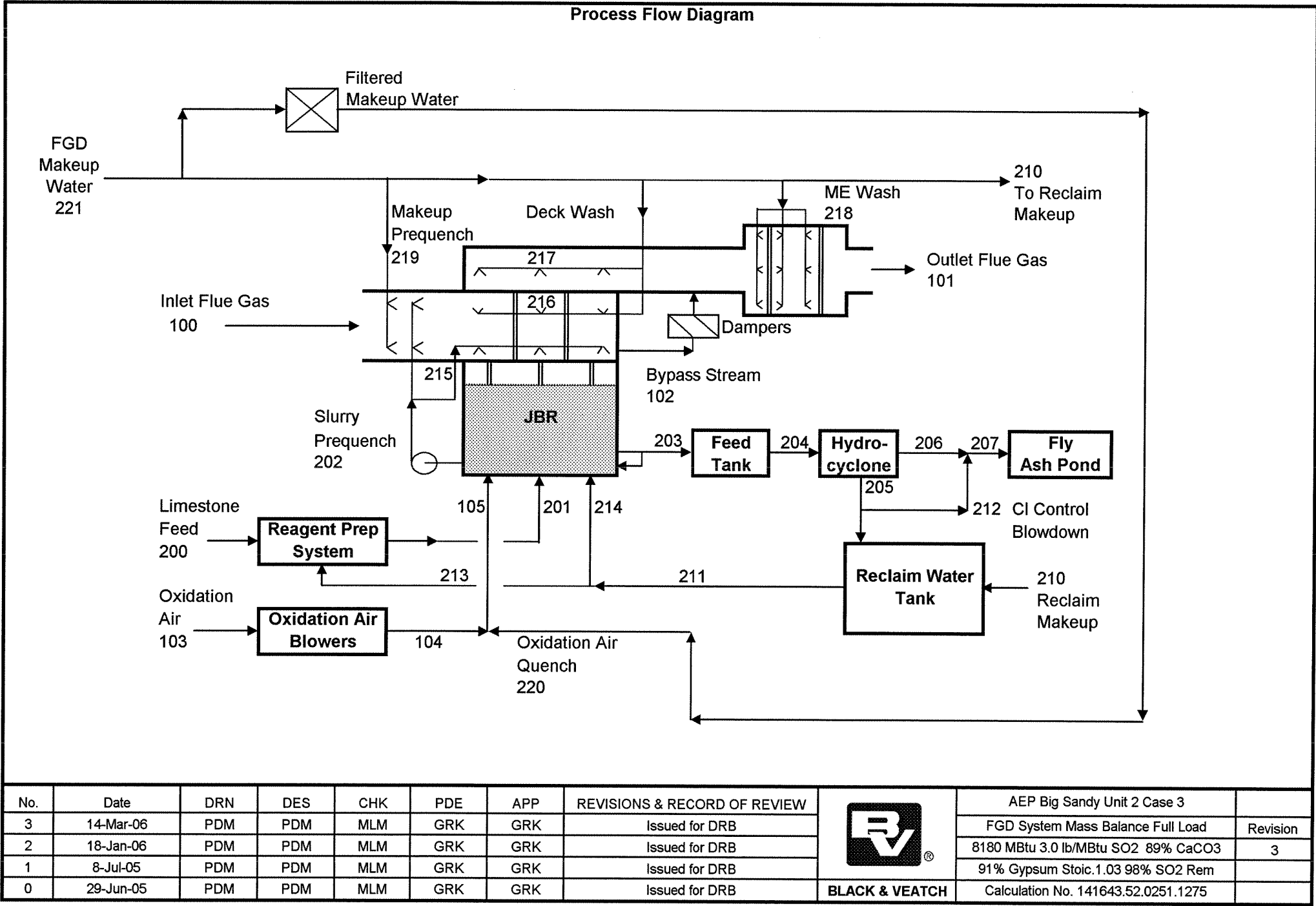




DESIGN BASIS SUMMARY	
FGD System Mass Balance Full Load	
Unit Rating, MW (net)	800
Boiler Heat Input, MMBtu/hr	8,180
Fuel Burn Rate, lb/hr	654,924
Altitude, ft. above MSL	568
Ambient Pressure, in H ₂ O	399
Ambient Temperature, °F	56
SO ₂ Inlet Loading, lb of SO ₂ /MMBtu	3.00
SO ₂ Removal Efficiency, %	98
Excess Air, %	21.4
Air Heater Leakage, %	16.4
Oxygen at FGD Inlet, %	6.0

COAL ANALYSIS ¹	
Carbon, %	69.33
Hydrogen, %	4.67
Sulfur, %	1.87
Nitrogen, %	1.34
Oxygen, %	6.03
Moisture, %	6.63
Chlorine, %	0.20
Ash, %	9.89
High Heating Value (HHV), Btu/lb	12,490

LIMESTONE ANALYSIS	
CaCO ₃ , %	89.0
Reactive MgCO ₃ , %	2.0
Total MgCO ₃ , %	4.0
Inerts, %	7.0
Slurry Solids, %	30.0
Specific gravity	1.23
Bond Work Index (BWI)	12
Delivered size	3/4" x 0"

GYPSUM QUALITY (Dry Basis)	
CaSO ₄ -2H ₂ O, %	91.0
CaSO ₃ -1/2 H ₂ O, %	0.0
CaCO ₃ , %	1.5
Inerts, %	4.2
MgCO ₃ , %	1.6
Fly Ash, %	1.7
Maximum Chloride Content, ppm	12,000
Solids, % min	50
Crystal Size (Stokes Mean Size), microns	40 - 70

Note:

- 1 Coal analysis is the ultimate analysis adjusted for moisture
2 All the flows denoted are on per unit basis

Gas Streams	100	101	102	103	104	105
	Total Inlet Flue Gas	Total Outlet Flue Gas	Bypass Stream	Oxidation Air-Inlet	Oxidation Air-Outlet	Oxidation Air-Humidified
Flow, acfm	3,079,306	2,571,161	0	33,845	24,427	33,132
Flow, lb/hr	9,427,932	10,086,822	0	156,193	156,193	228,106
H ₂ O, lb/hr	376,469	896,523	0	1,055	1,055	72,968
O ₂ , lb/hr	609,894	639,804	0	35,905	35,905	35,905
N ₂ , lb/hr	6,751,822	6,868,994	0	117,172	117,172	117,172
CO ₂ , lb/hr	1,663,641	1,681,010	0	71	71	71
SO ₂ , lb/hr	24,469	489	0	0	0	0
HCl, lb/hr	1,347	0	0	0	0	0
Fly ash lb/hr	1,930	164	0	0	0	0
Temp, F	350	127	350	56	128	75.2
Pressure, inwg	17.0	1.0	17.0	0.0	235.0	235.0

Liquid Streams	200	201	202	203	204	205	206	207	208	209	210
	Limestone Feed	Reagent Feed	Slurry Prequench	Absorber Bleed	H'cyclone Feed	H'cyclone Overflow	H'cyclone Underflow	Inlet to Fly Ash Pond	Not Used	Not Used	Reclaim Make Up
Flow, gpm	--	249	42,835	680	680	478	203	284			400
Frequency, min/day	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous			Continuous
Flow, lb/hr	44,772	153,794	24,180,712	384,019	384,019	242,538	141,481	182,639			200,287
Total SS, lb/hr	44,772	46,138	4,836,142	76,804	76,804	6,063	70,740	71,769			0
Total SS, %	100	30	20	20	20	2.5	50	39			0
Specific gravity	--	1.23	1.13	1.13	1.13	1.01	1.39	1.29			1.00
H ₂ O, lb/hr	0	107,656	19,344,570	307,215	307,215	236,475	70,740	110,870			200,287
CaCO ₃ , lb/hr	39,847	40,004	109,418	1,738	1,738	695	1,043	1,161			0
MgCO ₃ , lb/hr	1,791	1,961	119,028	1,890	1,890	756	1,134	1,263			0
CaSO ₄ -2H ₂ O, lb/hr	0	78	4,075,944	64,731	64,731	344	64,387	64,445			0
CaSO ₃ -1/2H ₂ O, lb/hr	0	0	0	0	0	0	0	0			0
Fly ash, lb/hr	0	792	294,916	4,684	4,684	3,513	1,171	1,767			0
Inerts, lb/hr	3,134	3,304	236,837	3,761	3,761	755	3,006	3,134			0
Cl, lb/hr	0	641	232,135	3,687	3,687	2,838	849	1,330			6
Cl, mg/L	0	5,957	12,000	12,000	12,000	12,000	12,000	12,000			32
pH	NA	7.5 - 8.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5			5.5 - 7.5

Liquid Streams	211	212	213	214	215	216	217	218	219	220	221
	Reclaim Water	Cl Control Blowdown	Reclaim to Reagent	Reclaim to JBR	Lower Deck Wash	Inlet Deck Wash	Upper Deck Wash	Makeup ME Wash	Makeup Prequench	Oxid Air Quench	Total Makeup
Flow, gpm	797	81	216	580	6,657	437	316	651	584	144	1,285
Frequency, min/day	Continuous	Continuous	Continuous	Continuous	Continuous	393	100	36	Continuous	Continuous	Continuous
Flow, lb/hr	401,667	41,158	109,023	292,645	3,758,150	59,727	10,940	8,200	292,290	71,913	643,357
Total SS, lb/hr	5,035	1,029	1,366	3,668	751,630	0	0	0	0	0	0
Total SS, %	1.3	2.5	1.3	1.3	20	0	0	0	0	0	0
Specific gravity	1.01	1.01	1.01	1.01	1.13	1.00	1.00	1.00	1.00	1.00	1.00
H ₂ O, lb/hr	396,633	40,129	107,656	288,977	3,006,520	59,727	10,940	8,200	292,290	71,913	643,357
CaCO ₃ , lb/hr	577	118	157	420	17,006	0	0	0	0	0	0
MgCO ₃ , lb/hr	628	128	170	457	18,499	0	0	0	0	0	0
CaSO ₄ -2H ₂ O, lb/hr	286	58	78	208	633,480	0	0	0	0	0	0
CaSO ₃ -1/2H ₂ O, lb/hr	0	0	0	0	0	0	0	0	0	0	0
Fly ash, lb/hr	2,917	596	792	2,125	45,836	0	0	0	0	0	0
Inerts, lb/hr	627	128	170	457	36,809	0	0	0	0	0	0
Cl, lb/hr	2,363	482	641	1,721	36,078	1.9	0.4	0.3	9	2.3	21
Cl, mg/L	5,957	12,000	5,957	5,957	12,000	32	32	32	32	32	32
pH	5.5 - 7.5	4.5 - 5.5	5.5 - 7.5	5.5 - 7.5	4.5 - 5.5	5.5 - 7.5	5.5 - 7.5	5.5 - 7.5	5.5 - 7.5	5.5 - 7.5	5.5 - 7.5

PERFORMANCE DATA	
SO ₂ removed, lb/hr	23,980
HCl removed, lb/hr	1,347
Fly ash removed, lb/hr	1,767
Limestone Reagent Stoichiometry Guarantee in Waste Solids	1.03
Limestone consumption, tph	22.4
Makeup water required, gpm	1,285
Chloride blowdown, gpm	81.0
Gypsum byproduct production (wet basis), tph	70.7

NO.	DATE	DRN	DES	CHK	PDE	APP	REVISIONS & RECORD OF REVIEW		AEP Big Sandy Unit 2 Case 3	
3	14-Mar-06	PDM	PDM	MLM	GRK	GRK	Issued for DRB		FGD System Mass Balance Full Load	Revision
2	18-Jan-06	PDM	PDM	MLM	GRK	GRK	Issued for DRB		8180 MBtu 3.0 lb/MBtu SO2 89% CaCO3	3
1	8-Jul-05	PDM	PDM	MLM	GRK	GRK	Issued for DRB		91% Gypsum Stoic.1.03 98% SO2 Rem	
0	29-Jun-05	PDM	PDM	MLM	GRK	GRK	Issued for DRB	BLACK & VEATCH	Calculation No. 141643.52.0251.1275	