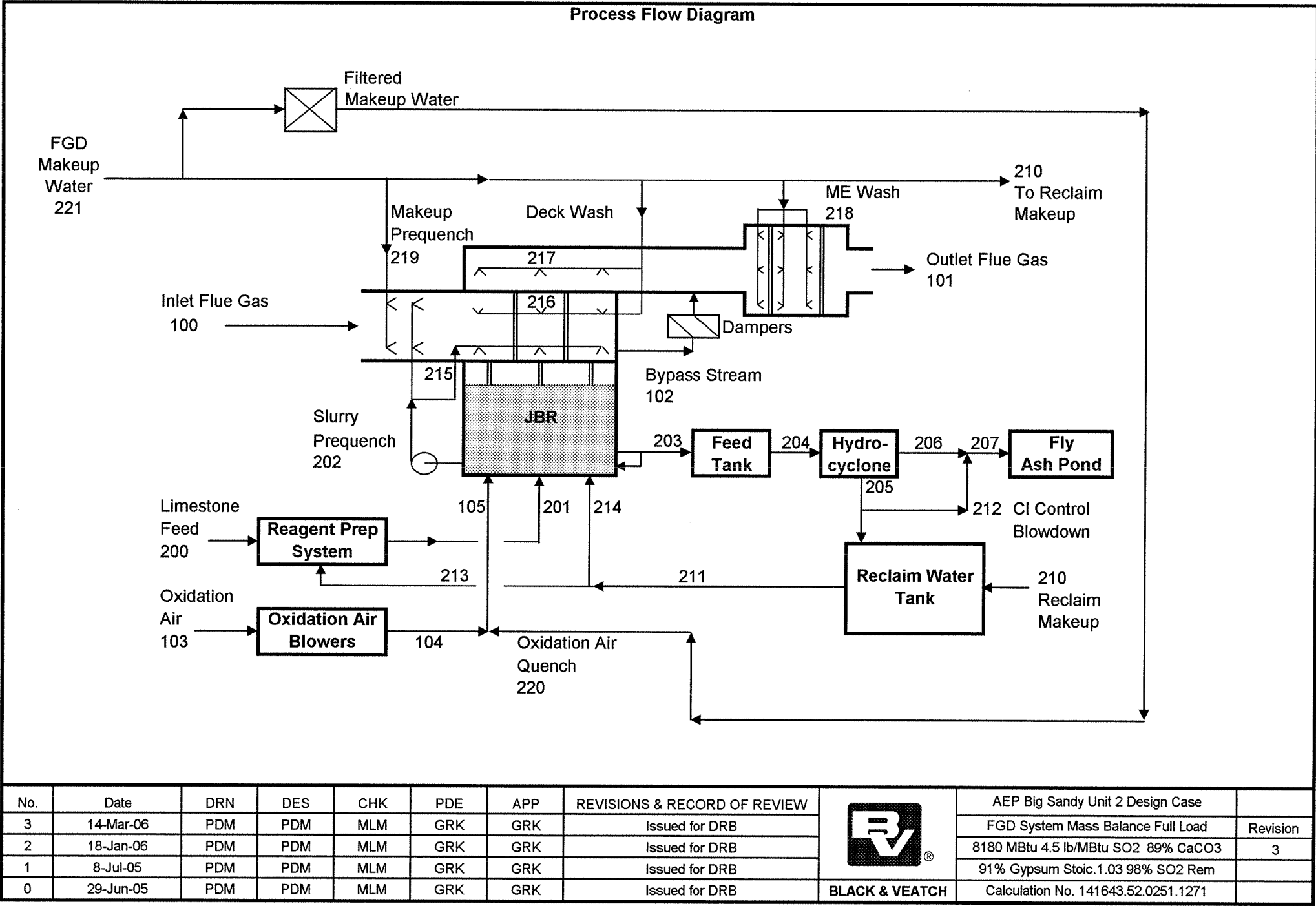




DESIGN BASIS SUMMARY	
FGD System Mass Balance Full Load	
Unit Rating, MW (net)	800
Boiler Heat Input, MMBtu/hr	8,180
Fuel Burn Rate, lb/hr	654,924
Altitude, ft. above MSL	568
Ambient Pressure, in H ₂ O	399
Ambient Temperature, °F	56
SO ₂ Inlet Loading, lb of SO ₂ /MMBtu	4.50
SO ₂ Removal Efficiency, %	98
Excess Air, %	21.0
Air Heater Leakage, %	20.0
Oxygen at FGD Inlet, %	6.4

COAL ANALYSIS ¹	
Carbon, %	69.33
Hydrogen, %	4.67
Sulfur, %	2.81
Nitrogen, %	1.34
Oxygen, %	5.10
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, %	90.7
CaSO ₃ -1/2 H ₂ O, %	0.0
CaCO ₃ , %	1.6
Inerts, %	4.3
MgCO ₃ , %	1.7
Fly Ash, %	1.6
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	3,176,748	2,661,558	0	33,845	24,427	33,132
Flow, lb/hr	9,769,043	10,439,705	0	156,193	156,193	228,106
H ₂ O, lb/hr	378,777	917,311	0	1,055	1,055	72,968
O ₂ , lb/hr	676,173	703,102	0	35,905	35,905	35,905
N ₂ , lb/hr	7,012,177	7,129,349	0	117,172	117,172	117,172
CO ₂ , lb/hr	1,663,641	1,689,210	0	71	71	71
SO ₂ , lb/hr	36,638	733	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	19.0	1.0	19.0	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	--	370	44,159	1,023	1,023	718	305	314			400
Frequency, min/day	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous			Continuous
Flow, lb/hr	65,993	228,687	24,928,293	577,250	577,250	364,579	212,671	217,390			200,287
Total SS, lb/hr	65,993	68,606	4,985,659	115,450	115,450	9,114	106,335	106,453			0
Total SS, %	100	30	20	20	20	2.5	50	49			0
Specific gravity	--	1.23	1.13	1.13	1.13	1.01	1.39	1.38			1.00
H ₂ O, lb/hr	0	160,081	19,942,634	461,800	461,800	355,464	106,335	110,937			200,287
CaCO ₃ , lb/hr	58,734	59,058	122,069	2,827	2,827	1,131	1,696	1,711			0
MgCO ₃ , lb/hr	2,640	2,992	132,790	3,075	3,075	1,230	1,845	1,861			0
CaSO ₄ -2H ₂ O, lb/hr	0	142	4,188,157	96,983	96,983	494	96,489	96,495			0
CaSO ₃ -1/2H ₂ O, lb/hr	0	0	0	0	0	0	0	0			0
Fly ash, lb/hr	0	1,463	293,823	6,804	6,804	5,103	1,701	1,767			0
Inerts, lb/hr	4,620	4,951	248,818	5,762	5,762	1,157	4,605	4,620			0
Cl, lb/hr	0	1,225	239,312	5,542	5,542	4,266	1,276	1,331			6
Cl, mg/L	0	7,651	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	1,109	9	322	787	6,657	437	316	651	634	144	1,335
Frequency, min/day	Continuous	Continuous	Continuous	Continuous	Continuous	393	100	36	Continuous	Continuous	Continuous
Flow, lb/hr	560,146	4,719	162,694	397,453	3,758,150	59,727	10,940	8,200	317,545	71,913	668,613
Total SS, lb/hr	8,996	118	2,613	6,383	751,630	0	0	0	0	0	0
Total SS, %	1.6	2.5	1.6	1.6	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	551,150	4,602	160,081	391,069	3,006,520	59,727	10,940	8,200	317,545	71,913	668,613
CaCO ₃ , lb/hr	1,116	15	324	792	18,403	0	0	0	0	0	0
MgCO ₃ , lb/hr	1,214	16	353	861	20,019	0	0	0	0	0	0
CaSO ₄ -2H ₂ O, lb/hr	487	6	142	346	631,400	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	5,037	66	1,463	3,574	44,296	0	0	0	0	0	0
Inerts, lb/hr	1,142	15	332	810	37,511	0	0	0	0	0	0
Cl, lb/hr	4,217	55	1,225	2,992	36,078	1.9	0.4	0.3	10	2.3	21
Cl, mg/L	7,651	12,000	7,651	7,651	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	35,905
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	33.0
Makeup water required, gpm	1,335
Chloride blowdown, gpm	9.3
Gypsum byproduct production (wet basis), tph	106.3

NO.	DATE	DRN	DES	CHK	PDE	APP	REVISIONS & RECORD OF REVIEW		AEP Big Sandy Unit 2 Design Case	
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 4.5 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		Calculation No. 141643.52.0251.1271	