Table 7-5 Summary of X-Ray Diffraction Mineralogy and Abrasion Analyses
EAST CONTRACT
Brightwater Conveyance System

Boring No.	Depth (ft)	Elevation (ft) [a]	USCS	Sample Type	Geologic Unit	X-Ray Diffraction Analysis						Miller Testing [d]		AVS [e]
						Total Clay [b]		Non Clay Minerals Percentage				Miller No.	Mass Loss (mg/hr)	
						%	Clay Minerals [c]	Q	Kf	Pf	Hb			
BRIGHTWATER TUNNEL 1														
E-357	30.0	212.1	SM		Qvt/Qvd	15.2	C, H, I, K	38.0	6.9	30.4	6.3	108	5.914	31.0
E-355	45.0	189.6	SW		Qpfnf	5.9	I, C, K	47.0	1.3	43.0	2.2	41	2.258	25.5
E-353	50.0	181.0	SW		Qpfnf	10.0	C,I,S,K	37.9	1.8	41.6	4.7	132	7.279	
E-352	79.0	152.1	ML		Qpogl	9.8	C, I, K	32.0	2.6	48.0	5.3	75	4.127	3.5
E-350	72.0	151.4	SP		Qpfnf	13.7	C, I, H, K	42.0	2.3	38.0	2.8	41	2.258	21.0
E-349	89.0	143.3	SP		Qpfnf	11.0	C,I,S,K	31.2	3.1	47.1	4.3	75	4.127	
E-343	70.0	131.9	CL		Qpfnl	16.0	C, I, V, K	34.0	0.8	44.0	1.8	20	1.089	20.0
E-339	155.0	136.5	SP		Qpfnf	5.5	C, I, K	47.0	0.5	24.3	22.5	120	6.621	22.5
E-334	104.0	85.5	SM		Qpfnf	20.6	H, S, C, I, K	39.0	3.1	31.2	3.9			18.5
E-517	44.0	83.0	SP-SM		Qal	11.0	C,I,S,K	31.1	2.4	42.7	10.6	146	8.013	

Notes:

a) Vertical datum = Metro. All locations surveyed to +/- 0.1 foot accuracy with the exception of some off alignment borings (noted as scaled on the log) which were estimated.

b) Total clay mineral percentage and clay minerals.

c) Clay minerals - listed in decreasing order of relative abundance from most to least.

d) ASTM G75 - test completed on slurry of 50/50 mix soil / distilled water.

e) AVS - Abrasion Value Cutter Steel.

f) For all Geologic Unit descriptions, see Figure 3-1.

Table 7-5 Summary of X-Ray Diffraction Mineralogy and Abrasion Analyses
CENTRAL CONTRACT
Brightwater Conveyance System

Boring No.	Depth (ft)	Elevation (ft) [a]	USCS	Sample Type	Geologic Unit	X-Ray Diffraction Analysis						Miller Testing [d]		AVS [e]
						Total Clay [b]		Non Clay Minerals Percentage				Miller No.	Mass Loss (mg/hr)	
						%	Clay Minerals [c]	Q	Kf	Pf	Hb			
BRIGHTWATER TUNNEL 2														
E-123	250.0	68.0	SM	Pulverized Powder	Qpfnf	10.8		63.0	3.3	19.9	2.9			
E-125	79.0	81.2	GM		Qpogf	9.9	I,C,K	40.0	4.7	41.0	4.5	240	13.186	
E-221	110.0	87.2	SM		Qpogf	9.5	C,I,K	39.3	1.1	41.0	8.9	67	3.660	
E-329	315.0	50.5	CH		Qpogl	43.1	C, S, I, K	16.6	1.6	31.4	6.8	32	1.762	0.5
E-330	194.0	81.0	ML		Qpfnl	14.0	C,S,I,K	31.4	2.7	42.1	7.0	60	3.314	
BRIGHTWATER TUNNEL 3														
E-116	214.7	112.7	CH	<4 μm Smear	Qpogl	49.7	C, I, K	21.0	1.7	17.0	11.0			
E-116	214.7	112.7	CH	<44 μm Smear	Qpogl	50.0	C, I, K	24.0	2.9	18.0	5.5			
E-119	75.0	91.8	ML		Qpogtm	6.9	C, I, K	21.9	3.0	64.8	3.3	177	9.722	7.5
E-212	165.0	194.8	SM	<4 μm Smear	Qpogt	49.6	C, I	22.0	3.5	18.0	6.9			
E-212	165.0	194.8	SM	<44 μm Smear	Qpogt	50.4	C, I, K, V	23.0	22.0	0.0	5.2			
E-213	143.0	179.6	MH		Qpogl	28.0	C, I, V, K	22.0	1.0	39.0	6.4	47	2.563	0.5
E-216	275.0	119.7	SP		Qpfnf	11.7	C, I, K	41.2	0.7	40.9	5.4	123	6.781	20.5
E-305	300.0	143.4	CL		Qpogl	16.3	C,I,S,K	30.5	3.9	43.1	5.9	42	2.285	
E-309	470.0	119.1	ML		Qpfnl	11.6	C,S,I,K	34.9	1.5	43.7	6.0	53	2.907	
E-315	45.0	110.5	GM		Qpogf	7.0	C, I, K	42.6	0.2	50.2	0.0			
E-318	85.0	93.3	GP		Qpogf	10.0	C, I, K	27.0	1.2	53.0	8.4	243	13.345	4.0
CENTRAL CONTRACT OFF-ALIGNMENT														
N-153	56.0	73.6	SW	Pulverized Powder	Qvrf	5.6		67.6	1.8	17.4	2.3			

Notes:

a) Vertical datum = Metro. All locations surveyed to +/- 0.1 foot accuracy with the exception of some off alignment borings (noted as scaled on the log) which were estimated.

b) Total clay mineral percentage and clay minerals.

c) Clay minerals - listed in decreasing order of relative abundance from most to least.

d) ASTM G75 - test completed on slurry of 50/50 mix soil / distilled water.

e) AVS - Abrasion Value Cutter Steel.

f) For all Geologic Unit descriptions, see Figure 3-1.

Table 7-5 Summary of X-Ray Diffraction Mineralogy and Abrasion Analyses
WEST CONTRACT
Brightwater Conveyance System

Boring No.	Depth (ft)	Elevation (ft) [a]	USCS	Sample Type	Geologic Unit	X-Ray Diffraction Analysis						Miller Testing [d]		AVS [e]
						Total Clay [b]		Non Clay Minerals Percentage				Miller No.	Mass Loss (mg/hr)	
						%	Clay Minerals [c]	Q	Kf	Pf	Hb			
BRIGHTWATER TUNNEL 4														
E-102	175.0	116.2	SW-SM	Pulverized Powder	Qpfnf	13.5	I, C, V, K	56.1	7.8	21.0	1.5			
E-105	383.0	166.0	CH	<4 μm Smear	Qpfnl	49.6	C, I, K, V	20.0	5.0	16.0	8.9			
E-105	383.0	166.0	CH	<44 μm Smear	Qpfnl	50.6	C, I, V	19.0	3.8	19.0	7.8			
E-107	370.0	179.5	GW		Qpfnf	3.8	I, C, K	34.0	4.1	56.7	1.4			
E-107	424.0	125.5	SP		Qpfnf	9.7	I, C, V, K	67.4	3.5	17.4	1.9			
E-110	245.9	198.8	CL	<4 μm Smear	Qpogl	50.3	C, I, K, V	20.0	5.0	16.0	8.9			
E-110	245.9	198.8	CL	<44 μm Smear	Qpogl	50.5	C, I, V	26.0	3.5	16.0	5.2			
E-202	311.0	88.1	SP	Pulverized Powder	Qpfnf	11.2	I, C, V	62.6	5.0	18.9	2.4			
E-208	260.0	191.0	SM		Qpogf	25.2	C, S, I, K	31.2	3.4	33.3	5.7			1.5
E-403	230.0	148.1	SP		Qpfnf	12.2	I, C, K	48.5	1.5	34.3	3.2			26.5
E-409	315.0	181.4	SP-SM		Qpfnf	7.5	C, I, K	42.3	1.3	45.7	3.2			25.5
E-412	195.0	205.7	CH		Qpogl	41.6	C, S, I, K	18.0	2.2	29.0	7.6			1.0

Notes:

a) Vertical datum = Metro. All locations surveyed to +/- 0.1 foot accuracy with the exception of some off alignment borings (noted as scaled on the log) which were estimated.

b) Total clay mineral percentage and clay minerals.

c) Clay minerals - listed in decreasing order of relative abundance from most to least.

d) ASTM G75 - test completed on slurry of 50/50 mix soil / distilled water.

e) AVS - Abrasion Value Cutter Steel.

f) For all Geologic Unit descriptions, see Figure 3-1.