AP42 Section: 11.9

Title: 11.9 Western Surface Coal Mining -

Equation and emission factor work from contractor

Sept. 1995

Note: This material is related to a section in *AP42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

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Western Surface Coal Mines 9/7/95

Emission Equations

Check of AP-42 Table 11.9-2 (english) vs. originating References = **OK**

Emission Factors

Check of AP-42 Table 11.9-4 vs. originating References

• Train Loading from Ref 5	AP-42 = 0.028 lb/ton Ref 5 (p47) mean for both tests = 0.027 lb/ton Ref 5 (p47) Belle Ayr test = 0.028 lb/ton Unable to tell if only Belle Ayr test was used or if it is a rounding difference.
• Topsoil Removal from Ref 4	AP-42 = 0.44 lb/ton Ref 4, Table 5-1 = 0.35 lb/yd^3 No conversion of topsoil from lb/yd^3 to lb/ton found in Ref 4. Back calc = 0.8 tons of topsoil/yd^3
• Scraper Unloading (topsoil) Ref 4.	AP-42 = 0.04 lb/ton Ref 4, Table 5-1= 0.03 lb/yd^3 Back calc = 1.33 tons/yd^3. This is different from above.
• Truck Dump - Bottom dump overburden	Ref 4 states other emissions included in factor. This is not mentioned in AP-42, however it has an E rating.
• Truck Dump - overburden	Ref 4, Mine 5 AP-42 states 0.001Kg/ton it probably is 0.001Kg/Mg
• Table 11.9-4	To be consistent, I would make all the tons under Units either "ton" or "T"

COMPARE OLD SECTION 8.24 w/ NEW SEC. 11.9

AP-42 Equations

— EQUATIONS —

	Ref	Equation	Table 8.24-1 metric	Table 11.9-1 metric	Table 8.24-2 English	Table 11.9-2 English
OK	1 and Muleski	Blasting	none	Muleski update added "A"	none	Muleski update
OK	1	Truck Loading	✓ =	✓	✓ =	✓
OK	1	Bulldozing Overburden	✓ =	✓	✓	Change "C" to "S"
OK	1	Bulldozing Coal	✓ =	✓	✓ =	✓
OK	1	Dragline	✓ =	✓	✓ =	✓
OK	1	Scraper	✓ =	✓		
OK	1	Grading	✓ =	✓	✓ =	✓
OK	1	Vehicle Traffic	✓	none	✓	none
OK	1	Haul Truck	Different →	MULESKI	Changing →	
OK	4	Active Storage Pile	✓ =	✓	✓ =	✓ wind is in ↑ (m/sec)

UNCONTROLLED EMISSION FACTORS

	Table 8.24-4 metric & English	Table 11.9-4 metric & English	Ref
Drill	✓ =	✓	1 ✓ and 4
Topsoil Removal	✓ =	✓	5 ✓ and 4
overburden Replace	✓ =	✓	5 ✓ and 4
Truck loading	✓ =	✓	4
" Train Loading	✓ =	✓	5 and 4
Bottom Dump Truck	✓ =	✓	5 and 4
End Dump Truck	✓ =	✓	4
Scraper Unloading	✓ =	✓	4
Wind Erosion	✓ =	✓	5 ✓

NO DIFFERENCES OTHER THAN THOSE ALREADY DISCUSSED

— TRAIN LOADING Ref ~~B~~ 5 (p.47)

Mean for Both Tests = 0.027

AP-42 chapter 11 = 0.028

Rounding Problem??

— Top Soil Removal (Ref 4)

Table 5-1 Ref 5 = 0.35 lb/yd^3

AP-42 = 0.44 lb/TON

CONVERSION of lbs/yd^3 → lbs/TON

0.8 TONS of TOPSOIL/yd^3 ??

~~→ Bottom Dump~~

- Truck Dump

Bottom Dump - Overburden Reference 4 states 0.002 lb/ton

includes emissions from other sources

— Scraper Unloading - (Ref 4)

Topsoil Conversion of lbs/yd^3 → lbs/TON

1.3 TONS of TOPSOIL/yd^3

AP-42 Emission Factors
Table 11.9-4 - Uncontrolled
Total Particulate

Quality Rating
using as criteria
Update of Fugitive Dust Emission Factors in Ap-42 Section 11.2
July 14, 1987

Test Data for Emission Factor = A

Category	Reference	Sample Method	Sound Methodology	TABLE 4 - Quality Rating Rating	Reason	Final Eq Rating	Current Rating
Drilling							
Overburden	1	Quasi-Stack	Quasi Stack = -1	-2	Code 4	D	B
Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Top Soil Removal							
by Scraper	5	Up/down	OK	-4	Code 8	E	E
^*^	4	Up/down	*** = -1	-4	Code 8	E	D
Overburden Replacement							
	5	Up/down	OK	-2	Code 4	C	C
Truck Loading							
^** Overburden	4	Up/down	*** = -1	-4	Code 8	E	C
Train Loading							
Coal	5	SF6 Tracer	OK	-4	Code 8	E	D
Coal	4	Up/down	*** = -1	-4	Code 8	E	D
Bottom Dump Truck-Unload							
Overburden	4	Up/down	*** = -1	-3	Code 7	E	E
Mine IV, Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Mine III, Coal	4	Up/down	*** = -1	-3	Code 7	E	E
Mine II, Coal	4	Up/down	*** = -1	-3	Code 7	E	E
Mine I, Coal	4	Up/down	*** = -1	-4	Code 8	E	D
Coal	5	SF6 Tracer	OK	-3	Code 6	D	D
End dump Truck-Unload							
Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Scraper Unloading							
Topsoil	4	Up/down	*** = -1	-3	Code 7	E	C
Wind Erosion/Exposed Areas							
Seeded land, stripped & graded overburden	5	Up/down	OK	-2	Code 4	C	C

Ref 1 - MRI/PedCo, 1981
Ref 4 - PedCo, 1978
Ref 5 - TRC, 1981

*** Ref 4 Methodology - No crosswind samples collected. Also, for several sample periods two sets of data were collected on the same test run (page 14, Ref 4)
These tests are not marked, but judging from wind data it occurred in all categories.

^*^ Ref 4, Topsoil Removal - No conversion reported for tons of topsoil/yd^3
Back calculation gives 0.8 tons/yd^3

^** Ref 4, Mine C Truck Loading - No conversion factor reported for tons of overburden/truck. Back calculation gives 64 tons/truck.

AP-42 Emission Factors
Table 11.9-4 - Uncontrolled
Total Particulate

Data Included for Factor Development

Category	Ref	Sample Method	Source	# of Mines	Total # of Tests		# of Tests/mine				
Drilling											
Overburden						Mine	1	2	1W	3	
Outliers??M1,T4;M1W,T11??	1	Quasi-Stack	Table 11-2	2	28		10	-	11	7	
						Mine	A	B	C	D	E
Coal	4	Up/down	Table 4-7	1	2		-	-	-	-	2
Top Soil Removal						Mine	Cord	BA-Sp	BA-S		
by Scraper	5	Up/down	Table 6-2	1	2				2		
						Mine	A	B	C	D	E
???Table 2-1 listed 10 tests???	4	Up/down	Table 4-7	1	5		-	-	-	5	-
Overburden Replacement						Mine	Cord-S	BA-Sp	BA-S		
	5	Up/down	Table 6-1	2	5		2	2	1		
Truck Loading						Mine	A	B	C	D	E
Overburden	4	Up/down	Table 4-7	1	6		-	-	-	-	6
Train Loading						Mine	Cord-F	BA-F			
Coal	5	SF6 Tracer	Table 5-2	2	2		1	1			
						Mine	A	B	C	D	E
Coal	4	Up/down	Table 4-7	1	4		-	-	4	-	-
Bottom Dump Truck-Unload						Mine	A	B	C	D	E
Overburden	4	Up/down	Table 4-7	1	2		-	-	-	-	2
*Coal	4	Up/down	Table 4-5	4	14		6	2	2	4	-
						Mine	Cord-F	BA-W			
Coal	5	SF6 Tracer	Table 5.1	2	3		1	2			
End dump Truck-Unload						Mine	A	B	C	D	E
*Coal	4	Up/down	Table 4-5	1	4		-	-	-	-	4
Scraper Unloading						Mine	A	B	C	D	E
Topsoil	4	Up/down	Table 4-7	1	5		-	-	-	5	-
Wind Erosion/Exposed Areas											
Seeded land, stripped &						Mine	Cord-Sp	Cord-S	BA-Sp	BA-S	
graded overburden	5	Up/down	Table 7.1	2	18		4	6	4	4	

* Assume Mine E, Ref 4 used only End-Dump Trucks for coal
There is no discussion in report where data for End-Dump Trucks originates

Ref 1 - MRI/PedCo, 1981
Ref 4 - PedCo, 1978
Ref 5 - TRC, 1981

Cord = Cordero Mine
BA = Belle Ayr Mine
W = winter
Sp = spring
S = summer
F = fall
Example: BA-Sp = Belle Ayr, Spring

AP-42 Equations
Table 11.9-2 - Uncontrolled

Quality Rating
using as criteria
Update of Fugitive Dust Emission Factors in Ap-42 Section 11.2
July 14, 1987

Test Data for Emission Factor Equation= A

Equation		Sample Method	Sound Methodology	TABLE 4 - Quality Rating Rating	Reason	Final Eq Rating	Current Rating
^*^ Blasting		Modified	ballon profile area				
	TSP	Exposure	-1	0	meets code 1	B	C
	10 um		-1	0	meets code 1	B	
^Truck Loading		Up-down					
	TSP		ok	-1	only 2 sites w/ >3 tests	B	B
	15 um		ok	-1	only 2 sites w/ >3 tests	B	
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B	
^Bulldozing Overburden		Up-down	Area source				
	TSP		-1	0	meets code 1	B	B
	15 um		-1	-1	13 tests<(9+3p); p=2	C	
	2.5 um*		-1	-1	13 tests<(9+3p); p=2	C	
^Bulldozing Coal		Up-down	Area source				
	TSP		-1	-1	11 tests<(9+3p); p=2	C	B
	15 um		-1	-1	12 tests<(9+3p); p=2	C	
	2.5 um*		-1	-1	12 tests<(9+3p); p=2	C	
^Dragline		Up-down					
	TSP		ok	0	meets code 1	A	B
	15 um		ok	0	meets code 1	A	
	2.5 um*		ok	0	meets code 1	A	
^Scraper		Exposure					
	TSP		ok	-1	only 2 sites w/ >3 tests	B	A
	15 um		ok	-2	only 1 site w/ >3 tests	C	
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B	
^Grading		Exposure					
	TSP		ok	-2	only 1 site w/ >3 tests	C	B
	15 um		ok	-2	only 1 site w/ >3 tests	C	
	2.5 um*		ok	-2	only 1 site w/ >3 tests	C	
^Vehicle Traffic		Exposure					
	TSP		ok	-1	10 tests<(9+3p); p=1	B	B
	15 um		ok	-1	10 tests<(9+3p); p=1	B	
	2.5 um*		ok	-1	10 tests<(9+3p); p=1	B	
^Haul Truck		Exp and					
	TSP	Up-down	ok	0	meets code 1	A	A
	15 um		ok	0	meets code 1	A	
	2.5 um*		ok	0	meets code 1	A	
^^Active Storage Pile		Up-down	No Cross-Wind Sample				
			only in-line				
	TSP		-1	0	meets code 1	B	C
	15 um		N/A	N/A	N/A	N/A	
	2.5 um		N/A	N/A	N/A	N/A	

* Assumed 2.5um test data same as TSP data since report lacked discussion
^ Reference 1 - MRI/Pedco, July 1981
^^ Reference 4 - Pedco, Febuary 1978
^*^ Blasting - Data from Ref 1 and Equation development by MRI, 1987.

AP-42 Equations
Table 11.9-2 - Uncontrolled

Data Included for Equation Development

Equation		Total # of Tests Table 13-1	Sample Method	Source	# of Mines	Total # of Tests	# of Tests/mine Mine 1	Mine 2	ine 1W	Mine 3
^Blasting		18	Modified	Table 9-1	3	18	5	6	-	7
	TSP		Exposure	Table 13-3	3	18	5	6	-	7
	10 um				3	10um factor ref is Materials Handling				
^Truck Loading		25	Up-down	p. 8-1	3	25	2	8	-	15
Otlir?M3,T13?	TSP			Table 13-3	3	24	2	8	-	14
	15 um			Table 13-6	3	25	2	8	-	15
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Bulldozing		27	Up-down	p. 8-1	3	15	4	7	-	4
Overburden	TSP	(Both coal &		Table 13-3	3	15	4	7	-	4
M1,T4 no data; Otlir?M3,T4over?	15 um	overburden)		Table 13-6	3	13	3	7	-	3
				& 8-13						
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Bulldozing,. Coal		27	Up-down	p. 8-1	3	12	4	3	-	5
Otlir?M1,T2coal?	TSP	(Both coal &		Table 13-3	3	11	3	3	-	5
	15 um	overburden)		Table 13-6	3	12	4	3	-	5
				& 8-13						
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Dragline		19	Up-down	p.8-1	3	19	6	5	-	8
Otlir?M1,T6?	TSP			Table 13-3	3	18	5	5	-	8
	15 um			Table 13-6	3	19	6	5	-	8
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Scraper		15	Exposure	p.7-1	3	15	5	6	2	2
	TSP			Table 13-3	3	15	5	6	2	2
Low Wind?J-2,J-3,J-4,J-5?	15 um			Table 13-6	3	11	1	6	2	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Grading		7	Exposure	p. 7-1	2	7	0	5	0	2
	TSP			Table 13-3	2	7	0	5	0	2
	15 um			Table 13-6	2	7	0	5	0	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Vehicle Traffic		10	Exposure	p. 7-1	3	10	3	4	0	3
	TSP			Table 13-3	3	10	3	4	0	3
	15 um			Table 13-6	3	10	3	4	0	3
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
**^Haul Truck		27	Exposure +	7-1 + 8-	3	19+11=30	6+5	6+0	3+6	4+0
Low Wind?J-6,J-12,J-21?;Remove K-7,L-	TSP		Up-down	Table 13-3	3	?25?	3+5	5+0	2+6	4+0
Low Wind?J-6,J-12,J-21?;Remove K-7,L-	15 um			Table 13-6	3	?25?	3+5	5+0	2+6	4+0
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^^Active Storage							Mine A	Mine B	Mine C	Mine D
Pile		N/A	Up-Down	Table 2-1	4	22	6	8	4	4
	TSP			Table 4-6	3	16	6	6	0	4
	15 um				N/A	N/A	N/A	N/A	N/A	N/A
	2.5 um				N/A	N/A	N/A	N/A	N/A	N/A

* Mine 1W = winter sampling period at Mine 1
^ Reference 1 - MRI/Pedco, July 1981
^^ Reference 4 - Pedco, Febuary 1978
Otlir = Outlier
Abbreviation: M3,T13 = Mine 3, Test 13
** # of samples reported in Table 13-1 does not match # of samples reported on pages 7-1and 8-1. Unsure of # of samples used for equation
Assumed all 11 up/down wind tests are uncontrolled from note on Table 13-5
Table 3-8 lists 35 tests performed w/ 26 of those uncontrolled.

Bulletin — Sect. 13.2 Fugitive Dust

~~PART~~ A

Coal Truck Loading or

1 yd³ overburden = 1½ ton

- Coal Loading
- Draglines

- Get Emission factors Equation for Material Handling

predicted vs observed

- TSP, 15, 2.5 Mm

- Use General Materials Handling 13.2.5 AP-42 western SCM equations

For each EF # of Mines Tested
# of Tests/mine

$$1.0\ m/s \times \frac{60\ sec}{min} \times \frac{60\ min}{hr} \times \frac{3.281\ ft}{m} \times \frac{1}{5280\ ft/mile}$$

$$1\ m/s = 2.237\ mph$$

$$\frac{1.16}{(m)^{1.2}}$$

Material Handling 13.2.4

$$E = k(0.0032)\frac{\left(\frac{u}{5}\right)^{1.3}}{\left(\frac{m}{2}\right)^{1.4}}\ lb/ton$$

15 μm X 0.48
2.5 μm X 0.11

Save as ASCII

— $\frac{\text{Predicted}}{\text{Observed}}$

— ln of $\frac{\text{Pred}}{\text{Observ}}$

— mean + std Devia

subs for different means
& Grand total

Sample std dev

population std dev

Carol

Table 11.9-2

	EQUATION	# of MINES	Quality Rating # of TESTS		Equipment	# of Test Sites	# of Tests
modified exposure	Blasting						
up/down	Coal Loading						
	Bull dozing						
	Dragline						
exposure	Scraper - Line	4 sampling Heads, vertical		upwind monitors 1- Dichotomous 1- Hi Vol	✓	3	
	Grading - Line				✓	2	
	Vehicle traffic - Line				✓	3	
exp + up/down	Haul Truck - Line				✓	3	

(0) (-1)

1p = 12 or 3

2p = 15 or 6

3p = 18 or 9

Tom Lapp
looking for Diagram of FTIR in field

Western Surface Coal Mines
COAL LOADING

*13.2.4-Equa1 = AP-42 Section 13.2.4 - Aggregate Handling and Storage Piles
**Table 11.9-2 = AP-42 Section 11.9 - Western Surface Coal Mining

Test No.	Test Moisture Content (%)	Mean Wind Speed (mph)	# of Samples for TSP	MRI/PedCo Table 8-6 All data sets Observed (avg) TSP (30um)	MRI/PedCo Table 8-11 w/o outlyers Observed (avg) TSP (30um)	*13.2.4 - Equa1 Predicted TSP (30um)	*Table 11.9-2 Predicted TSP (30um)	# of Samples IP & FP	MRI/PedCo Table 8-12 Observed (avg) 15 um (IP)	*13.2.4 - Equa1 Predicted 15 um (IP)	**Table 11.9-2 Predicted 15 um (IP)	MRI/PedCo Table 8-12 Observed (avg) 2.5 um(FP)	*13.2.4 - Equa1 Predicted 2.5 um(FP)	*Table 11.9-2 Predicted 2.5 um(FP)	Unit
Mine 1 , 1	22	2.237	8	0.00690	0.00690	0.00003	0.02842	5	0.00200	0.00002	0.00737	0.00010	0.000004	0.00054	lbs/ton
2	22	2.237	8	0.01260	0.01000	0.00003	0.02842	5	0.00300	0.00002	0.00737	0.00020	0.000004	0.00054	lbs/ton
Mine 2, 1	38	9.619	8	0.04850	0.04400	0.00009	0.01475	4	0.00500	0.00006	0.00451	0.00020	0.00001	0.00028	lbs/ton
2	38	9.619	5	0.07820	0.06800	0.00009	0.01475	4	0.02200	0.00006	0.00451	0.00080	0.00001	0.00028	lbs/ton
3	38	6.487	8	0.01850	0.01470	0.00005	0.01475	4	0.00300	0.00003	0.00451	0.00010	0.00001	0.00028	lbs/ton
4	38	5.816	8	0.01500	0.01340	0.00005	0.01475	4	0.00500	0.00003	0.00451	0.00180	0.00001	0.00028	lbs/ton
5	38	4.698	9	0.00990	0.00990	0.00004	0.01475	4	0.00400	0.00002	0.00451	0.00070	0.00001	0.00028	lbs/ton
6	38	10.738	8	0.02280	0.02280	0.00010	0.01475	4	0.01700	0.00007	0.00451	0.00290	0.00002	0.00028	lbs/ton
7	38	10.961	7	0.02060	0.02060	0.00011	0.01475	4	0.00800	0.00007	0.00451	0.00080	0.00002	0.00028	lbs/ton
8	38	11.185	8	0.00650	0.00650	0.00011	0.01475	3	0.00400	0.00007	0.00451	0.00020	0.00002	0.00028	lbs/ton
Mine 3, 1	11.9	3.803	8	0.08090	0.12000	0.00014	0.05940	5	0.04400	0.00009	0.01281	0.00380	0.00002	0.00113	lbs/ton
2	11.9	2.237	9	0.05140	0.08200	0.00007	0.05940	2	0.00800	0.00004	0.01281	0.00050	0.00001	0.00113	lbs/ton
3	11.9	2.237	9	0.05120	0.05100	0.00007	0.05940	3	0.01600	0.00004	0.01281	0.00220	0.00001	0.00113	lbs/ton
4	18	2.461	7	0.01170	0.01050	0.00004	0.03615	4	0.00200	0.00003	0.00883	0.00020	0.00001	0.00069	lbs/ton
5	18	2.461	7	0.01010	0.00870	0.00004	0.03615	4	0.00100	0.00003	0.00883	0.00010	0.00001	0.00069	lbs/ton
6	18	6.487	7	0.01610	0.01400	0.00015	0.03615	4	0.00600	0.00010	0.00883	0.00010	0.00002	0.00069	lbs/ton
7	12.2	2.908	6	0.03020	0.03500	0.00009	0.05765	3	0.00800	0.00006	0.01253	0.00120	0.00001	0.00110	lbs/ton
8	11.1	2.237	6	0.06900	0.06200	0.00008	0.06458	4	0.01200	0.00005	0.01364	0.00120	0.00001	0.00123	lbs/ton
9	11.1	2.908	6	0.05800	0.05800	0.00011	0.06458	4	0.01400	0.00007	0.01364	0.00050	0.00002	0.00123	lbs/ton
10	11.1	2.684	6	0.17720	0.19300	0.00010	0.06458	4	0.03800	0.00006	0.01364	0.00330	0.00001	0.00123	lbs/ton
11	11.1	4.25	6	0.09500	0.09500	0.00017	0.06458	4	0.02000	0.00011	0.01364	0.00050	0.00003	0.00123	lbs/ton
12	6.6	4.474	6	0.04770	0.04200	0.00039	0.12051	4	0.01100	0.00025	0.02177	0.00210	0.00006	0.00229	lbs/ton
13	6.6	4.25	6	0.97020	1.09000	0.00036	0.12051	4	0.37800	0.00023	0.02177	0.00540	0.00005	0.00229	lbs/ton
14	6.6	4.027	6	0.32550	0.35800	0.00034	0.12051	4	0.12100	0.00022	0.02177	0.00350	0.00005	0.00229	lbs/ton
15	6.6	5.592	6	0.18820	0.188	0.00051	0.12051	N/A	N/A	0.00033	0.02177	N/A	0.00008	0.00229	lbs/ton
# of Tests=25															
AVERAGE	**20.8**	**5.1**		**0.09688**	**0.10496**	**0.00013**	**0.05038**		**0.03133**	**0.00009**	**0.01079**	**0.00135**	**0.00002**	**0.00096**	lbs/ton

COAL LOADING
Predicted vs. Observed

Test No.	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed (all data) TSP (30um)	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed (w/o outlyers) TSP (30um)	MRI/PedCo Predicted (Table11.9-2) vs. Observed (all data) TSP (30um)	MRI/PedCo Predicted (Table11.9-2) vs. Observed (w/o outlyers) TSP (30um)	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed 15um (IP)	MRI/PedCo Predicted (Table11.9-2) vs. Observed 15um (IP)	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed 2.5um (IP)	MRI/PedCo Predicted (Table11.9-2) vs. Observed 2.5um (IP)
Mine 1 , 1	0.004	0.004	4.118	4.118	0.009	3.684	0.043	5.399
2	0.002	0.003	2.255	2.842	0.006	2.456	0.022	2.699
Mine 2, 1	0.002	0.002	0.304	0.335	0.012	0.901	0.067	1.401
2	0.001	0.001	0.189	0.217	0.003	0.205	0.017	0.350
3	0.003	0.004	0.797	1.003	0.012	1.502	0.080	2.802
4	0.003	0.003	0.983	1.101	0.006	0.901	0.004	0.156
5	0.004	0.004	1.490	1.490	0.006	1.126	0.008	0.400
6	0.005	0.005	0.647	0.647	0.004	0.265	0.005	0.097
7	0.005	0.005	0.716	0.716	0.009	0.563	0.020	0.350
8	0.017	0.017	2.269	2.269	0.018	1.126	0.081	1.401
Mine 3, 1	0.002	0.001	0.734	0.495	0.002	0.291	0.005	0.297
2	0.001	0.001	1.156	0.724	0.006	1.601	0.020	2.257
3	0.001	0.001	1.160	1.165	0.003	0.801	0.005	0.513
4	0.004	0.004	3.090	3.443	0.014	4.413	0.032	3.434
5	0.004	0.005	3.579	4.155	0.028	8.827	0.065	6.869
6	0.010	0.011	2.245	2.582	0.017	1.471	0.228	6.869
7	0.003	0.003	1.909	1.647	0.008	1.566	0.012	0.913
8	0.001	0.001	0.936	1.042	0.004	1.137	0.009	1.022
9	0.002	0.002	1.113	1.113	0.005	0.974	0.032	2.454
10	0.001	0.000	0.364	0.335	0.002	0.359	0.004	0.372
11	0.002	0.002	0.680	0.680	0.006	0.682	0.052	2.454
12	0.008	0.009	2.526	2.869	0.023	1.980	0.027	1.090
13	0.000	0.000	0.124	0.111	0.001	0.058	0.010	0.424
14	0.001	0.001	0.370	0.337	0.002	0.180	0.014	0.654
15	0.003	0.003	0.640	0.641	N/A	N/A	N/A	N/A
Geometric Mean								
Mine 1	0.0031	0.0035	3.0475	3.4208	0.0077	3.0081	0.0305	3.8176
Stnd Dev.	1.53	1.30	1.53	1.30	1.33	1.33	1.63	1.63
Mine 2	0.0036	0.0039	0.7176	0.7716	0.0072	0.6829	0.0196	0.5025
Stnd Dev.	2.20	2.10	2.23	2.16	1.87	2.06	3.46	3.20
Mine 3	0.0020	0.0019	0.9927	0.9494	0.0051	0.8869	0.0188	1.2897
Stnd Dev.	2.46	2.71	2.49	2.72	5.65	3.47	4.44	2.74
All 25 Tests	**0.0025**	**0.0025**	**0.9788**	**0.9844**	**0.0059**	**0.9000**	**0.0199**	**1.0311**
Stnd Dev.	**2.37**	**2.54**	**2.48**	**2.59**	**3.92**	**3.00**	**3.79**	**3.18**

Western Surface Coal Mines
DRAGLINE

*13.2.4-Equa1 = AP-42 Section 13.2.4 - Aggregate Handling and Storage Piles (1yd^3 of overburden= 1.5 tons)
**Table 11.9-2 = AP-42 Section 11.9 - Western Surface Coal Mining

Test No.	Test Moisture Content (%)	Drop Dist. (ft.)	Mean Wind Speed (mph)	# of Samples for TSP	MRI/PedCo Table 8-6 All data sets Observed (avg) TSP (30um)	MRI/PedCo Table 8-11 w/o outlyers Observed (avg) TSP (30um)	*13.2.4 - Equa1 Predicted TSP (30um)	Table 11.9-2 Predicted TSP (30um)	# of Samples IP & FP	MRI/PedCo Table 8-15 Observed (avg) 15 um (IP)	*13.2.4 - Equa1 Predicted 15 um (IP)	Table 11.9-2 Predicted 15 um (IP)	MRI/PedCo Table 8-15 Observed (avg) 2.5 um (FP)	*13.2.4 - Equa1 Predicted 2.5 um (FP)	*Table 11.9-2 Predicted 2.5 um (FP)	Unit
Mine 1 , 1	8.4	10	5.37	9	0.0254	0.0240	0.0005	0.0140	5	0.0060	0.0003	0.0056	0.0009	0.0001	0.0002	lbs/yd^3
2	8.4	32	6.93	9	0.0333	0.0290	0.0007	0.0502	5	0.0120	0.0005	0.0125	0.0002	0.0001	0.0009	lbs/yd^3
3	8.4	20	8.72	9	0.0046	0.0040	0.0010	0.0299	5	0.0020	0.0006	0.0090	0.0001	0.0001	0.0005	lbs/yd^3
4	8.4	28	4.47	9	0.0383	0.0480	0.0004	0.0433	5	0.0060	0.0003	0.0114	0.0001	0.0001	0.0007	lbs/yd^3
5	8.4	30	2.24	9	0.0670	0.0700	0.0002	0.0467	5	0.0160	0.0001	0.0120	0.0009	0.0000	0.0008	lbs/yd^3
6	8.4	82	4.03	8	0.2690	0.4000	0.0004	0.1413	5	0.0610	0.0002	0.0242	0.0087	0.0001	0.0024	lbs/yd^3
Mine 3, 1	15.6	40	10.51	7	0.0417	0.0420	0.0005	0.0533	3	0.0030	0.0003	0.0122	0.0002	0.0001	0.0009	lbs/yd^3
2	15.6	40	9.17	9	0.0260	0.0260	0.0004	0.0533	4	0.0070	0.0003	0.0122	0.0008	0.0001	0.0009	lbs/yd^3
3	15.6	5	8.05	9	0.0027	0.0030	0.0004	0.0054	4	0.0010	0.0002	0.0028	0.0003	0.0001	0.0001	lbs/yd^3
4	16.3	10	8.72	9	0.0171	0.0160	0.0004	0.0114	4	0.0150	0.0003	0.0046	0.0010	0.0001	0.0002	lbs/yd^3
5	14.9	30	6.04	9	0.0371	0.0680	0.0003	0.0394	4	0.0350	0.0002	0.0101	0.0110	0.0000	0.0007	lbs/yd^3
Mine 3, 1	2.7	100	2.24	8	0.1314	0.1840	0.0008	0.2471	4	0.0180	0.0005	0.0392	0.0017	0.0001	0.0042	lbs/yd^3
2	2.7	60	4.25	8	0.1504	0.1330	0.0019	0.1409	4	0.0160	0.0012	0.0274	0.0011	0.0003	0.0024	lbs/yd^3
3	2.7	100	4.92	8	0.1985	0.1920	0.0023	0.2471	3	0.0580	0.0015	0.0392	0.0060	0.0003	0.0042	lbs/yd^3
4	1.2	30	4.70	8	0.0966	0.0990	0.0067	0.0838	4	0.0430	0.0043	0.0215	0.0050	0.0010	0.0014	lbs/yd^3
5	0.2	10	13.87	8	0.0598	0.0600	0.3361	0.0428	4	0.0380	0.2180	0.0171	0.0001	0.0500	0.0007	lbs/yd^3
6	0.2	20	16.55	9	0.0830	0.0680	0.4230	0.0918	4	0.0280	0.2744	0.0277	0.0017	0.0629	0.0016	lbs/yd^3
7	0.2	25	9.17	9	0.1037	0.1040	0.1963	0.1174	4	0.0240	0.1274	0.0324	0.0023	0.0292	0.0020	lbs/yd^3
8	0.2	25	8.05	9	0.1046	0.1050	0.1658	0.1174	4	0.0170	0.1075	0.0324	0.0004	0.0246	0.0020	lbs/yd^3
# of Tests =19																
	7.3	**36.7**	**7.3**		**0.0784**	**0.0882**	**0.0599**	**0.5481**		**0.0216**	**0.0389**	**0.0186**	**0.0022**	**0.0089**	**0.0014**	**lbs/yd^3**

DRAGLINE
Predicted vs. Observed

Test No.	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed (all data) TSP (30um)	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed (w/o outlyers) TSP (30um)	MRI/PedCo Predicted (Table11.9-2) vs. Observed (all data) TSP (30um)	MRI/PedCo Predicted (Table11.9-2) vs. Observed (w/o outlyers) TSP (30um)	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed 15um (IP)	MRI/PedCo Predicted (Table11.9-2) vs. Observed 15um (IP)	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed 2.5um (IP)	MRI/PedCo Predicted (Table11.9-2) vs. Observed 2.5um (IP)
Mine 1 , 1	0.021	0.550	0.022	0.582	0.056	0.926	0.086	0.264
2	0.022	1.507	0.025	1.731	0.039	1.046	0.542	4.266
3	0.214	6.506	0.246	7.482	0.319	4.515	1.460	5.088
4	0.011	1.131	0.009	0.903	0.045	1.905	0.613	7.366
5	0.002	0.698	0.002	0.668	0.007	0.750	0.028	0.883
6	0.001	0.525	0.001	0.353	0.004	0.397	0.006	0.276
Mine 3, 1	0.013	1.278	0.013	1.269	0.114	4.061	0.391	4.529
2	0.017	2.049	0.017	2.049	0.041	1.740	0.082	1.132
3	0.138	2.003	0.124	1.803	0.241	2.842	0.184	0.307
4	0.023	0.669	0.024	0.715	0.017	0.304	0.058	0.195
5	0.007	1.061	0.004	0.579	0.005	0.289	0.004	0.061
Mine 3, 1	0.006	1.880	0.004	1.343	0.030	2.175	0.072	2.471
2	0.013	0.937	0.014	1.059	0.077	1.712	0.255	2.177
3	0.012	1.245	0.012	1.287	0.026	0.675	0.057	0.700
4	0.069	0.868	0.068	0.847	0.101	0.500	0.199	0.285
5	5.621	0.716	5.602	0.714	5.737	0.449	499.629	7.284
6	5.097	1.107	6.221	1.351	9.800	0.990	36.991	0.918
7	1.893	1.132	1.888	1.129	5.306	1.350	12.689	0.868
8	1.585	1.122	1.579	1.118	6.326	1.906	61.611	4.989
Geometric Mean								
Mine 1	0.012	1.143	0.012	1.082	0.031	1.164	0.139	1.475
Stnd Dev.	6.059	2.578	7.183	2.953	4.911	2.306	8.204	4.491
Mine 2	0.022	1.301	0.019	1.142	0.039	1.120	0.066	0.451
Stnd Dev.	3.040	1.597	3.467	1.746	4.614	3.495	5.901	5.265
Mine 3	0.219	1.085	0.219	1.083	0.569	1.046	2.718	1.537
Stnd Dev.	18.609	1.330	19.972	1.255	14.328	1.852	33.790	2.952
All 19 Tests	0.048	1.157	0.046	1.098	0.112	1.101	0.399	1.098
Stnd Dev.	12.350	1.784	13.661	1.905	11.626	2.297	22.367	4.106

Table ___. APPARENT EMISSION RATES FOR BLASTING

Mine	Sampling period	Apparent emission rate, lb/blast						
		At 1.2 m ht				At 2.4 m ht		
Coal blast								
	Dist	100m	108.5m	117m	125.5m	100m	108.5m	117m
B	1[a]							
	2[a]							
C	1	17.8	17.7	19.5		6.6[b]	21.5	16.0
	2	17.1	20.5	17.4	18.5			
D	1	69.1	72.1	90.6		37.6	44.4	[c]
	2	58.5	50.9	42.5	34.0			
	Dist	200m	208.5m	217m		200m	208.5m	217m
E	1	45.3	46.0	32.2		36.6	40.7	35.0
	Dist	100m	108.5m	117m	125.5m			
	2	24.2	33.9	24.6	30.1			
Overburden blast								
	Dist	100m	110m	120m				
A	1	1323	849	559				
	Dist	30m	38.5m	47m	55.5m	30m	38.5m	47m
C	1	10.2	13.1	11.0	13.6			
	2	11.2	9.4	11.3		8.8	6.0	9.5
	Dist	67m	73m	80m	86m	67m	73m	80m
E	1	52.9	79.3	79.2	46.8			18.0
	2	64.2	56.1	64.0		20.4	23.3	

[a] Improper sampling configuration—samplers on highwall above blast area.
[b] Inconsistent data point; removed as an outlier.
[c] Sampler malfunction.

Table ____. APPARENT EMISSION RATES FOR TRUCK DUMP

Mine	Sampling period	Apparent emission rate, lb/truck						
		At 1.2 m ht				At 2.4 m ht		
	Dist	10m	20m	30m	40m	10m	20m	30m
A	1	0.32	0.36	0.55				
	2	0.55	0.83	0.65				
	3	1.33	1.44	0.73				
	4	0.41	0.22	0.51				
	5	0.33	0.30	0.45				
	6	0.03	0.03	0.11				
B	1	2.7	2.0	2.1	2.1			
	2	2.5	1.8	2.2		2.7	0.90	1.7
	Dist	30m	38.5m	47m	55.5m	30m	38.5m	47m
C	1[a]							
	2[a]							
	3	0.26	0.42	0.71		0.2[b]	0.41	0.35
	4	0.42	0.44	0.76	0.80[c]			
	Dist	20m	26m	32m	38m	20m	26m	38m
D	1	2.2	4.4	6.3	5.7			
	2	0.9	1.2	1.8		1.8	2.1	2.0
	3[d]	5.8	9.5	14.0		7.8	9.4	7.2
	4[d]	7.1	11.6	15.3	12.7			
	5	3.6	6.3	8.0	7.4			
	6	2.7	3.4	3.2		2.1	3.3	4.0
	Dist	8.5m	17m	25.5m	34m	8.5m	17m	25.5m
E	1	0.19	0.49	0.60		0.20	0.45	0.61
	2	0.27	0.86	0.81	1.3[c]			
	3	0.19	0.43	0.34		0.25	0.31	1.7
	4	0.70	0.88	2.0	2.5[c]			

[a] Samplers not in plume.
[b] Data outlier—more than 3 std. dev. away from mean.
[c] Insufficient sample set.
[d] Atypical operation (only two trucks in 80 minutes); not used to estimate emission factor.

Table ____. APPARENT EMISSION RATES FOR STORAGE PILE

Mine	Sampling period	Apparent emission rate, lb/truck						
		At 1.2 m ht				At 2.4 m ht		
	Dist	175m	190m	205m	40m	30m	190m	205m
A	1	17.7	33.1	25.4		20.9	30.4	30.1
	Dist							
	2	9.3	5.4	10.8		8.1	8.2	7.8
	3	0.2	0.7	1.2		1.0	0.1	0
	4	0.9	0.9	1.4		1.7	0.4	1.5
	5	21.3	14.5	20.3		13.7	17.4	15.8
	6	0.4	2.1	0		0.5	1.0	1.1
	Dist	25m	40m	55m	70m	25m	40m	55m
B	1	64.5	105.7	133.0	161.4			
	2	88.5	100.7	95.0		58.4	72.5	115.1
	3	63.6	58.5	69.3	97.2			
	4	41.7	57.9	75.9		16.2	47.4	55.5
	Dist	35m	45m	55m	65m	35m	45m	55m
	5	9.6	13.4	14.6	12.5			
	6	12.9	10.4	9.3		6.0	10.7	7.8
	Dist	30m	40m	50m	60m	30m	40m	50m
	7[a]	50.3	79.9	97.6	113.0			
	8[a]	43.0	41.7	91.5		28.4	35.4	51.3
	Dist	60m	70m	80m	90m	60m	70m	80m
C	1[a]	50.6	52.8	106.3		38.3	41.0	56.3
	2[a]	250.9	322.2	444.4	554.1			
	3[a]	147.3	169.9	173.4		45.6	139.0	204.3
	4[a]	62.7	25.2	160.0	130.7			
	Dist	25m	33.5m	42m	50.5m	25m	33.5m	42m
D	1	2.8	1.5	5.0		0	1.3	1.5
	2	0.8	2.1	1.9	0.2			
	3	3.1	3.5	6.9		2.2	4.1	2.6
	4	4.3	5.8	6.4	0			

[a] Severe interference from other sources; not used in estimating emission factor.

Table ____. APPARENT EMISSION RATES FOR MISCELLANEOUS OPERATIONS

Mine	Sampling period	At 1.2 m ht			At 2.4 m ht			
Coal drilling, lb/hole								
	Dist	5m	13.5m	22.m	30.5m	5m	13.5m	22m
E	1	0.20	0.30	0.28	0.32[a]			
	2	0.16	0.17	0.07		0.55	0.04	0
Overburden drilling, lb/hole								
	Dist	5.6m	15m	24.4m	33.9m	5.6m	15m	24.4m
A	1[b]	0.004	0.41	1.4		1.5	0.90	2.0
C	1	0.13	0.86	3.6	7.2[a]			
	2							
Overburden shovel, lb/truck								
	Dist	20m	25m	30m	35m	20m	25m	30m
E	1	2.6	1.5	2.2		2.8	3.4	3.4
	2	2.5	4.2	5.0	7.0			
	3	1.0	0.94	1.0		0.57	0.70	1.0
	4	1.0	0.82	1.8	1.6			
	5	1.9	1.6	1.5		1.5	1.9	2.4
	6	2.1	2.6	5.7	5.3			
Fly-ash dump, lb/hr								
	Dist	10m	20m	30m		10m	20m	30m
A	1[c]							
	2	3.7	4.7	4.7		2.1	1.8	3.6
	3	2.4	1.7	3.9				
Overburden dump, lb/truck								
	Dist	15m	20m	25m	30m	15m	20m	25m
E	1	0.29	0.22	0.27		0.25	0.16	0.14
	2	0.23	0.17	0.27	0.45[a]			
	3[b]							
	4[b]							
Train loading, lb/car								
	Dist	12m	20.5	29m	37.5m	12m	20.5m	29m
C	1	0.025	0.004	0.027		0.008	0.004	0.001
	2	0.006	0.016	0.014	0.004			
	3	0.024	0.014	0.045		0.011	0.010	0.27
	4	0.010	0.014	0.012	0.016			
	1[d]							
	2[d]							
	3[d]							
	4[d]							
	5[d]							

Mine	Sampling period	At 1.2 m ht			At 2.4 m ht			
Topsoil remover-scraper, lb/VMT Dist		30m	34m	38m	42m	30m	34m	38m
D	1	75.3	110.4	81.3		20.6	97.3	71.4
	2	368.9	176.2	438.7	554.7			
	3	731.2	767.8	1154.7		357.8	480.5	536.7
	4	172.5	260.3	228.8	321.2			
	5	217.3	289.0	138.9	256.3			
Topsoil dumping-scraper, lb/VMT Dist		5m	10m	15m	20m	5m	10m	15m
D	1	28.1	30.0	20.7	26.4			
	2	21.4	15.3	21.7		5.5	23.3	17.9
	3	33.5	29.8	20.3	27.0			
	4	13.1	10.4	7.4		22.1	15.6	11.9
	5	38.6	32.2	26.2	31.0			
Front-end loader, lb/bucket Dist		80m	88m	97m	105m			
D	1	0.4	0.6	0.8	0.7			

[a] Insufficient sample set.
[b] Samplers out of plume.
[c] Severe interference from other sources.
[d] Data voided because of inadequate wind measurements, air turbulence near source and samplers, and excessive reentrained material.

Table ____. OVERBURDEN REPLACEMENT EMISSION FACTOR DATA

Test type and location	Q_o (lb/ton)
Overburden Replacement Cordero—Winter	0.00028 0.0045 0.0050 0.0028 0.0042 0.0014 0.0072 0.029 0.0009 0.0005 0.0023 0.0117
Mean for Test Standard Deviation	0.0060 0.008
Overburden Replacement Cordero—Summer	0.023 0.015 0.017 0.0089 0.013 0.016 0.029 0.024 0.019 0.014 0.0064 0.0087
Mean for Test Standard Deviation	0.016 0.007
Overburden Replacement Belle Ayr—Spring	0.012 0.038 0.016 0.004 0.027 0.0097 0.011 0.0019
Mean for Test Standard Deviation	0.015 0 . 0 1 2

Test type and location	Q_o (lb/ton)
Overburden Replacement Belle Ayr—Summer	0.020 0.0023 0.0016 0.010 0.0178
Mean for Test Standard Deviation	0.010 0.008
Overburden Replacement Summary	
Mean for Test Standard Deviation	0.012 0.0095

Table _____. TOPSOIL REMOVAL EMISSION FACTOR DATA

Test Type and Location	Q° (lb/ton)
Topsoil Removal Belle Ayr—Summer	0.148 0.050 0.015 0.047 0.071 0.084 0.027 0.027 0.55
Topsoil Removal Summary	
Mean for Test Standard Deviation	0.058 0.04

Table ____. COAL DUMPING EMISSION FACTOR DATA

Test Type and Location	Q° (lb/ton)
Coal Dumping Cordero—Fall (Baghouse Not Working)	0.017 0.007 0.024
Mean for Test Standard Deviation	0.016 0.009
Coal Dumping Cordero—Summer (Baghouse Operational)	0.0085 0.0195 0.0110 0.0015 0.0045 0.0036
	0.0066 0.0160 0.0080 0.0039 0.0320 0.0092
	0.066 0.046 0.076 0.032 0.018
	0.105 0.141 0.024 0.013 0.012 0.035
	0.020 0.058 0.063 0.027 0.093 0.050 0.014 0.012 0.018

Test Type and Location	Q° (lb/ton)
Coal Dumping Cordero—Summer (Baghouse Operational)	0.051 0.129 0.028 0.039
Mean for Test Standard Deviation	0.043 0.047
Coal Dumping Belle Ayr—Winter (No Control)	0.133 0.133 0.160 0.042 0.012
Mean for Test Standard Deviation	0.096 0.065
Coal Dump Summary (No Control) Belle Ayr—Winter Cordero—Fall	
Mean for Test Standard Deviation	0.066 0.064
Cordero—Summer (Control)	
Mean for Test Standard Deviation	0.036 0.035

Table ___. WIND EROSION TEST RESULTS

Test	Test No.	Wind Speed (m/sec)	Emission (ton/acre yr)	Probable Error (ton/acre yr)
Belle Ayr—Spring Stripped Overburden	1	3.4	0.27	±0.29
	2	4.0	2.10	±5.46
Reclaimed Land	1	5./6	0.62	±0.42
	2	4.5	0	-
Cordero--Spring Graded Overburden	1	4.5	0	-
	2	4.5	0	-
Reclaimed Land	1	4.5	0	-
	2	4.5	0.36	±0.15
Belle Ayr—Summer Stripped Overburden	1	5.6	0.50	±0.92
	2	5.6	0	-
Reclaimed Land	1	7.8	0.24	±1.82
	2	7.8	2.50	±1.14
Cordero—Summer Graded Overburden	1	2.8	0	-
	2	2.7	0.25	±0.36
	3	6.7	0	-
	4	6.7	0	-
Reclaimed Land	1	2.7	0	-
	2	2.4	0	-
Average			0.38	
Standard Deviation			0.73	

ALL

Table 4-3. APPARENT EMISSION RATES FOR SHOVEL/TRUCK LOADING

Mine	Sampling period	Apparent emission rate, lb/truck						
		At 1.2 m ht				At 2.4 m ht		
	Dist	15m	30m	45m	60m	30m	45m	60m
A	1		.06	.17	.12	.07	.09	.12
	2		.09	.10	.10			
	3	.18	.13	.12				
	Dist	15m	30m	45m		15m	30m	45m
	4	.12	.21	.23		.19	.19	.19
	5	1.08	.95	1.11				
	6	.89	1.33	1.76				
	Dist	30m	40m	50m	60m	30m	40m	50m
B	1	.58	.57	.46	.46			
	2	.54	.61	.44		.47	.52	.43
	3	.08	.19	.18		.16	.14	.15
	4	.20	.16	.17	.20			
	5[a]							
	6[a]							
	Dist	50m	58.5m	67m	75.5m	50m	58.5m	67m
C	1	.23	.24	.27		.20	.22	.16
	2	.13	.20	.26	.32[b]			
	3	.14	.14	.21		.07	.09	.13
	4	.09	.09	.04	.16[b]			
	Dist	20m	28.5m	37m	45.5m	20m	28.5m	37m
E	1	.31	.37	.43		.27	.20	.13
	2	.17	.41	.41	.27			
	3	.21	.31	.42		.20	.28	.33
	4	.21	.18	.45	.34			

[a] Samplers not in plume.

[b] Insufficient sample set.

ALC

Table 4-4. APPARENT EMISSION RATES FOR BLASTING

Mine	Sampling period		Apparent emission rate, lb/blast: At 1.2 m ht				At 2.4 m ht		
Coal blast									
		Dist	100m	108.5m	117m	125.5m	100m	108.5m	117m
B	1[a]								
	2[a]								
C	1		17.8	17.7	19.5		6.6[b]	21.5	16.0
	2		17.1	20.5	17.4	18.5			
D	1		69.1	72.1	90.6		37.6	44.4	c
	2		58.5	50.9	42.5	34.0			
		Dist	200m	208.5m	217m		200m	208.5m	217m
E	1		45.3	46.0	32.2		36.6	40.7	35.0
		Dist	100m	108.5m	117m	125.5m			
	2		24.2	33.9	24.6	30.1			
Overburden blast									
		Dist	100m	110m	120m				
A	1		1323	849	559				
		Dist	30m	38.5m	47m	55.5m	30m	38.5m	47m
C	1		10.2	13.1	11.0	13.6			
	2		11.2	9.4	11.3		8.8	6.0	9.5
		Dist	67m	73m	80m	86m	67m	73m	80m
E	1		52.9	79.3	79.2	46.8			
	2		64.2	56.1	64.0		20.4	23.3	18.0

[a] Improper sampling configuration--samplers on highwall above blast area.

[b] Inconsistent data point; removed as an outlier.

[c] Sampler malfunction.

ALL

Table 4-5. APPARENT EMISSION RATES FOR TRUCK DUMP

Mine	Sampling period	Apparent emission rate, lb/truck						
		At 1.2 m ht				At 2.4 m ht		
	Dist	10m	20m	30m	40m	10m	20m	30m
A	1	.32	.36	.55				
	2	.55	.83	.65				
	3	1.33	1.44	.73				
	4	.41	.22	.51				
	5	.33	.30	.45				
	6	.03	.03	.11				
B	1	2.7	2.0	2.1	2.1			
	2	2.5	1.8	2.2		2.7	.90	1.7
	Dist	30m	38.5m	47m	55.5m	30m	38.5m	47m
C	1[a]							
	2[a]							
	3	.26	.42	.71		.02[b]	.41	.35
	4	.42	.44	.76	.80[c]			
	Dist	20m	26m	32m	38m	20m	26m	38m
D	1	2.2	4.4	6.3	5.7			
	2	.9	1.2	1.8		1.8	2.1	2.0
	3[d]	5.8	9.5	14.0		7.8	9.4	7.2
	4[d]	7.1	11.6	15.3	12.7			
	5	3.6	6.3	8.0	7.4			
	6	2.7	3.4	3.2		2.1	3.3	4.0
	Dist	8.5m	17m	25.5m	34m	8.5m	17m	25.5m
E	1	.19	.49	.60		.20	.45	.61
	2	.27	.86	.81	1.3[c]			
	3	.19	.43	.34		.25	.31	1.7
	4	.70	.88	2.0	2.5[c]			

[a] Samplers not in plume.

[b] Data outlier--more than 3 std. dev. away from mean.

[c] Insufficient sample set.

[d] Atypical operation (only two trucks in 80 minutes); not used to estimate emission factor.

AZL

Table 4-6. APPARENT EMISSION RATES FOR STORAGE PILE

Mine	Sampling period	Apparent emission rate, lb/hr						
		At 1.2 m ht				At 2.4 m ht		
	Dist	175m	190m	205m		175m	190m	205m
A	1	17.7	33.1	25.4		20.9	30.4	30.1
	Dist	30m	40m	50m		30m	40m	50m
	2	9.3	5.4	10.8		8.1	8.2	7.8
	3	.2	.7	1.2		1.0	.1	0
	4	.9	.9	1.4		1.7	.4	1.5
	5	21.3	14.5	20.3		13.7	17.4	15.8
	6	.4	2.1	0		.5	1.0	1.1
	Dist	25m	40m	55m	70m	25m	40m	55m
B	1	64.5	105.7	133.0	161.4			
	2	88.5	100.7	95.0		58.4	72.5	115.1
	3	63.6	58.5	69.3	97.2			
	4	41.7	57.9	75.9		16.2	47.4	55.5
	Dist	35m	45m	55m	65m	35m	45m	55m
	5	9.6	13.4	14.6	12.5			
	6	12.9	10.4	9.3		6.0	10.7	7.8
	Dist	30m	40m	50m	60m	30m	40m	50m
	7[a]	50.3	79.9	97.6	113.0			
	8[a]	43.0	41.7	91.5		28.4	35.4	51.3
	Dist	60m	70m	80m	90m	60m	70m	80m
C	1[a]	50.6	52.8	106.3		38.3	41.0	56.3
	2[a]	250.9	322.2	444.4	554.1			
	3[a]	147.3	169.9	173.4		45.6	139.0	204.3
	4[a]	62.7	25.2	160.0	130.7			
	Dist	25m	33.5m	42m	50.5m	25m	33.5m	42m
D	1	2.8	1.5	5.0		0	1.3	1.5
	2	.8	2.1	1.9	.2			
	3	3.1	3.5	6.9		2.2	4.1	2.6
	4	4.3	5.8	6.4	0			

[a] Severe interference from other sources; not used in estimating emission factor.

ALL

Table 4-7. APPARENT EMISSION RATES FOR MISCELLANEOUS OPERATIONS

Mine	Sampling period	At 1.2 m ht				At 2.4 m ht		
Coal drilling, lb/hole								
	Dist	5m	13.5m	22m	30.5m	5m	13.5m	22m
E	1	.20	.30	.28	.32[a]			
	2	.16	.17	.07		.55	.04	0
Overburden drilling, lb/hole								
	Dist	5.6m	15m	24.4m	33.9m	5.6m	15m	24.4m
A	1[b]							
C	1	.004	.41	1.4		1.5	.90	2.0
	2	.13	.86	3.6	7.2[a]			
Overburden shovel, lb/truck								
	Dist	20m	25m	30m	35m	20m	25m	30m
E	1	2.6	1.5	2.2		2.8	3.4	3.4
	2	2.5	4.2	5.0	7.0			
	3	1.0	.94	1.0		.57	.70	1.0
	4	1.0	.82	1.8	1.6			
	5	1.9	1.6	1.5		1.5	1.9	2.4
	6	2.1	2.6	5.7	5.3			
Fly-ash dump, lb/hr								
	Dist	10m	20m	30m		10m	20m	30m
A	1[c]							
	2	3.7	4.7	4.7				
	3	2.4	1.7	3.9		2.1	1.8	3.6
Overburden dump, lb/truck								
	Dist	15m	20m	25m	30m	15m	20m	25m
E	1	.29	.22	.27		.25	.16	.14
	2	.23	.17	.26	.45[a]			
	3[b]							
	4[b]							
Train loading, lb/car								
	Dist	12m	20.5m	29m	37.5m	12m	20.5m	29m
C	1	.025	.004	.027		.008	.004	.001
	2	.006	.016	.014	.004			
	3	.024	.014	.045		.011	.010	.027
	4	.010	.014	.012	.016			
E	1[d]							
	2[d]							
	3[d]							
	4[d]							
	5[d]							
Topsoil removal-scraper, lb/VMT								
	Dist	30m	34m	38m	42m	30m	34m	38m
D	1	75.3	110.4	81.3		20.6	97.3	71.4
	2	368.9	176.2	438.7	554.7			
	3	731.2	767.8	1154.7		357.8	480.5	536.7
	4	172.5	260.3	228.8	321.2			
	5	217.3	289.0	138.9	256.3			
Topsoil dumping-scraper, lb/VMT								
	Dist	5m	10m	15m	20m	5m	10m	15m
D	1	28.1	30.0	20.7	26.4			
	2	21.4	15.3	21.7		5.5	23.3	17.9
	3	33.5	29.8	20.3	27.0			
	4	13.1	10.4	7.4		22.1	15.6	11.9
	5	38.6	32.2	26.2	31.0			
Front-end loader, lb/bucket								
	Dist	80m	88m	97m	105m			
D	1	.4	.6	.8	.7			

[a] Insufficient sample set. [b] Samplers out of plume.

[c] Severe interference from other sources.

[d] Data voided because of inadequate wind measurements, air turbulence near source and samplers, and excessive reentrained material.

TABLE 6.1 - OVERBURDEN REPLACEMENT EMISSION FACTOR DATA

TEST TYPE AND LOCATION	TEST NO.	RECEPTOR LOCATION	DOWNWIND DISTANCE (m)	WIND SPEED (m/sec)	STABILITY CLASS	Q_x (lb/ton)	DEPLETION FACTOR	Q_o (lb/ton)
OVERBURDEN REPLACEMENT	1	2-1	52	1.7	B	5.39×10^{-5}	.19	.00028
CORDERO - WINTER		2-2	76	1.7	B	7.41×10^{-4}	.16	.0045
		2-3	104	1.7	B	7.23×10^{-4}	.15	.0050
		3-3	128	1.7	B	3.82×10^{-4}	.13	.0028
		4-2	120	1.7	B	5.80×10^{-4}	.14	.0042
	2	200-1	52	7.9	D	9.48×10^{-4}	.68	.0014
		200-2	67	7.9	D	4.74×10^{-3}	.66	.0072
		200-3	82	7.9	D	1.91×10^{-2}	.64	.029
		400-1	104	7.9	D	5.80×10^{-4}	.62	.0009
		400-2	120	7.9	D	2.95×10^{-4}	.61	.0005
		400-3	136	7.9	D	1.36×10^{-3}	.60	.0023
		400-4	152	7.9	D	6.89×10^{-3}	.59	.0117
MEAN FOR TEST						.003	.50	.0060
STANDARD DEVIATION								.008
OVERBURDEN REPLACEMENT	1	1	70	8.9	D	.016	.69	.023
CORDERO - SUMMER		2	75	8.9	D	.010	.68	.015
		4	84	8.9	D	.011	.67	.017
		5	88	8.9	D	.006	.67	.0089
		7	122	8.9	D	.0086	.60	.013
	2	1	70	6.7	D	.0098	.61	.016
		2	75	6.7	D	.018	.60	.029
		3	84	6.7	D	.014	.60	.024
		4	91	6.7	D	.011	.59	.019
		5	88	6.7	D	.0081	.58	.014
		6	91	6.7	D	.0037	.58	.0064
		7	122	6.7	D	.0048	.56	.0087
MEAN FOR TEST						.01	.63	.016
STANDARD DEVIATION								.007
OVERBURDEN REPLACEMENT	1	1	87	7.6	C	.0075	.65	.012
BELLE AYR - SPRING		2	91	7.6	C	.025	.64	.038
		3	98	7.6	C	.010	.64	.016
		4	101	7.6	C	.0026	.64	.004
	2	1	99	8.5	D	.017	.65	.027
		2	96	8.5	D	.0063	.65	.0097
		3	91	8.5	D	.0074	.65	.011
		4	88	8.5	D	.0012	.66	.0019
MEAN FOR TEST						.0096	.64	.015
STANDARD DEVIATION								.012

TABLE 6.1 - OVERBURDEN REPLACEMENT EMISSION FACTOR DATA (Continued)

TEST TYPE AND LOCATION	TEST NO.	RECEPTOR LOCATION	DOWNWIND DISTANCE (m)	WIND SPEED (m/sec)	STABILITY CLASS	Q_x (lb/ton)	DEPLETION FACTOR	Q_o (lb/ton)
OVERBURDEN REPLACEMENT	1	1	64	2.2	C	.005	.26	.020
		4	105	2.2	C	.00049	.21	.0023
		5	108	2.2	C	.00033	.21	.0016
BELLE AYR - SUMMER		6	110	2.2	C	.0022	.21	.010
		7	116	2.2	C	.0037	.21	.0178
MEAN FOR TEST						.0023	.23	.010
STANDARD DEVIATION								.008
OVERBURDEN REPLACEMENT SUMMARY								
MEAN FOR TEST						.006	.50	.012
STANDARD DEVIATION								.0095

TABLE 6.2 - TOPSOIL REMOVAL EMISSION FACTOR DATA

TEST TYPE AND LOCATION	TEST NO.	RECEPTOR LOCATION	DOWNWIND DISTANCE (m)	WIND SPEED (m/sec)	STABILITY CLASS	Q_x (lb/ton)	DEPLETION FACTOR	Q_o (lb/ton)
TOPSOIL REMOVAL	2	1	92	4.5	D	.065	.44	.148
		2	92	4.5	D	.022	.44	.050
BELLE AYR - SUMMER		3	92	4.5	D	.0067	.44	.015
		5	177	4.5	D	.018	.38	.047
		6	177	4.5	D	.027	.38	.071
	3	1	92	4.5	D	.037	.44	.084
		2	92	4.5	D	.012	.44	.027
		3	92	4.5	D	.012	.44	.027
		6	177	4.5	D	.021	.38	.055
TOPSOIL REMOVAL SUMMARY								
MEAN FOR TEST						.025	.42	.058
STANDARD DEVIATION								.04

TABLE 5.1 - COAL DUMPING EMISSION FACTOR DATA

TEST TYPE AND LOCATION	TEST NO.	RECEPTOR LOCATION	DOWNWIND DISTANCE (m)	WIND SPEED (m/sec)	STABILITY CLASS	Q_x (lb/ton)	DEPLETION FACTOR	Q_o (lb/ton)
COAL DUMPING CORDERO - FALL (Baghouse Not Working)	3	60-200	61	2.7	B	.0073	0.43	.017
		90-200	61	2.7	B	.0030	0.43	.007
		110-400	122	2.7	B	.0067	0.29	.024
MEAN FOR TESTS						.006	.38	.016
STANDARD DEVIATION								.009
COAL DUMPING CORDERO - SUMMER (Baghouse Operational)	1	2-200	61	3.4	C	.0035	0.41	.0085
		3-200	61	3.4	C	.0080	0.41	.0195
		4-200	61	3.4	C	.0046	0.41	.0110
		1-500	152	3.4	C	.0005	0.33	.0015
		2-500	152	3.4	C	.0015	0.33	.0045
		4-500	152	3.4	C	.0012	0.33	.0036
	2	3-200	61	2.7	B	.0023	0.35	.0066
		4-200	61	2.7	B	.0056	0.35	.0160
		5-200	61	2.7	B	.0028	0.35	.0080
		1-500	152	2.7	B	.0011	0.28	.0039
		2-500	152	2.7	B	.0090	0.28	.0320
		3-500	152	2.7	B	.0026	0.28	.0092
	3	1-200	61	3.1	B	.027	0.41	.066
		2-200	61	3.1	B	.019	0.41	.046
		4-200	61	3.1	B	.031	0.41	.076
		5-200	61	3.1	B	.013	0.41	.032
		5-400	122	3.1	B	.0063	0.35	.018
	4	2-200	61	3.1	B	.043	0.41	.105
		3-200	61	3.1	B	.058	0.41	.141
		5-200	61	3.1	B	.0099	0.41	.024
		3-400	122	3.1	B	.0047	0.35	.013
		4-400	122	3.1	B	.0042	0.35	.012
		5-400	122	3.1	B	.0120	0.35	.035
	5	2-200	61	2.2	B	.0056	0.28	.020
		3-200	61	2.2	B	.0162	0.28	.058
		4-200	61	2.2	B	.0175	0.28	.063
		5-200	61	2.2	B	.0075	0.28	.027
		6-200	61	2.2	B	.026	0.28	.093
		2-400	122	2.2	B	.0116	0.23	.050
		3-400	122	2.2	B	.0032	0.23	.014
		4-400	122	2.2	B	.0027	0.23	.012
		5-400	122	2.2	B	.0042	0.23	.018
	6	2-200	61	1.3	B	.0061	0.12	.051
		3-200	61	1.3	B	.0155	0.12	.129
		5-200	61	1.3	B	.0034	0.12	.028
		6-200	61	1.3	B	.0047	0.12	.039
MEAN FOR TESTS						.011	0.26	.043
STANDARD DEVIATION								.047

TABLE 5.1 - COAL DUMPING EMISSION FACTOR DATA (Continued)

TEST TYPE AND LOCATION	TEST NO.	RECEPTOR LOCATION	DOWNWIND DISTANCE (m)	WIND SPEED (m/sec)	STABILITY CLASS	Q_x (lb/ton)	DEPLETION FACTOR	Q_o (lb/ton)
COAL DUMPING BELLE AYR - WINTER (No Control)	2	120-200	61	1.3	B	.016	0.12	.133
		135-200	61	1.3	B	.016	0.12	.133
	3	075-200	61	2.1	B	.069	0.43	.160
		105-200	61	2.1	B	.018	0.43	.042
		120-200	61	2.1	B	.005	0.43	.012
MEAN FOR TESTS						.025	0.26	.096
STANDARD DEVIATION								.065
COAL DUMP SUMMARY (No Control) BELLE AYR - WINTER CORDERO - FALL								
MEAN FOR TEST						.018	0.27	.066
STANDARD DEVIATION								.064
(Control) CORDERO - SUMMER								
MEAN FOR TEST						.011	0.31	.036
STANDARD DEVIATION								.035

ALL

TABLE 7.1

WIND EROSION TEST RESULTS

TEST	TEST NO.	WIND SPEED (m/sec)	EMISSION (ton/acre yr)	PROBABLE ERROR (ton/acre yr)
BELLE AYR - SPRING				
STRIPPED OVERBURDEN	1	3.4	0.27	± 0.29
	2	4.0	2.10	± 5.46
RECLAIMED LAND	1	5.6	0.62	± 0.42
	2	4.5	0	-
CORDERO - SPRING				
GRADED OVERBURDEN	1	4.5	0	-
	2	4.5	0	-
RECLAIMED LAND	1	4.5	0	-
	2	4.5	0.36	± 0.15
BELLE AYR - SUMMER				
STRIPPED OVERBURDEN	1	5.6	0.50	± 0.92
	2	5.6	0	-
RECLAIMED LAND	1	7.8	0.24	± 1.82
	2	7.8	2.50	± 1.14
CORDERO - SUMMER				
GRADED OVERBURDEN	1	2.8	0	-
	2	2.7	0.25	± 0.36
	3	6.7	0	-
	4	6.7	0	-
RECLAIMED LAND	1	2.7	0	-
	2	2.4	0	-
AVERAGE			0.38	
STANDARD DEVIATION			0.73	

Equations on Table - 8.24-1

- For each Equation
  - # Mines
  - # Test/mine
  - Judge w/ Quality Reading

  Upwind/Downwind or Exposure
  Copy p28

Sources for Table - 8-24-4

Refs 1 = MRI
5 = Blue
4 -

TABLE 3-8. SUMMARY OF TESTS PERFORMED

Sources	Mine 1	Mine 2	Mine 1W[a]	Mine 3	Total
Drill (overburden)	11	-	12	7	30
Blasting (coal)	3	6		7	16
Blasting (overburden)	2			3	5
Coal loading	2	8		15	25
Dozer (overburden)	4	7		4	15
Dozer (coal)	4	3		5	12
Dragline	6	5		8	19
Haul truck	7[b]	9	10	9	35[c] ?
Light- and medium-duty truck	5	5		3	13[d]
Scraper	5[b]	5	2	2	14
Grader		6		2	8 - ?
Exposed area (overburden)	11	14	3	6	34[e]
Exposed area (coal)	10	7	6	16	39
Total	70	75	33	87	265

[a] Winter sampling period.
[b] Five of these tests were comparability tests.
[c] Nine of these were for controlled sources.
[d] Two of these were for controlled sources.
[e] Three of these were for controlled sources.

How do you know which test was dropped and which was for controlled sources

TABLE 3-4. SAMPLING CONFIGURATIONS FOR SIGNIFICANT SOURCES

Source	Point, line, or area[a]	Sampling configuration
Drilling (overburden)	Point	Quasi-stack
Blasting (coal and overburden)	Area	Exposure profiling (modification)
Coal loading (shovel/truck and front-end loader)	Point or area	Upwind/downwind
Dozer (coal and overburden) Text also says AREA	Line or point	Upwind/downwind
Dragline	Point or area	Upwind/downwind
Haul truck	Line	Exposure profiling
Light- and medium-duty vehicles	Line	Exposure profiling
Scraper	Line	Exposure profiling
Grader	Line	Exposure profiling
Wind erosion of exposed areas	Area	Wind tunnel
Wind erosion of storage piles	Area	Wind tunnel

balloon supported 5 samplers also 5 hi-vol @ ≈100m

[a] Several of these sources could be operated as a line, point, or area source. Where possible, the predominant method of operation was used. In other cases, sampling requirements dictated the type of operation.

TABLE 3-5. SOURCE CHARACTERIZATION PARAMETERS MONITORED DURING TESTING

Source	Parameter[a]	Quantification technique
All tests[a]	Wind speed and direction	Anemometer
	Temperature	Thermometer
	Solar intensity	Pyranograph
	Humidity	Sling psychrometer
	Atmospheric pressure	Barometer
	Percent cloud cover	Visual estimate
Overburden drilling	Silt content	Dry sieving
	Moisture content	Oven drying
	Depth of hole	Drill operator
Blasting	Number of holes	Visual count
	Size of blast area —	Measurement
	Moisture content	From mining company
Coal loading	Silt content	Dry sieving
	Moisture content	Oven drying
	Bucket capacity	Equipment specifications
	Equipment operation	Record variations
Dozer	Silt content	Dry sieving
	Moisture content	Oven drying
	Speed	Time/distance
	Blade size	Equipment specifications
Dragline	Silt content	Dry sieving
	Moisture content	Oven drying
	Bucket capacity	Equipment specifications
	Drop distance	Visual estimate
Haul truck	Surface silt content	Dry sieving
	Vehicle speed	Radar gun
	Vehicle weight	Truck scale
	Surface loading	Mass/area of collected road sample
	Surface moisture content	Oven drying
	Number of wheels	Visual observation
Light- and medium-duty vehicles	Same parameters and quantification techniques as for haul trucks	

(continued)

COAL LOADING
Predicted vs. Observed

Test No.	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed (all data) TSP (30um)	MRI/PedCo Predicted (13.2.4 equa1) vs. Observed (w/o outlyers) TSP (30um)	MRI/PedCo Predicted (Table11.9-2) vs. Observed (all data) TSP (30um)
Mine 1 , 1	0.004	0.004	4.118
2	0.002	0.003	2.255
Mine 2, 1	0.002	0.002	0.304
2	0.001	0.001	0.189
3	0.003	0.004	0.797
4	0.003	0.003	0.983
5	0.004	0.004	1.490
6	0.005	0.005	0.647
7	0.005	0.005	0.716
8	0.017	0.017	2.269
Mine 3, 1	0.002	0.001	0.734
2	0.001	0.001	1.156
3	0.001	0.001	1.160
4	0.004	0.004	3.090
5	0.004	0.005	3.579
6	0.010	0.011	2.245
7	0.003	0.003	1.909
8	0.001	0.001	0.936
9	0.002	0.002	1.113
10	0.001	0.000	0.364
11	0.002	0.002	0.680
12	0.008	0.009	2.526
13	0.000	0.000	0.124
14	0.001	0.001	0.370
15	0.003	0.003	0.640
Geometric Mean			
Mine 1			
Stnd Dev.			
Mine 2			
Stnd Dev.			
Mine 3			
Stnd Dev.			
25 All ~~25~~ Tests	$\Sigma(.004 - .00246)^2$		
Stnd Dev.			

form → 0.0024655050760669
docs: avg of ln -6.005358593463489

$e^{\text{avg of } \ln} =$ $\boxed{e^{-6.005}}$

STD =

$$e^{\sqrt{\frac{\Sigma(\ln - \ln_{avg})^2}{n}}}$$

1	0
2	.69
3	1.09
1.817	1.78

$G.m = \sqrt[n]{x_1, x_2, x_3, x_n}$

AP-42 Equations
Table 11.9-2 - Uncontrolled

Data Included for Equation Development

Equation		Total # of Tests Table 13-1	Sample Method	Source	# of Mines	Total # of Tests	# of Tests/mine Mine 1	Mine 2	ine 1W	Mine 3
^Blasting		18	Modified	9-1	3	18	5	6	-	7
	TSP		Exposure	Table 13-3	3	18	5	6	-	7
	~~15 um~~	10 um			3	~~No Discussion of data selected for PM factor development~~				
	~~2.5 um~~				3	Dust factor comes from Material handling				
^Truck Loading		25	Up-down	p. 8-1	3	25	2	8	-	15
Otlir?M3,T13?	TSP			Table 13-3	3	24	2	8	-	14
	15 um			Table 13-6	3	25	2	8	-	15
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Bulldozing		27	Up-down	p. 8-1	3	15	4	7	-	4
Overburden	TSP	(Both coal &		Table 13-3	3	15	4	7	-	4
M1,T4 no data; Otlir?M3,T4over?	15 um	overburden)		Table 13-6	3	13	3	7	-	3
				& 8-13						
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Bulldozing,. Coal		27	Up-down	p. 8-1	3	12	4	3	-	5
Otlir?M1,T2coal?	TSP	(Both coal &		Table 13-3	3	11	3	3	-	5
	15 um	overburden)		Table 13-6	3	12	4	3	-	5
				& 8-13						
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Dragline		19	Up-down	p.8-1	3	19	6	5	-	8
Otlir?M1,T6?	TSP			Table 13-3	3	18	5	5	-	8
	15 um			Table 13-6	3	19	6	5	-	8
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Scraper		15	Exposure	p.7-1	3	15	5	6	2	2
	TSP			Table 13-3	3	15	5	6	2	2
Low Wind?J-2,J-3,J-4,J-5?	15 um			Table 13-6	3	11	1	6	2	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Grading		7	Exposure	p. 7-1	2	7	0	5	0	2
	TSP			Table 13-3	2	7	0	5	0	2
	15 um			Table 13-6	2	7	0	5	0	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Vehicle Traffic		10	Exposure	p. 7-1	3	10	3	4	0	3
	TSP			Table 13-3	3	10	3	4	0	3
	15 um			Table 13-6	3	10	3	4	0	3
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
**^Haul Truck		**27**	Exposure +	7-1 + 8-	3	**19+11=30**	6+5	6+0	3+6	4+0
Low Wind?J-6,J-12,J-21?;Remove K-7,L-	TSP		Up-down	Table 13-3	3	?25?	3+5	5+0	2+6	4+0
Low Wind?J-6,J-12,J-21?;Remove K-7,L-	15 um			Table 13-6	3	?25?	3+5	5+0	2+6	4+0
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^^Active Storage							Mine A	Mine B	Mine C	Mine D
Pile		N/A	Up-Down	Table 2-1	4	22	6	8	4	4
	TSP			Table 4-6	3	16	6	6	0	4
	15 um				N/A	N/A	N/A	N/A	N/A	N/A
	2.5 um				N/A	N/A	N/A	N/A	N/A	N/A

* Mine 1W = winter sampling period at Mine 1
^ Reference 1 - MRI/Pedco, July 1981
^^ Reference 4 - Pedco, Febuary 1978
Otlir = Outlier
Abbreviation: M3,T13 = Mine 3, Test 13
** # of samples reported in Table 13-1 does not match # of samples reported on pages 7-1and 8-1. Unsure of # of samples used for equation
Assumed all 11 up/down wind tests are uncontrolled from note on Table 13-5
Table 3-8 lists 35 tests performed w/ 26 of those uncontrolled.

AP-42 Equations
Table 11.9-2 - Uncontrolled

Quality Rating
using as criteria
Update of Fugitive Dust Emission Factors in Ap-42 Section 11.2
July 14, 1987

Test Data for Emission Factor Equation= A

Equation		Sample Method	Sound Methodology	TABLE 4 - Quality Rating Rating	Reason	Final Eq Rating	Current Rating
^*^ *Blasting		Modified	bullen profile given				
	TSP	exposure	-1	0	Meets Code 1	B	C
	~~15 um~~ 10 um		-1	0	"	B	
	~~2.5 um~~*						
^Truck Loading		Up-down					
	TSP		ok	-1	only 2 sites w/ >3 tests	B	B
	15 um		ok	-1	only 2 sites w/ >3 tests	B	
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B	
^Bulldozing		Up-down	Area source				
Overburden	TSP		-1	0	meets code 1	B	B
	15 um		-1	-1	13 tests<(9+3p); p=2	C	
	2.5 um*		-1	-1	13 tests<(9+3p); p=2	C	
^Bulldozing		Up-down	Area source				
Coal	TSP		-1	-1	11 tests<(9+3p); p=2	C	B
	15 um		-1	-1	12 tests<(9+3p); p=2	C	
	2.5 um*		-1	-1	12 tests<(9+3p); p=2	C	
^Dragline		Up-down					
	TSP		ok	0	meets code 1	A	B
	15 um		ok	0	meets code 1	A	
	2.5 um*		ok	0	meets code 1	A	
^Scraper		Exposure					
	TSP		ok	-1	only 2 sites w/ >3 tests	B	A
	15 um		ok	-2	only 1 site w/ >3 tests	C	
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B	
^Grading		Exposure					
	TSP		ok	-2	only 1 site w/ >3 tests	C	B
	15 um		ok	-2	only 1 site w/ >3 tests	C	
	2.5 um*		ok	-2	only 1 site w/ >3 tests	C	
^Vehicle Traffic		Exposure					
	TSP		ok	-1	10 tests<(9+3p); p=1	B	B
	15 um		ok	-1	10 tests<(9+3p); p=1	B	
	2.5 um*		ok	-1	10 tests<(9+3p); p=1	B	
^Haul Truck		Exp and					
	TSP	Up-down	ok	0	meets code 1	A	A
	15 um		ok	0	meets code 1	A	
	2.5 um*		ok	0	meets code 1	A	
^^Active Storage		Up-down	No Cross-Wind Sample				
Pile			only in-line				
	TSP		-1	0	meets code 1	B	C
	15 um		N/A	N/A	N/A	N/A	
	2.5 um		N/A	N/A	N/A	N/A	

* Assumed 2.5um test data same as TSP data since report lacked discussion
^ Reference 1 - MRI/Pedco, July 1981
^^ Reference 4 - Pedco, Febuary 1978

^*^ Reference 1 test Data. Equation developed by MRI April, 1987 by Mukski

AP-42 Equations
Table 11.9-2 - Uncontrolled

Quality Rating
using as criteria
Update of Fugitive Dust Emission Factors in Ap-42 Section 11.2
July 14, 1987

Test Data for Emission Factor Equation= A

Equation		Sample Method	Sound Methodology	TABLE 4 - Quality Rating Rating	Reason	Final Eq Rating	Current Rating
^Blasting		Modified	ballon profile & area				
	TSP	Exposure	-1	0	meets code 1	B	C
CHANGE	15 um		-1	0	meets code 1	B	
	2.5 um*		-1	0	meets code 1	B	
^Truck Loading		Up-down					
	TSP		ok	-1	only 2 sites w/ >3 tests	B	B
	15 um		ok	-1	only 2 sites w/ >3 tests	B	
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B	
^Bulldozing		Up-down	Area source				
Overburden	TSP		-1	0	meets code 1	B	B
&COAL???	15 um		-1	0	meets code 1	B	
	2.5 um*		-1	0	meets code 1	B	
^Dragline		Up-down					
	TSP		ok	0	meets code 1	A	B
	15 um		ok	0	meets code 1	A	
	2.5 um*		ok	0	meets code 1	A	
^Scraper		Exposure					
	TSP		ok	-1	only 2 sites w/ >3 tests	B	A
	15 um		ok	-2	only 1 site w/ >3 tests	C	
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B	
^Grading		Exposure					
	TSP		ok	-2	only 1 site w/ >3 tests	C	B
	15 um		ok	-2	only 1 site w/ >3 tests	C	
	2.5 um*		ok	-2	only 1 site w/ >3 tests	C	
^Vehicle Traffic		Exposure					
	TSP		ok	-1	10 tests<(9+3p)	B	B
p=1	15 um		ok	-1	10 tests<(9+3p)	B	
	2.5 um*		ok	-1	10 tests<(9+3p)	B	
^Haul Truck		Exp and					
	TSP	Up-down	ok	0	meets code 1	A	A
	15 um		ok	0	meets code 1	A	
	2.5 um*		ok	0	meets code 1	A	
^^Active Storage		Up-down	No Cross-Wind Sample				
Pile			only in-line				
	TSP		-1	0	meets code 1	B	C
	15 um		N/A	N/A	N/A	N/A	
	2.5 um		N/A	N/A	N/A	N/A	

* Assumed 2.5um test data same as TSP data since report lacked discussion
^ Reference 1 - MRI/Pedco, July 1981
^^ Reference 4 - Pedco, Febuary 1978

AP-42 Equations
Table 11.9-2 - Uncontrolled

Data Included for Equation Development

Equation		Total # of Tests Table 13-1	Sample Method	Source	# of Mines	Total # of Tests	# of Tests/mine Mine 1	Mine 2	ine 1W	Mine 3
^Blasting		18	Modified	Table 9-1	3	18	5	6	-	7
???Equation Reference???	TSP		Exposure	Table 13-3	3	18	5	6	-	7
	15 um			Table 13-6	3	18	5	6	-	7
	2.5 um			N/A	N/A	N/A	N/A	N/A	N/A	N/A
^Truck Loading		25	Up-down	p. 8-1	3	25	2	8	-	15
Otlir?M3,T13?	TSP			Table 13-3	3	24	2	8	-	14
	15 um			Table 13-6	3	25	2	8	-	15
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
overburden ^Bulldozing		27 (both)	Up-down	p. 8-1	3	~~27~~ 15	~~8~~ 4	~~10~~ 7	-	~~8~~ 4
Otlir?M1,T2coal?	TSP			Table 13-3	3	~~26~~ 15	~~8~~ 4	~~10~~ 7	-	~~8~~ 4
M1,T4 no data; Otlir?M3,T4over?	15 um			Table 13-6	3	~~25~~ 13	~~8~~ 3	~~10~~ 7	-	~~8~~ 3
				& 8-13						
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Dragline		19	Up-down	p.8-1	3	19	6	5	-	8
Otlir?M1,T6?	TSP			Table 13-3	3	18	5	5	-	8
	15 um			Table 13-6	3	19	6	5	-	8
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Scraper		15	Exposure	p.7-1	3	15	5	6	2	2
	TSP			Table 13-3	3	15	5	6	2	2
Low Wind?J-2,J-3,J-4,J-5?	15 um			Table 13-6	3	11	1	6	2	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Grading		7	Exposure	p. 7-1	2	7	0	5	0	2
	TSP			Table 13-3	2	7	0	5	0	2
	15 um			Table 13-6	2	7	0	5	0	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Vehicle Traffic		10	Exposure	p. 7-1	3	10	3	4	0	3
	TSP			Table 13-3	3	10	3	4	0	3
	15 um			Table 13-6	3	10	3	4	0	3
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
**^Haul Truck		27	Exposure +	7-1 + 8-	3	19+11=30	6+5	6+0	3+6	4+0
Low Wind?J-6,J-12,J-21?;Remove K-7,L-1	TSP		Up-down	Table 13-3	3	?25?	3+5	5+0	2+6	4+0
Low Wind?J-6,J-12,J-21?;Remove K-7,L-1	15 um			Table 13-6	3	?25?	3+5	5+0	2+6	4+0
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^^Active Storage Pile							Mine A	Mine B	Mine C	Mine D
		N/A	Up-Down	Table 2-1	4	22	6	8	4	4
	TSP			Table 4-6	3	16	6	6	0	4
	15 um				N/A	N/A	N/A	N/A	N/A	N/A
	2.5 um				N/A	N/A	N/A	N/A	N/A	N/A

* Mine 1W = winter sampling period at Mine 1
^ Reference 1 - MRI/Pedco, July 1981
^^ Reference 4 - Pedco, Febuary 1978
Otlir = Outlier
Abbreviation: M3,T13 = Mine 3, Test 13
** # of samples reported in Table 13-1 does not match # of samples reported on pages 7-1and 8-1. Unsure of # of samples used for equation
Assumed all 11 up/down wind tests are uncontrolled from note on Table 13-5
Table 3-8 lists 35 tests performed w/ 26 of those uncontrolled.

				Source	# of Mines	Total	1	2	3	4
Bulldozing		27 (both) coal & over	up-down	8.1	3	12	3	3	-	5
other? M1/T2 - coal?	TSP					11				
	15					12	4	3	-	5

AP-42 Equations
Table 11.9-2 - Uncontrolled

Data Included for Equation Development

Equation		Total # of Samples Table 13-1	Sample Method	Source	# of Mines	Total # of Samples	# of Tests/mine Mine 1	Mine 2	Mine 1W*	Mine 3
Blasting		18	Modified	Table 9-1	3	18	5	6	-	7
???Equation Reference???	TSP		Exposure	Table 13-3	3	18	5	6	-	7
AP-42 ≠ MRI/PEDCO	15 um			Table 13-6	3	18	5	6	-	7
	2.5 um			N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ref 1 Truck Loading		25	Up-down	p. 8-1	3	25	2	8	-	15
Otlir?M3,T13?	TSP			Table 13-3	3	24	2	8	-	14
	15 um			Table 13-6	3	25	2	8	-	15
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
Ref 1 Bulldozing		27	Up-down	p. 8-1	3	27	8	10	-	9
Otlir?M1,T2coal?	TSP			Table 13-3	3	26	7	10	-	9
M1,T4 no data; Otlir?M3,T4over?	15 um			Table 13-6 & 8-13	3	25	7	10	-	8
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
Ref 1 Dragline		19	Up-down	p.8-1	3	19	6	5	-	8
Otlir?M1,T6?	TSP			Table 13-3	3	18	5	5	-	8
	15 um			Table 13-6	3	19	6	5	-	8
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
Ref Scraper		15	Exposure	p.7-1	3	15	5	6	2	2
	TSP			Table 13-3	3	15	5	6	2	2
Low Wind?J-2,J-3,J-4,J-5?	15 um			Table 13-6	3	11	1	6	2	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
Ref 1 Grading		7	Exposure	p. 7-1	2	7	0	5	0	2
	TSP			Table 13-3	2	7	0	5	0	2
	15 um			Table 13-6	2	7	0	5	0	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
Ref 1 Vehicle Traffic		10	Exposure	p. 7-1	3	10	3	4	0	3
	TSP			Table 13-3	3	10	3	4	0	3
	15 um			Table 13-6	3	10	3	4	0	3
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
Ref 1 **Haul Truck		27	Exp and	p 7-1 + 8-1	3	19+11=30	6+5	6+0	3+6	4+0
ow Wind?J-6,J-12,J-21?;Remove K-7,L-1	TSP		Up-down	Table 13-3	3	?25?	3+5	5+0	2+6	4+0
ow Wind?J-6,J-12,J-21?;Remove K-7,L-1	15 um			Table 13-6	3	?25?	3+5	5+0	2+6	4+0
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
Ref 4 Active Storage Pile		22					6	8	4	4
	TSP		up-down	Table 4-6		16	6	6	0	4
	15 um			NA						
	~~10 um~~			~~N~~						
	2.5 um			NA						

← Table 2-1

Table 2-1

~~Mine A Mine B C D E~~

Mine A B C D

* Mine 1W = winter sampling period at Mine 1
Otlir = Outlier
Abbreviation: M2,T13 = Mine 2, Test 13
** # of samples reported in Table 13-1 does not match # of samples reported on pages 7-1and 8-1. Unsure of # of samples used for equation
Assumed all 11 up/down wind tests are uncontrolled from note on Table 13-5
Table 3-8 lists 35 tests performed w/ 26 of those uncontrolled.

Ref 1 = MRI/PEDCO July, 1981
Ref 4 = PEDCO Feb, 1978

TSP

for Blasting

$AP\text{-}42 = 0.0005A^{1.5}$

$MRI/PEDCO = \frac{861A^{0.8}}{D^{1.8}M^{1.4}}$

$\leq 15\mu m$

and ND

and $\frac{2550A^{0.6}}{D^{1.5}M^{2.3}}$

AP-42 Equations
Table 11.9-2 - Uncontrolled Test Data for Emission Factor Equation= A

Equation		Sample Method	Sound Methodology	TABLE 4 - Quality Rating Rating	Reason	Final Eq Rating	Previous AP-42 Rating
Blasting		Modified	ballon profile				
	TSP	Exposure	-1	0	meets code 1	B	
	15 um		-1	0	meets code 1	B	
	2.5 um*		-1	0	meets code 1	B	
Truck Loading		Up-down					
	TSP		ok	-1	only 2 sites w/ >3 tests	B	
	15 um		ok	-1	only 2 sites w/ >3 tests	B	
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B	
Bulldozing		Up-down	Area Source				
	TSP		-1 ~~ok~~	0	meets code 1	A B	
	15 um		-1 ~~ok~~	0	meets code 1	A B	
	2.5 um*		-1 ~~ok~~	0	meets code 1	A B	
Dragline		Up-down					
	TSP		ok	0	meets code 1	A	
	15 um		ok	0	meets code 1	A	
	2.5 um*		ok	0	meets code 1	A	
Scraper		Exposure					
	TSP		ok	-1	only 2 sites w/ >3 tests	B	
	15 um		ok	-2	only 1 site w/ >3 tests	C	
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B	
Grading		Exposure					
	TSP		ok	-2	only 1 site w/ >3 tests	C	
	15 um		ok	-2	only 1 site w/ >3 tests	C	
	2.5 um*		ok	-2	only 1 site w/ >3 tests	C	
Vehicle Traffic		Exposure					
	TSP		ok	-1	10 tests<(9+3p)	B	
	15 um		ok	-1	10 tests<(9+3p)	B	
	2.5 um*		ok	-1	10 tests<(9+3p)	B	
Haul Truck		Exp and					
	TSP	Up-down	ok	0	meets code 1	A	
	15 um		ok	0	meets code 1	A	
	2.5 um*		ok	0	meets code 1	A	
ctive Storage Pile							
	TSP	up-down	? No Cross-wind ? only in-line ?				
	15 um			0	meets code 1	B	
	10 um		-1				
	2.5 um						

* Assumed 2.5um test data same as TSP data since report lacked discussion

* ?

AP-42 Equations
Table 11.9-2 - Uncontrolled

Data Included for Equation Development

Equation		Total # of Samples Table 13-1	Source	# of Mines	Total # of Samples	# of Tests/mine Mine 1	Mine 2	Mine 1W*	Mine 3
Blasting		18	Table 9-1	3	18	5	6	-	7
???Equation Reference???	TSP		Table 13-3	3	18	5	6	-	7
AP-42 ≠ MRI/PEDCO	15 um		Table 13-6	3	18	5	6	-	7
	2.5 um		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Truck Loading		25	p. 8-1	3	25	2	8	-	15
up-down Otlir?M3,T13?	TSP		Table 13-3	3	24	2	8	-	14
	15 um		Table 13-6	3	25	2	8	-	15
	2.5 um		Table 13-8	No discussion of data selected for FP factor development					
Bulldozing		27	p. 8-1	3	27	8	10	-	9
up-down Otlir?M1,T2coal?	TSP		Table 13-3	3	26	7	10	-	9
M1,T4 no data; Otlir?M3,T4over?	15 um		Table 13-6	3	25	7	10	-	8
	2.5 um		Table 13-8	No discussion of data selected for FP factor development					
Dragline		19	p.8-1	3	19	6	5	-	8
up-down Otlir?M1,T6?	TSP		Table 13-3	3	18	5	5	-	8
	15 um		Table 13-6	3	19	6	5	-	8
	2.5 um		Table 13-8	No discussion of data selected for FP factor development					
Scraper		15	p.7-1	4 3	15	5	6	2	2
Exp Low wind?	TSP		Table 13-3	4 3	15	5	6	2	2
~~Remove~~ J-2,J-3,J-4,J-5	15 um		Table 13-6	4 3	11	1	6	2	2
	2.5 um		Table 13-8	No discussion of data selected for FP factor development					
Grading		7	p. 7-1	2	7	0	5	0	2
Exp	TSP		Table 13-3	2	7	0	5	0	2
	15 um		Table 13-6	2	7	0	5	0	2
	2.5 um		Table 13-8	No discussion of data selected for FP factor development					
Vehicle Traffic		10	p. 7-1	3	10	3	4	0	3
	TSP		Table 13-3	3	10	3	4	0	3
Exp	15 um		Table 13-6	3	10	3	4	0	3
	2.5 um		Table 13-8	No discussion of data selected for FP factor development					
**Haul Truck		27	p. 7-1	4 3	19 + 11 = 30	6 + 5	6 + 0	3 + 6	4 + 0
Exp Low wind Remove K-7,L-1	TSP		Table 13-3	4 3	?17? 25	~~6 + 5~~ 3 + 5	5 + 0	2 + 6	4 + 0 ~~4 + 0~~
Low wind Remove K-7,L-1	15 um		Table 13-6	4 3	?17? 25	6 3 + 5	5 + 0	2 + 6	4 + 0 ~~4 + 0~~
6 up-down J-6,J-12,J-21, [redacted]	2.5 um		Table 13-8	No discussion of data selected for FP factor development					
Active Storage Pile									
	TSP								
	15 um								
	10 um								
	2.5 um								

* Mine 1W = Winter sampling period
Otlir = Outlier
Abbreviation: M2,T13 = Mine 2, Test 13
** # of samples reported in Table 13-1 does not match # of samples reported on page 7-1. Unsure of # of samples used for equation

~~Assume~~ ~~include~~ ~~some~~ all of the 11 up-wind down-wind tests are uncontrolled. ~~unable to determine if so~~

Also, Table 3-8 list 35 test total with 26 being uncontrolled

19 + 11 - 5 = 25

Table 11.9-2		Data Included for Equation Development							
			Total #			# of Tests/mine			
Equation		Source	of Samples	Source	# of Mines	Mine 1	Mine 2	Mine 1W	Mine 3
Blasting		Table 13-1	18	Table 9-1	3	5	6	-	7
? where does AP-42 equation come from	TSP		18	Table 13-3	3	5	6	–	7
	15 um		18	Table 13-6	3	5	6	–	7
	~~10 um~~								
	2.5 um			~~Table~~ N/A					
Truck Loading		Table 13-1	25	p. 8-1	3	2	8	-	15
– outlier ? Mine 3	TSP		24	Table 13-3	3	2	8	–	14
	15 um		25	Table 13-6	3	2	8	–	15
	~~10 um~~								
	2.5 um			Table 13-8					
Bulldozing		Table 13-1	27	p. 8-1	3	8	10	-	9
– outlier ? Mine 3	TSP		26	Table 13-3	3	7	10	–	9
outlier ? Mine 3,4	15 um		25	Table 13-6	3	7	10	–	8
Mine 1,4 no data	~~10 um~~								
	2.5 um								
Dragline		Table 13-1	19	p.8-1	3	6	5	-	8
– Outlier ? Mine 1	TSP		18	Table 13-3	3	5	5	–	8
	15 um		19	Table 13-6	3	6	5	–	8
	~~10 um~~								
	2.5 um			Table 13-8					
Profile Only – Scraper		Table 13-1	15	p.7-1	4	5	6	2	2
?? Remove 3-2, 3-3, 3-4	TSP		15	Table 13-3	4	5	6	2	2
	15 um		11	Table 13-6	4	1	6	2	2
	~~10 um~~								
	2.5 um			Table 13-8					
Grading		Table 13-1	7	p. 7-1	2	0	5	0	2
	TSP		7	Table 13-3	2	–	5	–	2
	15 um		7	Table 13-6	2	–	5	–	2
	~~10 um~~								
	2.5 um								
Vehicle Traffic		Table 13-1	10	p. 7-1	3	3	4	0	3
? ~~Profile only~~	TSP ?		? 10 ?	~~?~~ 13-3		3	4	0	3
	15 um		? 10 ?	~~?~~ 13-6		3	4	0	3
	~~10 um~~								
	2.5 um			Table 13-8					
* Haul Truck		Table 13-1	27	p. 7-1	4	6	~~10~~ 6	3	~~8~~ 4
Profile Only – Remove K-7, L-1	TSP		17	Table 13-3	4	6	~~8~~ 5	2	~~8~~ 4
Remove K-7, L-1	15 um		17	Table 13-6	4	6	~~8~~ 5	2	~~8~~ 4
	~~10 um~~								
	2.5 um			Table 13-8					
ctive Storage Pile	TSP								
	15 um								
	~~10 um~~								
	2.5 um								

= 12

= 19

* - # of samples reported in Table 13-1 does not match the # of samples reported on page 7-1

Table 11.9-2

Equation		# of Mines	Mine 1	Mine 2	Mine 1W	Mine 3	
			# of Tests/mine				
Blasting	Table 13-1	# Samples - 18	5	6		7	
1-parameter	TSP	Table 3-1 # of Test performed = 21					
	15 um						
	10 um	from 9-1 = 18					
	2.5 um						
Truck Loading		# Samples - 25	2	8	-	15	p 8-1
(coal)	TSP	# of Test Performed = 25					
1-prm	15 um						
	10 um	p 7-1 = 25					
	2.5 um						
Bulldozing		# Samples - 27	8	10	-	9	p 8-1
2-prm	TSP	# of Test = 27					
	15 um						
	10 um	p 7-1 = 27					
	2.5 um						
Dragline		# samples - 19	6	5	-	8	p 8-1
2-prm	TSP	# of Test = 19					
	15 um						
	10 um						
	2.5 um						
Scraper	Table B-1	# samples 15	Exposure 5	6	2	2	p 7-1
2-prm	TSP	Table 3-1 # of Test = 14	up-down 5				
only use exposure profile data	15 um						
	10 um	p 7-1 = 15					
	2.5 um	+ p 8-1 = 20					
Grading		# samples - 7	Exposure 0	5	0	2	p 7-1
1-prm	TSP	# of Test = 8					
	15 um						
	10 um	p. 7-1 = 7					
	2.5 um						
Vehicle Traffic		# of Sample 10	Exposure 5	4	0	3	p 7-1
1-prm	TSP	# of Test = 13					
	15 um						
	10 um	from p 7-1 = 12					
	2.5 um						
Haul Truck		# of Sample 27	Exposure 6	10	3	9	p 7-1
2-prm	TSP	# of Test = 35	up-wind 5		6		
only use exposure profile data	15 um						
	10 um	from p. 7-1 = 28					
	2.5 um	+ p 8-1 = 39					
Active Storage Pile							
	TSP						
	15 um						
	10 um						
	2.5 um						

Table 11.9-2						
Equation		# of Mines	# of Tests/mine			
Blasting						
$0.000 SA^{1.5}$	TSP					
- bulldozer supported profile - 5 samples	15 um					
- 5 hr total - 100m downwind	10 um					
	2.5 um					
Truck Loading						
	TSP					
	15 um					
	10 um					
	2.5 um					
Bulldozing						
	TSP					
	15 um					
	10 um					
	2.5 um					
Dragline						
	TSP					
	15 um					
	10 um					
	2.5 um					
Scraper		Total	Mine 1, site 1	Mine 2	Mine 1, site 2	Mine 3, site 4
$2.7 \times 10^{-5} (S)^{1.3} W^{2.4}$	TSP	~~17~~	5	5	2	2
	15 um					
	10 um	14				
	2.5 um					
Grading						
	TSP	7				
	15 um					
	10 um					
	2.5 um					
Light Vehicle Traffic		~~Traffic~~ Total	Mine 1, site 3	Mine 2	Mine 3	Mine 1, site 4
	TSP	13	2	4	4	3
	15 um					
	10 um	10				
	2.5 um					
Haul Truck						
	TSP	19	2			
	15 um					
	10 um					
	2.5 um					
Active Storage Pile						
	TSP					
	15 um					
	10 um					
	2.5 um					

Table-4

Equation				Equipment	# of Test Sites	# of Tests/site	Total ≥ 5	<f2 using Crawlen
Blasting								
???Equation Reference???	TSP	Modified exp	0	(-1) re modification	✓	✓	✓	NO (-1)
1 = param	15 um							
	2.5 um							
Truck Loading								
Otlir?M3,T13?	TSP	up/down	0 (-1) only (2 tests at Mine1)	✓	✓	site #1 = 2 (-1)	tests ✓	NO (-1)
1 = param	15 um							
	2.5 um							
Bulldozing								
Otlir?M1,T2coal?	TSP							
4 no data; Otlir?M3,T4over?	15 um	up/down	0	✓	✓	✓	✓	NO (-1)
2 = param	2.5 um							
Dragline								
Otlir?M1,T6?	TSP	up/down	0	✓	✓	✓	✓	NO (-1)
2 = param	15 um							
	2.5 um							
Scraper								
2 = param	TSP	exp	many curves missing (-1 2 sites for TSP)	✓	✓	All Categories = site #3 = 2 tests		
Low Wind?J-2,J-3,J-4,J-5?	15 um		(-2 1 site only (for 15))			~~(3 cat only site #3 = 1 test)~~ (-1)	✓	NO (-1)
	2.5 um							
Grading								
1 = param	TSP	exp	-2 (1 site only for all)	✓	only 2 sites (-1)	site #3 = 2 tests	✓	NO (-1)
	15 um							
	2.5 um							
Vehicle Traffic								
1 = param	TSP	exp	~~(9+30)~~ Total test = 10 -1 (for all)	✓	✓	✓	✓	NO (-1)
	15 um							
	2.5 um							
2 = param **Haul Truck								
,J-12,J-21?;Remove K-7,L-1	TSP	exp and up/down	0	✓	✓	✓	✓	NO (-1)
,J-12,J-21?;Remove K-7,L-1	15 um							
	2.5 um							
Active Storage Pile								
	TSP							
	15 um							
	10 um							
	2.5 um							

— <f2

Say median = 2

Then all data must fall btw 1 and 4

AP-42 Emission Factors
Table 11.9-4 - Uncontrolled
Total Particulate

Quality Rating
using as criteria
Update of Fugitive Dust Emission Factors in Ap-42 Section 11.2
July 14, 1987

Test Data for Emission Factor = A

Category	Reference	Sample Method	Sound Methodology	TABLE 4 - Quality Rating Rating	Reason	Final Eq Rating	Current Rating
Drilling							
Overburden	1	Quasi-Stack	Quasi Stack = -1	-2	Code 4	D	B
Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Top Soil Removal							
by Scraper	5	Up/down	OK	-4	Code 8	E	E
^*^	4	Up/down	*** = -1	-4	Code 8	E	D
Overburden Replacement							
	5	Up/down	OK	-2	Code 4	C	C
Truck Loading							
^**^ Overburden	4	Up/down	*** = -1	-4	Code 8	E	C
Train Loading							
Coal	5	SF6 Tracer	OK	-4	Code 8	E	D
Coal	4	Up/down	*** = -1	-4	Code 8	E	D
Bottom Dump Truck-Unload							
Overburden	4	Up/down	*** = -1	-3	Code 7	E	E
Mine IV, Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Mine III, Coal	4	Up/down	*** = -1	-3	Code 7	E	E
Mine II, Coal	4	Up/down	*** = -1	-3	Code 7	E	E
Mine I, Coal	4	Up/down	*** = -1	-4	Code 8	E	D
Coal	5	SF6 Tracer	OK	-3	Code 6	D	D
End dump Truck-Unload							
Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Scraper Unloading							
Topsoil	4	Up/down	*** = -1	-3	Code 7	E	C
Wind Erosion/Exposed Areas							
Seeded land, stripped & graded overburden	5	Up/down	OK	-2	Code 4	C	C

Ref 1 - MRI/PedCo, 1981
Ref 4 - PedCo, 1978
Ref 5 - TRC, 1981

*** *Ref 4 Methodology - No crosswind samples collected. Also, for several sample periods* two sets of data were collected on the same test run (page 14, Ref 4)
These tests are not marked, but judging from wind data it occurred in all categories.

^*^ - No conversion reported for tons of topsoil/yd³
Back calculation gives 0.8 tons/yd³

^**^ - for Ref 4, mine C, No conversion factor reported for tons of overburden/truck. Back calculating looks like 64 tons/truck

AP-42 Emission Factors **Data Included for Factor Development**
Table 11.9-4 - Uncontrolled
Total Particulate

Category	Ref	Sample Method	Source	# of Mines	Total # of Tests		# of Tests/mine				
Drilling											
Overburden						Mine	1	2	1W	3	
Outliers??M1,T4;M1W,T11??	1	Quasi-Stack	able 11-2	2	28		10	-	11	7	
						Mine	A	B	C	D	E
Coal	4	Up/down	Table 4-7	1	2		-	-	-	-	2
Top Soil Removal						Mine	Cord	BA-Sp	BA-S		
	5	Up/down	Table 6-2	1	2				2		
						Mine	A	B	C	D	E
???Table 2-1 listed 10 tests???	4	Up/down	Table 4-7	1	5		-	-	-	5	-
Overburden Replacement						Mine	Cord-S	BA-Sp	BA-S		
	5	Up/down	Table 6-1	2	5		2	2	1		
Truck Loading						Mine	A	B	C	D	E
Overburden	4	Up/down	Table 4-7	1	6		-	-	-	-	6
Train Loading						Mine	Cord-F	BA-F			
Coal	5	SF6 Tracer	Table 5-2	2	2		1	1			
						Mine	A	B	C	D	E
Coal	4	Up/down	Table 4-7	1	4		-	-	4	-	-
Bottom Dump Truck-Unload						Mine	A	B	C	D	E
Overburden	4	Up/down	Table 4-7	1	2		-	-	-	-	2
*Coal	4	Up/down	Table 4-5	4	14		6	2	2	4	-
						Mine	Cord-F	BA-W			
Coal	5	SF6 Tracer	Table 5.1	2	3		1	2			
End dump Truck-Unload						Mine	A	B	C	D	E
*Coal	4	Up/down	Table 4-5	1	4		-	-	-	-	4
Scraper Unloading						Mine	A	B	C	D	E
Topsoil	4	Up/down	Table 4-7	1	5		-	-	-	5	-
Wind Erosion/Exposed Areas											
Seeded land, stripped &						Mine	Cord-Sp	Cord-S	BA-Sp	BA-S	
graded overburden	5	Up/down	Table 7.1	2	18		4	6	4	4	

* Assume Mine E, Ref 4 used only End-Dump Trucks for coal
There is no discussion in report where data for End-Dump Trucks originates

Ref 1 - MRI/PedCo, 1981
Ref 4 - PedCo, 1978
Ref 5 - TRC, 1981

Cord = Cordero Mine
BA = Belle Ayr Mine
W = winter
Sp = spring
S = summer
F = fall
Example: BA-Sp = Belle Ayr, Spring

AP-42 Emission Factors
Table 11.9-4 - Uncontrolled

Quality Rating
using as criteria
Update of Fugitive Dust Emission Factors in Ap-42 Section 11.2
July 14, 1987

Test Data for Emission Factor = A

Category	Reference	Sample Method	Sound Methodology	TABLE 4 - Quality Rating Rating	Reason	Final Eq Rating	Current Rating
Drilling							
Overburden	1	Quasi-Stack	Quasi Stack = -1	-2	Code 4	D	B
Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Top Soil Removal							
by Scraper	5	Up/down	OK	-4	Code 8	E	E
? lyd's = 0.8 tons? —	4	Up/down	*** = -1	-4	Code 8	E	D
Overburden Replacement			~~OK~~				
	5	Up/down	OK	-2	Code 4	C	C
Truck Loading							
* Overburden	4	Up/down	*** = -1	-4	Code 8	E	C
Train Loading							
Coal	5	SF6 Tracer	OK	-4	Code 8	E	D
Coal	4	Up/down	*** = -1	-4	Code 8	E	D
Bottom Dump Truck-Unload							
Overburden	4	Up/down	*** = -1	-3	Code 7	E	E
Mine IV, Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Mine III, Coal	4	Up/down	*** = -1	-3	Code 7	E	E
Mine II, Coal	4	Up/down	*** = -1	-3	Code 7	E	E
Mine I, Coal	4	Up/down	*** = -1	-4	Code 8	E	D
Coal	5	SF6 Tracer	OK	-3	Code 6	D	D
End dump Truck-Unload							
Coal	4	Up/down	*** = -1	-4	Code 8	E	E
Scraper Unloading							
Topsoil	4	Up/down	*** = -1	-3	Code 7	E	C
Wind Erosion/Exposed Areas							
Seeded land, stripped & graded overburden	5	Up/down	OK	-2	Code 4	C	C

Ref 1 - MRI/PedCo, 1981
Ref 4 - PedCo, 1978
Ref 5 - TRC, 1981

*** Ref 4 Methodology - No crosswind samples collected. Also, for several sample periods two sets of data were collected on the same test run (page 14, Ref 4)
These tests are not marked, but judging from wind data it occurred in all categories.

* For Ref 4, Mine C, no conversion factor reported for tons of overburden/truck. Such calculating looks like Coal tons/truck.

AP-42 Factors
Table 11.9-4 - Uncontrolled
Total Particulate

Data Included for Factor Development

Category	Ref	Sample Method	Source	# of Mines	Total # of Tests		# of Tests/mine				
Drilling						**Mine**	**1**	**2**	**1W**	**3**	
Outliers?? ~~M1~~, T4 Overburden	1	Quasi-Stack	Table 11-2	2	~~30~~ 28		~~14~~ 10	-	~~12~~ 11	7	
and M10, T11 ??						**Mine**	**A**	**B**	**C**	**D**	**E**
Coal	4	Up/down	Table 4-7	1	2		-	-	-	-	2
Top Soil Removal						**Mine**	**A**	**B**	**C**	**D**	**E**
???Table 2-1 listed 10 tests???	4	Up/down	Table 4-7	1	5		—	—	—	5	—
						Mine	**Cord**	**BA-Sp**	**BA-S**		
	5	Up/down	Table 6-2	1	2		—	—	2		
Overburden Replacement						**Mine**	**Cord-S**	**BA-Sp**	**BA-S**		
	5	Up/down	Table 6-1	2	5		2	2	1		
Truck Loading			4-7		6	**Mine**	**A**	**B**	**C**	**D**	**E**
Overburden	4	Up/down	Table ~~4-3~~	~~4~~ 1	~~18~~		~~8~~	~~14~~	~~4~~	-	~~4~~ 6
~~??Table 2-1 listed 20 tests??~~											
Train Loading						**Mine**	**Cord-F**	**BA-F**			
Coal	5	SF6 Tracer	Table 5-2	2	2		1	1			
						Mine	**A**	**B**	**C**	**D**	**E**
Coal	4	Up/down	Table 4-7	1	4		—	—	4	—	—
Bottom Dump Truck-Unload						**Mine**	**A**	**B**	**C**	**D**	**E**
Overburden	4	Up/down	Table 4-7	1	2		—	—	—	—	2
*Coal	4	Up/down	Table 4-5	4	14		6	2	2	4	—
						Mine	**Cord-F**	**BA-W**			
Coal	5	SF6 Tracer	Table 5.1	2	3		1	2			
End dump Truck-Unload						**Mine**	**A**	**B**	**C**	**D**	**E**
*Coal	4	Up/down	Table 4-5	1	4		—	—	—	—	4
Scraper Unloading						**Mine**	**A**	**B**	**C**	**D**	**E**
Topsoil	4	Up/down	Table 4-7	1	5		—	—	—	5	—
ind Erosion/Exposed Areas											
Seeded land, stripped &						**Mine**	**Cord-Sp**	**Cord-S**	**BA-Sp**	**BA-S**	
graded overburden	5	Up/down	Table 7.1	2	18		4	6	4	4	

* Assume Mine E, Ref 4 used only End-Dump Trucks for coal
There is no discussion in report where data for End-Dump Trucks originates

Ref 1 - MRI/PedCo
Ref 4 - PedCo, 1978
Ref 5 - TRC

Cord = Cordero Mine
BA = Belle Ayr Mine
W = winter
Sp = spring
S = summer
F = fall
Example: BA-Sp = Belle Ayr, Spring

AP-42 Emission Factors
Table 11.9-4 - Uncontrolled

Quality Rating
using as criteria
Update of Fugitive Dust Emission Factors in Ap-42 Section 11.2
July 14, 1987

Test Data for Emission Factor = A
Total Particulate

Equation	Reference	Sample Method	Sound Methodology	TABLE 3 - Quality Rating Rating	Reason	Final Eq Rating	Prior
Drilling							
Overburden	1	Quasi-Stack	Quasi-Stacks -1	-2	Code 4	D	B
page 14 Also counted 2 sets of samplers used during 1 run as 2 sample periods — Coal	4	Up/down	NO Crosswind Samples, -1	-4	CODE 8	E	E
Top Soil Removal							
???Table 2-1 listed 10 tests???	4	Up/down	** -1	-4	CODE 8	E	D
? 1 yd³ = 0.8 TONS?	5	Up/down					E
Overburden Replacement	5	Up/down					C
* Didn't get the factor for Truck Loading Overburden ??Table 2-1 listed 26 tests??	4	Up/down	** -1	-4	code 8	E	C
Train Loading							
Coal	5	SF6 Tracer					D
Coal	4	Up/down	** -1	-4	Code 8	E	D
Bottom Dump Truck-Unload							
Overburden	4	Up/down	** -1	-3	Code 7	E	E
*Coal	4	Up/down	IV -1 / -1 III; II -1 / -1 I	-4 / -3; -3 / -4	8 / 7; 7 / 8	E / E; E / E	E / E; C / D
Coal	5	SF6 Tracer					
End dump Truck-Unload							
*Coal	4	Up/down	** -1	-4	Code 8	E	E
Scraper Unloading							
Topsoil	4	Up/down	** -1	-3	Code 7	E	C
Wind Erosion/Exposed Areas							
Seeded land, stripped & graded overburden	5	Up/down					

Ref 1 - MRI/PedCo, 1981
Ref 4 - PedCo, 1978
Ref 5 - TRC, 1981

* No conversion factor reported for tons of overburden/truck looks like 64 tons/truck for Ref 4, Mine C

SCALE:
A = EXCELLENT
E = VERY POOR

** Sound METHODOLOGY - for REF 4 → Some of the data consists of 2 sets of samplers used during 1 run. This was counted as two sample periods. (page 14) Also, no crosswind samples were collected

Table ____. APPARENT EMISSION RATES FOR SHOVEL/TRUCK LOADING

Mine	Sampling period	Apparent emission rate, lb/truck						
		At 1.2 m ht				At 2.4 m ht		
	Dist	15m	30m	45m	60m	30m	45m	60m
A	1		0.06	0.17	0.12	0.07	0.09	0.12
	2		0.09	0.10	0.10			
	3	0.18	0.13	0.12				
	Dist	15m	30m	45m		15m	30m	45m
	4	0.12	0.21	0.23		0.19	0.19	0.19
	5	1.08	0.95	1.11				
	6	0.89	1.33	1.76				
	Dist	30m	40m	50m	60m	30m	40m	50m
B	1	0.58	0.57	0.46	0.46			
	2	0.54	0.61	0.44		0.47	0.52	0.43
	3	0.08	0.19	0.18		0.16	0.14	0.15
	4	0.20	0.16	0.17	0.20			
	5[a]							
	6[a]							
	Dist	50m	58.5m	67m	75.5m	50m	58.5m	67m
C	1	0.23	0.24	0.27		0.20	0.22	0.16
	2	0.13	0.20	0.26	0.32[b]			
	3	0.14	0.14	0.21		0.07	0.09	0.13
	4	0.09	0.09	0.04	0.16[b]			
	Dist	20m	28.5m	37m	45.5m	20m	28.5m	37m
E	1	0.31	0.37	0.43		0.27	0.20	0.13
	2	0.17	0.41	0.41	0.27			
	3	0.21	0.31	0.42		0.20	0.28	0.33
	4	0.21	0.18	0.45	0.34			

[a] Samplers not in plume.
[b] Insufficient sample set.

C13502.WPS Intro
C13502-1.ZIP Paved Roads
C13502-2.ZIP Unpaved Roads
C13502-3.ZIP Heavy Construct
C13502-4.ZIP Aggregate Handling
C13502-5.ZIP

AP-42 Equations
Table 11.9-4 - Uncontrolled

Data Included for Equation Development

Equation		Total # of Tests Table 13-1	Sample Method	Source	# of Mines	Total # of Tests	# of Tests/mine A	B	C	D	E
Drilling overburden (Ref #1)	TSP		Quasi-Stack	Table 1-2	2	30	11	-	12	7	
	15 um										
	2.5 um										
Drilling Coal (Ref #4)	TSP		up/down	Table 4-7	1						
	15 um										
	2.5 um										
Top Soil Removal (Table 4-7 = 5 tests, Table 2-1 = 10 tests) — Ref 4, Ref 5	TSP		up/down	Table 4-7	1	5				5	
	~~15 um~~		up/down	Table 6-2	1	2				2	
	2.5 um										
Overburden Replacement (Ref 5)	TSP		up/down	Table 6-1	2	5		2	2	1	
	15 um										
	2.5 um										
Train Loading Ref 5 - coal	TSP		Truck	Table 5-2	2	2					1
	~~15 um~~										
Ref 4	~~2.5 um~~		up/down	Table 4-7	1				4		
* Bottom dump Truck Unloading Ref 4 - Overburden	TSP										
	~~15 um~~		up/down	Table 4-7	1	2					2
Ref 4 — Coal			up/down	Table 4-5	4	~~15~~ 14	6	2	2	4	4
Ref 5 - Coal	~~2.5 um~~		~~up/down~~ Truck	Table 5.1	2	3			Belle Ayr Winter 2		
Ref 4 * End dump Truck unloading coal	TSP		up/down	Table 4-5?	1	?4?					?4?
	15 um										
	2.5 um										
Scraper Unloading topsoil (Ref 4)	TSP		up/down	Table 4-7	1	5				5	
	15 um										
	2.5 um										
Wind Erosion of exposed areas (Ref 5)											
	TSP		up/down	Table 7.1	2	18 (Cordero Spr)	4	6	4	4	
	15 um										
	2.5 um										
Ref 4 Truck loading (Table 2-1 = 26 tests)	TSP		up/down	Table 4-3	4	18	6	4	4	-	4

Ref 1 - MRI/PedCo
Ref 4 - PedCo 1978
Ref 5 - TRC

For Ref 5

Mine
A = Cordero Winter
B = Cordero Summer
C = Belle Ayr Spring
D = Belle Ayr Summer
E = Bell Ayr Fall
F = Cordero Fall

* Assume Mine E of Ref 4 used only End Dump trucks for Coal
No Discussion in Report

AP-42 Equations
Table 11.9-4 - Uncontrolled

Data Included for Equation Development

Equation		Total # of Tests Table 13-1	Sample Method	Source	# of Mines	Total # of Tests	# of Tests/mine A	B	C	D	E
Drilling overburden						mines	1	2	1W	3	
Ref #1	TSP		Phase - Stat	Table 11-2	2	30	11	–	12	7	
	15 um										
	2.5 um										
Drilling Coal											
Ref #4	TSP		Upwind/Downwind (Hi vol)	Table 4-7	1	2	-	-	-	-	2
	15 um										
	2.5 um										
Table 4-7 = 5 tests Top Soil Removal											
Table ← Ref 4	TSP										
Table Ref 5	15 um										
	2.5 um										
Overburden Replacement											
	TSP										
	15 um										
	2.5 um										
Train Loading coal											
	TSP										
	15 um										
	2.5 um										
Bottom dump Truck Unloading Overburden											
	TSP										
	15 um										
Coal											
	2.5 um										
End dump Truck unloading coal											
	TSP										
	15 um										
	2.5 um										
Scraper Unloading topsoil											
	TSP										
	15 um										
	2.5 um										
Wind Erosion of exposed areas											
	TSP										
	15 um										
	2.5 um										

Ref 1 - MRI/PedCo
Ref 4 - PedCo 1978
Ref 5 - TRC

AP-42 Equations
Table 11.9-2 - Uncontrolled

Data Included for Equation Development

Equation		Total # of Tests Table 13-1	Sample Method	Source	# of Mines	Total # of Tests	# of Tests/mine Mine 1	Mine 2	ine 1W	Mine 3
? → ^Blasting		18	Modified	Table 9-1	3	18	5	6	-	7
???Equation Reference???	TSP		Exposure	Table 13-3	3	18	5	6	-	7
mel/Pedco ≠ AP-42	15 um			Table 13-6	3	18	5	6	-	7
	2.5 um			N/A	N/A	N/A	N/A	N/A	N/A	N/A
^Truck Loading		25	Up-down	p. 8-1	3	25	2	8	-	15
Otlir?M3,T13?	TSP			Table 13-3	3	24	2	8	-	14
	15 um			Table 13-6	3	25	2	8	-	15
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Bulldozing		27	Up-down	p. 8-1	3	27	8	10	-	9
Otlir?M1,T2coal?	TSP			Table 13-3	3	26	7	10	-	9
M1,T4 no data; Otlir?M3,T4over?	15 um			Table 13-6	3	25	7	10	-	8
				& 8-13						
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Dragline		19	Up-down	p.8-1	3	19	6	5	-	8
Otlir?M1,T6?	TSP			Table 13-3	3	18	5	5	-	8
	15 um			Table 13-6	3	19	6	5	-	8
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Scraper		15	Exposure	p.7-1	3	15	5	6	2	2
	TSP			Table 13-3	3	15	5	6	2	2
Low Wind?J-2,J-3,J-4,J-5?	15 um			Table 13-6	3	11	1	6	2	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Grading		7	Exposure	p. 7-1	2	7	0	5	0	2
	TSP			Table 13-3	2	7	0	5	0	2
	15 um			Table 13-6	2	7	0	5	0	2
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^Vehicle Traffic		10	Exposure	p. 7-1	3	10	3	4	0	3
	TSP			Table 13-3	3	10	3	4	0	3
	15 um			Table 13-6	3	10	3	4	0	3
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
**^Haul Truck		27	Exposure +	7-1 + 8-	3	19+11=30	6+5	6+0	3+6	4+0
Low Wind?J-6,J-12,J-21?;Remove K-7,L-1	TSP		Up-down	Table 13-3	3	?25?	3+5	5+0	2+6	4+0
Low Wind?J-6,J-12,J-21?;Remove K-7,L-1	15 um			Table 13-6	3	?25?	3+5	5+0	2+6	4+0
	2.5 um			Table 13-8	No discussion of data selected for FP factor development					
^^Active Storage							Mine A	Mine B	Mine C	Mine D
Pile		N/A	Up-Down	Table 2-1	4	22	6	8	4	4
	TSP			Table 4-6	3	16	6	6	0	4
	15 um				N/A	N/A	N/A	N/A	N/A	N/A
	2.5 um				N/A	N/A	N/A	N/A	N/A	N/A

* Mine 1W = winter sampling period at Mine 1
^ Reference 1 - MRI/Pedco, July 1981
^^ Reference 4 - Pedco, Febuary 1978
Otlir = Outlier
Abbreviation: M3,T13 = Mine 3, Test 13
** # of samples reported in Table 13-1 does not match # of samples reported on pages 7-1and 8-1. Unsure of # of samples used for equation
Assumed all 11 up/down wind tests are uncontrolled from note on Table 13-5
Table 3-8 lists 35 tests performed w/ 26 of those uncontrolled.

Center Value

Median

2

1.

4

.5 .7 $\boxed{1.2}$ 3.9 7.8

go mean 1.7

F2 - .84 ← ← 3.4

.6 2.41

AP-42 Equations
Table 11.9-2 - Uncontrolled

Quality Rating
using as criteria
Update of Fugitive Dust Emission Factors in Ap-42 Section 11.2
July 14, 1987

Test Data for Emission Factor Equation= A

Equation		Sample Method	Sound Methodology	TABLE 4 - Quality Rating Rating	Reason	Final Eq Rating
? ^Blasting Pedco/MRI ≠ AP-42		Modified	ballon profile & area			
	TSP	Exposure	-1	0	meets code 1	B
	15 um		-1	0	meets code 1	B
	2.5 um*		-1	0	meets code 1	B
^Truck Loading		Up-down				
	TSP		ok	-1	only 2 sites w/ >3 tests	B
	15 um		ok	-1	only 2 sites w/ >3 tests	B
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B
^Bulldozing		Up-down	Area source			
	TSP		-1	0	meets code 1	B
	15 um		-1	0	meets code 1	B
	2.5 um*		-1	0	meets code 1	B
^Dragline		Up-down				
	TSP		ok	0	meets code 1	A
	15 um		ok	0	meets code 1	A
	2.5 um*		ok	0	meets code 1	A
^Scraper		Exposure				
	TSP		ok	-1	only 2 sites w/ >3 tests	B
	15 um		ok	-2	only 1 site w/ >3 tests	C
	2.5 um*		ok	-1	only 2 sites w/ >3 tests	B
^Grading		Exposure				
	TSP		ok	-2	only 1 site w/ >3 tests	C
	15 um		ok	-2	only 1 site w/ >3 tests	C
	2.5 um*		ok	-2	only 1 site w/ >3 tests	C
^Vehicle Traffic		Exposure				
	TSP		ok	-1	10 tests<(9+3p)	B
p=1	15 um		ok	-1	10 tests<(9+3p)	B
	2.5 um*		ok	-1	10 tests<(9+3p)	B
^Haul Truck		Exp and				
	TSP	Up-down	ok	0	meets code 1	A
	15 um		ok	0	meets code 1	A
	2.5 um*		ok	0	meets code 1	A
^^Active Storage		Up-down	No Cross-Wind Sample			
Pile			only in-line			
	TSP		-1	0	meets code 1	B
	15 um		N/A	N/A	N/A	N/A
	2.5 um		N/A	N/A	N/A	N/A

* Assumed 2.5um test data same as TSP data since report lacked discussion
^ Reference 1 - MRI/Pedco, July 1981
^^ Reference 4 - Pedco, Febuary 1978

For Blasting

AP-42 $= 0.0005 A^{1.5}$

MRI/Pedco $= \frac{961 A^{0.8}}{D^{1.8} M^{1.9}}$