Annex A2 - Dust Em	ission Ra	ate Esti	mation									
Blasting												
(Reference : AP-42, Section	11.9, Table	11.9-2, htt	p://www.epa	.gov/ttn/chie	f/ap42/ch11/	final/c11s09	.pdf)					
Equation:												
E = 0.00022(A) <sup>1.5</sup>												
E A	emission rat blasting area		t)									
А	biasting area	a (IIIZ)										
A	1000	m2	(provided	by engineer	r)							
no. of blast		blast/day										
E		kg/blast										
E (hourly average)	1.93	g/s m above	(6.96 x 10	00 / 3600)								
release height	0.5	III above	gu									
Excavation												
Activity:	materials h	andling										
	rock crushi		ening									
	truck move	ment										
Materials handling												
(Reference to AP-42, Sec	tion 13.2.4	http://ww	w.epa.gov/	ttn/chief/an-	42/ch13/fina	al/c13s0204	1.pdf)					
•												
Equation:												
E = k (0.0016) (U/2.2) <sup>1.3</sup> /	(M/2) <sup>1.4</sup>		(AP-42, Se	ection 13.2.	4-4)							
E	kg/Mg	multi-li-										
K U	particle size mean wind s		2)									
M	moisture (%		s)									
	(											
k	0.74			ection 13.2.								
U	2.06			of wind spec		d at on-site	met station	n in 2006)				
M period of excavation	4.8		(AP-42, S	ection 13.2.	4-4)							
no. of day per month	1.5	days										
no. of hour per day	12	hour	(7am-7pm	)								
total volume of soil		m3/1.5y										
volume of soil per hr		m3/hour										
density of soil		Mg/m3										
total weight of soil % reduction	231.71 50		(by wateri	oa)								
E (mitigated)	1.60E-04		(by watern	19)								
_ (gucu)	0.0103	g/s										
Rock crushing		T // /	100111	"	64 / 1	: (/ (0//		1000 10				
(Reference to AP-42, Sec	tion 11.19.2	, Table 1	1.9.2-1, htt	b://www.epa	a.gov/ttn/cn	iet/ap42/cn	1 1/final/c1 1	s1902.pat)				
Two types of emission will	l he conside	ered ie te	ertiary crus	hina & scree	enina							
Two steps of crushing wo						d for each t	ertairy crus	hing & scre	ening.			
•												
volume of rock		m3/day										
no. of day per month no. of hour per day		days hour	(7am-7pm									
volume of rock per hr		m3/hr	(ram-rpm	)								
density of rock		kg/m3										
total weight of crushed		Mg/hr										
rock	55	IVIG/TII										
a. crushing	0.0006	ka/Ma	(AD 42 T	able 11.19.2	1 controll	od omissio	a factor)					
E (mitigated)	9.8E-03		(AF-42, 16	able 11.19.2	2-1, CONTROL	eu emissio	i iacioi)					
L (magatou)	0.02 00	9,0										
b. screening												
E	0.0011		(AP-42, Ta	able 11.19.2	2-1, controll	ed emissio	n factor)					
E (mitigated)	0.018	g/s										
Truck Movement on Unpa	ved Road											
(Reference to AP-42, Sec		http://ww	w.epa.gov/	ttn/chief/an-	42/ch13/fina	al/c13s0202	2.pdf)					
Equation:								_				
$E = k (s/12)^a (W/3)^b$												
E .	lb/vmt		0.156.11									
k s	empirical co surface mate											
W	mean vehicl											
а	empirical co											
b	empirical co	nstant = 0	.45					_				
		Un 6 ment	(AD 40 T	- bl - 40.0.0	0)							
K	4.9	lb/vmt	(AP-42, 1	able 13.2.2-	<b>'</b> 2)	l			l	l	L	

s	6.5	%	(AP-42, Ta	ble 13.2.2-	3)							
W	21.5	Mg	(average c	f truck weig	ht with pay	load (28 to	on) and with	out pay loa	d (15 ton))			
а	0.7		(AP-42, Ta	ble 13.2.1-	2)			•				
b	0.45											
lb/vmt to g/vkt	289.10											
E	2237.43	g/vkt										
total vol. of rock to be	161400	m2										
disposed offsite	161400	1113										
total no. of day	107	day										
no of hour a day	12	hour										
volume of rock per hr	125.7	m3/hr										
bulk factor of rock	1.4											
no. of vehicle per hr	0.4											
(rock)	24	veh/hr										
total vol. of soil to be	050000											
disposed offsite	350600	m3										
no. of yr for soil												
generation	1.5	yr										
volume of soil per hr	67.6	m3/hr										
bulk factor of soil	1.2	1110/111										
vol. of vehicle		m3										
voi. or verticle	7.5	IIIO										
no. of vehicle per hr (soil)	11	veh/hr										
4-4-1 44-1	70	le /le a										
total no. of trips		veh/hr	(overall or	roduction L	v limit the :	objole as -	od to 10 == /-	novina 4L	o houl roc -	with caa-	anto cod ···	otorin~
% reduction	90	7/0					ed to 10 m/s			with aggre	gate and w	atering
E ( 30 )   0	4055		то кеер we	t of the roa	a all the tin	ie, referenc	e to AP-42	rigure 13.	2.2-2)			
E (mitigated)	4.35E-03	g/m/s										
Filling												
Activity:	materials h	andling										
	wind erosio	n										
	truck move											
Materials handling												
Equation:												
E = k (0.0016) (U/2.2) <sup>1.3</sup> /	(84/2) 1.4		(AD 42 S	ection 13.2.	1 1)							
			(AF-42, 36	0.1011 13.2.4	+-4)							
E	kg/Mg	w r										
k	particle size											
U	mean wind s		i)									
М	moisture (%,	)										
k	0.74			ection 13.2.								
U	2.06					ENT Landfil	I met station	in 2006)				
M	4.8		(AP-42, Se	ection 13.2.	4-4)							
period of filling	1.5	yr										
no. of day per month	24	days										
no. of hour per day	12	hour	(7am-7pm	)								
total volume of soil	407200	m3/1.5yr										
volume of soil per hr	78.5	m3/hr										
density of soil		kg/m3										
total weight of soil	122.54											
% reduction		Mg/hr										
E (mitigated)	50	Mg/hr %	(by watering	ng)								
		%	(by watering	ng)								
_ ,ga.ca/	1.60E-04	% kg/Mg	(by watering	ng)								
		% kg/Mg	(by watering	ng)								
	1.60E-04	% kg/Mg	(by watering	ng)								
Wind Erosion	1.60E-04 0.0054	% kg/Mg g/s			12)							
Wind Erosion E	1.60E-04 0.0054 0.85	kg/Mg g/s Mg/hec/y		ection 11.9-	12)							
Wind Erosion E E (unmitigated)	1.60E-04 0.0054 0.85 2.7E-06	kg/Mg g/s Mg/hec/y g/m2/s	(AP-42, Se	ection 11.9-	12)							
Wind Erosion E E (unmitigated) % reduction	1.60E-04 0.0054 0.85 2.7E-06	kg/Mg g/s Mg/hec/y g/m2/s		ection 11.9-	12)							
Wind Erosion E E (unmitigated)	1.60E-04 0.0054 0.85 2.7E-06	kg/Mg g/s Mg/hec/y g/m2/s	(AP-42, Se	ection 11.9-	12)							
Wind Erosion E E (unmitigated) % reduction E (mitigated)	1.60E-04 0.0054 0.85 2.7E-06	kg/Mg g/s Mg/hec/y g/m2/s	(AP-42, Se	ection 11.9-	12)							
Wind Erosion  E  E (unmitigated) % reduction E (mitigated) Truck Movement	0.85 2.7E-06 1.35E-06	% kg/Mg g/s Mg/hec/y g/m2/s %	(AP-42, Se	ection 11.9-		DIA120000	2 pdf)					
Wind Erosion E E (unmitigated) % reduction E (mitigated)	0.85 2.7E-06 1.35E-06	% kg/Mg g/s Mg/hec/y g/m2/s %	(AP-42, Se	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion E E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec	0.85 2.7E-06 1.35E-06	% kg/Mg g/s Mg/hec/y g/m2/s %	(AP-42, Se	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion E E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec	0.85 2.7E-06 1.35E-06	% kg/Mg g/s Mg/hec/y g/m2/s %	(AP-42, Se	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion  E E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec Equation: E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup>	1.60E-04 0.0054 0.85 2.7E-06 50 1.35E-06	% kg/Mg g/s Mg/hec/y g/m2/s %	(AP-42, Se	ection 11.9-		al/c13s020/	2.pdf)					
Wind Erosion E E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec Equation: E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E	1.60E-04 0.0054 0.85 2.7E-06 50 1.35E-06	% kg/Mg g/s Mg/hec/y g/m2/s % http://ww	(AP-42, Se (by watering)	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion  E  E (unmitigated) % reduction  E (mitigated)  Truck Movement (Reference to AP-42, Sec  Equation:  E = k (s/12) <sup>8</sup> (W/3) <sup>b</sup> E k	1.60E-04 0.0054 0.85 2.7E-06 1.35E-06	% kg/Mg g/s Mg/hec/yg/m2/s % http://ww	(AP-42, Se (by waterin w.epa.gov/	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion  E  E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec  Equation: E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E  k s	1.60E-04 0.0054 0.85 2.7E-06 50 1.35E-06 tion 13.2.2,	% kg/Mg g/s Mg/hec/y g/m2/s % http://ww	(AP-42, Se (by watering w.epa.gov/s	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion  E  E (unmitigated) % reduction  E (mitigated)  Truck Movement (Reference to AP-42, Sec  Equation:  E = k (s/12) <sup>8</sup> (W/3) <sup>b</sup> E k	1.60E-04 0.0054 0.85 2.7E-06 50 1.35E-06 tion 13.2.2, lb/vmt empirical cosurface man vehicl	% kg/Mg g/s Mg/hec/y g/m2/s % http://ww	(AP-42, Se (by waterin w.epa.gov/s	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion  E  E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec  Equation: E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E  k s	1.60E-04 0.0054  0.85 2.7E-06 50 1.35E-06  tion 13.2.2,  lb/vmt empirical co surface mature mean vehicle empirical composition of the mean vehicle empirical	% kg/Mg g/s  Mg/hec/y g/m2/s %  http://ww  instant = 4. erial silt co e weight (Instant = 1.	(AP-42, Se (by watering) w.epa.gov/a 9 lb/vkt ntent (%) 0n) 7	ection 11.9-		al/c13s020/	2.pdf)					
Wind Erosion E E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec Equation: E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E k s W	1.60E-04 0.0054 0.85 2.7E-06 50 1.35E-06 tion 13.2.2, lb/vmt empirical cosurface man vehicl	% kg/Mg g/s  Mg/hec/y g/m2/s %  http://ww  instant = 4. erial silt co e weight (Instant = 1.	(AP-42, Se (by watering) w.epa.gov/a 9 lb/vkt ntent (%) 0n) 7	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion  E  E (unmitigated) % reduction  E (mitigated) Truck Movement (Reference to AP-42, Sec  Equation:  E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E  k s W a	1.60E-04 0.0054  0.85 2.7E-06 50 1.35E-06  tion 13.2.2,  lb/vmt empirical co surface mature mean vehicle empirical composition of the mean vehicle empirical	% kg/Mg g/s  Mg/hec/y g/m2/s %  http://ww  instant = 4. erial silt co e weight (Instant = 1.	(AP-42, Se (by watering) w.epa.gov/a 9 lb/vkt ntent (%) 0n) 7	ection 11.9-		al/c13s0202	2.pdf)					
Wind Erosion  E  E (unmitigated) % reduction  E (mitigated) Truck Movement (Reference to AP-42, Sec  Equation:  E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E  k s W a	1.60E-04 0.0054  0.85 2.7E-06 50 1.35E-06  tion 13.2.2,  tb/mt empirical cosurface mateman vehicle empirical coempirical coempirical coempirical coempirical coempirical coempirical coempirical coempirical coempirical co	% kg/Mg g/s  Mg/hec/y g/m2/s %  http://ww  instant = 4. erial silt co e weight (Instant = 1.	(AP-42, Se (by waterin w.epa.gov/s 9 lb/vkt nntent (%) on) 7	ection 11.9-	42/ch13/fina	al/c13s0202	2.pdf)					
Wind Erosion  E  E (unmitigated) % reduction  E (mitigated) Truck Movement (Reference to AP-42, Sec  Equation:  E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E  k s W a	1.60E-04 0.0054  0.85 2.7E-06 50 1.35E-06  tion 13.2.2,  tb/mt empirical cosurface mateman vehicle empirical coempirical coempirical coempirical coempirical coempirical coempirical coempirical coempirical coempirical co	% kg/Mg g/s Mg/hec/y g/m2/s % http://ww http://ww nstant = 4.erial silt coe e weight (it nstant = 0.	(AP-42, Se (by watering w.epa.gov/s)  9 lb/vkt ntent (%) on) 7 45	ection 11.9- ig)	42/ch13/fina	al/c13s0202	2.pdf)					
Wind Erosion E E (unmitigated) % reduction E (mitigated)  Truck Movement (Reference to AP-42, Sec Equation: E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E k s W a b k	1.60E-04 0.0054 0.0054 0.85 2.7E-06 50 1.35E-06 tion 13.2.2, tion 13.2.2, tion 13.2.2, tempirical co empirical co empirical co empirical co empirical co 6.5.6	% kg/Mg g/s  Mg/hec/y g/m2/s %  http://ww  http://ww  nstant = 4.erial silt coe e weight (timestant = 0.mstant	(AP-42, Se (by waterin w.epa.gov// w.epa.gov// on) 7 45 (AP-42, Ta	ection 11.9- g) trt/chiel/ap- ble 13.2.2- ble 13.2.2-	42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina			0ad (15 tor	201			
Wind Erosion  E  E (unmitigated) % reduction  E (mitigated) Truck Movement (Reference to AP-42, Sec  Equation:  E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E  k  s  W  a  b  k  s  W	1.60E-04 0.0054  0.85 2.7E-06 50 1.35E-06  tion 13.2.2,  tb/mt empirical co surface mate empirical co empirical co empirical co empirical co 6.5 2.00	% kg/Mg g/s Mg/hec/y g/m2/s % http://ww http://ww nstant = 4.erial silt coe e weight (tinstant = 0.mstant = 0.	(AP-42, Se (by waterin w.epa.gov/s 9 lb/wt nnlent (%) on) 7 45 (AP-42, Ta (AP-42, Ta (AP-42, Ta (AP-42, Ta	tn/chief/ap-	42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina		e.pdf)	load (15 tor	))))			
Wind Erosion  E  E  E (unmitigated) % reduction  E (mitigated) Truck Movement (Reference to AP-42, Sec  Equation:  E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E  W  a  b  k  s  W  a  b	1.60E-04 0.0054 0.0054 0.85 2.7E-06 50 1.35E-06 tion 13.2.2, tion 13.2.2, tion 13.2.2, 4.9 6.5.5 20 0.7.7	% kg/Mg g/s g/s Mg/hec/y g/m2/s % Ms/het//www. http://www. http://	(AP-42, Se (by waterin w.epa.gov/s 9 lb/wt nnlent (%) on) 7 45 (AP-42, Ta (AP-42, Ta (AP-42, Ta (AP-42, Ta	ection 11.9- g) trt/chiel/ap- ble 13.2.2- ble 13.2.2-	42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina			load (15 tor				
Wind Erosion E E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec Equation: E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E k s W a b k s W a b b	1.60E-04 0.0054  0.855 2.7E-06 50 1.35E-06  tion 13.2.2,  tion 13.2.2,  tion 13.2.2,  ampirical co empirical co empirical co 4.9 6.5.5 20 0.7 0.45	% kg/Mg g/s g/s Mg/hec/y g/m2/s % http://ww http://ww http://ww later = 0.  Ib/wnt 9% Mg	(AP-42, Se (by waterin w.epa.gov/s 9 lb/wt nnlent (%) on) 7 45 (AP-42, Ta (AP-42, Ta (AP-42, Ta (AP-42, Ta	tn/chief/ap-	42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina			load (15 tor	0))			
Wind Erosion  E  E (unmitigated) % reduction  E (mitigated) Truck Movement (Reference to AP-42, Sec  Equation:  E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E  k  s  W  a  b  k  s  W  a  b  lb  b  lb to g	1.60E-04 0.0054  0.85 2.7E-06 50 1.35E-06  tion 13.2.2,  tb/mt empirical co surface mate mean vehicle empirical co empirical co	% kg/Mg g/s g/s Mg/hec/y g/m2/s % http://www.nstant = 4.erial silt coe e weight (thistant = 0.nstant = 0.lb/vmt % Mg	(AP-42, Se (by waterin w.epa.gov/s 9 lb/wt nnlent (%) on) 7 45 (AP-42, Ta (AP-42, Ta (AP-42, Ta (AP-42, Ta	tn/chief/ap-	42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina			load (15 tor	)))			
Wind Erosion E E (unmitigated) % reduction E (mitigated) Truck Movement (Reference to AP-42, Sec Equation: E = k (s/12) <sup>a</sup> (W/3) <sup>b</sup> E k s W a b k s W a b b	1.60E-04 0.0054 0.0054 0.85 2.7E-06 50 1.35E-06 tition 13.2.2, tition 13.2.2, tition 13.2.2, 0.00000000000000000000000000000000	% kg/Mg g/s g/s Mg/hec/y g/m2/s % http://www.nstant = 4.erial silt coe e weight (thistant = 0.nstant = 0.lb/vmt % Mg	(AP-42, Se (by waterin w.epa.gov/s 9 lb/wt nnlent (%) on) 7 45 (AP-42, Ta (AP-42, Ta (AP-42, Ta (AP-42, Ta	tn/chief/ap-	42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina 42/ch13/fina			load (15 tor	3)))			

