

Valid Dust Sample Counts by Sample Type

37 Months of Dust Rule, 8/1/2014 - 8/31/2017

Sample Type	Sample Type Code	Operator Samples					MSHA Samples						MSHA and Operator Totals					
		Total Valid	Applicable Std		≥ Applicable ECV Value		Total Valid	Applicable Std		≥ Applicable ECV Value		Exceed 100 $\mu\text{g}/\text{m}^3$ Qtz		Total Valid	Applicable Std		≥ Applicable ECV Value	
			#	%	#	%		#	%	#	%	#	%		#	%	#	%
DO	1	75,678	1,193	1.6	644	0.9	7,540	199	2.6	108	1.4	161	2.1	83,218	1,392	1.7	752	0.9
ODO	2	87,401	401	0.5	162	0.2	31,570	466	1.5	258	0.8	153	0.5	118,971	867	0.7	420	0.4
DA	3	16,074	235	1.5	153	1.0	4,633	86	1.9	47	1.0	19	0.4	20,707	321	1.6	200	1.0
DWP	4	17,818	134	0.8	70	0.4	9,800	56	0.6	32	0.3	99	1.0	27,618	190	0.7	102	0.4
PART 90	5	2,992	65	2.2	36	1.2	529	18	3.4	6	1.1	2	0.4	3,521	83	2.4	42	1.2
NDA	6	0					671	16	2.4	9	1.3	0	0.0	671	16	2.4	9	1.3
INTAKE ⁺	7	1,888	125	6.6	44	2.3	8,099	113	1.4	36	0.4	0	0.0	9,987	238	2.4	80	0.8
NDWP	8	3	0	0.0	0	0.0	18,391	19	0.1	11	0.1	14	0.1	18,394	19	0.1	11	0.1
Total:		201,854	2,153	1.1	1,109	0.5	81,233	973	1.2	507	0.6	448	0.6	283,087	3,126	1.1	1,616	0.6

⁺ Intake DA Type 3 samples are included with Intake Type 7 samples.

A total of **137,015** valid operator samples were taken with the Continuous Personal Dust Monitor (CPDM). Operator CPDM sampling began on Feb. 1, 2016. Only **282** CPDM samples (0.2%) were ≥ **ECV values**, and 737 (0.5%) samples exceeded the dust standard.

MSHA informational samples taken in the longwall tailgate area (061) are not included.

Face-Area Dust Sample Summary

Key Parameter	Before Rule (8/1/12 - 7/31/14)	Under Rule (8/1/14 - 8/31/17)
Operator Face Area Samples		
Valid Sample Count	45,525	165,355
Average Concentration (mg/m ³)	0.682	0.631
# Samples > Dust Standard	2,540	1,640
% Samples > Dust Standard	5.6	1.0
Average Sample Time (minutes)	479	562
Average Tonnage	885	1,623
MSHA Face Area Samples		
Valid Sample Count	39,390	40,599
Average Concentration (mg/m ³)	0.585	0.574
# Samples > Dust Standard	918	731
% Samples > Dust Standard	2.3	1.8
Average Sample Time (minutes)	480	568
Average Tonnage	944	1,430

Operator DO Dust Sample Compliance

8/1/2012 thru 8/31/2017

Sampling Period	Sampling Device	Valid Dust Sample Count	Samples > Dust Std.		Samples ≥ ECV Values*	
			Count	% Exc.	Count	% Exc.
Two Years Before Start of Dust Rule						
8/1/12 - 7/31/14 (24 months, 2.0 mg/m ³ Std)	CMDPSU	47,202	2,384	5.1	1,490	3.2
Start of Dust Rule using CMDPSU Sampler						
8/1/14 - 3/31/16 (20 months, 2.0 mg/m ³ Std)	CMDPSU	28,101	871	3.1	539	1.9
First Seventeen Months using CPDM Sampler						
4/1/16 - 7/31/16 (4 months, 2.0 mg/m ³ Std)	CMDPSU ⁺	223	0	0.0	0	0.0
	CPDM	13,176	40	0.3	14	0.1
8/1/16 - 8/31/17 (13 months, 1.5 mg/m ³ Std)	CMDPSU ⁺	532	0	0.0	0	0.0
	CPDM	33,623	282	0.8	98	0.3
4/1/16 - 8/31/17 Subtotal:		47,554	322	0.7	112	0.2

* MSHA did not begin using applicable excessive concentration values (ECVs) corresponding to dust standards until 8/1/2014; estimated compliance based on single ECV values was determined for the 2 years prior to 8/1/14 for comparison.

CMDPSU⁺ - The only coal mine operators now using the CMDPSU for DO sampling are small anthracite mines.

MSHA DO Quartz Sample Compliance

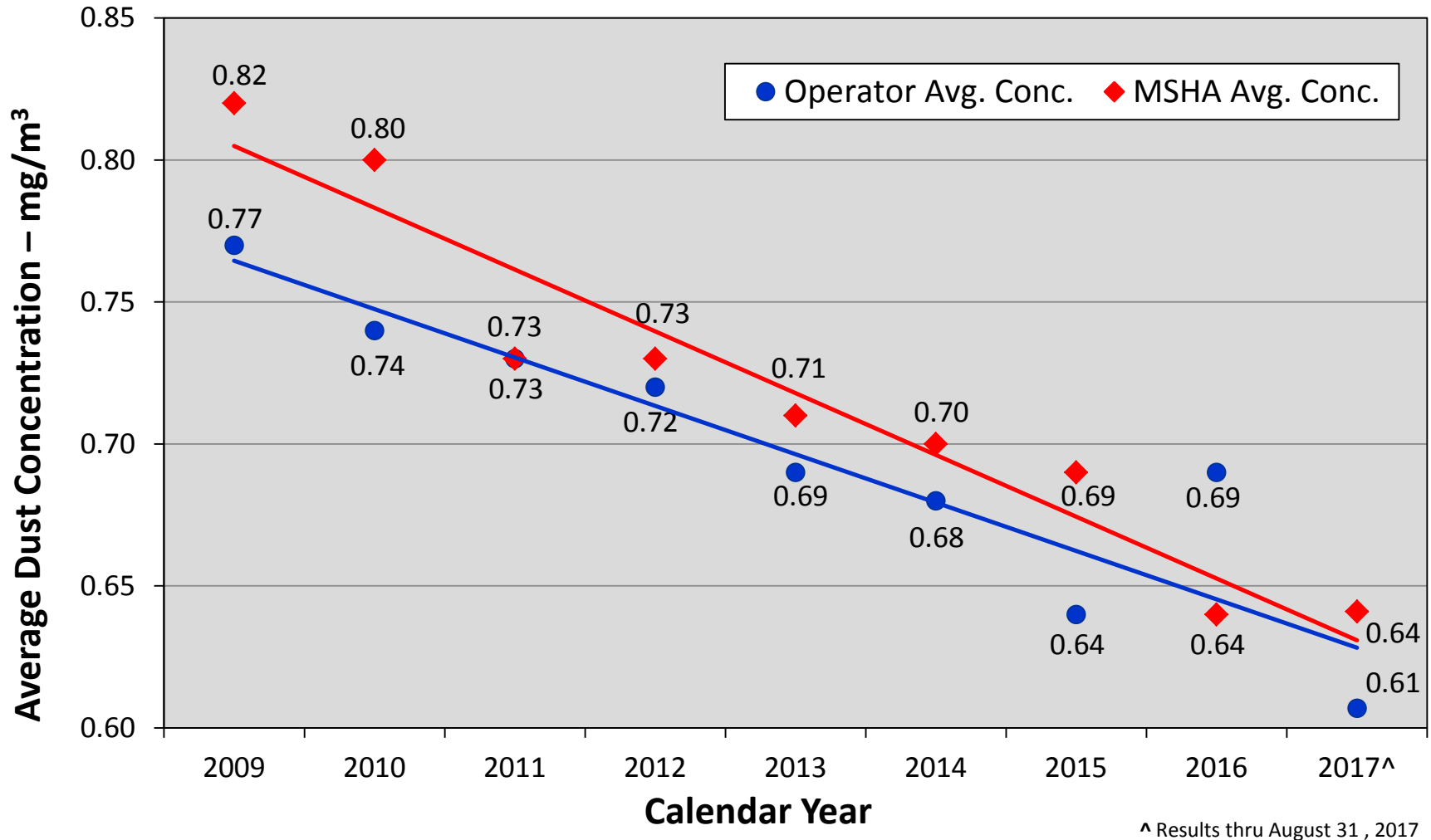
8/1/2012 - 8/31/2017

Sampling Period	Sampling Device	Valid DO Samples Analyzed	DO Samples > 100 µg/m ³	
			Count	% Exc.
Before Start of Dust Rule				
8/1/12 - 7/31/14	CMDPSU	3,140	201	6.4
Dust Rule Results				
8/1/14 - 8/31/17	CMDPSU	6,685	146	2.4

Note that MSHA did not routinely analyze ODO occupational samples until after the start of the rule.

Underground Coal Mines

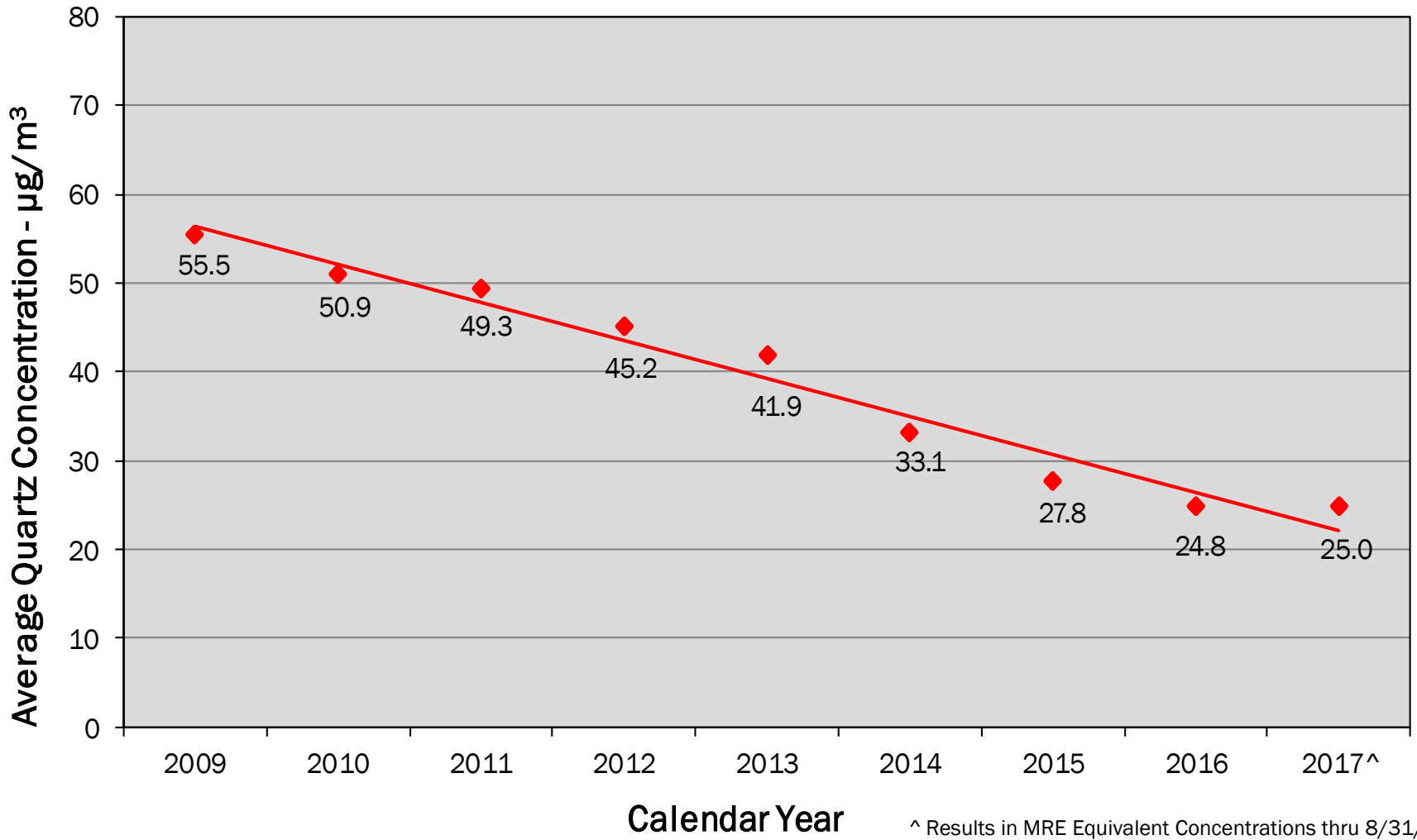
Average Designated Occupation* Dust Concentration by Calendar Year



* those occupations exposed to the highest levels of respirable coal mine dust (dustiest occupations)

Underground Coal Mines

MSHA Average Designated Occupation* Quartz Concentration by Calendar Year



*those occupations exposed to the highest levels of respirable coal mine dust (dustiest occupations)