

TECHNICAL MEMORANDUM

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## RESPONSE TO COMMENT ON THE RESOLUTION COPPER PROJECT DEIS: ACTION ITEM AQ9 - SURFACE MATERIAL SILT CONTENT USED TO ESTIMATE FUGITIVE DUST EMISSIONS

**PREPARED FOR:** USDA Forest Service – Tonto National Forest  
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**PROJECT NO.:** 262-37  
**COPIES:** Resolution Copper  
**DATE:** May 18, 2020

### INTRODUCTION

In the comments to the Resolution Copper Project (Project) Draft Environmental Impact Statement (DEIS), comment #524-20 (submitted by US Environmental Protection Agency (US EPA) included a comment that the silt content value (3%) used as input to emission factor calculations to estimate the Project’s fugitive emissions from several activities could result in an underestimate of PM<sub>2.5</sub> and PM<sub>10</sub> emissions:

*While the Draft EIS relied on [a dispersion] analysis contained in the Resolution Copper Project NEPA Air Quality Impacts Analyses, we are concerned that it may have underestimated PM<sub>10</sub>, as well as PM<sub>2.5</sub>, emissions. The dispersion analysis used the Arizona Statewide average for silt content of 3.0% in calculations for fugitive emissions from unpaved road and other sources. For unpaved roads, EPA's AP-42, Chapter 13.2.2, outlines that site-specific silt content information should be used when available, but, when they cannot be obtained, the sector-specific averages available in Table 13.2.2-1 should be used. In the absence of site-specific silt content for unpaved road emissions from the project, we recommend the sector-specific averages as the closest analogue and average silt content to use. In either case, it does not appear that modelled air quality concentrations would exceed the PM<sub>10</sub> or PM<sub>2.5</sub> NAAQS; however, this should be verified by the USFS. We acknowledge the revised dispersion analysis is unlikely to show the preferred alternative will cause or contribute to an increase in the severity or frequency of NAAQS violations [...]*

On Feb. 19<sup>th</sup>, 2020, staff from the US Forest Service – Tonto National Forest (TNF), Resolution Copper (Resolution), SWCA, Inc. (SWCA), Arizona Department of Environmental Quality (ADEQ), Pinal County Air Pollution Control District (PCAQCD), and Air Sciences Inc. (Air

Sciences) met to discuss the agency and public comments on the DEIS. Air Sciences was asked to provide additional information regarding the silt content value and the fugitive dust sources at the Project which use the silt content value for emissions calculations.

#### **RESPONSE TO COMMENT #524-20**

In the Draft Resolution Modeling Plan (Modeling Plan) (Air Sciences, July 2015) submitted to PCAQCD to support the Class II permitting application for the Project, a silt content value of 2% was proposed as an input value to the emission factors used to estimate emissions of PM<sub>10</sub> and PM<sub>2.5</sub> from surface unpaved roads, underground unpaved roads, and bulldozing activity.

The 2% silt content value was based on data from the “Proposed Grinding System for the Resolution Project Based on Small-Scale Test Data” (Grindability Report) (January 2011). The Grindability Report analyzed 20 samples from the ore body at the Project for sieve passing percentages of the ore samples at 53 micrometers (µm) and 106 µm. AP42 13.2.2 defines “silt” as “particles smaller than 75 µm in diameter.” A linear interpolation between the passing percentages at 53 and 106 µm was performed to estimate a passing percentage at 75 µm for each of the 20 samples. The average estimated 75 µm passing percentage was 1.8%. This was rounded up to 2% and used as the required input for silt content for PM<sub>2.5</sub> and PM<sub>10</sub> emission factors for surface unpaved roads, underground unpaved roads, and bulldozing. The sieve passing percentages and estimates of silt content are provided in Table 1.

In their review of the Modeling Plan, the PCAPCD requested supporting information regarding the 2% silt content value. Air Sciences and Resolution conducted a review of the emission factor estimation method and supporting data available at that time, including the methods described in AP-42 Appendix C.1 – Procedures for Sampling Surface/Bulk Dust Loading. As a result of this review, Air Sciences/Resolution decided to take a conservative approach and increase the silt content to 3% (above the measures silt content of the actual site-specific data). The 3% value comes from a US EPA spreadsheet that supports AP-42 Section 13.2.2 *Unpaved Roads – Related Information, Surface Material Silt Content by State*<sup>1</sup>. US EPA’s description of the spreadsheet states:

“EPA has used these values in the preparation of the National Emission Inventory. In the absence of locally derived surface material silt content, users may choose to use the values in this table as default values.”

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<sup>1</sup> Accessed May 13, 2020. <https://www3.epa.gov/ttnchie1/ap42/ch13/related/c13s02-2.html>

The decision to increase the silt content value from 2% to 3% was based on two considerations:

1. To use the US EPA-accepted value for Surface Material Site Content for Arizona rather than applying the site-specific data from the Grindability Report study. This decision was intended to avoid agency or public disagreement with the methodology, selection of materials used, averaging methods, etc., of the Grindability Report study.
2. To use a more conservative (i.e., higher) silt content value than indicated by the site-specific data. Even though none of the samples in the Grindability Report study indicated a 75  $\mu\text{m}$  sieve passing percentage greater than 2.5%, six of the twenty samples (30%) had a passing percentage greater than 2%.

Comment #524-20 includes a recommendation to use an industry sector-specific typical silt content value from AP42 Table 13.2.2-1. The list of industry sectors in Table AP-42 13.2.2-1 shows no industry sector that is representative of Arizona underground mining and associated surface activities. A vast majority of the vehicle miles travelled estimated for the project will be travelled on extremely well-maintained roads, by a comparatively homogenous fleet of equipment, traveling at consistently low speeds, in a very humid underground environment. Travel on surface roads will not include large and heavy ore and waste rock hauling trucks typical of a surface, open pit mine. At the Project, all ore mined will be conveyed, not hauled, to the West Plant site for processing. Given that there is no appropriate industry analogue and the very wide range of silt content values in Table 13.2.2-1, using a sector-specific average from Table 13.2.2-1 could not be technically justified. The 3% silt content value was determined to be the most representative yet conservative value for this Project evidenced by the similarity of the site-specific silt content data for ore samples and the US EPA-supplied average Arizona silt content value. The Class II permit Modeling Plan and the NEPA Modeling Plan, that both documented the use of the 3% silt content value, have been reviewed and approved by multiple regulatory agencies (PCAQCD, TNF, ADEQ) in the permit-review and DEIS development process.

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**Table 1. Ore Body Sample Sieve Passing Percentages**

Sample Test	Passing Percentage (%)		
	53 $\mu\text{m}$	106 $\mu\text{m}$	75 $\mu\text{m}^*$
1-266	0.82	1.36	1.04
1-267	1.66	2.72	2.10
1-268	1.65	2.44	1.97
1-269	1.46	2.25	1.79
1-270	1.54	2.45	1.91
1-271	1.22	1.95	1.52
1-272	2.09	3.01	2.47
1-273	2.01	2.89	2.38
1-274	1.24	1.73	1.44
1-275	1.49	1.88	1.65
1-276	1.31	1.84	1.53
1-277	1.60	2.24	1.87
1-278	1.79	2.43	2.05
1-279	1.25	2.46	1.76
1-280	1.54	2.26	1.84
1-281	1.30	1.76	1.49
1-282	1.18	1.74	1.41
1-283	1.00	1.40	1.16
1-284	1.82	2.68	2.17
1-285	1.74	2.75	2.16
<b>Average</b>			<b>1.79</b>

\* Estimated by linear interpolation.