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Project No. 23-7-513

Subject: Corrosion Potential Evaluation Addendum, Proposed Residential Development, Parcel 1, Red Mountain Ranch, US Highway 6, Eagle, Colorado

Gentlemen:

Presented in this report is an addendum to our previous report of the subsurface conditions encountered at the subject site for evaluation of the corrosion potential to ductile iron pipe and potential sulfate attack on concrete exposed the onsite soils. Our previous report of the subsoil conditions encountered at the subject site was dated December 21, 2023, Project No. 23-7-513.

Results of laboratory testing and visual evaluation of three samples taken from the exploratory borings at the subject site are summarized below along with American Water Works Association (AWWA) Standard soil test evaluation points.

Project No. 23-7-513	**Sample from Boring 4 at 4 feet**	AWWA C105 Table A.1 Points
Date Sampled	**09-21-23**	
Date Sample Received	**12-26-23**	
Lab Sample I.D. No.	**3463**	
Sample Visual Description	**Sandy Silty Clay (Fill)**	
Minimum Laboratory Resistivity	**740 ohm-cm**	**10**
pH	**8.0**	**0**
Redox Potential E(h)	**260 mV**	**0**
Sulfides	**Negative**	**0**
Moisture Content	**3.47%**	**1**
Total Soluble Salts	**4880 ppm**	
	0.488%	
Water Soluble Sulfates	**2560 ppm**	
	0.256%	
Organic Matter Content	**2.07%**	
*AWWA C105 Appendix A, Table A.1 Total Score:		**11**

Project No. 23-7-513	**Sample from Boring 5 at 4 feet**	AWWA C105 Table A.1 Points
Date Sampled	**09-27-23**	
Date Sample Received	**12-26-23**	
Lab Sample I.D. No.	**3464**	
Sample Visual Description:	**Sandy Silt**	
Minimum Laboratory Resistivity	**2530**	**1**
pH	**8.7**	**3**
Redox Potential E(h)	**227 mV**	**0**
Sulfides	**Positive**	**3.5**
Moisture Content	**10.5%**	**1**
Total Soluble Salts	**1070 ppm**	
	0.107%	
Water Soluble Sulfates	**169 ppm**	
	0.0169%	
Organic Matter Content	**0.98%**	
*AWWA C105 Appendix A, Table A.1 Total Score:		**8.5**

Project No. 23-7-513	**Sample from Boring 5 at 9 feet**	AWWA C105 Table A.1 Points
Date Sampled	**09-27-23**	
Date Sample Received	**12-26-23**	
Lab Sample I.D. No.	**3465**	
Sample Visual Description	**Silty Sand**	
Minimum Laboratory Resistivity	**4680 ohm-cm**	**0**
pH	**8.9**	**3**
Redox Potential E(h)	**249 mV**	**0**
Sulfides	**Trace**	**2**
Moisture Content	**2.7%**	**1**
Total Soluble Salts	**505 ppm**	
	0.0505%	
Water Soluble Sulfates	**41 ppm**	
	0.0041%	
Organic Matter Content	**0.76%**	
*AWWA C105 Appendix A, Table A.1 Total Score:		**6**

*The Table A.1 soil test evaluation is based on the sample resistivity, pH, redox potential, sulfides, and moisture/drainage conditions. In scoring these samples, we assumed fair site drainage (1 point). The points rating for the two shallow depth fine-grained soil samples tested was 8.5 and 11 and the one deeper coarse granular soil sample tested was 6. A ten-point score or greater indicates that the soil is corrosive to ductile iron pipe and protection is needed.

A certain level of corrosion protection from the soils to the pipe should be provided. Based on our experience in the area and the test results, poly-wrap of the pipe which is typically used in the area should be adequate at this site.

Water soluble sulfate test results ranged from less than 0.1% on the lower coarse granular and silt soil samples to 0.256% on the upper fine-grained soil sample indicating the need for Class 2 requirements for sulfate resistant Portland cement in concrete exposed to the onsite soils. A cement meeting the sulfate resistance such as Type II typically used in this area plus fly ash appears acceptable for resistance to sulfate attack at this site.

If you have any questions or need further assistance, please call our office.

Sincerely,

Kumar & Associates, Inc.

COLORADO REGISTERED STEVEN L. PAWLAK 15222 1/8/24 PROFESSIONAL ENGINEER

Steven L. Pawlak, P.E.

SLP/kac

cc: The Dwell Company – Steve Stone (stone@dwellmountain.com)