



Colorado Dept. of Transportation
222 S 6th St., Rm 317, Grand Junction, CO 81501
douglas.killerud@state.co.us

June 23rd, 2015

Attn: Doug Killerud

Re: Alpengsee Water District – Results of Special Purposes Sampling (Well #1 / Well #2)

P.O. #411005225

Dear Mr. Killerud,

We have received the results of the special purposes raw water sampling, which was performed at the request of the Colorado Dept. of Transportation, as a means of establishing the existing water quality at the potable drinking water supply wells, which supply the Alpengsee Water District.

The spreadsheet below provides a break-down of the results of each parameter, and the established human-health implications, and/or aesthetic considerations, associated with elevated levels of each analyte.

Our review has established that there are naturally elevated levels, for the following analytes:

- Well #1 – Iron (highlighted in the associated spreadsheet, below)
- Well #2 – Iron (highlighted in the associated spreadsheet, below)

All other analytes were within acceptable concentration limits.

ALPENSEE WATER DISTRICT – WELL #1

Sample Type / Result : (expressed @ ug/L, unless otherwise specified)		Established Limit:		Level of Concern w- Results / Human Health Implications & Aesthetics
		Primary	Secondary	
1,1,1,2 - Tetrachloroethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,1,1, - Trichloroethane	< 0.5	200 ug/L	N/A	Liver, nervous system, or circulatory problems
1,1,2,2, - Tetrachloroethane	< 0.6	N/A	N/A	May have long term health effects, with continued exposure
1,1,2 - Trichloroethane	< 0.5	5 ug/L	N/A	Liver, kidney, or immune system problems
1,1 - Dichloroethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,1 - Dichloroethylene	< 0.5	7 ug/L	N/A	Liver problems
1,1 - Dichloropropene	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,2,3, - Trichlorobenzene	< 0.5	70 ug/L	N/A	Changes in adrenal glands
1,2,3 - Trichloropropane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,2,4 - Trichlorobenzene	< 0.5	70 ug/L	N/A	Changes in adrenal glands
1,2,4 - Trimethylbenzene	< 0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
1,2 - Dichloroethane	< 0.5	5 ug/L	N/A	Increased risk of cancer
1,2 - Dichloropropane	< 0.5	5 ug/L	N/A	Increased of cancer
1,3,5 - Trimethylbenzene	< 0.5	5 ug/L	N/A	Increased of cancer
1,3 - Dichloropropane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,3 - Dichloropropene	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Alachlor	< 0.2	2 ug/L	N/A	Eye, liver, kidney or spleen problems, anemia. Increased risk of cancer.
Artazine	< 0.1	N/A	N/A	May have long term health effects, with continued exposure
Benzene	< 0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
Benzo(a)pyrene	< 0.02	N/A	N/A	May have long term health effects, with continued exposure
Bromobenzene	< 0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
Bromochloromethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Bromodichloromethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Bromoform	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Bromomethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Butachlor	< 0.25	N/A	N/A	May have long term health effects, with continued exposure
Carbon Tetrachloride	< 0.5	5 ug/L	N/A	Liver problems, increased risk of cancer
Chlorodibromomethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Chloroethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Chloroform	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Chloromethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Cis-1,2-Dichloroethylene	< 0.5	7 ug/L	N/A	Liver problems
Di(2-thylhexyl)adipate	< 0.6	400 ug/L	N/A	Weight loss, liver problems, or possible reproductive difficulties
Di(2-thylhexyl)phthalate	< 0.6	6 ug/L	N/A	Weight loss, liver problems, or possible reproductive difficulties
Dibromomethane	< 0.8	N/A	N/A	May have long term health effects, with continued exposure
Dichlorodifluoromethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Dichloromethane	< 0.5	5 ug/L	N/A	Liver problems, increased risk of cancer
Ethylbenzene	< 0.5	700 ug/L	N/A	Liver or kidney problems
Fluorotricholomethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Hexachlorobutadiene	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Isopropylbenzene	< 0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
m-Dichlorobenzene	< 0.5	100 ug/L	N/A	Liver or Kidney problems
Metolachlor	< 0.25	N/A	N/A	May have long term health effects, with continued exposure
Monochlorobenzene	< 0.5	100 ug/L	N/A	Liver or Kidney problems
Naphthalene	< 0.5	N/A	N/A	May have long term health effects, with continued exposure

n-Butylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
n-Propylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
o-Chlorotoluene	<0.5	N/A	N/A	May have long term health effects, with continued exposure
o-Dichlorobenzene	<0.5	600 ug/L	N/A	Anemia; liver, kidney or spleen damage; changes in blood
Para-Dichlorobenzene	<0.5	100 ug/L	N/A	Liver or Kidney problems
p-Chlorotoluene	<0.5	N/A	N/A	May have long term health effects, with continued exposure
p-Isolpropyltoluene	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Propachlor	<0.25	N/A	N/A	May have long term health effects, with continued exposure
Sec-Butylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
Simazine	<0.07	4 ug/L	N/A	Problems with blood
Styrene	<0.5	100 ug/L	N/A	Liver, kidney, or circulatory system problems
Tert-Butylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
Tetrachloroethylene	<0.5	5 ug/L	N/A	Liver problems, increased risk of cancer
Toluene	<0.5	1000 ug/L	N/A	Nervous system, kidney, or liver problems
Trans-1,2-Dichloroethylene	<0.5	100 ug/L	N/A	Liver problems
Trichloroethylene	<0.5	5 ug/L	N/A	Liver problems, increased risk of cancer
Vinyl Chloride	<0.5	2 ug/L	N/A	Increased risk of cancer
Xylenes (total)	<0.5	10,000 ug/L	N/A	Nervous system damage
Radium - 226	0.1 (+/- 0.1)	5 ug/L (w/228)	N/A	Increased risk of cancer
Radium - 228	0.0 (+/- 0.7)	5 ug/L (w/226)	N/A	Increased risk of cancer
Radon	1300 (+/- 44)	4,000 ug/L	N/A	Increased risk of cancer
e-Coli	< 1 mpn/100 ml	Absent	N/A	Bacteria is indicative of contamination of the water supply with human and/or animal waste
Nitrite Nitrogen	<0.03 mg/L	1 mg/L	N/A	Infants under 6 months may become ill & die. Symptoms include shortness of breath, and "blue baby" syndrome.
Oil & Grease	<0.5 mg/L	N/A	N/A	May have long term health effects, with continued exposure
Total Organic Carbon	1.5 mg/L	N/A	N/A	May have long term health effects, with continued exposure
Antimony	<0.0001 mg/L	6 ug/L		Increase in blood cholesterol, decrease in blood sugar
Arsenic	<0.0001 mg/L	N/A	N/A	May have long term health effects, with continued exposure
Barium	0.095 mg/L	2 mg/L	N/A	Increase in blood pressure
Beryllium	<0.001 mg/L	0.004 mg/L	N/A	Intestinal lesions
Cadmium	<0.001 mg/L	0.005 mg/L	N/A	Kidney damage
Chromium	<0.001 mg/L	100 ug/L	N/A	Allergic dermatitis
Copper	0.0398 mg/L	1.3 mg/L	N/A	Short Term – Gastrointestinal distress / Long term – Liver or Kidney damage.
Lead	0.0079 mg/L	0.015 mg/L	N/A	Infants & Children may experience developmental delays. Adults may experience kidney problems and/or high blood pressure
Mercury	<0.0001 mg/L	0.002 ug/L	N/A	Kidney damage
Nickel	<0.001 mg/L	N/A	N/A	May have long term health effects, with continued exposure
Selenium	<0.001 mg/L	0.05 mg/L	N/A	Hair or fingernail loss, numbness in fingers or toes, circulatory problems
Sodium	9.8 mg/L	N/A	100 mg/L	May elevate blood pressure in some individuals
Thallium	<0.001 mg/L	0.002 mg/L	N/A	Hair loss, changes on blood; kidney, intestine, or liver problems
Uranium	<0.0002 mg/L	30 ug/L	N/A	Increased risk of cancer, kidney toxicity
Total Alkalinity (A CaCO3)	92.2 mg/L	N/A	N/A	May affect taste and/or odor in water
Bicarbonate	112.5 mg/l	N/A	N/A	May affect taste and/or odor in water
Carbonate	<0.1 mg/L	N/A	N/A	May affect taste and/or odor in water
Chloride	10.6 mg/L	N/A	250 mg/L	May affect taste and/or odor in water
Iron	1.529 mg/L	N/A	0.3 mg/L	May affect taste and/or odor in water
Fluoride	<0.09	4 mg/L	2 mg/L	Bone disease,(pain & tenderness of the bones), children may have mottled teeth.
Potassium	1.5 mg/L	N/A	N/A	May affect taste and/or odor in water

Nitrate Nitrogen	.48 mg/L	10 mg/L	N/A	Infants under 6 months may become ill & die. Symptoms include shortness of breath, and "blue baby" syndrome.
pH	6.48 units	N/A	6-9 units	May affect the softness or hardness of water, may also affect piping
Calcium	27.5 mg/L	N/A	N/A	May affect the softness or hardness of water, may also affect piping
Magnesium	6.1mg/L	N/A	N/A	May affect the softness or hardness of water, may also affect piping. May also create a staining effect on fixtures, and in laundry
Sodium Adsorption Ratio	0.4 units	N/A	N/A	May affect the softness or hardness of water, may also affect piping & outside landscaping.
Total Hardness (ACaCO3)	93.6 mg/L	N/A	N/A	May affect the softness or hardness of water, may also affect piping
Sulfate	10.0 mg/L	N/A	250 mg/L	May affect taste and/or odor in water
Total Dissolved Solids	147 mg/L	N/A	500 mg/L	May affect taste and/or odor in water
Total Coliform	Absent	Absent	N/A	Bacteria is indicative of contamination of the water supply with human and/or animal waste

END OF WELL #1 REPORT

ALPENSEE WATER DISTRICT - WELL #2

Sample Type / Result: (expressed @ ug/L, unless otherwise specified)		Established Limit:		Level of Concern w- Results / Human Health Implications & Aesthetics
		Primary	Secondary	
1,1,1,2 - Tetrachloroethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,1,1, - Trichloroethane	< 0.5	200 ug/L	N/A	Liver, nervous system, or circulatory problems
1,1,2,2, - Tetrachloroethane	< 0.6	N/A	N/A	May have long term health effects, with continued exposure
1,1,2 - Trichloroethane	< 0.5	5 ug/L	N/A	Liver, kidney, or immune system problems
1,1 - Dichloroethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,1 - Dichloroethylene	< 0.5	7 ug/L	N/A	Liver problems
1,1 - Dichloropropene	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,2,3, - Trichlorobenzene	< 0.5	70 ug/L	N/A	Changes in adrenal glands
1,2,3 - Trichloropropane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,2,4 - Trichlorobenzene	< 0.5	70 ug/L	N/A	Changes in adrenal glands
1,2,4 - Trimethylbenzene	< 0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
1,2 - Dichloroethane	< 0.5	5 ug/L	N/A	Increased risk of cancer
1,2 - Dichloropropane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,3,5 - Trimethylbenzene	< 0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
1,3 - Dichloropropane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
1,3 - Dichloropropene	< 0.5	N/A	N/A	May have long term health effects, with continued exposure
Alachlor	< 0.2	2 ug/L	N/A	Eye, liver, kidney or spleen problems, anemia. Increased risk of cancer.
Artazine	< 0.1	N/A	N/A	May have long term health effects, with continued exposure
Benzene	< 0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
Benzo(a)pyrene	< 0.02	N/A	N/A	May have long term health effects, with continued exposure
Bromobenzene	< 0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
Bromochloromethane	< 0.5	N/A	N/A	May have long term health effects, with continued exposure

Bromodichloromethane	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Bromoform	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Bromomethane	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Butachlor	<0.25	N/A	N/A	May have long term health effects, with continued exposure
Carbon Tetrachloride	<0.5	5 ug/L	N/A	Liver problems, increased risk of cancer
Chlorodibromomethane	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Chloroethane	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Chloroform	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Chloromethane	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Cis-1,2-Dichloroethylene	<0.5	7 ug/L	N/A	Liver problems
Di(2-thylhexyl)adipate	<0.6	400 ug/L	N/A	Weight loss, liver problems, or possible reproductive difficulties
Di(2-thylhexyl)phthalate	<0.6	6 ug/L	N/A	Weight loss, liver problems, or possible reproductive difficulties
Dibromomethane	<0.8	N/A	N/A	May have long term health effects, with continued exposure
Dichlorodifluoromethane	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Dichloromethane	<0.5	5 ug/L	N/A	Liver problems, increased risk of cancer
Ethylbenzene	<0.5	700 ug/L	N/A	Liver or kidney problems
Fluorotricholomethane	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Hexachlorobutadiene	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Isopropylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
m-Dichlorobenzene	<0.5	100 ug/L	N/A	Liver or Kidney problems
Metolachlor	<0.25	N/A	N/A	May have long term health effects, with continued exposure
Monochlorobenzene	<0.5	100 ug/L	N/A	Liver or Kidney problems
Naphthalene	<0.5	N/A	N/A	May have long term health effects, with continued exposure
n-Butylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
n-Propylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
o-Chlorotoluene	<0.5	N/A	N/A	May have long term health effects, with continued exposure
o-Dichlorobenzene	<0.5	600 ug/L	N/A	Anemia; liver, kidney or spleen damage; changes in blood
Para-Dichlorobenzene	<0.5	100 ug/L	N/A	Liver or Kidney problems
p-Chlorotoluene	<0.5	N/A	N/A	May have long term health effects, with continued exposure
p-Isolpropyltoluene	<0.5	N/A	N/A	May have long term health effects, with continued exposure
Propachlor	<0.25	N/A	N/A	May have long term health effects, with continued exposure
Sec-Butylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
Simazine	<0.07	4 ug/L	N/A	Problems with blood
Styrene	<0.5	100 ug/L	N/A	Liver, kidney, or circulatory system problems
Tert-Butylbenzene	<0.5	5 ug/L	N/A	Anemia, decrease in blood platelets, increase of cancer
Tetrachloroethylene	<0.5	5 ug/L	N/A	Liver problems, increased risk of cancer
Toluene	<0.5	1000 ug/L	N/A	Nervous system, kidney, or liver problems
Trans-1,2-Dichloroethylene	<0.5	100 ug/L	N/A	Liver problems
Trichloroethylene	<0.5	5 ug/L	N/A	Liver problems, increased risk of cancer
Vinyl Chloride	<0.5	2 ug/L	N/A	Increased risk of cancer
Xylenes (total)	<0.5	10,000 ug/L	N/A	Nervous system damage
Radium - 226	0.1 (+/- 0.1)	5 ug/L (w/228)	N/A	Increased risk of cancer
Radium - 228	0.0 (+/- 0.7)	5 ug/L (w/226)	N/A	Increased risk of cancer
Radon	1730 (+/- 44)	4,000 ug/L	N/A	Increased risk of cancer
e-Coli	< 1 mpn/100 ml	Absent	N/A	Bacteria is indicative of contamination of the water supply with human and/or animal waste
Nitrite Nitrogen	<0.03 mg/L	1 mg/L	N/A	Infants under 6 months may become ill & die. Symptoms include shortness of breath, and "blue baby" syndrome.
Oil & Grease	<0.5 mg/L	N/A	N/A	May have long term health effects, with continued exposure
Total Organic Carbon	1.5 mg/L	N/A	N/A	May have long term health effects, with continued exposure
Antimony	<0.0001 mg/L	6 ug/L		Increase in blood cholesterol, decrease in blood sugar

Arsenic	<0.0001 mg/L	N/A	N/A	May have long term health effects, with continued exposure
Barium	0.090 mg/L	2 mg/L	N/A	Increase in blood pressure
Beryllium	<0.001 mg/L	0.004 mg/L	N/A	Intestinal lesions
Cadmium	<0.001 mg/L	0.005 mg/L	N/A	Kidney damage
Chromium	0.001 mg/L	100 ug/L	N/A	Allergic dermatitis
Copper	0.0047 mg/L	1.3 mg/L	N/A	Short Term - Gastrointestinal distress / Long term - Liver or Kidney damage.
Lead	0.0008 mg/L	0.015 mg/L	N/A	Infants & Children may experience developmental delays. Adults may experience kidney problems and/or high blood pressure
Mercury	<0.0001 mg/L	0.002 ug/L	N/A	Kidney damage
Nickel	<0.001 mg/L	N/A	N/A	May have long term health effects, with continued exposure
Selenium	<0.001 mg/L	0.05 mg/L	N/A	Hair or fingernail loss, numbness in fingers or toes, circulatory problems
Sodium	10.7 mg/L	N/A	100 mg/L	May elevate blood pressure in some individuals
Thallium	<0.001 mg/L	0.002 mg/L	N/A	Hair loss, changes on blood; kidney, intestine, or liver problems
Uranium	0.0002 mg/L	30 ug/L	N/A	Increased risk of cancer, kidney toxicity
Total Alkalinity (A CaCO3)	95.3 mg/L	N/A	N/A	May affect taste and/or odor in water
Bicarbonate	116.3 mg/l	N/A	N/A	May affect taste and/or odor in water
Carbonate	<0.1 mg/L	N/A	N/A	May affect taste and/or odor in water
Chloride	8.8 mg/L	N/A	250 mg/L	May affect taste and/or odor in water
Iron	0.870 mg/L	N/A	0.3 mg/L	May affect taste and/or odor in water
Fluoride	0.11	4 mg/L	2 mg/L	Bone disease,(pain & tenderness of the bones), children may have mottled teeth.
Potassium	1.5 mg/L	N/A	N/A	May affect taste and/or odor in water
Nitrate Nitrogen	0.43 mg/L	10 mg/L	N/A	Infants under 6 months may become ill & die. Symptoms include shortness of breath, and "blue baby" syndrome.
pH	6.44 units	N/A	6-9 units	May affect the softness or hardness of water, may also affect piping
Calcium	26.8 mg/L	N/A	N/A	May affect the softness or hardness of water, may also affect piping
Magnesium	6.0 mg/L	N/A	N/A	May affect the softness or hardness of water, may also affect piping. May also create a staining effect on fixtures, and in laundry
Sodium Adsorption Ratio	0.5 units	N/A	N/A	May affect the softness or hardness of water, may also affect piping & outside landscaping.
Total Hardness (ACaCO3)	91.8 mg/L	N/A	N/A	May affect the softness or hardness of water, may also affect piping
Sulfate	10.5 mg/L	N/A	250 mg/L	May affect taste and/or odor in water
Total Dissolved Solids	146 mg/L	N/A	500 mg/L	May affect taste and/or odor in water
Total Coliform	Absent	Absent	N/A	Bacteria is indicative of contamination of the water supply with human and/or animal waste

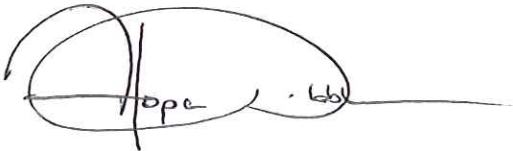
END OF WELL #2 REPORT

PHYSICAL WELL INSPECTION REPORT

DATE	WELL #1			WELL #2		
4/22/15	STATIC WATER LEVEL	7' 2"		STATIC WATER LEVEL	6' 4"	
4/22/15	DRAWDOWN LEVEL	14' 5" 14' 9"	@ 1 min. @ 2 min. (sucking air)	DRAWDOWN LEVEL	22' 1" 22' 1"	@ 1 min. (1 st test) @ 1 min. (2 nd test)
4/22/15	RECHARGE LEVEL	7' 7" 7' 3"	@ 2 min. @ 5 min. 10 sec.	RECHARGE LEVEL	6' 6" 6' 6" 6' 4.5"	@ 35 sec. (1 st test) @ 1 min. 21 sec. (2 nd test) @ 3 min. (2 nd test)
4/22/15	VISUAL INSPECTION	Oil sheen & bubbles visible		VISUAL INSPECTION	Slight oil sheen & bubbles visible	
4/22/15	pH	7.08		pH	7.03	
4/22/15	Temp	7° (cel)		Temp	10.2°	
4/22/15	Comments: <ul style="list-style-type: none"> • Sampling performed prior to draw down test. • Draw down test taken while water is in static mode. • Well casing is 10" nominal = 4.04 gal/ft. • Top of casing to ground = 16" • Water level measurements are from top of casing. 			Comments: <ul style="list-style-type: none"> • Sampling performed prior to draw down test. • Draw down test taken while water is in static mode. • Well casing is 8" nominal = 2.64 gal/ft. • Top of casing to ground = 17" • Water level measurements are from top of casing. 		

If you have any questions, or concerns, please do not hesitate to contact us.

Kind regards,



Hope Dibble, CWP

Compliance Manager / Design Treatment Consultant
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