Bradford Smith Objection Letter to DRMS
Regarding the Use of Cyanide in Reopening the Leadville Mill

The proposed use of sodium cyanide by CJK, a company inexperienced in the use of cyanide, in its application to reopen the Leadville Mill is a cause for great concern to the citizens of Colorado. ***Although claiming to follow the processes and guidance of a national mining industry consortium (The Cyanide Code), there is no indication that CJK has direct experience with such industry standards or with the use of cyanide.*** The Cyanide Code requires certifications that are not currently indicated to be in place within the CJK Lake County team. Their cyanide risk management plan is an empty shell. Given the hazard that cyanide poses to our people and environment, allowing an unproven company to use cyanide is just asking for an accident to occur.

Please consider the following:

The use of cyanide carries significant inherent risks to our water supply and accidents do occur.

1. A 52,000 gallon cyanide accident in Montana.
2. A Colorado mining accident contaminating 17 miles of the Alamosa River.
3. A Central Asian truck accident poisoning 2600 people.
4. A cyanide laden tailing spill causing significant impact on wildlife in Eastern Europe.

By its very nature, cyanide poses a threat to our family water supplies here in Lake County. The chemical complexes formed with, for example iron or lead, will be stable, long lasting, and highly likely to reach the underlying aquafer over time. It is important to note that there are now only two mining operations in Colorado that use cyanide in their mills, and neither is close to residential property. The CJK mill directly borders residential property.

An accident at the facility could result in contamination of groundwater and the surrounding soil by metal-cyanide complexes. The nature of that contamination depends on what other chemicals the company puts into the disposal pit and tailing storage facility as well as the composition of the ore being processed. Because CJK milling doesn't describe or perhaps even know the specific contents of each site, the types and potential hazards of these metal-cyanide complexes is unknown.

Realistically, the only way to truly eliminate the risk of groundwater contamination from cyanide is to not use cyanide in ore processing, particularly near residential areas. Improper storage procedures and handling could result in aquifer contamination by chemically stable metal-cyanide complexes that could be transported to surrounding wells and potentially to the Arkansas River.

Specifically: Cyanide anions and complexes react readily with hydroxyl radicals formed by exposure to sunlight, meaning that concentrations in surface waters will dissipate quickly, but contamination in aquifers or soils will last for some time. Free cyanide ions generally form very stable complexes with metals, especially iron. A recent paper on subsurface fate and transport of cyanide species at a manufactured gas site found that most cyanide species found in the aquifer were iron-bound. Ferrocyanide complexes are stable and soluble in groundwater but can degrade readily to toxic free cyanide when exposed to light. However, as stated above, other complexes can form depending on the type of materials disposed of with the cyanide waste, especially in the context of mining. For example, this paper found that free cyanide can react with mercury to produce mercuric cyanide complexes,

which are highly toxic. Other heavy metal complexes like chromium or lead cyanide are also toxic. The leaching process used to dissolve gold in ore heaps will readily dissolve these compounds as well, forming complexes that could have severe environmental implications if improperly stored or if there is an accidental spill. The nonspecific nature of the CJK Milling's filing in regard to the contents of their disposal pits makes this point much more concerning.

It seems like the two greatest potential sources of concern are the disposal pit and the tailing storage facility. If a leak or leaching were to happen at either of these facilities, the released cyanide anions would react with metals in the tailings or soil - primarily iron - but potentially heavy metals like mercury. These soluble complexes would be transported into the aquifer where they would remain until exposed to light or biological systems, in which case toxic byproducts could form. However, data on how toxic these byproducts are is limited. The biggest concern is the lack of disclosure of the nature of additional chemical waste that will be added to the disposal pit and tailing storage facility. The type of waste disposed of, along with the cyanide, will ultimately determine which cyanide complexes and derivatives form in the aquifer in the event of leakage or leaching. It would be difficult to quantitatively estimate the levels of cyanide complexes without knowing the storage conditions of the waste and the geology of the surrounding area. Such information is not contained in the application.

The unknown is what will end up in the soil and then in our water supply. In fact, the chemical composition of the materials being processed have not been definitively characterized. All of the uncertainties in the outcome from accidental spillage make this a high-risk process. How does the money made by CJK from the gold and silver benefit Lake County and the State of Colorado. Further, will the company leave Lake County with the clean-up after it has collected the valuable materials?

I am a homeowner with two wells that are downhill from the Leadville Mill and are at significant risk of water contamination. As a homeowner relying on the same water sources as the Leadville Mill, I say that the use of cyanide is not worth the risk. There are other ways to extract gold and silver. We conducted well water quality tests on the water from our wells this past summer at our expense. Attachment 1 show the results. There is now NO CYANIDE in our water, to the measuring accuracy of the test. Our water does not now pose a risk to my family. It is high quality.

I ask that you deny the CJK application, and any other ones submitted where cyanide use is proposed in Lake County, particularly near residential areas. My family's health and well-being are seriously threatened by the proposed CJK use of cyanide at the Leadville Mill site. As proposed, CJK likely will be long gone with their gold and silver while residual cyanide will remain in our soil and water.

Thank you for your consideration of this request.

Respectfully,

Bradford Smith
Homeowner, Lake County Colorado

Attachment 1. Well Water at 1472 County Road, 36 Lake County CO

2UHK07	Jun 21, 2023 Cyanide Water Test	1742 county rd 36 Hose bib house	Fully Flushed Unfiltered	Download & Sha

All Results
Self-Tests
Next Steps
Treatment
Nearby Water
Glossary

All Results

Sort by
Evaluation

Compare to
Health Benchmarks

HGL

Additional info
Alerts

Name & Type	Detection	Benchmark	Alerts
Cyanide Inorganics	Not Detected		n/a

BFV845 | Jun 21, 2023 | Advanced Well Water Test | 1742 county rd 36 | Hose bib house | Large plastic: First Draw | ... | Unfiltered

Overview
All Results
Health
Aesthetics
Plumbing
Self-Tests
Next Steps
Treatment
Nearby Water
Glossary

All Results

Sort by: Evaluation | Compare to: Health Benchmarks | HGL | Additional info: Alerts

Name & Type	Detection	Benchmark	Alerts
Chloroform Disinfection Byproducts	6.54 PPB		
Total THMs Disinfection Byproducts	6.54 PPB		
Barium Metals	0.0232 PPM		
Copper Metals	0.0024 PPM		
Iron Metals	0.966 PPM		
Manganese Metals	0.0159 PPM		
Nitrate (as N) Inorganics	3 PPM		
Strontium Metals	0.067 PPM		
Sulfate Inorganics	103 PPM		
Alkalinity (as CaCO3) Properties	188 PPM	No HGL exists	
Calcium Minerals	57.6 PPM	No HGL exists	
Chloride Inorganics	17.6 PPM	No HGL exists	
Conductivity Properties	458 umhos/cm	No HGL exists	
CSMR Properties	0.17	No HGL exists	
Grains per gallon Properties	14.39 Grains	No HGL exists	
Hardness Properties	239 PPM	No HGL exists	

Hardness (Ca,Mg) Properties	**238.54** PPM	No HGL exists	
Hardness (Total) Properties	**240.4** PPM	No HGL exists	
Langelier Saturation Index Properties	**-0.33**	No HGL exists	
Magnesium Minerals	**23** PPM	No HGL exists	
pH Properties	**7.1**	No HGL exists	
Silica Inorganics	**14.9** PPM	No HGL exists	
Sodium Minerals	**8.17** PPM	No HGL exists	
Sodium Adsorption Ratio Properties	**0.23**	No HGL exists	
Total Dissolved Solids Properties	**268** PPM	No HGL exists	
Turbidity Properties	**7.5** NTU	No HGL exists	
1,1 Dichloroethane VOCs	Not Detected		n/a
1,1 Dichloroethylene VOCs	Not Detected		n/a
1,1 Dichloropropene VOCs	Not Detected		n/a
1,1,1 Trichloroethane VOCs	Not Detected		n/a
1,1,1,2 Tetrachloroethane VOCs	Not Detected		n/a
1,1,2 Trichloroethane VOCs	Not Detected		n/a
1,1,2,2 Tetrachloroethane VOCs	Not Detected		n/a
1,2 Dichlorobenzene VOCs	Not Detected		n/a
1,2 Dichloroethane VOCs	Not Detected		n/a
1,2 Dichloropropane VOCs	Not Detected		n/a
1,2,3 Trichlorobenzene VOCs	Not Detected		n/a
1,2,3 Trichloropropane VOCs	Not Detected		n/a
1,2,4 Trichlorobenzene	Not Detected		n/a

	VOCs		
	**1,2,4 Trimethylbenzene** VOCs	Not Detected	n/a
	**1,3 Dichlorobenzene** VOCs	Not Detected	n/a
	**1,3 Dichloropropane** VOCs	Not Detected	n/a
	**1,3,5 Trimethylbenzene** VOCs	Not Detected	n/a
	**1,4 Dichlorobenzene** VOCs	Not Detected	n/a
	**2,2 Dichloropropane** VOCs	Not Detected	n/a
	**Aluminum** Metals	Not Detected	n/a
	**Antimony** Metals	Not Detected	n/a
	**Arsenic** Metals	Not Detected	n/a
	**Benzene** Petroleum Compounds	Not Detected	n/a
	**Beryllium** Metals	Not Detected	n/a
	**Boron** Inorganics	Not Detected	n/a
	**Bromobenzene** VOCs	Not Detected	n/a
	**Bromochloromethane** Disinfection Byproducts	Not Detected	n/a
	**Bromodichloromethane** Disinfection Byproducts	Not Detected	n/a
	**Bromoform** Disinfection Byproducts	Not Detected	n/a
	**Bromomethane** VOCs	Not Detected	n/a
	**Cadmium** Metals	Not Detected	n/a
	**Carbon Tetrachloride** VOCs	Not Detected	n/a
	**Chlorobenzene** VOCs	Not Detected	n/a
	**Chloroethane** VOCs	Not Detected	n/a
	**Chloromethane** VOCs	Not Detected	n/a

	**Chlorotoluene 2** VOCs	Not Detected	n/a
	**Chlorotoluene 4** VOCs	Not Detected	n/a
	**Chromium (Total)** Metals	Not Detected	n/a
	**cis 1,2 Dichloroethylene** VOCs	Not Detected	n/a
	**cis 1,3 Dichloropropene** VOCs	Not Detected	n/a
	**Cobalt** Metals	Not Detected	n/a
	**Dibromochloromethane** Disinfection Byproducts	Not Detected	n/a
	**Dibromochloropropane** VOCs	Not Detected	n/a
	**Dibromomethane** Disinfection Byproducts	Not Detected	n/a
	**Dichlorodifluoromethane** VOCs	Not Detected	n/a
	**Dichloromethane** VOCs	Not Detected	n/a
	**E. coli** Bacteria	Not Detected	n/a
	**Ethylbenzene** Petroleum Compounds	Not Detected	n/a
	**Ethylene dibromide** VOCs	Not Detected	n/a
	**Fluoride** Inorganics	Not Detected	n/a
	**Hexachlorobutadiene** VOCs	Not Detected	n/a
	**Isopropylbenzene** VOCs	Not Detected	n/a
	**Lead** Metals	Not Detected	n/a
	**Lithium** Metals	Not Detected	n/a
	**m,p Xylene** Petroleum Compounds	Not Detected	n/a
	**Mercury** Metals	Not Detected	n/a
	**Methyl Tertiary Butyl Ether** Petroleum Compounds	Not Detected	n/a

	**Molybdenum** Metals	Not Detected	n/a
	**Naphthalene** Petroleum Compounds	Not Detected	n/a
	**n Butylbenzene** VOCs	Not Detected	n/a
	**Nickel** Metals	Not Detected	n/a
	**Nitrite (as N)** Inorganics	Not Detected	n/a
	**n Propylbenzene** VOCs	Not Detected	n/a
	**o Xylene** Petroleum Compounds	Not Detected	n/a
	**Phosphorus** Inorganics	Not Detected	n/a
	**p Isopropyltoluene** VOCs	Not Detected	n/a
	**Potassium** Minerals	Not Detected	n/a
	**sec Butylbenzene** VOCs	Not Detected	n/a
	**Selenium** Metals	Not Detected	n/a
	**Silver** Metals	Not Detected	n/a
	**Styrene** VOCs	Not Detected	n/a
	**tert Butylbenzene** VOCs	Not Detected	n/a
	**Tetrachloroethylene** VOCs	Not Detected	n/a
	**Thallium** Metals	Not Detected	n/a
	**Tin** Metals	Not Detected	n/a
	**Titanium** Metals	Not Detected	n/a
	**Toluene** Petroleum Compounds	Not Detected	n/a
	**Total Coliform** Bacteria	Not Detected	n/a
	**trans 1,3 Dichloropropene** VOCs	Not Detected	n/a
	Trichloroethylene		

	VOCs	Not Detected	n/a
	Trichlorofluoromethane VOCs	Not Detected	n/a
	Uranium Metals	Not Detected	n/a
	Vanadium Metals	Not Detected	n/a
	Vinyl Chloride VOCs	Not Detected	n/a
	Zinc Metals	Not Detected	n/a