

Is Contrary Creek Contaminated?

By: Jennifer Spitz

For those members who are interested in making the field trip to Contrary Creek, we want to share this information for your awareness for health and safety. There has been some discussion by club members that Contrary Creek is contaminated. This is in fact a true statement. Based on the limited research we have conducted from reports published by the Environmental Protection Agency (EPA), Contrary Creek was contaminated by acid mine drainage (AMD) from several pyrite mines prior to 1923. The AMD included heavy metals which made the stream virtually void of aquatic life. Two of the mine sites were reclaimed by the EPA in 1968, and reclamation of the site began in 1976 which included the use of sewage sludge as a soil conditioner. Severe droughts in 1976 and 1977 and the highly toxic nature of the mine waste required a continuing maintenance program to establish vegetation. By the fall of 1980 approximately 90 percent of the reclaimed areas supported fair to good grass cover. In 1979 and 1980 there appeared to be slight decreases in concentrations and loads of acidity and some metals, but it was too early to determine if the remedial trend was beginning.

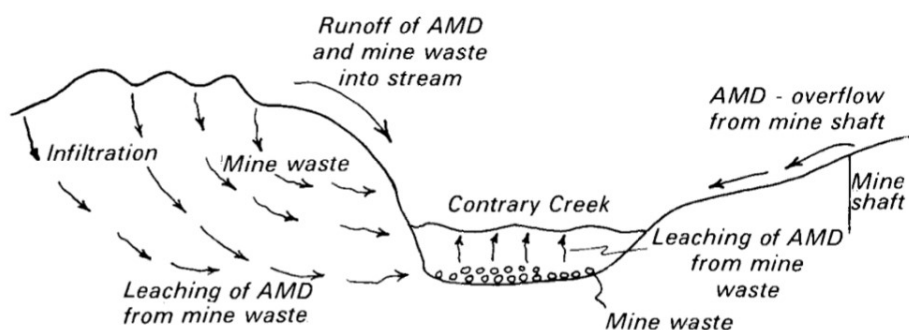


Figure 1. Sources of mine drainage into Contrary Creek. (Not to scale).

Table 1. Average composition of water at mouth of Contrary Creek (mg/l)*

pH	Acidity as CaCO ₃	SO ₄	Fe	Cu	Zn	Pb	Mn
3.3	169	267	23.1	1.20	3.5	0.05	1.5

*Average of approximately 20 samples collected in 1974.

Picture 1. Figure and Table extracted from the 1982 EPA article (Hinkle 1982).

Further research was conducted online by club members, and we were NOT able to find more recent studies or data to determine if the environmental conditions at Contrary Creek have improved since 1982. Additional research was conducted online and a July 2016 trip report was published by other state and local mineral clubs who have made the field trip to Contrary Creek. The trip report contains pictures of the club members wading in the Contrary Creek waters searching and collecting minerals. The trip report does not indicate any concerns for health or safety issues such as skin irritations from the highly acidic waters. It was also brought to our attention that several club members in the Tidewater Gem and Mineral Society (TGMS)

have previously waded in the creek waters and have dug in the mining spoils searching for garnets and other minerals but no health issues have been reported by these members.

Since the Contrary Creek is open to the public, TGMS cannot enforce restrictions on the actions taken by members while attending the site visit. Members who wish to attend the site visit will do so at their own risk. We encourage people to conduct additional research and to take proper health and safety precautions prior to visiting the Contrary Creek site. We also provide the following recommendations:

1. It is recommended that the following Personal Protective Equipment (PPE) such as but not limited to rubber boots that do not leak, gloves that will keep soils and water off skin, long sleeve shirt and pants that protect skin, protective eye glasses, and a mask.
2. Given the information provided by the EPA, we recommend no digging on site. The EPA established vegetation on the banks of the creek to leave in place and cover the mining spoils to allow natural attenuation to occur (i.e. allow nature to take its course and clean the contamination on its own). By digging the vegetated areas, you are damaging the remedial efforts the EPA established for the site in the 1970s. It is also recommended not to dig in the mining spoils. Based on the information provided in the EPA articles (as shown in Picture 1 above), the mining spoils are the cause for the contamination at Contrary Creek. If a member wishes to dig below the vegetated soil surface or in the mining spoils, take the proper health and safety precautions and it is recommended that a mask be worn to limit possible chemical, heavy metal, and dust inhalation. There are different types of masks and respirators that can be purchased, and members of the club are not certified OSHA safety experts to recommend the proper mask. Club members will dig at their own risk.
3. Do not wade or swim in the creek waters. Previous studies and data indicate low pH acidic levels in the creek where aquatic life (e.g. fish) is not sustainable. There is no new data or information to support that the condition of the water has improved since the 1970s. Swimming or wading in the creek will be at the club members' own risk.
4. It is recommended that if children attend this field trip, parents closely monitor their activities. If parents wish to allow their children to swim and dig, it will be at their own risk.
5. Surface collecting of minerals is encouraged. It was reported that there are over 20 minerals that have been recovered from this site including gold!

We encourage our club members to attend the Contrary Creek site visit, but to be aware of the health and safety risks presented in the EPA reports. Research and use the available information to make educated decisions for health and safety precaution while you enjoy the site visit.

References

Hinkle, Kenneth. Project Summary Reclamation of Toxic Mine Waste Utilizing Sewage Sludge—Contrary Creek Demonstration. Environmental Protection Agency. August 1982.

<https://p2infohouse.org/ref/22/21170.pdf>

Lines, Dave. Trip Report Contrary Creek, Mineral, VA. July 2016.

http://www.smrnc.org/uploads/3/4/4/8/3448020/2016-07-09_contrary_creek.pdf