

# Letter Health Consultation

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REED CITY BRINE RELEASE

REED CITY, MICHIGAN

APRIL 21, 2008

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Agency for Toxic Substances and Disease Registry  
Division of Health Assessment and Consultation  
Atlanta, Georgia 30333

## **Health Consultation: A Note of Explanation**

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

REED CITY BRINE RELEASE

REED CITY, MICHIGAN

Prepared By:

Michigan Department of Community Health  
Under Cooperative Agreement with the  
U.S. Department of Health and Human Services  
Agency for Toxic Substances and Disease Registry



STATE OF MICHIGAN  
DEPARTMENT OF COMMUNITY HEALTH  
LANSING

JENNIFER M. GRANHOLM  
GOVERNOR

JANET OLSZEWSKI  
DIRECTOR

March 11, 2008

Ms. Rebecca Stieg  
23141 U.S. 10  
Reed City, MI 49677

Dear Ms. Stieg:

This health consultation letter serves as documentation of the Michigan Department of Community Health's (MDCH) assistance to you following a brine release from a pipeline on the property where you live. After your phone call on December 10, 2007, I followed up with Summit Petroleum (the owner of the pipeline) and their consultant, Gosling Czubak Engineering Sciences, Inc.; the Michigan Department of Environmental Quality (MDEQ) Office of Geological Survey; and the Central Michigan District Health Department (CMDHD), who are all copied on this letter.

*Questions Posed*

Your primary concern regarding the release from the pipeline was that the appropriate analyses be done to ensure that your drinking water well was not affected. Per MDEQ regulations, the well water would be tested for chlorides and four volatile organic compounds (VOCs) most often associated with petroleum products: benzene, toluene, ethylbenzene, and total xylenes (collectively known as "BTEX"). You wondered if this would be sufficient information on which to base a conclusion regarding drinking water safety.

Additionally, there are two ponds on the property. Although the ponds are not used for swimming and are not stocked with fish, you were concerned that your dog might be exposed to contamination if he were to enter and drink from the pond.

*Public Health Role*

You had been referred to MDCH by Mr. Jeff Kimble of the U.S. Environmental Protection Agency (EPA), whom you contacted when you were first seeking information regarding the release. The Toxicology and Response Section of MDCH conducts public health activities (such as consultations, assessments, and education) at sites of environmental contamination and concern. We do this as part of a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR), a branch of the U.S. Department of Health and Human Services. Regulatory agencies (MDEQ, EPA) and local agencies are usually the parties that request our assistance, but we also provide services to private individuals as needed.

Please note that ATSDR and, by extension, MDCH are primarily advisory agencies. The purpose of a health consultation is not to evaluate or confirm regulatory compliance but to determine if any potentially harmful exposures are occurring or may occur in the future.

*Background*

You had been noticing a “rotten egg” smell for several months and had the local gas company check inside your house for a possible source. More recently, a wet area appeared in the yard with what appeared to be a slick or sheen on the surface. About this time, Summit Petroleum discovered that a brine pipeline located on the property was leaking. The company mobilized equipment and staff to the site to initiate repairs and conduct environmental sampling.

*Environmental Sampling and Interpretation*

After determining the location of the leak and removing the overlaying soil, Gosling Czubak collected 12 soil samples from within and adjacent to the excavation area to determine if and where any contamination remained. The consultant also collected a sample of groundwater under the excavation and a well water sample from the nearest residence. The samples were analyzed for chlorides and BTEX. After additional excavation occurred, the consultant collected eight more soil samples, again analyzing for chlorides and BTEX. The local health department conducted additional well samples, from all three houses on the property, analyzing for additional VOCs and inorganic chemicals.

Table 1 shows the analytical results for the soil samples taken after the second excavation. I compared the results to the MDEQ Drinking Water Protection Criteria (DWPC) and the Direct Contact Criteria (DCC). The DWPC is a concentration of a chemical in soil that is not expected to leach into groundwater at levels greater than the drinking water criterion for that chemical. The DCC is a concentration of a chemical in soil that is not expected to cause adverse health effects when a person is exposed to the soil by skin contact or unintentional ingestion. Both of these criteria are protective against long-term (30 years) exposure. Your family could be exposed to the pipeline’s contents via drinking water, if the contaminants entered the groundwater and then your well, or soil contact, if you garden or children play in the area where the excavation took place.

Table 1. Concentrations of chemicals detected in soil following two rounds of excavation at a brine release site, Reed City, Osceola County, Michigan.

<b>Chemical</b>	<b>Units</b>	<b>No. detections / No. samples</b>	<b>Concentration Range</b>	<b>DWPC (No. exceedances)</b>	<b>DCC (No. exceedances)</b>
Chloride	mg/kg	8 / 8	499 – 8,290	5,000 (6)	500 (7)
Benzene	µg/kg	1 / 8	75	100 (0)	180,000 (0)
Toluene	µg/kg	1 / 8	283	16,000 (0)	250,000 (0)
Ethylbenzene	µg/kg	1 / 8	60	1,500 (0)	140,000 (0)
Xylenes	µg/kg	1 / 8	352	5,600 (0)	150,000 (0)

- Notes:
1. “mg/kg” is milligrams chemical per kilogram soil; “µg/kg” is micrograms per kilogram
  2. Samples were taken December 14, 2007.
  3. “DWPC” is the Part 201 Drinking Water Protection Criteria. “DCC” is the Part 201 Direct Contact Criteria.

The exceedances of the DWPC for chloride in the soil may be alarming at first, but the drinking water results (shown in Table 2, below) indicate that this chemical has not entered the drinking water at levels of concern, if at all.

The exceedance of the DCC for chloride in the soil is not of concern because the criterion is based on the protection of plant life. Too much salt can be detrimental for plants. Generally, skin contact with salt or brine is relatively harmless, although contact without adequate washing afterward may dry the skin. Also, if you have a cut on your hand and get salt in it, it will irritate the tissue.

Even though two soil samples exceeded the criteria protective of groundwater venting to surface water (criteria not shown), I do not believe that sufficient amounts of the chemicals would leach from the soil into the groundwater and vent to the pond. The soil data show hardly any impact outside of the point where the release occurred. Additionally, BTEX was detected in the soil at depths of 5.5 to 7.5 feet, whereas groundwater depth is greater than 20 feet. Thus, you need not be concerned whether your dog might be exposed to release-related chemicals in the ponds.

Table 2 shows the analytical results for the drinking water well samples. Although four samples were analyzed, these represented three locations. Two of the samples were from your well, so I reported the results for that well only once, using the highest concentrations found. I compared the results to the MDEQ Drinking Water Criteria (DWC). The DWC is a concentration of a chemical in groundwater that is not expected to cause adverse health effects when a person drinks that water for the long-term (30 years). I chose not to compare the groundwater sample from the excavation site to the DWC because we had actual drinking water data.

Table 2. Concentrations of chemicals of interest in drinking water at the site of a brine release, Reed City, Osceola County, Michigan.

<b>Chemical</b>	<b>Units</b>	<b>No. detections / No. locations</b>	<b>Concentration Range</b>	<b>DWC (No. exceedances)</b>
Chloride	mg/L	2 / 3	5 - 13	250 (0)
Benzene	µg/L	0 / 3	ND	5 (0)
Toluene	µg/L	0 / 3	ND	790 (0)
Ethylbenzene	µg/L	0 / 3	ND	74 (0)
Xylenes	µg/L	0 / 3	ND	280 (0)
Nitrate (as nitrogen)	mg/L	2 / 3	0.4 – 0.9	10 (0)

- Notes:**
1. “mg/L” is milligrams chemical per liter water; “µg/L” is micrograms per liter
  2. Samples were taken December 10, 2007 (one well) and January 9, 2008 (three wells).
  3. “DWC” is the Part 201 Drinking Water Criteria.

The drinking water samples taken by the health department were analyzed for nitrates as well. Levels of nitrates in groundwater greater than 2 mg/L (milligrams per liter) are most likely due to human activity (such as runoff from agricultural land). More “pristine” areas would typically have less than 0.1 mg/L. The levels found in the wells on this property might be naturally occurring. You may want to retest every few years to make sure levels are not increasing. The

health concern regarding nitrates in water is that it can interfere with the oxygen-carrying capacity of the blood. This is most often seen in infants receiving formula, described as a “blue-baby” syndrome. You have children but they are not infants. That fact, as well as the nitrate concentrations being well below criterion, indicates to me that the nitrates pose no threat to their well-being. Treatment to remove the nitrates from the water, such as a reverse-osmosis system, is not necessary.

You may have noticed in the laboratory results provided by Gosling Czubak that the consultant compared the chloride and BTEX values to the most restrictive of MDEQ criteria, some of which are lower than the criteria I used. For regulatory purposes, Summit Petroleum must meet all relevant and applicable criteria, whereas for public health purposes, I chose the criteria most directly related to exposure pathways of concern.

*Conclusions and Further Actions*

It is my professional opinion that the appropriate soil and water analyses have been conducted to ensure that the release from the pipeline does not pose a threat to the health of the residents of this property. Chloride and petroleum-related chemicals, primarily BTEX, are the most likely chemicals to be present in such a release.

Summit Petroleum should address, with MDEQ oversight, the contamination caused by the brine release. (This action has already begun.)

MDCH remains available for further consultation at this site, if warranted. Please do not hesitate to contact me with any questions.

Sincerely,

Christina Bush, Toxicologist  
Toxicology and Response Section  
Division of Environmental Health  
Bureau of Epidemiology

517-335-9717  
[bushcr@michigan.gov](mailto:bushcr@michigan.gov)

Attachments:

References and Resources  
Map of Reed City, Osceola County, Michigan

CC: Scott Huber, Summit Petroleum  
Don Conway, Gosling Czubak  
Mark Smith, MDEQ Office of Geological Survey  
Doug Fitzgerald, CMDHD  
ATSDR

## Reed City Brine Release Letter Health Consultation - References and Resources

Gosling Czubak. 2007. "Project Status Summary: Summit Petroleum – Richmond Twp SWD Pipeline Release. December 18, 2007." Project No. 2007704.01. Traverse City, Michigan.

MDCH Division of Environmental Health. Site file: Reed City Brine Release.

MDEQ Drinking Water Laboratory. 2008. Analytical results for sample numbers LB97197, LB97198, and LB97199 (work orders 80101391\_01, 8010391\_02, and 8010391\_03, respectively). Lansing, Michigan.

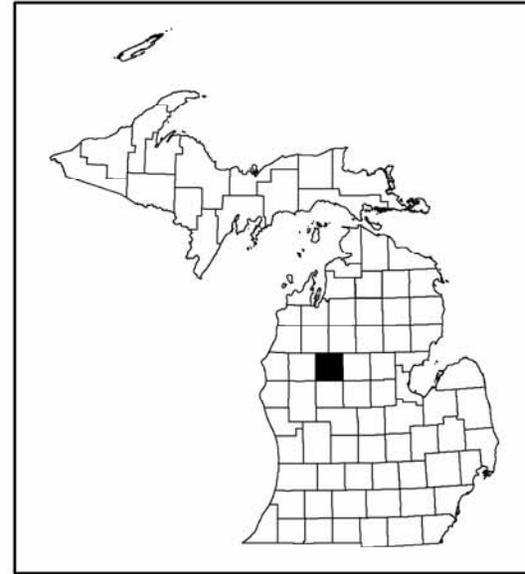
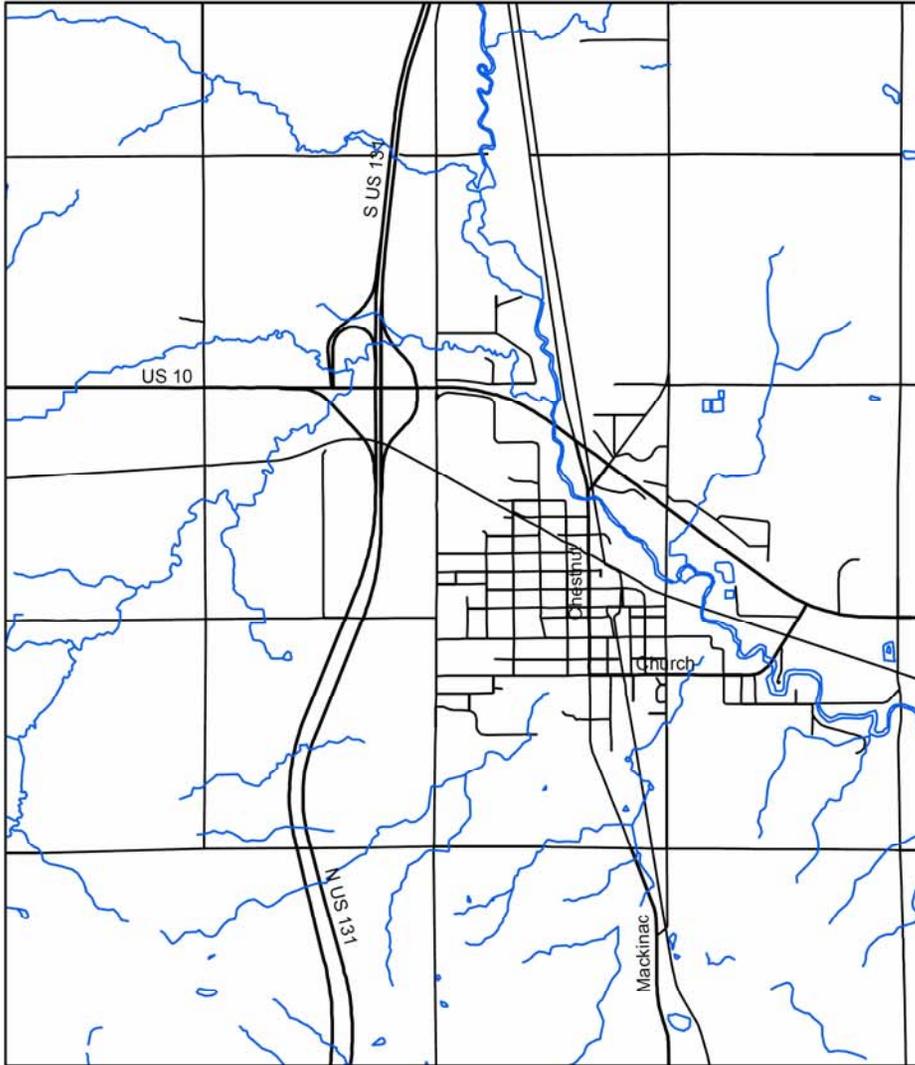
MDEQ Remediation and Redevelopment Division Operational Memorandum No. 1: Part 201 Soil Direct Contact Criteria/Part 213 Soil Direct Contact Risk-based Screening Levels. Attachment 1, Table 1 – Groundwater Residential and Industrial - Commercial Criteria. 2006 January. [http://www.deq.state.mi.us/documents/deq-rrd-OpMemo\\_1-Attachment1Table1GW.pdf](http://www.deq.state.mi.us/documents/deq-rrd-OpMemo_1-Attachment1Table1GW.pdf)

MDEQ Remediation and Redevelopment Division Operational Memorandum No. 1 – Technical Support Document – Attachment 3: Part 201 Drinking Water Criteria/Part 213 Drinking Water Risk-based Screening Levels. 2004 December. [http://www.deq.state.mi.us/documents/deq-rrd-OpMemo\\_1-Attachment3DrinkingWaterCriteriaTechnicalSupportDocument.pdf](http://www.deq.state.mi.us/documents/deq-rrd-OpMemo_1-Attachment3DrinkingWaterCriteriaTechnicalSupportDocument.pdf)

MDEQ Remediation and Redevelopment Division Operational Memorandum No. 1 – Technical Support Document – Attachment 6: Part 201 Soil Direct Contact Criteria/Part 213 Soil Direct Contact Risk-based Screening Levels. 2005 April. [http://www.deq.state.mi.us/documents/deq-rrd-OpMemo\\_1-Attachment6.pdf](http://www.deq.state.mi.us/documents/deq-rrd-OpMemo_1-Attachment6.pdf)

MDEQ Remediation and Redevelopment Division Operational Memorandum No. 1: Part 201 Soil Direct Contact Criteria/Part 213 Soil Direct Contact Risk-based Screening Levels. Attachment 1, Table 2 – Soil Residential/Commercial I Criteria. 2006 January. [http://www.deq.state.mi.us/documents/deq-rrd-OpMemo\\_1-Attachment1Table2SoilResidential.pdf](http://www.deq.state.mi.us/documents/deq-rrd-OpMemo_1-Attachment1Table2SoilResidential.pdf)

# Reed City and Vicinity, Osceola County, Michigan



## Certification

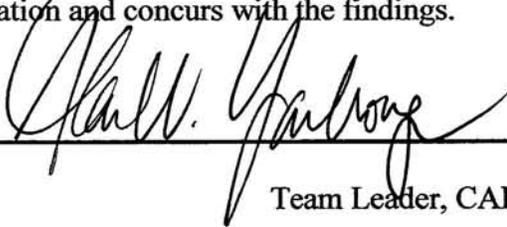
This "Reed City Brine Release" Letter Health Consultation was prepared by the Michigan Department of Community Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures. Editorial review was completed by the cooperative agreement partner.



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Technical Project Officer, Cooperative Agreement Program Evaluation Branch (CAPEB),  
Division of Health Assessment and Consultation (DHAC), ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.



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Team Leader, CAPEB, DHAC, ATSDR