

# **APPENDIX F**

A RESOLUTION ADOPTING PROPOSED AMENDMENTS TO THE COUNTY WELL  
REGULATION

WASHTENAW COUNTY BOARD OF COMMISSIONERS  
February 4, 2004

WHEREAS, Washtenaw County Environmental Health Department is charged with assuring groundwater drinking water wells are safe; and

WHEREAS, the current County Well Regulation does not address factors that may impact the safety of drinking water from individual wells; and

WHEREAS, Washtenaw County Environmental Health has proposed amendments to provide further assurances that appropriate steps are taken to ensure safe water; and

WHEREAS, these amendments are protective of groundwater and public health; and

WHEREAS, this matter has been reviewed by Corporation Counsel, the Finance Department, the County Administrator's Office and the Ways & Means Committee

NOW THEREFORE BE IT RESOLVED that the Washtenaw County Board of Commissioners hereby adopts the amendments to the Washtenaw County Rules and Regulation for the Protection of Groundwater, as attached hereto and made a part hereof

BE IT FURTHER RESOLVED that the Board of Commissioners hereby directs the County Clerk to publish the Washtenaw County Rules and Regulations for the Protection of Groundwater in the newspaper of general circulation

COMMISSIONER	Y	N	A	COMMISSIONER	Y	N	A	COMMISSIONER	Y	N	A
Armentrout	X			Irwin	X			Sizemore	X		
Bergman	X			Kern	X			Solowczuk	X		
Brackenbury	X			Peterson	X			Yekulis	X		
Gunn	X			Prater	X						

CLERK/REGISTER'S CERTIFICATE - CERTIFIED COPY      ROLL CALL VOTE: TOTALS      11   0   0

STATE OF MICHIGAN      )

COUNTY OF WASHTENAW)SS

I, Peggy M. Haines, Clerk/Register of said County of Washtenaw and Clerk of Circuit Court for said County, do hereby certify that the foregoing is a true and accurate copy of a resolution adopted by the Washtenaw County Board of Commissioners at a session held at the County Administration Building in the City of Ann Arbor, Michigan, on February 4 2004, as it appears of record in my office.

In Testimony Whereof, I have hereunto set my hand and affixed the seal of said Court at Ann Arbor, this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

**PEGGY M. HAINES, Clerk/Register**

BY: \_\_\_\_\_  
Deputy Clerk



Res. No. 04-0029

**WASHTENAW COUNTY RULES & REGULATIONS**  
**FOR THE**  
**PROTECTION OF GROUNDWATER**

**PREAMBLE**

Recognizing that the supply of safe potable water is fundamental to individual, public and community health; further recognizing that public groundwater supply facilities installed and operated in a proper manner are necessary for safeguarding public health; still further recognizing the need to isolate and protect individual wells furnishing water for human consumption from sewage or other sources of pollution; and insofar as possible, to prevent the contamination of groundwater resources and supplies, or the creation of conditions menacing the public health, these Rules and Regulations governing groundwater are hereby established under authority of the State of Michigan's Public Health Code, Act 368 of the Public Acts of 1978, State of Michigan, MCL 333.1101 et seq. as amended.

**PURPOSE**

It is the purpose of this Regulation to assure that the construction and abandonment of wells is conducted in such a manner that the groundwater of this County will not be contaminated or polluted, and that water obtained from wells will be suitable for beneficial use and will not jeopardize the health, safety or welfare of the people of this County or the environment.

## **Article I Definitions**

**Sec. 1:1** "Approved" means acceptable for intended use as judged by the Health Officer utilizing public health laws, rules, regulations, and technical data.

**Sec. 1:2** "Contaminant" means a biological, chemical, physical, or radiological constituent in water that is or may become injurious to the public health, safety, or welfare or to the environment.

**Sec. 1:3** "Contamination" means an impairment of the quality of water to a degree that creates a hazard, or may create a hazard, to the public health through poisoning or through spread of disease, or otherwise affects the aesthetic quality of the groundwater.

**Sec. 1:4** "Department" means the Washtenaw County Department of Public Health.

**Sec. 1:5** "Drainfield" means that part of an on-site sewage system that provides for the infiltration of sewage below the ground surface.

**Sec. 1:6** "Emergency basis" means a circumstance where a well driller or homeowner is unable to obtain a well permit from the Department due to the office being closed and that an undue hardship would likely result if drilling the well was delayed until the office was open.

**Sec. 1:7** "Groundwater" means the water in the zone of saturation that fills all of the pore spaces of the subsurface geologic material.

**Sec. 1:8** "Health Officer" means the Director of the Washtenaw County Department of Public Health or his/her designated representative who shall be a Registered Sanitarian or who is under the supervision of a Registered Sanitarian.

**Sec. 1:9** "Imminent health hazard" means a condition that in the judgment of the Health Officer exists that may require immediate action to prevent endangering the health of the public.

**Sec. 1:10** "Maintenance" means, but shall not be limited to, repair or replacement of a pump, well screen, pressure tank, piping, wiring, controls, or treatment device that is part of a well.

**Sec. 1:11** "Municipality" means a city, village, township, county, district or other public body created by, or pursuant to, State law or any combination of such units acting cooperatively or jointly.

**Sec. 1:12** "Owner" means a person who holds, or at the time of construction who held, a legal, equitable or possessory interest of any kind in a well or in the property on which the well system is located, including, but not limited to, a trust, vendor, vendee, lessor, or lessee. However, owner does not include a person or a regulated financial institution who, without participation in the operation of the well, is acting in a fiduciary capacity or who holds indicia of ownership primarily to protect the person's or the regulated financial institution's security interest in the well or the property on which it is located. This exclusion does not apply to a grantor, beneficiary, remainderman, or other person who could directly or indirectly benefit financially from the exclusion other than by the receipt of payment of fees and expenses related to the administration of a trust.

**Sec. 1:13** "PHAC/EAB" means Public Health Advisory Committee / Environmental Appeals Board.

**Sec. 1:14** "Person" means an individual, partnership, cooperative, association, private corporation, personal representative, receiver, trustee, assignee, governmental entity or any other legal entity.

**Sec. 1:15** "Potable water" means water that is free of contaminants in concentrations that may cause disease or harmful physiological effects, is safe for human consumption and meets the State drinking water standards set forth in Michigan's Safe Drinking Water Act 399 of the Public Acts of 1976, as amended, (MCL 325.1001 et seq.) as it now exists or may be amended in the future.

**Sec. 1:16** "Public nuisance," when applied to a well, means any well that threatens to impair the quality of groundwater or otherwise jeopardize the health and safety of the public or the environment.

**Sec. 1:17** "Test or exploratory hole" means an excavation, or direct push used for determining the nature of underground geological or hydrological conditions, by direct observation, or by any other means.

**Sec. 1:18** Wells

1. "Well" means an excavation and an integrated system of pumps, pipes, controls, reservoirs, and mechanical devices used for the purpose of injecting into or extracting water or other fluids from below the ground surface or for making tests or observations of underground conditions, or for any other similar purpose.
2. Wells include, but are not limited to:
  - a. "Abandoned water well" means any of the following:
    - i. A well that has its use permanently discontinued.

- ii. A well that is in such disrepair that its continued use for the purpose of obtaining groundwater is impractical.
  - iii. A well that has been left with the drilling uncompleted.
  - iv. A well that is a threat to groundwater resources.
  - v. A well that is or may be a health or safety hazard.
- b. "Community water well" means a public water supply that provides year-round service to not fewer than fifteen (15) living units or which regularly provides year-round service to not fewer than twenty-five (25) residents.
  - c. "Extraction well" means any well used to extract water for treatment or other processes.
  - d. "Heat exchange well" means a well for the purpose of utilizing the geothermal properties of earth formations for heating or air conditioning.
  - e. "Individual domestic well" means a water well used to supply water for domestic needs of an individual residence.
- 3. "Industrial well" means a well that is used to supply water for industrial processes, fire protection, or similar nonpotable uses.
  - 4. "Injection well" means any well used to inject water or other fluids into the groundwater.
  - 5. "Irrigation well" means a well that is used to provide water for plants, livestock, or other agricultural processes.
  - 6. "Monitoring well" means any well installed for the purpose of observing/monitoring the conditions of a water-bearing aquifer to determine the quality of groundwater or concentration of contaminants in underground waters.

7. "Non-community well" means a water system that provides water for drinking or household purposes to twenty-five (25) or more persons for at least sixty (60) days per year or has fifteen (15) or more service connections. (A few examples are schools, restaurants, churches, campgrounds and highway rest stops with their own water supplies.)
8. "Purge well" means wells used for the purpose of extracting and treating water from a contaminated aquifer.
9. "Test well" means a well that is used to obtain information on groundwater quantity, quality, or aquifer characteristics for the purpose of designing or operating a water supply well.
10. "Water supply well" means a well that is used to provide potable water for drinking or domestic purposes.
11. Wells, for the purpose of this regulation shall not include:
  - a. Oil and gas wells constructed under the jurisdiction of the Michigan Department of Environmental Quality (MDEQ), except those wells converted to use as water wells; or
  - b. Wells used for the purpose of:
    - i. Providing community water supplies under the jurisdiction of MDEQ,
    - ii. Dewatering wells less than twenty-five (25) feet in depth during construction,
    - iii. Stabilizing hillsides or earth embankments,

- iv. Wells less than twenty-five (25) feet in depth used to lower the water tables for construction purposes.
- c. The following excavations:
  - i. Holes or excavations for drainfield soil evaluation tests,
  - ii. Drill holes for seismic exploration where such drill holes are less than twenty-five (25) feet in depth.

## **Article II Well Permit Requirements**

**Sec. 2:1** No person shall construct or drill any well unless a permit has first been issued by the Health Officer authorizing such installation and construction of the well, provided: (1) a permit shall not be required for maintenance of a well, and (2) an existing well may be replaced on an emergency basis prior to receiving a permit in the event its intended use is for a residence that is occupied and a repair cannot be made. In such instances the permit must be applied for within twenty-four (24) hours of the next business day. If the emergency well replacement is not in compliance with the other requirements of this Regulation upon Department review, the well will be required to be relocated or otherwise modified to be in compliance. (3) A single permit will be required for all direct-push geoprobe type wells installed on a legally described property boundary.

**Sec. 2:2** Application for a permit shall be made by the property owner(s) or his/her authorized representative on forms provided by the Health Officer. The application for a permit shall be accompanied by the appropriate service fee designated by the Washtenaw County Board of Commissioners, and plans showing locations of pertinent features of the

proposed well, including sewage disposal systems or works carrying or containing sewage, potential sources of contamination, property description, and any other necessary data that may be required by the Health Officer. The permit shall be valid only for the property described in the application for the permit.

**Sec. 2:3** A permit for the drilling of a well shall become void twelve (12) months from the date of issuance. If the drilling of a well has not been completed within the twelve (12) month period, a new permit shall be required. The well driller or individual(s) drilling a well shall have a copy of the permit including the plot plan accessible on site during the drilling operation. A permit may be re-activated within three (3) years of the permit issuance date and will be assessed fifty (50%) per cent of the permit fee for re-activation.

**Sec. 2:4** No municipality shall issue a building permit where a well is necessary or otherwise allow construction to commence on any land where an approved public or private water supply is not available until a well permit has been issued by the Health Officer.

**Sec. 2:5** A permit for a well shall be denied in writing by the Health Officer for one or more of the following reasons:

- a. A potable water well where the property dimensions are too small for the required isolation distances specified in Sec 6:7 and a variance is not warranted.
- b. The installation of the system, in the opinion of the Health Officer, would create a dangerous condition, public nuisance, or potentially contaminate the groundwater. Agricultural structures that are built to the US

Department of Agriculture compliance with the generally accepted agricultural and management practices (GAAMPs) shall not be considered a public nuisance.

- c. The submitted information is not in compliance with the provisions of these Rules and Regulations

### **Article III Construction Requirements.**

**Sec. 3:1** All wells are subject to inspection by the Health Officer and all construction work and pump installations shall be approved by the Health Officer. Inspection and approval shall be limited to the general layout and functional aspects. Inspections of such systems when required shall be promptly made following notification.

**Sec. 3:2** Prior to the installation of any well, an application shall be filed with the Health Officer accompanied by a site plan indicating the proposed location of the well, its intended use, the nearest source of contamination within 100 hundred (100) feet, and prominent features of the property. When applying for a non-potable well permit for such use as a monitoring or dewatering well, the name, address and telephone number of the consultant(s) or engineer and property owner shall be provided along with the anticipated diameter and depth of the well.

**Sec. 3:3** No person shall construct or drill any well unless a permit has first been issued by the Health Officer authorizing such installation and construction except as authorized under Sec. 2.1

**Sec. 3:4** The Health Officer shall be notified by the permit holder or well driller by fax or by another mutually-agreed upon format prior to the beginning of the installation and construction of the well.

**Sec. 3:5** The Health Officer may, upon presentation of proper identification, at any and all reasonable times, enter any and all places, property, enclosures and structures where well drilling and construction has taken place for the purpose of making examinations and investigations to determine whether any provision of this Regulation is being violated. The Health Officer may require that each completion, modification, or abandonment operation be inspected prior to any further work.

**Sec. 3.6** A registered well driller may request an inspection by the Department of any well drilled.

#### **Article IV Plugging Abandoned Wells**

**Sec. 4:1** A well shall be considered abandoned and shall be plugged in accordance with this regulation when:

- It has been replaced with a new well, or
- It has been out of service for more than twelve (12) months, or
- When the structure it is serving has been connected to a municipal supply;

provided however, a well may continue in use if the well is registered with the Department for its intended use, there is a complete separation from any municipal supply, and the well remains in working condition.

**Sec. 4.2:** When it is determined a well is abandoned, it shall be plugged in accordance with the following:

- a. Potable water supply: An abandoned well or dry hole shall be plugged by a well drilling contractor who is registered pursuant to the provisions of Part 127 of PA 368 (Groundwater Quality Control Act) of 1978.
- b. Dewatering wells shall be plugged by a registered de-watering well driller in accordance with Part 127 of PA 368 of 1978, Section 4 utilizing methods specified within Section 4, Rules #261 – 268.
- c. Other non-potable water wells may be abandoned under the supervision of a registered well driller, professional engineer, certified professional geologist or a registered sanitarian knowledgeable of well plugging procedures.

**Sec. 4:3** A pump, a drop pipe, a packer, other equipment, debris, or obstructions shall be removed from the well, if possible, before plugging.

**Sec. 4:4** An abandoned well or dry hole (other than dewatering wells) shall be plugged as follows:

- a. Well or dry hole that terminates in overburden shall be plugged by filling with any of the following materials:
  - (i) Neat cement.
  - (ii) Concrete grout.
  - (iii) Bentonite chips.
  - (iv) Bentonite pellets.

(v) Bentonite grout.

- b. A section of a well or dry hole that is in bedrock shall be plugged by filling with neat cement or concrete grout from the bottom of the well or dry hole to not less than twenty (20) feet above the top of the bedrock or to the ground surface. The section of the well from twenty (20) feet above the bedrock to the ground surface shall be plugged in accordance with the provisions of subdivision (a) of this subrule.
- c. Gravel, sand, stone aggregate, or other materials that are acceptable to the Department may be used for plugging that portion of a well that penetrates lost circulation zones, such as gravel or cavernous, creviced, or fractured bedrock.

**Sec. 4:5** The flow from an abandoned flowing well shall be stopped by plugging the well with neat cement or concrete grout.

**Sec. 4:6** Abandoned wells that discharge subterranean gases shall be plugged with neat cement or concrete grout.

**Sec. 4:7** Abandoned well or dry hole plugging materials shall be placed as follows:

- a. Bentonite chips or bentonite pellets shall be poured slowly into the top of the well or dry hole to prevent bridging in the casing or borehole. Fine bentonite particles that accumulate in the shipping container shall not be used. The plugging operation shall continue until the bentonite chips or bentonite pellets appear at the ground surface. Upon completion of the

plugging operation, water shall be placed into the casing or borehole to promote expansion of the bentonite above the static water level.

- b. Neat cement, concrete grout, or bentonite grout shall be placed through a tremie pipe from the bottom of the well or dry hole to the ground surface.
- c. Other materials and methods may be used if the materials and methods proposed to be used will plug the abandoned well or dry hole to prevent them from acting as a channel for contamination or the escape of subterranean gases and if prior approval is given by a Health Officer.

**Sec. 4:8** A large diameter dug well or crock well shall be plugged pursuant to the provisions stated above or may be plugged as follows:

- a. A layer of bentonite chips or bentonite pellets that is not less than six (6) inches thick shall be placed at the bottom of the well. The remainder of the well shall be plugged by placing clean soil backfill in layers that are not more than ten (10) feet thick, with a layer of bentonite chips or bentonite pellets that is not less than six (6) inches thick placed on top of each clean soil backfill layer. Dry granular bentonite may be used in place of, or in combination with, bentonite chips or bentonite pellets, and neat cement or concrete grout may be poured if the well has been dewatered before plugging.
- b. The uppermost section of concrete crock or tile or the upper three (3) feet of stone, brick, or other curbing material that supports the well bore shall be removed. Before backfilling the well up to the ground surface, a layer

of bentonite chips or bentonite pellets that is not less than six (6) inches thick shall be placed.

#### **Article V Records**

**Sec. 5:1** Within sixty (60) days of the date of completion of a well, a well drilling contractor shall furnish the well owner with one (1) copy and the Health Officer with two (2) copies of a well log that contains the information required on the form furnished by the director. The Health Officer shall send one (1) copy of the well log to the Michigan Department of Environmental Quality within thirty (30) days after the Health Officer receives the copies of the well log. A well drilling contractor shall retain a copy of the well log.

**Sec. 5:2** A well drilling contractor shall record the geologic material types and thicknesses penetrated during the drilling process. The record shall be available for inspection during well drilling.

**Sec. 5:3** Within sixty (60) days after plugging an abandoned well or dry hole, the person who performed the plugging operation shall provide the Department or Local Health Department with two (2) copies of a report that sets forth all of the following information:

- a. The well owner's name.
- b. The location of the well.
- c. The well depth.
- d. The well diameter.
- e. The plugging procedure.

- f. The plugging material.
- g. The amount of plugging material used. Standard forms for the report shall be provided by the Department.
- h. In lieu of reporting quarter section/ quarter section/ quarter section in identifying the location of wells, GPS coordinates may be submitted provided that within two (2) years of adoption of this Regulation, all well locations must be identified utilizing latitude and longitude coordinates.

**Sec. 5:4** When an abandoned well is plugged where a replacement well will be or has been constructed, the plugging information may be recorded on the well log that is submitted for the replacement well. Information on several abandoned wells or dry holes within a single parcel may be submitted on a single well log form if the geologic materials and plugging methods are similar.

**Sec. 5:5** A well log shall be signed by a registered well drilling contractor.

**Sec. 5:6** Monitoring well test results may be requested by the Department. When so requested, the results shall be submitted in a mutually agreeable format within thirty (30) days of request.

#### **Article VI Potable Water Supply Requirements**

**Sec. 6:1** It shall be unlawful for any person to occupy, or to permit to be occupied, any premise in Washtenaw County not equipped with an adequate supply of potable water as determined by the Health Officer or the municipality supplying the water. A potable well in existence at the time of adoption of these Regulations may be continued and maintained in service without the approval of the Health Officer as long as

satisfactory performance is maintained, the water remains potable and the system use is not changed so that it becomes a public water supply as regulated by Act 399 of the Public Acts of 1976, as amended.

**Sec. 6:2** These Rules and Regulations shall apply to all non-community and private groundwater supplies within Washtenaw County. Requirements with respect to water well and/or pumping equipment installations or water well abandonment procedures shall include those requirements as set forth in Part 127, Act 368 of the Public Acts of 1978, and Act 399 of the Public Acts of 1976 and all rules and regulations and amendments applicable thereto.

**Sec. 6:3** Water supplies intended for human consumption that are not potable shall be treated by methods approved by the Michigan Department of Environmental Quality or the Washtenaw County Health Officer. If the water is not made potable, said water supply and/or well shall be properly abandoned to protect the water-bearing formation against contamination, or identified at each outlet that it is unfit for human consumption.

**Sec. 6:4** A contaminated potable groundwater water supply system that, in the judgment of the Health Officer represents an imminent health hazard, shall be identified with suitable signs at each outlet, or the outlets shall be made inoperable to the satisfaction of the Health Officer.

**Sec. 6:5** All wells intended for human consumption shall conform to the minimum construction requirements of these Rules and Regulations whenever a new building is being constructed, a new well is drilled, and/or the water is no longer potable.

**Sec. 6:6** A newly drilled well shall not be used for human consumption until the construction and installation have been approved by the Health Officer, and the following

are submitted: (a) a completed water well record prepared by the well driller, when applicable, and (b) a certified laboratory report indicating the water supply is free from specified bacteriological or chemical contaminants. All water samples shall be collected by the owner, well driller, or permit holder, Health Officer, or other person specifically designated by the Health Officer.

**Sec. 6:7** All potable water wells, in addition to the requirements of Act 399 of the Public Acts of 1976, shall be located not closer than fifty (50) feet from any septic tank or injection well, and not closer than one hundred (100) feet from any drainfield or other source of contamination, and shall be located wholly upon the property served. Isolation distances may be increased by the Health Officer when sufficient protection is not provided by the specified isolation distances and shall be increased by the Health Officer where greater isolation distances are required by Act 399 of the Public Acts of 1976, as amended. Under certain conditions, where suitably executed and recorded easements or right-of-way agreements exist, this provision may be waived by specific written permission of the Health Officer. Return wells used in conjunction with a groundwater heat pump shall be at least fifty (50) feet from any supply well. A groundwater heat pump shall have a disposal location approved by the Health Officer.

**Sec. 6:8** The Health Officer may reduce the minimum required isolation distance of one hundred (100) feet from a well to a drainfield if compliance with said isolation requirement would create undue hardship upon the property owner(s) and if, in the opinion of the Health Officer, the well can be drilled into an aquifer that is protected from surface contamination by a minimum ten (10) foot thick continuous clay layer, as determined from area well logs.

## **Article VII Department Responsibility for Community Notification**

**Sec. 7:1** Upon the request of any city, village, township or charter township, the Health Officer shall provide notification of any well permit issued in that jurisdiction (or in that jurisdiction's designated wellhead protection area) after the effective date of this Amendment.

**Sec. 7:2** The Health Officer shall maintain a database of all well drilling activities identified in this Regulation. Periodically the Department shall produce and make available a report on groundwater in Washtenaw County.

## **Article VIII Jurisdiction / Right to Inspect**

**Sec. 8:1** The Health Officer shall have jurisdiction throughout Washtenaw County, including all cities, villages, townships, and charter townships, in the administration and enforcement of these Rules and Regulations and any amendments hereafter adopted, unless otherwise specifically herein. All premises affected by these Rules and Regulations shall be subject to inspection by the Health Officer, and the Health Officer may collect such samples for laboratory examination as s/he deems necessary for the enforcement of these Rules and Regulations.

**Sec. 8:2** The Health Officer, upon presentation of proper identification, may enter and inspect at reasonable hours any well installation on public or private property for the purpose of reviewing the installation or abandonment of a well.

**Sec. 8:3** No person shall remove, mutilate or conceal any notice or placard posted by the Health Officer except by permission of the Health Officer.

**Article IX      Violation Remedies**

**Sec. 9:1**      After learning that this Regulation has been violated, the Health Officer may:

- a.      Issue a Cease and Desist Order and/or suspend any permit, certificate or other approval issued pursuant to this Regulation to the owner or other party violating this Regulation, and afford the owner or other interested party Notice and Opportunity for Hearing.
- b.      Request that Washtenaw County Corporation Counsel file a legal action to enjoin the violation. In addition, the Health Officer may seek to recover any and all costs related to correcting, removing or abating the violation, including enforcement costs.
- c.      Issue a citation within ninety (90) days after the alleged violation is discovered. The citation shall state with particularity the nature of the violation, including reference to the Section of the Regulation alleged to have been violated, the civil penalty established for such violation, if any, and a right to appeal the citation pursuant to MCLA 333.2461. The citation shall be delivered or sent by U.S. mail to the alleged violator.
- d.      Any party issued a citation may request an informal conference within ten (10) days from the date the citation is issued, at which time the person may indicate why s/he believes that s/he has not violated this Regulation.
- e.      Any party issued a citation may appeal the citation to the PHAC/EAB or its designated committee within thirty (30) days after the citation is issued.

- f. A person aggrieved by a final decision of the Health Officer or the PHAC/EAB or its designated committee, may petition Washtenaw County Circuit Court for review. The time period for appeal shall begin the day following the date of such final decision.

**Sec. 9:2** Monetary civil penalties may be imposed according to the following schedule:

- a. First violation: Up to: \$ 200.00
- b. Second violation: \$ 500.00
- c. Third and subsequent violations each: \$ 1000.00

**Sec. 9:3** A civil penalty levied under this Section may be assessed for each violation or day that the violation continues. The civil penalty may be for a specified violation of this Regulation or promulgated Rule that the Health Officer has the authority and duty to enforce.

**Sec. 9:4** A decision by the Health Officer not to issue a citation shall not be construed as a waiver of any other rights or remedies authorized by law or this Regulation.

**Sec. 9:5** Notwithstanding the existence or pursuit of any other remedy, the Health Officer may maintain an action in the name of the County in a court of competent jurisdiction for an injunction or other appropriate process against any person to restrain or prevent violations of these Rules and Regulations.

**Article X Conviction of Misdemeanor**

**Sec. 10:1** Any person who violates or who knowingly submits false information required by this Regulation is guilty of a misdemeanor, punishable by imprisonment for not more than ninety (90) days, or a fine of not more than \$200.00 or both. Conviction by jury, court or voluntary plea and acceptance by court under this provision shall not waive any other claim for fines, costs, injunction or other relief authorized by this Regulation. Each day that a violation of this Regulation exists shall constitute a separate offense.

**Article XI Assessment against the Property**

**Sec. 11:1** If the owner or party violating this Regulation refuses on demand to pay such expenses incurred by the Department to abate, correct or remove a violation, unsanitary condition or nuisance, the sum shall be assessed against the property and shall be collected and treated in the same manner as taxes assessed under the general tax laws of this State.

**Article XII Right to Obtain Samples**

**Sec. 12:1** Inspection under this Regulation shall include the right to obtain samples where the Health Officer has reason to believe that there is a likelihood of contamination of surface water, ground water, water supply or other unsanitary conditions. Upon written notice, an owner or occupant of premises where such inspection is sought shall cooperate with the Health Officer or his/her designated representative.

## **Article XIII Hearings and Appeals**

**Sec. 13:1** If an owner or interested party is adversely affected by any decision under this Regulation, s/he may request in writing a Hearing before the PHAC/EAB or its designated Committee within thirty (30) days of the date of such decision. The Health Officer shall issue a Notice of Hearing within fifteen (15) days after receiving the request. A Hearing shall then be held at the next regular meeting of the PHAC/EAB (or its designated committee), scheduled for such purposes; provided, however, that a Hearing shall be conducted no later than sixty (60) days after the Notice of Hearing is mailed to the owner or interested party. The PHAC/EAB (or its designated committee) shall affirm, reverse or modify the contested decision by a majority vote of the entire Board. The decision by the PHAC/EAB (or its designated committee) shall be in writing and state the reasons and grounds for such decision. A copy shall be furnished to the owner, any interested person, and the Health Officer within thirty (30) days of the decision.

**Sec. 13:2** The PHAC/EAB shall hear appeals and may grant individual variances from these Rules and Regulations where it is determined no substantial health hazard is likely to occur therefrom, and unnecessary hardship might result from strict compliance with these Rules and Regulations. A written notice of appeal and/or request for a variance shall be filed with the Health Officer. The notice of appeal shall state the particular grounds on which it is based. Opportunity for the hearing shall be given at the next regular or scheduled PHAC/EAB meeting following the request unless receipt of the request is within less than fourteen (14) calendar days of the time for such a meeting in

which event a hearing may be provided for at a subsequent regular or special meeting of the PHAC/EAB. Due notice of such hearing shall be given to all persons listed on the last assessment roll for the township as the owner(s) of any real property contiguous to the appellant's property. In addition, notice of such hearing shall be published at least five (5) calendar days prior to the date of the hearing in the newspaper of general circulation published in Washtenaw County. The Board shall furnish the appellant with a written report of its findings and decision within sixty (60) calendar days of the date of such hearing.

**Sec. 13:3** All amendments to these Regulations shall be approved by the Washtenaw County PHAC/EAB and the Washtenaw County Board of Commissioners after a public hearing required by Section 2442 of Act 368 of the Public Acts of 1978, as amended, has been held. All amendments shall become effective forty-five (45) days after approval by the Washtenaw County Board of Commissioners or at a time specified by the Washtenaw County Board of Commissioners.

# **APPENDIX G**

On-Site Groundwater Extraction

Capital Costs	Units	Cost/Unit	Number of Units	Cost	Comments
<b>Infrastructure</b>					
Extraction Wells	per well	\$50,000	1	\$50,000	
Injection Wells	per well	\$50,000	0	\$0	
Trenched Connection Piping	per foot	\$100	1000	\$100,000	
Additional Pipe Costs	per foot	\$20	0	\$0	
Site Preparation	lump sum	\$10,000	1	\$10,000	
Electrical Service	lump sum	\$10,000	1	\$10,000	
Pumping Systems	per well	\$3,000	3	\$9,000	
Process Controls	lump sum	\$10,000	1	\$10,000	
Contingencies	lump sum	15%		\$28,350	
<b>Sub-Total</b>				<b>\$217,350</b>	
<b>Consulting/Engineering Fees</b>					
Extraction Well Installation	lump sum	12%	1	\$6,000	
Connection Piping	lump sum	12%	0	\$0	
Pumping System/Process Controls	lump sum	12%	0	\$0	
Contingencies	lump sum	30%		\$1,800	
<b>Sub-Total</b>				<b>\$7,800</b>	
<b>Access (including land owner fees, legal fees, insurance)</b>					
Site	site	\$75,000	0	\$0	
Contingencies	lump sum	50%		\$0	
<b>Sub-Total</b>				<b>\$0</b>	
<b>Total Capital Costs</b>				<b>\$225,150</b>	

Operation and Maintenance Costs Per Year	Units	Unit Cost	Units/Year	Number of Years	Comments
Treatment System Operation	1000 gallons	\$3.07	131,400	1	\$403,398 See Supporting Calculations
Pipeline Maintenance	lump sum	\$5,000	1	1	\$5,000
Well Maintenance	lump sum	\$10,000	1	1	\$10,000
Analytical - Extraction Wells	per sample	\$250	36	1	\$9,000 Sample 3 wells monthly during purging
Electrical for Pumping	per year	\$15,000.00	1	1	\$15,000 Estimate
Access Fees	lump sum	\$3,000	0	1	\$0
Pall Staff	per person	\$56,000	0.5	1	\$28,000
Contingencies	lump sum	15%			\$69,210
<b>Total Operation and Maintenance Cost</b>					<b>\$539,608</b>

Post Closure Costs	Units	Cost/Unit	Number of Units	Cost	Comments
Plugging of Pipelines	foot	\$3	1,000	\$3,000	Based on verbal from Cementrite, Mt. Pleasant, MI
Plugging of Extraction Well	well	\$1,500	1	\$1,500	
Plugging of Injection Well	well	\$1,000	0	\$0	
Technical/Professional Services	lump sum	20%	1	\$900	
Contingencies	lump sum	30%		\$1,620	
<b>Total Post Closure Cost</b>				<b>\$7,020</b>	

NPDES = National Pollutant Discharge Elimination System

General Comments Regarding Costs
The alternative cost estimates were developed from a variety of sources including technology unit costs developed by Pall and/or its consultants, vendor information, published cost-estimating guides, and prior experience with similar technologies.
Costs are based on current (2004) U.S. Dollars. No adjustments have been made to account for inflation.

**On-Site Groundwater Extraction**

Capital Costs	Units	Cost/Unit	Number of Units	Cost	Comments
<b>Infrastructure</b>					
Extraction Wells	per well	\$50,000	1	\$50,000	
Injection Wells	per well	\$50,000	0	\$0	
Trenched Connection Piping	per foot	\$100	1000	\$100,000	
Additional Pipe Costs	per foot	\$20	0	\$0	
Site Preparation	lump sum	\$10,000	1	\$10,000	
Electrical Service	lump sum	\$10,000	1	\$10,000	
Pumping Systems	per well	\$3,000	3	\$9,000	
Process Controls	lump sum	\$10,000	1	\$10,000	
Contingencies	lump sum	15%		\$28,350	
<b>Sub-Total</b>				<b>\$217,350</b>	
<b>Consulting/Engineering Fees</b>					
Extraction Well Installation	lump sum	12%	1	\$6,000	
Connection Piping	lump sum	12%	0	\$0	
Pumping System/Process Controls	lump sum	12%	0	\$0	
Contingencies	lump sum	30%		\$1,800	
<b>Sub-Total</b>				<b>\$7,800</b>	
<b>Access (including land owner fees, legal fees, insurance)</b>					
Site	site	\$75,000	0	\$0	
Contingencies	lump sum	50%		\$0	
<b>Sub-Total</b>				<b>\$0</b>	
<b>Total Capital Costs</b>				<b>\$225,150</b>	

Operation and Maintenance Costs Per Year	Units	Unit Cost	Units/Year	Number of Years	Cost	Comments
Treatment System Operation	1000 gallons	\$3.07	131,400	1	\$403,398	See Supporting Calculations
Pipeline Maintenance	lump sum	\$5,000	1	1	\$5,000	
Well Maintenance	lump sum	\$10,000	1	1	\$10,000	
Analytical - Extraction Wells	per sample	\$250	36	1	\$9,000	Sample 3 wells monthly during purging
Electrical for Pumping	per year	\$15,000	1	1	\$15,000	Estimate
Access Fees	lump sum	\$3,000	0	1	\$0	
Pall Staff	per person	\$58,000	0.5	1	\$28,000	
Contingencies	lump sum	15%			\$69,210	
<b>Total Operation and Maintenance Cost</b>					<b>\$539,608</b>	

Post Closure Costs	Units	Cost/Unit	Number of Units	Cost	Comments
Plugging of Pipelines	foot	\$3	1,000	\$3,000	Based on verbal from Cementite, Mt. Pleasant, MI
Plugging of Extraction Well	well	\$1,500	1	\$1,500	
Plugging of Injection Well	well	\$1,000	0	\$0	
Technical/Professional Services	lump sum	20%	1	\$900	
Contingencies	lump sum	30%		\$1,620	
<b>Total Post Closure Cost</b>				<b>\$7,020</b>	

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General Comments Regarding Costs
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Costs are based on current (2004) U.S. Dollars. No adjustments have been made to account for inflation.

INTERIM RESPONSE PLAN - ESTIMATED COSTS  
 MOBILIZATION OF A 200 GPM MOBILE OZONE UNIT  
 March 24, 2004

<b>OPERATION &amp; MAINTENANCE</b>				
<b>Electrical Service (Based on \$0.10/KWH)</b>		<b>KW</b>	<b>Cost/Day</b>	<b>Cost/Year</b>
Air Compressor		20	\$ 48	\$ 17,520
Injector Booster Pumps		22	\$ 53	\$ 19,272
Discharge Pump		25	\$ 60	\$ 21,900
Ozone Generator		12	\$ 29	\$ 10,512
Heat / AC		15	\$ 36	\$ 13,140
Misc.		10	\$ 24	\$ 8,760
	<b>Sub-Totals</b>		<b>\$ 250</b>	<b>\$ 91,104</b>
<b>Chemicals</b>		<b>Lbs/Day</b>		
Hydrogen Peroxide (50%) (Based on \$0.27/Lb.)		216	\$ 58	\$ 21,287
	<b>Sub-Totals</b>		<b>\$ 58</b>	<b>\$ 21,287</b>
<b>Maintenance</b>				
Ozone/Oxygen Parts			\$ 274	\$ 100,000
Pumps/Drives			\$ 82	\$ 30,000
Valves			\$ 27	\$ 10,000
Misc.			\$ 27	\$ 10,000
Outside Services			\$ 41	\$ 15,000
	<b>Sub-Totals</b>		<b>\$ 452</b>	<b>\$ 165,000</b>
<b>Access fee (estimated \$3,000 per month)</b>				<b>\$ 36,000</b>
<b>TOTALS (O &amp; M)</b>			<b>\$ 760</b>	<b>\$ 313,391</b>

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**Extraction/Injection in Maple Village Area**

Capital Costs	Units	Cost/Unit	Number of Units	Cost	Comments
<b>Infrastructure</b>					
Extraction Wells	per well	\$50,000	1	\$50,000	
Injection Wells	per well	\$50,000	1	\$50,000	
Trenched Connection Piping	per foot	\$150	2620	\$393,000	
Additional Pipe Costs	per foot	\$20	1340	\$26,800	
Site Preparation	lump sum	\$10,000	1	\$10,000	
Electrical Service	lump sum	\$25,000	1	\$25,000	
Pumping Systems	per well	\$3,000	1	\$3,000	
Process Controls	lump sum	\$30,000	1	\$30,000	
Contingencies	lump sum	20%		\$102,200	
<b>Sub-Total</b>				<b>\$690,000</b>	
<b>Consulting/Engineering Fees</b>					
Extraction Well Installation	lump sum	12%	1	\$6,000	
Connection Piping	lump sum	12%	1	\$47,160	
Pumping System/Process Controls	lump sum	12%	1	\$3,960	
Contingencies	lump sum	10%		\$5,712	
<b>Sub-Total</b>				<b>\$62,832</b>	
<b>Access (including land owner fees, legal fees, insurance)</b>					
Site	site	\$0	1	\$0	Unknown, to be determined
Contingencies	lump sum	50%		\$0	
<b>Sub-Total</b>				<b>\$0</b>	
<b>Total Capital Costs</b>				<b>\$752,832</b>	

Operation and Maintenance Costs Per Year	Units	Unit Cost	Units/Year	Number of Years	Comments
Treatment System Operation	1000 gallons	\$2.64	105,120	1	\$277,517 See Supporting Calculations
Pipeline Maintenance	lump sum	\$5,000	1	1	\$5,000
Analytical - Extraction Wells	per sample	\$250	12	1	\$3,000 Sample 1 well monthly during purging
Well Maintenance	lump sum	\$10,000	3	1	\$30,000
Electrical for Pumping/Injection	per year	\$20,000	1	1	\$20,000 Estimate
Access Fees	lump sum	\$0	1	1	\$0 Unknown, to be determined
Pail Staff	per person	\$56,000	0.5	1	\$28,000
Contingencies	lump sum	30%			\$108,155
<b>Total Operation and Maintenance Cost</b>					<b>\$471,672</b>

Post Closure Costs		Cost/Unit	Number of Units	Cost	Comments
Plugging of Pipelines	foot	\$3	3,960	\$11,880	Based on verbal from Cementrite, Mt. Pleasant, MI
Plugging of Extraction Well	well	\$1,500	1	\$1,500	
Plugging of Injection Well	well	\$1,000	2	\$2,000	
Technical/Professional Services	lump sum	20%	1	\$3,076	
Contingencies	lump sum	30%		\$5,537	
<b>Total Post Closure Cost</b>				<b>\$23,993</b>	

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Costs are based on current (2004) U.S. Dollars. No adjustments have been made to account for inflation.