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EPA Superfund
Record of Decision:

PETOSKEY MUNICIPAL WELL FIELD
EPA ID: MID006013049
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PETOSKEY, MI
06/14/1995

INTERIM ACTION RECORD OF DECISION

FOR THE

PETOSKEY MUNICIPAL WELL FIELD SUPERFUND SITE

PETOSKEY, MICHIGAN

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JOHN ENGLER Governor
DEPARTMENT OF NATURAL RESOURCES
STEVENS T MASON BUILDING, PO BOX 50028, LANSING MI 68909-7528

ROLAND HARMES, Director

June 6, 1995

Mr. Valdas V. Adamkus, R-19J
Administrator, Region 5
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Mr. Adamkus:

The Michigan Department of Natural Resources (MDNR), on behalf of the State of Michigan, has reviewed the Record of Decision (ROD) for the Peloskey Manufacturing Superfund site interim action (IA) for the Ingalls Avenue Municipal Well, and the proposed remedy contained in that ROD. Michigan concurs with the IA remedy proposed in the ROD consisting of:

> On-line treatment of groundwater from the Ingalls Avenue Municipal Well through the use of air stripping with the use of carbon treatment as a contingency in the event that, witch 18 months of the signature of the ROD, site-related semi-volatile contaminants exceed maximum cantaminant levels in the Ingalls well tap.

The state elects the cost-equivalency option as an alternative to the implementation of the propored remedy. The state will be entering into an agreement with the City of Petoskey whereby they will agree to:

A. Design and implement the cost-equivalency option.

B. Pay all additional costs associated with the design, construction and operation and maintenance of such an alternate water treatment system beyond the $500,000 already allocated by the MDNR to the City of Petoskey for development of an alternate water supply.

C. Agree not to hold the State of Michigan responsible for payment of any additional funds associated with the alternate water treatment plant beyond the $500,000 already allocated.

The EPA needs to provide the state of Michigan with an explanation of the appropriate mechanism to transfer funds from the EPA to the state of Michigan and identify the responsibilities associated with "... assum[ing] the lead for supervising the design and construction of the new drinking water source, pursuant to the NCP at 40 § 300.515(f)(1)(ii)(B)."

We look forward toworking together to accomplish this IA remedy at this site.

If you have further questions, please contact Mr. William Bradford, Chief. Superfund Section, Environmental Response Division, at 517-373-8815, or you may contact me.

Sincerely,

Russell J. Harding
Deputy Director

CC: Mr. James Mayka, EPA
Ms. Karla Johnson, EPA
Ms. Teresa Van Donsel, EPA
Mr. Chad McIntosh, Governor's Office
Mr. Jeremy Firestone, MDAG
Mr. Alan J. Howard. MDNR
Mr. William Bradford, MDNR

DECLARATION

SELECTED REMEDIAL ALTERNATIVE
FOR INTERIM ACTION AT THE
PETOSKEY MUNICIPAL WELL FIELD SITE
PETOSKEY, MICHIGAN

Statement of Basis and Purpose

This decision document presents the selected remedial action for interim action at the Petoskey Municipal Well Field Site (Site), in Petoskey, Michigan. This remedial action was chosen in accordance with the Comprehensive Environmental Response; Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for this Site.

The State of Michigan concurs with the selected remedy. The Letter of Concurrence is attached to this Record Of Decision.

Assessment of the Site

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action in this Record of Decision (ROD), my present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

The selected remedial action is an interim remedy for the Site. The purpose of this remedy is to ensure that individuals drinking water from the Ingalls Avenue Municipal Well are not exposed to unacceptable levels of contamination from the Petoskey Manufacturing Company source area. Soil contamination at the Petoskey Manufacturing Company source area and ground water contamination in the well field will be addressed in a subsequent Record of Decision.

The selected remedy includes on-line treatment of ground water from the Ingalls Avenue Municipal Well. Air stripping has been identified as the appropriate treatment technology to address the levels and types of contamination seen to date in ground water at and near the municipal well. To address State of Michigan concerns that site-related semi-volatile contamination could adversely impact the Ingalls Well in the near future, the Record of Decision also includes carbon treatment as a contingent treatment remedy. The U.S. EPA will coordinate quarterly sampling at the Ingalls Well tap for a period of eighteen months from the date of this Record of Decision. If during this eighteen-month period, two consecutive quarters of sampling at the Ingalls Well tap reveal a site-related, semi-volatile contaminant exceeding a Maximum Contaminant Level, the selected remedy will utilize granular activated carbon, instead of air stripping, for treatment of the water supply. If the Ingalls Well is replaced and the replacement supply is in operation within eighteen months of the signature of this ROD, the contingent carbon treatment remedy would no longer be available and quarterly sampling at the Ingalls Well would be discontinued.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. The remedy does not satisfy the statutory preference for remedies that employ treatment that reduces the toxicity, mobility, or volume as a principal element. Because this interim remedy does not directly address the ground water and soil contamination problems identified at the Petoskey Municipal Well Field Superfund Site and because the Site itself will be addressed in a subsequent ROD, the five-year review will not apply to this action.

Enhancement of Remedy Option

By selecting this remedy, the U.S. Environmental Protection Agency is seeking to ensure that contamination from the Petoskey Manufacturing Company property does not impact the Ingalls Avenue Municipal Well at levels which are considered unsafe. The selected alternative of air stripping will, if constructed, reduce levels of volatile organic compounds that enter the municipal water distribution system. If semi-volatile organic contaminant treatment is found to be necessary, carbon treatment will address both volatile and semi-volatile organic compounds. Either of these actions, if found to be necessary, would be adequate to achieve the requirements of CERCLA and the National Contingency Plan. The U.S. EPA cannot justify expending Superfund monies to replace the water system when more cost-effective alternatives (air stripping and granular activated carbon) are capable of providing an added margin of safety to an already safe drinking water supply. Therefore, the U.S. EPA will allow the State of Michigan to request that the City's cost of constructing a new drinking water source be considered an "enhancement" of the remedy under 40 CFR §300.515(f).

The U.S. EPA finds that such an "enhancement" of the U.S. EPA's selected remedy, while not necessary for the protection of human health and the environment, would not conflict with or be inconsistent with the U.S. EPA's selected remedy. If such enhancement is requested by the State of Michigan, U.S. EPA would contribute the capital cost of U.S. EPA's selected remedy, in the amount of $1,238,000 for air stripping or $1,444,000 for carbon treatment, to be used by the State to partially defray the City's cost of replacing the Ingalls Avenue Well. In that case, the U.S. EPA's selected remedy will not be implemented and the State will agree to assume the lead for supervising the design and construction of the new drinking water source, pursuant to the NCP at 40 CFR § 300.515(f) (1) (ii) (B). U.S. EPA understands that the City of Petoskey will be required to fund the entire additional cost associated with the enhanced remedy.

Valdas V. Adamkus Date
Regional Administrator

Use This Space to Write Your Comments

Your input on the proposed plan for the Petoskey Municipal Well Field Superfund Site is important to U.S. EPA. Comments provided by the public are valuable in helping us select a cleanup plan for the site.

You may use the space below to write your comments. When finished, please fold, stamp, and mail this page comments must be postmarked by January 29, 1994. If you have questions about the comments period, please contact Dave Novak at (312) 886-9840 or through U.S. EPA's toll free number: 1-800-621-8431 (M-F 9:00 a.m. to 4:30 p.m.).

To whom this may concern: I am the President of Petoskey Mfg. Co. I attended your December 2, 1993 Public Hearing at the Petoskey High School. I was not impressed with the solution to use an air stripper. I feel Petoskey Mfg. Co. has gone beyond the limit of what is normal clean-up. Before any further clean-up procedures should be adopted I feel we should move in an easiest to hardest direction.
Currently, the city well is not a health hazard to the People of Petoskey. Why wouldn't it be prudent to continue monitoring the levels. Until such time that it would be necessary to begin a new direction, the monitoring levels should be over the E.P.A. limit. I doubt that they would ever get over the E.P.A limit. I feel Petoskey Mfg. CO. is being made the SCAPEGOAT with this matter. The city well is outdated and under capacity. I don't feel that it is the E.P.A.'s responsibility to buy Petoskey a Surface Water Treatment Plant. Petoskey is looking at the E.P.A. as the one with deep pockets to fill their needs that they should have been planning for for several years. We are a small company trying to survive in a very political fish bowl. I urge E.P.A. NOT to succomb to the political pressures and proceed in a responsible manner and move in an easiest to hardest process.

I have no comment, but please add me to your mailing list for the Petoskey Municipal Well Field Superfund Site.

Name: Michael E. Olson

Affiliation (if any): Petoskey Mfg. Co.

Address: P.O. Box G.

City: Petoskey, MI.

State: Michigan Zip: 49770

RECORD OF DECISION SUMMARY
For Interim Action At The
Petoskey Municipal Well Field
Petoskey, Michigan

1.0 SITE NAME, LOCATION, AND DESCRIPTION

The Petoskey Municipal Well Field Site (the "Site") is located in Petoskey, Michigan. The City of Petoskey is located in the northwest corner of Michigan's lower peninsula (Figure 1). The Site includes contaminated source area soils and the ground water that has been impacted by contaminants migrating from the source area. Ground water contamination has impacted the Ingalls Avenue Municipal Well ("Ingalls Well") which is located on the shore of Lake Michigan and supplies water to residents of the City of Petoskey.

The Petoskey Manufacturing Company (PMC) has been identified as the source area for the volatile organic compound (VOC) contamination in the Ingalls Avenue Municipal Well. PMC is a small fabricating operation that was established in 1946 as a die cast manufacturer, continued with painting operations in the late 1960's, and remains in operation today. PMC is located at 200 West Lake Street in Petoskey, Emmet County, Michigan. Because of the connection between PMC and the Superfund Site, the Site is also commonly known as the "PMC Site."

The PMC source area is located approximately 500 feet south of Little Traverse Bay (Figure 2). In general, ground water from the PMC source area moves towards the bay and into Lake Michigan and also moves towards the Ingalls Avenue Municipal Well when the well is pumping. The Bear River is located approximately 500 feet east of the PMC Site. Geology at the Site consists of a thin layer (1 to 30 foot thick) of sands and gravels overlying the approximately 400 foot thick Devonian age Traverse Group. The Traverse Group consists of fractured limestone with thin interbeds of shale.

Disposal of spent solvents and/or paint sludge on the ground surface outside the PMC building has contaminated soils and ground water in the vicinity of the source area. Water from the City of Petoskey's Ingalls Well contains VOCs, including trichloroethene (TCE), and low levels of semi-volatile organic contaminants (SVOCs) and inorganic contaminants. The Ingalls Well is still being used to service the population of Petoskey and supplies 60 to 70% of the City's water needs.

<IMG SRC 0595274>
<IMG SRC 0595274A>

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

In 1981, the Ingalls Well was found to be contaminated with VOCs. In 1982, the U.S. EPA and MDNR identified PMC as a potentially responsible party for the water supply contamination. Analysis of samples obtained from the area west of the PMC building indicated that elevated levels of VOCs were present in the soils:

In 1982, under the direction of the MDNR, PMC removed approximately 131 cubic yards of contaminated soil, backfilled the excavation, and capped it with a polymembrane liner.

Prior to 1982, TCE concentrations of approximately 50 parts per billion (ppb) were found in the Ingalls Well. Following the removal of the contaminated soil, TCE concentrations in the municipal well decreased to approximately 4.0 ppb and have remained relatively stable for the last five years. A MDNR ground water study conducted in 1982 and 1983 confirmed the presence of ground water contamination and found that the local ground water flow from the PMC Site was toward the Ingalls Well when the well was pumping. The MDNR also indicated that additional work was necessary to further identify and characterize the source(s) of contamination.

In July 1983, the PMC Site was evaluated using the Hazard Ranking System. The PMC Site was subsequently added to the National Priorities List on September 8, 1983.

In 1984, the U.S. EPA negotiated an Administrative Order by Consent with PMC. This Order required PMC to conduct further hydrogeological studies. PMC retained an environmental consultant and completed the work under the direction of the U.S. EPA and MDNR. Work included the installation of four monitoring well clusters, ground water and soil sampling, and ground water flow analysis.

In 1987, PMC signed another Administrative Order by Consent with the U.S. EPA. PMC agreed to conduct a full Remedial Investigation/Feasibility Study (RI/FS) to determine the nature and extent of contamination and investigate appropriate remedial alternatives to address the contamination. PMC started the work plan phase of the Administrative Order, but in 1990 the U.S. EPA relieved PMC of conducting further RI/FS work due to delays in developing the work plan and PMC's questionable financial ability to complete the work required by the Administrative Order. The U.S. EPA entered into a State Cooperative Agreement with the MDNR in 1990, in which the MDNR agreed to perform the RI/FS.

In April 1989, the Agency for Toxic Substance and Disease Registry (ATSDR) prepared a Health Assessment for the PMC Site. This assessment concluded that:

> The "site is of potential public health concern because of the risk to human health that could result from possible exposure to hazardous substances at levels that may result in adverse health effects over time."
>
> "Human exposure to TCE and DCE [dichloroethene] has occurred via ingestion of contaminated water and inhalation of contaminated air."

Data from the Remedial Investigation conducted by the MDNR were released to the public in January of 1994. A Phase I Remedial Investigation Report is expected to be released by the MDNR in late 1995. The MDNR will conduct additional field work during the summer and fall of 1995 will release a Phase II Remedial Investigation Report in 1996.

While the state-lead RI/FS was ongoing, the U.S. EPA in 1992 began a Focused Feasibility Study (FFS) to examine the impact of the PMC contamination at the Ingalls Well. The FFS concluded that current VOC levels at the well were below the Maximum Contaminant Levels (MCLs) promulgated pursuant to the Safe Drinking Water Act. The FFS also determined that risk levels calculated for present and future scenarios based on current levels of contamination are within the U.S. EPA's acceptable risk range. However, because of the uncertainty associated with future concentrations of VOCs in the Ingalls Well, the U.S. EPA in 1993 proposed that an air-stripper be constructed at the Ingalls Well to reduce existing levels of VOCs, especially TCE, in the well and ensure that the City's water supply is not adversely impacted by the higher levels of VOC contamination that have been found in ground water near the Ingalls Well. This action was proposed as an interim measure at the Ingalls Well to fully ensure the protection of the City's water supply with regards to the Superfund contamination emanating from the PMC Site. This interim action does not address the source of the ground water contamination.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

A community relations plan was developed in 1992 by the MDNR to document community concerns and to plan an information strategy for the PMC Site. At the request of the City of Petoskey, the MDNR has postponed holding any public meetings to discuss the RI/FS until issues regarding the Ingalls Well are resolved.

As part of its community relations program, MDNR maintains an information repository at the Petoskey Public Library. The library is located at 451 East Mitchell Street in Petoskey. The Administrative Record and all formal reports developed prior to and during the RI are available at this location. As Site activities progress, MDNR will add additional RI/FS information to the repository.

U.S. EPA took the lead in developing the technical documents to support the evaluation and selection of an interim action. These documents, including the FFS, can also be found in the Site repository.

U.S. EPA notified the local community, by way of the Proposed Plan, of the recommendation of a interim remedial alternative for the PMC Site. To encourage public participation in the selection of a remedial alternative, U.S. EPA scheduled a public comment period from December 1, 1993, to January 29, 1994.

Additionally, on December 2, 1993, U.S. EPA held a public meeting to discuss the recommended remedial alternative and the other alternatives identified and evaluated in the FFS. The MDNR, the Michigan Department of Public Health (MDPH) and the Agency for Toxic Substances and Disease Registry also participated in the meeting. A transcript of this meeting is included as part of the Administrative Record for the Interim Action at the PMC Site. U.S. EPA's responses to oral comments received during this public meeting and to written comments received during the public comment period are included in the Responsiveness Summary which is attached to this ROD.

Press releases announcing the public comment period, the public meeting and the availability of the Proposed Plan, were sent to the Petoskey News Review, the Super Shopper and the Charlevoix Courier. The information was also provided to local media, including:

WPBN-TV (7) NBC, Traverse City;
WWTV-TV (9) CBS, Cadillac;
WWUP-TV (10) CBS, Sault St Marie;
WCMU-TV (36) PBS, Mt Pleasant;
WGTU-TV (29) ABC, Traverse City;
WJML (AM & FM) Petoskey;
WWPZ (AM), Petoskey; and
WKHQ (FM), Charlevoix.

4.0 SCOPE AND ROLE OF RESPONSE ACTION

The selected remedy for interim action at the Ingalls Well is not intended to be the final response action at the Site. The purpose of the selected alternative for this interim action is to protect the Petoskey Municipal Well Field from unsafe levels of contamination from the PMC site. The interim remedy selected for the Ingalls Well will include on-line treatment of ground water by air stripping and routine, long-term monitoring of water quality in the well. If, within eighteen months of the date of this Record of Decision, two consecutive quarters of sampling at the Ingalls Well tap reveal a site-related semi-volatile contaminant exceeding a Maximum Contaminant Level, the selected remedy would consist of carbon treatment instead of air stripping. If the Ingalls Well is replaced and the replacement supply is in operation within eighteen months of the signature of this ROD, the contingency carbon treatment technology would no longer be available. No principal threat for the PMC Site will be addressed as part of this action.

5.0 SUMMARY OF SITE CHARACTERISTICS

On September 1, 1981, the Michigan Department of Public Health notified the City of Petoskey that routine samples from the Ingalls Well contained between 20 and 50 parts per billion (ppb) of TCE. Subsequent testing of the well in 1982 found concentrations of 50 ppb of TCE and 32 ppb of (DCE). Following the 1982 excavation of contaminated soil from an area west of the PMC facility, the reported concentrations of both contaminants in the Ingalls Well decreased to below the U.S. EPA Maximum Contaminant Level (MCL) for TCE of 5 ppb and below the non-zero Maximum Contaminant Level Goal (MCLG) for DCE of 7 ppb.

MCLs and MCLGs are the Federal standards used to evaluate the degree of chemical contamination in water supplies. MCLs are enforceable standards that apply to specified contaminants which U.S. EPA has determined to have an adverse effect on human health above certain levels. MCLs are set as close as feasible to MCLGs. Feasibility takes into account both technology and cost considerations. MCLGs are non-enforceable health-based goals that have been established at levels at which no known or anticipated adverse effects on the health of persons occur and which will allow an adequate margin of safety.

Because of the complexity of the ground water flow patterns, it has not been possible to clearly establish ground water flow direction in any of the remedial investigation studies conducted to date. Ground water patterns are naturally variable due to the site's proximity to Lake Michigan and Bear River. Ground water

flow patterns are also variable because of the intermittent pumping at the Ingalls Well. However, in general it has been noted that operation of the Ingalls Well changes the directional pattern. Ground water flows towards the well when it is pumping.

The contaminant plume has moved approximately 600 feet to the northwest of the PMC facility to the Ingalls Well, and is within 100 feet of the lake shore. It appears that the contaminated ground water drawn into the Ingalls Well is diluted by surface water infiltration from Lake Michigan. This dilution appears to reduce the concentration of TCE in the well. Since the removal action in 1982, the level of TCE contamination in the Ingalls Well has dropped over time and has remained at 4 ppb for several years.

From what is known of ground water flow at the Site, levels of contamination should have continued to drop at all wells since the removal action in 1982. However, at Monitoring Well PS-CD and Monitoring Well PS-11, levels of TCE have remained relatively high even though other wells closer to the source area have experienced decreasing levels of TCE contamination. The most likely reason for Monitoring Well PS-CD and Monitoring Well PS-11 retaining the higher levels of contamination is the possibility that TCE may have sunk into the fractured bedrock as a Dense Non-Aqueous Phase Liquid (DNAPL). The pocket of contamination within the bedrock could serve as a secondary source of contamination to the ground water entering the Ingalls Well. The RI has not confirmed the presence of a DNAPL; however, due to the complex fractures of bedrock, any field program designed to find a DNAPL would likely fail to locate the pocket.

Three residential wells are located within 1/2 mile of the Ingalls Well. In 1991, two of the three residential wells were sampled by the Michigan Department of Public Health for volatile organic compounds (VOCs) at the request of the MDNR. No confirmed contamination was found. The third private well was unable to be sampled because the property was closed for the winter.

Table 1 provides detail concerning the frequency of detection and range of detection for all VOCs and semi-volatile compounds (SVOCs) seen in monitoring wells during the two most recent rounds of comprehensive ground water sampling (December 1992, March 1993) conducted as part of the Remedial Investigation. Sampling conducted by the MDNR found levels of TCE as high as 7B ppb in monitoring wells downgradient of the site. Low levels of SVOCs have also been seen in monitoring wells. The most prevalent of SVOCs are bis(2-ethylhexyl)phthalate and di-n-octyl phthalate, which were seen in monitoring wells at estimated maximum concentrations of 7 ppb. Only trace levels (estimated at 0.5 ppb) of bis(2-ethylhexyl)phthalate have been seen in the Ingalls Well due to the mixing of ground water and surface water that occurs when the Ingalls Well is in operation. Di-n-octyl phthalate has not been detected in the Ingalls Well.

The December 1992 and March 1993 sampling events also analyzed ground water for the presence of pesticides. However, only the March 1993 sampling event detected the presence of any pesticides in ground water. See Table 1 for a list of identified pesticides from the March 1993 sampling event. Of the eleven pesticides identified, only one pesticide, dieldrin, was found at trace levels at the Ingalls Well. Follow-up ground water sampling was conducted in October of 1993 to provide additional information concerning concentrations of pesticides in the well field. Analyses identified very low levels of heptachlor epoxide, 4,4'-DDE and endosulfan sulfate. No pesticides were found in the ground water from the Ingalls Well. Of the pesticides seen in ground water to date, only 4,4'-DDT and 4,4'-DDE have been found in site soils.

Because the majority of pesticides seen in the ground water were not seen in soil samples taken from the site, it is possible that the presence of low-level pesticides in the ground water is an area-wide problem. As in many communities in the country, the past prevalent use of pesticides makes it unlikely that the PMC Site is the sole source of the trace 4,4'-DDT and 4,4'-DDE in ground water. The sporadic, low-level detection of 4,4'-DDE and 4,4'-DDT does not warrant treatment for semi-volatile contaminants at the Ingalls Well.

TABLE 1

Data from 12/92 and 3/93 Groundwater Sampling Events

Volatile Organic Compounds	Frequency of Detection	Range of Detected Concentrations*
Vinyl Chloride	1/44	2 ppb
Methylene Chloride	12/44	0.5J - 3 ppb
Acetone	6/44	0.9J-15J ppb
Carbon Disulfide	7/44	0.6J-3 ppb
Cis-1,2-dichloroethene	7/44	0.4J-8 ppb
Trichloroethene (TCE)	15/44	0.7J-78E ppb
Tetrachloroethene	7/44	0.9J-2
Methyl-t-Butyl Ether	7/44	0.6J-8 ppb
Toluene	1/44	0.6J ppb
Chloroform	1/44	3J ppb

Semi-Volatile Organic Compounds	Frequency of Detection	Range of Detection Concentrations*
Di-n-butylphthalate	1/44	0.6J ppb
Butylbenzylphthalate	2/44	0.6J-1J ppb
3,3'-dichlorobenzidine	1/44	1J ppb
Bis(2-ethylhexyl)Phthalate	13/44	0.5J-7J ppb
Di-n-octyl Phthalate	13/44	0.5J-7J ppb

* Note - Contaminant concentrations marked with a "J" are estimated values.

Contaminant concentrations marked with an "E" identifies concentrations that exceed the calibration range of the GC/MS instrument for the specific analysis.

TABLE 1 – Continued
Data from 12/92 and 3/93 Groundwater Sampling Events

Semi-Volatile Organic Compounds - Pesticides	Frequency of Detection	Range of Detection Concentrations*
Heptachlor	2/43	0.006J - 0.028J
Aldrin	2/43	0.008JP - 0.026J
Endosulfan 1	2/43	0.012JP - 0.019JP
Dieldrin	2/43	0.008JP - 0.015JP
4,4'-DDE	2/43	0.028JP - 0.068JP
4,4'-DDT	4/43	0.008JP - 0.27J
Alpha-Chlordane	4/43	0.013JP - 0.81PE
Gamma-Chlordane	5/43	0.015JP - 1.2PE
Delta-BHC	1/43	0.034JP
Heptachlor Epoxide	1/43	0.007JP
Endrin Aldehyde	2/43	0.15BP - 0.20B

* Note Contaminant concentrations marked with a "J" are estimated values.

Contaminant concentrations marked with an "E" identifies concentrations that exceed the calibration range of the GC/MS instrument for the specific analysis.

Contaminant concentrations marked with a "B" identify sample results where the compound was detected in the associated blank sample. Contaminant concentrations marked with a "P" identify sample results where there was a greater than 25% difference for detected concentrations between the two GC columns.

While soils at the PMC facility are contaminated with metals, very little inorganic contamination has been seen during ground water monitoring conducted during the Remedial Investigation. Zinc was seen at moderately elevated concentrations in several monitoring wells and it is possible that the zinc in ground water is due to a 1990 hydraulic fluid spill at the PMC facility. During that period, some formulations of hydraulic fluid contained zinc.

During December 1992 and March 1993 MDNR monitoring, arsenic was detected only in well PS-A (located south of PMC). In April 1993, the City of Petoskey's contractor, McNamee Industrial Services, Inc., (hereafter referred to as "McNamee"), took a round of ground water samples from borings and wells north of the Site near the Ingalls Well. Sample results showed low levels of arsenic (maximum concentration 4 ppb). Although arsenic was seen in Site soils, the distribution of arsenic detections in ground water suggests that the low levels found may be background concentrations or unrelated to movement of contaminants from the PMC source area. All detections of arsenic in ground water are far below the MCL of 50 ppb.

During the analysis of samples from the monitoring wells and the Ingalls Well, volatile and semi-volatile Tentatively Identified Compounds (TICs) were found. TICs are contaminants that are seen during gas chromatography/mass spectrometry (GC/MS) analysis, but cannot be clearly identified as specific chemicals. The most significant levels of TICs are seen in Well PS-6. The location of the TIC chemicals at Well PS-6 corresponds with the area of the 1990 hydraulic fluid release at the PMC facility. During the December 1992 sampling event, field personnel observed a floating product on three ground water samples taken from wells taken near the PMC facility. A sample of the floating product was analyzed and found to contain approximately 2% oil and grease. The exact extent of the floating product is not known.

Because of the complex fractured bedrock geology and the possibility of DNAPLs at the Site, any future active restoration of the well field would be difficult. However, the MDNR will evaluate both source area and ground water technologies that have the potential of remediating the contamination at the PMC property and in the Petoskey well field. Until a final remedy at the Site can be implemented, construction and operation of the alternative selected in this interim action ROD will ensure that the municipal water from the Ingalls Well does not have unsafe levels of VOCs.

6.0 SUMMARY OF SITE RISKS

The Baseline Risk Assessment for ground water that was released in conjunction with the FFS for interim action at the Ingalls Well followed the guidance provided in U.S. EPA's Risk Assessment Guidance for Superfund (RAGs): Volume I, Human Health Evaluation Manual.

The data used in the Baseline Risk Assessment for ground water were from samples collected and analyzed by the Michigan Department of Public Health and the Michigan Department of Natural Resources between 1989 and March 1991. Data collected prior to 1989 were excluded from these tables because the more recent data were believed to be more representative of present conditions. Data from more recent sampling rounds were not available for inclusion in the Baseline Risk Assessment. However, a qualitative discussion has been added to account for new information from the most recent sampling events.

6.1 BASELINE RISK ASSESSMENT - CHEMICALS OF POTENTIAL CONCERN

Chemicals considered in the Baseline Risk Assessment are those which are present as a result of chemical releases which have occurred at the Site and are termed "chemicals of potential concern". To identify these, chemicals present in soil and ground water samples are distinguished from those which may naturally be present (Site background) and those which can be unintentionally introduced into samples through sample collection or laboratory analysis. Further, consideration is given to the frequency of occurrence of the chemical at the Site. Those infrequently identified may not be significant in view of overall Site contamination. Chemicals considered to be of potential concern are evaluated further in the Baseline Risk Assessment.

All of the chemicals that were detected in the ground water between 1989 and 1991 were included as chent cals of potential concern, with the exception of bromodichloromethane, bromoform, chloroform, and dibromochloromethene, which are trihalomethanes associated with chlorination that were detected at the

Ingalls well. For the purposes of the Baseline Risk Assessment, the chemicals of potential concern at the site were:

Arsenic;
cis-1,2-Dichloroethene;
trans-1,2-Dichloroethene;
Methyl-t-butyl ether;
Tetrachloroethylene;
1,1,1-Trichloroethane;
Trichloroethylene; and
Zinc.

Although analysis of ground water from monitoring wells in the early 1980s detected SVOCs, the levels dropped off after completion of the removal action. Therefore, until 1992 and 1993, the Remedial Investigation did not routinely analyze for SVOCs at monitoring wells. For the timeframe evaluated in the Baseline Risk Assessment there were no SVOC data to support inclusion of chemicals that have been seen at low levels in the 1992 and 1993 sampling rounds. A qualitative discussion of the impact of SVOCs in the ground water is presented below in Section 6.5.

In the data used for the Baseline Risk Assessment for ground water, trihalomethanes were detected only in the Ingalls well, which was sampled following chlorination of the well. Trihalomethanes can form in water from chlorination so it can bereasonably be assumed that the trihalomethanes, which were notdetected in the monitoring wells, are due solely to thechlorination of the water supply and are not related to the PMC site. More recent sampling has shown very low concentrations of trihalomethanes in area monitoring wells. Therefore, it can be argued that chlorination at the Ingalls Well is not the sole source of the trihalomethane contamination. It is necessary to emphasize that the concentrations of trihalomethanes in the well field are low and would not cause the Ingalls Well to exceed the MCL for total trihalomethanes.

6.2. BASELINE RISK ASSESSMENT – TOXICITY ASSESSMENT

The purpose of the toxicity assessment is to evaluate the potential for chemicals of potential concern to cause adverse effects in exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure to a chemical and the increased likelihood and/or severity of adverse effects.

Exposure to chemicals may elicit both carcinogenic and non-carcinogenic responses. The carcinogenic response is assumed to be a "non-threshold" effect; that is, any exposure, no matter how small, is assumed to increase the potential for developing cancer. For non-carcinogenic effects, protective mechanisms are believed to exist that must be overcome before an adverse health effect can be manifested in an exposed individual. As a result, it is assumed that a range of exposures from zero to some finite value exists that can be tolerated by an organism without expression of adverse effects.

6.3 BASELINE RISK ASSESSMENT – EXPOSURE ASSESSMENT

The exposure assessment identifies actual and potential pathways by which human exposure to contaminated Site media may occur. The assessment considers factors such as the physical location of contaminated areas, the type of contamination and the populations which may come into contact with these areas. Exposure pathways are identified for two ground water use scenarios, a pathway based on consumption of water from the Ingalls Well at current levels of contamination and a pathway based on consumption of ground water with contaminant levels consistent with levels found in nearby monitoring wells. Both current and future pathways, which represent possible exposures, are then quantified to estimate the magnitude of daily contaminant exposure that a population may incur. To accomplish this, assumptions pertaining to the exposed population are made, such as the nature of the individuals (e.g., child vs. adult), the rate of contact with the contaminated medium (e.g., adult consumes 2 liters water daily) and the length of time the exposure is likely to occur (e.g., years vs. lifetime). These population variables are then combined with chemical concentration data to calculate a level of exposure.

The current exposed population consists of residents of the city that use the municipal water supply with

water from the Ingalls Well. The potential future exposed population includes users of a water supply well that could be installed near the site. The exposure routes are, for purposes of this risk assessment, ingestion of ground water, dermal absorption of chemicals in the water during showering, and inhalation of chemicals that volatilize from the water to air during showering.

Much of the population of the City of Petoskey is exposed to water from the Ingalls Well. Therefore, subpopulations of concern must be considered. These subpopulations include children, pregnant and nursing mothers, ill persons, and elderly persons. The toxicity values used in this Baseline Risk Assessment were developed to be protective of these subpopulations.

Estimated Intakes of Chemicals from Ingestion

Adults were assumed to weigh 70 kg and children were assumed to weigh 15 kg. An exposure duration of 30 years was used for adults. This exposure period is based on the upper bound (90^{th} percentile) number of years spent by an individual at one residence. Six years was selected as the exposure duration period for children. The averaging time (the total number of days over which intakes are averaged) for children was 2,190 days (6 years times 365 days/year) for exposure to non-carcinogenic chemicals and 25,550 days (70 years times 365 days/year) for exposure to carcinogenic chemicals. The averaging times for adults were 10,950 days (30 years times 365 days/year) for exposure to non-carcinogenic chemicals and 25,550 days (70 years times 365 days/year) for exposure to carcinogenic chemicals. For carcinogenic effects, the total dose during the exposure period was assumed to be cumulative and is averaged over a lifetime (70 years). Adults were assumed to ingest 2 liters of water a day; children were assumed to ingest one liter of water a day. The exposure frequency was assumed to be 350 days per year.

Estimated Intakes of Chemicals by Dermal Absorption

In addition to evaluating the possible adverse effects from drinking contaminated water, the Baseline Risk Assessment also considered possible risks from dermal absorption of chemicals during showering. An exposure time of 0.17 hours/event (10 minutes) and an exposure frequency of 350 days/year were used to estimate dermal exposure.

Estimated Intakes of Chemical by Inhalation

Volatile chemicals such as TCE may volatilize from water to air during showering. The contaminants may then be inhaled by the bather. An exposure time of 0.34 hours/event (20 minutes) was used for inhalation during showering to account for 10 minutes spent in the shower and an additional 10 minutes spent in the bathroom after showering during which inhalation of the chemicals of potential concern present in air could occur. An exposure frequency of 350 days/year and an inhalation rate of 0.6 m3/hour were used for both adults and children. A respirable fraction of 100% was assumed.

Using these scenarios, risk numbers are calculated for each contaminant. These calculations factor in the amount of exposure assumed, the dose of the chemical received (based on the available monitoring data), and a toxicity value for each individual chemical which quantifies the toxicity of that chemical. Different toxicity values are used based on whether or not the chemical is carcinogenic. The toxicity value for a carcinogenic chemical is called a slope factor, and the toxicity value for a noncarcinogen is called a reference dose.

6.4 BASELINE RISK ASSESSMENT RESULTS

The results of these calculations are estimates of cancer risk for carcinogenic risks and estimates of Hazard Indices for noncarcinogenic risks. The cancer risk number is expressed in scientific notation and represents an estimate of an individual's increased risk of getting cancer over a lifetime. The carcinogenic risk estimate is generally a conservative estimate, i.e., the risk may be less than predicted. For example, 1.0 x 10-6 represents an increase in an individual's risk of cancer by 1 chance in a million, under the exposure conditions assumed. U.S. EPA considers this 1.0 x 10-6 number as a point of departure when determining risk at a Site. Risks calculated to be less than this value are considered protective of human health and the environment, while risks between 1.0 x 10-4 and 1.0 x 10-6 are within a range acceptable to U.S. EPA but may

not be considered protective due to site-specific conditions. Risks greater than 1.0 x 10-4 are generally unacceptable.

The Hazard Index (HI) represents the risk of adverse non-cancer effects occurring due to exposure to the Site. The HI number generated is interpreted differently from the cancer risk number. To evaluate risk at a site due to noncarcinogenic contaminants, U.S. EPA has determined that an HI less than or equal to 1 estimates that no adverse effects are likely to occur due to the hypothetical exposure, while a Hazard Index greater than 1 estimates that adverse effects due to site exposure may occur and signals that potential risks to human health must be carefully evaluated.

In summary, the Baseline Risk Assessment calculated the following risks from use of ground water at the Site:

- The carcinogenic risk to an adult resulting from 30 years of residential use of ground water from the Ingalls Well is 2.8 x 10-6. The Hazard Index calculated for this scenario is less than 1.

- The carcinogenic risk to a child resulting from 6 years of residential use of ground water from the Ingalls Well is 1.3 x 10-6. The Hazard Index calculated for this scenario is less than 1.

- The carcinogenic risk to an adult resulting from 30 years of residential use of ground water from a contaminated private well is 1.9 x 10-5. The Hazard Index calculated for this scenario is less than 1.

- The carcinogenic risk to a child resulting from 6 years of residential use of ground water from a contaminated private well is 9.0 x 10-6. The Hazard Index calculated for this scenario is less than 1.

The current VOC contaminant levels present in the Ingalls Well are below MCLs. Therefore, according to the chemical data gathered to date from the Ingalls Well, the water is of acceptable quality according to Federal chemical-specific standards. Because the current risk from residential use of the water from the Ingalls Well (2.8 x 10-6) is within the U.S. EPA's acceptable risk range of 1x10-6 to 1x10-4, U.S. EPA has the discretion to decide whether site-specific conditions warrant an action.

The risk posed by future consumption of ground water from a contaminated private well (1.9 x 10-5) is also within the risk range where U.S. EPA has discretion concerning the acceptability of a risk and the need for remedial action.

U.S. EPA has determined that there is uncertainty associated with future concentrations of volatile chemicals in the Ingalls Well. The risk estimates summarized above do not reflect the possibility that site conditions could change and higher levels of contaminants could enter the well at levels which exceed health-based standards. See Section 6.6 below. Therefore, notwithstanding these present and future risk scenarios, the U.S. EPA finds that actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

6.5 BASELINE RISK ASSESSMENT - IMPLICATIONS OF MORE RECENT DATA

Results from the sampling round conducted in December of 1992 and March of 1993 were not included in the Baseline Risk Assessment. In general, the levels seen in monitoring wells were not significantly different than those seen during earlier sampling rounds. However, there was one additional contaminant found that could have an impact on the future scenario for calculation of risk to users of a private well. Vinyl chloride was seen at 2 ppb in monitoring well PS-4. If the 2 ppb detection of vinyl chloride were to be used

in the risk calculations, the risk from consumption of contaminated water from a private well would increase significantly. However, inclusion of vinyl chloride at the 2 ppb level would be a very conservative assumption since other monitoring wells have not detected the contaminant and a lifetime's worth of ground water would, based on the monitoring results, not be contaminated at that level. Vinyl chloride has not been seen in the municipal well and, therefore, this detection would not have an impact on the risk calculations for the current municipal ground water use scenario.

As discussed above in Section 6.1, SVOCs were not considered in the original calculation of risks. As seen in Table 1, the primary SVOCs found in ground water were Di-n-octyl Phthalate and bis(2-Ethylhexyl)Phthalate. Although no MCL is available for Di-n-Octyl Phthalate, the estimated maximum concentration seen in ground water, 7 ppb, is far below the MDNR Act 307 Type B Health Based Drinking Water Value of 130 ppb which is used here solely as a point of reference. It is interesting to note that no Di-n-octyl Phthalate was detected in wells during the December 1992 round of sampling. All detections noted in Table 1 are from March 1993 data. Future rounds of sampling will confirm the presence or absence of this contaminant and assist in determining whether the contaminant is site related or a laboratory contaminant. Because the contaminant has not been seen in the Ingalls Well, inclusion of Di-n-octyl Phthalate in the Baseline Risk Assessment would have no effect on the risk from consumption of municipal water. Inclusion of the chemical in the Baseline Risk Assessment would have a negligible effect on the calculated risks for a private well.

The MCL for bis(2-Ethylhexyl)Phthalate is 6 ppb. The estimated maximum concentration of bis(2-Ethylhexyl)Phthalate seen in monitoring wells, 7 ppb, exceeds the MCL. The chemical was not detected in the Ingalls Well when sampled in December 1992. In the March 1993 sampling round, 0.5 ppb of the contaminant was seen in the Ingalls Well. Such a low level of this contaminant would have very little effect on the level of risk calculated in theBaseline Risk Assessment for consumption of ground water from the Ingalls Well. Because of the dilution that occurs as the Ingalls Well operates the presence of bis(2-Ethylhexyl)Phthalate is not expected to cause the MCL to be exceeded at the Ingalls Well. However, the estimated maximum concentration of bis(2- Ethylhexyl)Phthalate seen in monitoring wells would increase the overall risk from consumption of ground water from a private well.

During the 1992 and 1993 sampling conducted by MDNR, arsenic was not seen in monitoring wells or in Ingalls Well samples. Because arsenic was previously seen in a single monitoring well south of the PMC Site and not in the Ingalls Well, arsenic was included only in the Risk Assessment calculations for private well users. In an April 1993 sampling of City monitoring wells conducted by McNamee, arsenic was found at very low levels in City monitoring wells. However, the distribution of detections does not demonstrate that PMC is the source of the low level arsenic seen periodically in ground water. It is possible that the presence of arsenic could be due to background conditions. If arsenic were determined to be naturally occurring at levels seen during monitoring, it may be appropriate to remove arsenic from consideration in the Baseline Risk Assessment. Because arsenic was the primary source of risk in the private well scenario, the removal of arsenic from the Baseline Risk Assessment would greatly decrease the estimated risk to users of private contaminated wells. However, if arsenic were to be removed from the risk calculations, the risk to private well users would remain within U.S. EPA's discretionary risk range. All arsenic detections in the well field are far below the MCL of 50 ppb.

Antimony was seen in several monitoring wells and in the Ingalls Well during the December 1992 sampling event; the detection of antimony at the Ingalls Well was estimated at 13.9 ppb and exceeded the 6 ppb MCL. Follow-up sampling conducted in March of 1993 did not detect the presence of antimony in the wells where antimony had previously been seen or in any monitoring wells at the Site. In addition, U.S. EPA sampled the Ingalls Well in January 1995 and found no antimony in either well tap or well point samples. Although recent sampling has not shown antimony to be a concern at the Ingalls Well, the risk to users of the Ingalls Well and the risk to users of potentially contaminated private wells would increase if future sampling detects antimony in the Ingalls Well or the well field.

6.6 UNCERTAINTIES

The lack of analyses for many chemicals may mean that there are chemicals present that were not evaluated in this risk assessment. This will tend to underestimate the risks associated with the Site. As an example, inorganic chemical data for the Ingalls Well were not available for the timef rame evaluated in the Baseline

Risk Assessment.

The Baseline Risk Assessment could not quantify risks from those contaminants without known slope factors or reference factors. The slope factors calculated by the U.S. EPA for potential carcinogens have inherent uncertainty because they are calculations of lifetime cancer risks based on less-than-lifetime exposures and incorporate high-dose to low-dose extrapolations. In addition, methods to quantify risks and possible synergistic effects due to exposure to multiple contaminants or multiple pathways are very limited. The use of risk additivity helps prevent the underestimation of cancer risks or potential noncancer health effects.

The quantitation limits for some chemicals may be greater than corresponding ground water standards, criteria, or other "toxicity reference values." This could result in a chemical remaining undetected even though it is actually present at a concentration that could be of significance to the risk assessment.

The Baseline Risk Assessment cannot account for the possibility that Site conditions could change and higher levels of contaminants could enter the Ingalls Well in excess of health-based standards.

6.7 ENVIRONMENTAL RISKS

Because the alternatives proposed as part of the interim action address the municipal water supply and possible residential use of contaminated ground water from a private well, no formal quantitative ecological assessment was necessary. There are no known ecological risks from the residential use of contaminated ground water.

At present, the plume of contaminated ground water discharges to Lake Michigan, but at levels not believed to pose any risk to ecological habitats. This topic will be discussed further in the final Record of Decision for the Site.

7.0 DESCRIPTION OF ALTERNATIVES

Based on the results of the available ground water monitoring data, the U.S. EPA prepared a Focused Feasibility Study (FFS) to identify and evaluate remedial alternatives that would minimize or eliminate the health risks caused by site-related contaminants. The goal for remedy selection at the Ingalls Well is to select a remedial action that would protect the municipal well supply from unacceptable levels of contamination from the PMC site. Five alternatives were evaluated.

7.1 ALTERNATIVE ONE: NO ACTION

Alternative One is the No Action Alternative. The National Contingency Plan (NCP) requires that the No Action Alternative be carried through the detailed analysis of alternatives. Under this alternative, no active remedial action or institutional controls would be applied at the site.

If no interim action were taken to remediate the ground water at the Ingalls Well or to develop another source, VOCs in the ground water at the Ingalls Well would be expected to continue to be present at current levels. In general, residual contamination in the ground water aquifer would be expected to decline over time as the organics are slowly diluted by natural recharge of the aquifer. However, the possible presence of a DNAPL near the Ingalls Well complicates any evaluation of future impacts of well field contamination on the Ingalls Well. While recent levels of TCE (estimated at 4 ppb) at the Ingalls Well have been below the MCL of 5 ppb, U.S. EPA cannot predict the future behavior of the DNAPL that may be present in fractures in the bedrock. If no interim action were taken, the high levels of TCE contamination at Well PS-CD indicate that the Ingalls Well remains at risk for further contamination. Under the No Action Alternative, contaminant exposure pathways including ingestion, air emissions, and dermal contact would remain and present risks.

Capital and operating costs for Alternative One would be zero because no remedial action, institutional controls, or monitoring would be implemented. Therefore, there is no net present value cost associated with implementation of Alternative One.

7.2 ALTERNATIVE TWO: DEVELOPMENT OF A NEW GROUND WATER SOURCE

In 1987, a water supply study was performed for the City of Petoskey by its contractor, McNamee; to evaluate the possibility of developing a new ground water source. The water supply study was revised by McNamee in 1990. The study identified Bear Creek/Bay View area as a location that may be suitable for meeting the city's present and future water supply needs.

At the Bear Creek site, three new wells would have to be installed to replace the existing capacity of the Ingalls Well. Each well would have a capacity of 600 gallons per minute (approximately 2.59 million gallons per day). Approximately six and a half miles of new pipeline would be required to connect the new well field to the existing City water main system. In addition, improvements would need to be made to the city watermain to connect both storage tanks to the new water supply. The Ingalls Well is currently capable of providing backup service to the lower pressure district, which is normally serviced by the Lime Kiln Municipal Well. The estimated 2.59 million gallons per day (MGD) is below the current maximum capacity of the Ingalls Well when the Lime Kiln Well is out of service. If it is determined that the replacement water supply discussed in this alternative should also be capable of supporting the water supply needs of the lower pressure district, consideration should be given to installing a fourth well to increase capacity above the high pressure district's maximum day demand. Construction and operation of an additional 600 gpm well would increase capacity to approximately 3.45 million gallons per day (MGD) and would exceed the City's current maximum day demand.

Development of a new, non-contaminated ground water source would remove the contaminant exposure pathway to municipal water users in the Petoskey community. Both direct human contact, and environmental exposures due to volatilization and direct contact will be eliminated. Initial placement of the replacement well(s) would be important to ensure that it would not be affected by this contaminant plume or other possible ground water contamination. Alternative Two would have no effect on private well users if they continue to utilize water from the contaminated aquifer.

Capital costs for Alternative Two were assumed to include: three new supply wells, alternate power supplies for the well field and booster station, a booster station, water mains, and improvements to the present city system. Costs also include indirect capital costs such as engineering, construction management, and a 20 percent contingency. The cost of the land necessary for this alternative is not included as a capital cost. Capital costs for Alternative Two with three 600 gpm wells are estimated to be $6,128,000. If a fourth 600 gpm well is added, capital costs are estimated to be $ 6,472,000.

Annual operating costs for Alternative Two are estimated to be $440,275 for a three well system and $548,000 for a four well system. Annual costs include estimated utilities, maintenance, chemicals and supplies, and analytical expenses.

Based on a 30-year operating life, the net present value cost for implementation of Alternative Two with the three well system isestimated to be $11,591,111. The net present value of the four well system is estimated to be $13,272,155. The net present value is computed using a constant 7 percent discount rate for the life of the project. For purposes of evaluation in the FFS, the capital cost was amortized as a "one-time" cost at the beginning of the remedialion, and the annual costs were initiated in the first year.

7.3 ALTERNATIVE THREE: DEVELOPMENT OF A LAKE MICHIGAN SURFACE WATER SUPPLY INTAKE AND TREATMENT SYSTEM

In addition to evaluating the possibility of developing a new ground water source (Alternative Two), the McNamee water supply study also evaluated the possibility of constructing a new surface water intake and treatment system. Four alternative sites for a surface water supply intake and treatment system were investigated. After review of the location options and selection procedures in the McNamee study, Site Number 1 (Ingalls Avenue) appears to be the preferred location for a water treatment plant and will therefore be evaluated in this alternative. The open space for a surface water treatment plant is available at the Ingalls site, and the treatment plant's effluent could be tied into the existing distribution system. The city currently owns approximately 2.25 acres at the Ingalls Avenue location and this would be adequate for the plant, although it would not be of adequate size to allow for any future expansion.

The Ingalls Well has capacity in excess of the current usage. The design for this alternative is based upon

the existing service area average day demand of 1.60 MGD and the maximum day demand of 3.2 MGD placed on the Ingalls Well. These design criteria are consistent with those calculated by McNamee.

Development of a new, surface-water source of drinking water would remove the contaminant exposure pathway to municipal water users in the Petoskey community. Both direct human contact, and environmental exposures due to volatilization and direct contact will be eliminated. Alternative Three would have no effect on private well users if they continue to utilize water from the contaminated aquifer.

Capital costs for Alternative Three were assumed to include the intake structure and piping, low-service pump station, water treatment plant, clear well, drying/seepage beds, water treatment plant site improvement, water main and installation. Costs also include indirect capital costs such as engineering, construction management, and contingency calculated at 25% of the installed cost. Capital costs for Alternative Three are estimated to be $7,113,000 for a conventional treatment plant and $6,069,000 for a direct filtration treatment plant.

Annual operating costs for Alternative Three are estimated to be $225,000 for a conventional treatment plant and $195,000 for a direct filtration treatment plant. Annual costs include estimated utilities, estimated maintenance, chemicals and supplies, and insurance and training.

Based on a 30-year operating life, the net present value cost for implementation of Alternative Three is estimated to be $9,905,034 for the conventional treatment plant and $8,488,763 for direct filtration treatment plant. The net present value is computed using a constant 7 percent discount rate for the life of the project. For purposes of evaluation in the FFS, the capital cost was amortized as a "one-time" cost at the beginning of the remediation, and the annual costs were initiated in the first year.

7.4 ALTERNATIVE FOUR: TREATMENT OF GROUND WATER FROM THE INGALLS WELL AQUIFER USING AIR STRIPPING

Alternative Four calls for the construction of an air stripping system for the treatment of the volatile organic contaminants found in the ground water at the Ingalls Well. Water recovered from the Ingalls Well would be passed through a 14-foot diameter air stripper before being directed into the City of Petoskey's drinking water treatment system and supply network or discharged to nearby surface water. In order to ensure constant operation of the air stripping treatment system, two stripping towers and their associated equipment would be required. One tower would operate at all times, with the second acting as a backup. Maximum pumping rate from the Ingalls Well when the Lime Kiln Well is out of service is 2,200 gallons per minute (gpm); all hydraulic system components would be designed to accommodate this maximum flow rate.

Water from the Ingalls Well would be initially pumped to the top of the stripping column, distributed across the tower diameter, and allowed to pass downward through 15 feet of random packing within the tower. Concurrently, 8,500 cubic feet per minute (cfm) of air is discharged upward through the packed section. Contact between the air and ground water will be accentuated by the high surface area of the packing material. The high contact efficiency and physical properties of the volatile organic compounds would allow the VOCs to transfer from the ground water into the vapor stream. Sufficient contact time in the stripper would result in "clean" water exiting the bottom of the tower. The treated water would be collected in an effluent tank equipped with a recycle pump. The recycle pump would be used to maintain a minimum constant flow of water through the treatment system in the event of the loss of feed water flow. After exiting the treatment system, the contents of the effluent tank would be chlorinated by the existing addition system and pumped to the City's drinking water treatment system or surface discharged without chlorination, based on the demands of the community.

If, based on a comparison with State and Federal standards, treatment of the contaminant-laden vapor stream from the air stripper would be found to be necessary, the off-gas would be collected at the top of the stripping tower and directed into vapor-phase carbon beds (CVA system). As the air passes through the carbon, the organic contaminants within the air stream would be adsorbed onto the activated carbon. Air leaving the carbon filters would then be expected to be below the limits set for emissions by air permits (or substantive permit equivalent). Based on the use of the dilution factor matrix for air dispersion and initial mass balances it is unlikely that the use of vapor-phase adsorption would be necessary. At 100 percent stripping efficiency, it is estimated that the system would release a maximum of 140 pounds of VOCs

per year. Should vapor-phase carbon beds be used in conjunction with air stripping, it would be necessary to determined if the spent carbon is hazardous under 40 CFR Part 261. If the spent carbon would be determined to be hazardous, it would have to be managed according to Federal and State hazardous waste regulations.

The initial construction necessary for Alternative Four would be the preparation of the site for the treatment system. The ground water treatment system would be placed at the Ingalls Well site, in conjunction with the existing water pretreatment equipment. The air stripping system would require a reinforced concrete foundationf or the placement of the columns and associated piping. For ease of operation during the winter months, a protective structure would enclose the associated treatment system equipment. Valves, controls and instrumentation would be installed within the climate-controlled structure to facilitate maintenance during inclement weather. Sufficient space would be allowed within the structure to allow easy access when servicing.

The stripper would be fabricated off-site and shipped to the Ingalls Well site from the manufacturers. Installation of the equipment, connecting piping, and associated appurtenances would be completed on site by construction contractors. Construction activities would not require direct contact with the contaminated ground water and would therefore be performed in Level D personal protection equipment.

Institutional actions would be initiated during construction to prevent exposure of the general public to dangerous conditions. This would include the fencing of the site prior to construction activities to restrict access and the implementation of appropriate security measures. The fencing of the site would be permanent during operations to maintain an air dispersion area with limited public access around the air stripper.

Following the start-up of the treatment system, a monitoring schedule would be initiated at the Ingalls Well treatment system. Regular monitoring would include a daily check of flow rates and pressure drops through the operating system components. Frequent monitoring of the quality of the influent and effluent liquid streams from the air stripping system will confirm the operating efficiency of the treatment system. Monitoring results and carbon contaminant loading calculations will be used to determine the need for carbon replacement. Routine sampling and chemical analysis of ground water from nearby monitoring wells would be included to track the levels and types of contamination in the aquifer.

The air stripper could be designed to either operate continuously or on a demand basis. Continuous operation would optimize performance of the stripper system and provide supplemental removal of VOCs from the well field during periods when the municipal supply does not require the Ingalls Well to pump. Continuous operation would also require the surface water discharge of excess treated water to Lake Michigan.

Operation of the system on a demand basis would reduce utility charges included as a part of O&M and eliminate the need for the discharge of large amounts of excess water to Lake Michigan. However, the operation of the system on a demand basis would also require the provision of an approximately 200,000 gallon clear well to serve as an intermediate storage point for water prior to treatment. The capital cost of the clear well is included in the cost estimate for this alternative.

Proper air-stripping of the drinking water supply at the Ingalls Well would essentially remove the VOC contaminant exposure pathway to municipal water users in the Petoskey community. Both direct human contact, and environmental exposures to VOCs due to volatilization and direct contact will be virtually eliminated. Alternative Four would have no effect on private well users if they continue to utilize water from the contaminated aquifer.

Capital costs for Alternative Four are based on continuous operation of the system and were assumed to include stripper fabrication, associated equipment and controls, shipping, site preparation, installation, and institutional actions (site fence and equipment structure). Costs also include indirect capital costs such as engineering, construction management, and a 15 percent contingency. Capital costs for Alternative Four are estimated to be $1,238,000.

Annual operating costs for Alternative Four are estimated to be $169,000 per year. Annual costs include estimated utilities, sampling and analytical costs, and estimated maintenance.

Based on a 30 year operating life, the net present value cost for implementation of Alternative Four is estimated to be $3,335,128. The net present value is computed using a constant 7 percent discount rate for the life of the project. For purposes of evaluation in the FFS, the capital cost was amortized as a "one-time" cost at the beginning of the remediation, and the annual costs were initiated in the first year.

7.5 ALTERNATIVE FIVE: TREATMENT OF GROUND WATER FROM THE INGALLS WELL AQUIFER USING GRANULAR ACTIVATED CARBON

Alternative Five, carbon treatment, calls for the construction of a granular activated carbon (GAC) adsorption system for the treatment of volatile and semi-volatile organic contaminants at the Ingalls well. Water recovered from the Ingalls Well would be passed through the GAC before being directed into the City of Petoskey's drinking water treatment system and supply network or discharged to nearby surface water. The maximum pumping rate from the Ingalls Well when the Lime Kiln Well is out of service is 2,200 gallons per minute. All system components would be designed to accommodate this maximum flow rate.

The ground water would initially be split into a five stream manifold system before entering the activated carbon adsorption system. The system would consist of five 10-foot diameter x 10-foot high steel vessels, connected in parallel, containing 20,000 pounds of granular activated carbon each. Four of the carbon vessels would be in service at all times, while the fifth would act as a backup during carbon changes or system emergencies. As the water passes downward through the activated carbon beds, the organic contaminants would be adsorbed onto the carbon surface. The treated water would be collected in an effluent tank equipped with a recycle pump. The recycle pump would be used to maintain a minimum constant flow of water through the treatment system in the event of the loss of feed water flow. Contents of the effluent tank would be chlorinated by the existing addition system and pumped to the City's drinking water treatment system or surface discharged without chlorination, based on the demands of the community. All system components would be automated to require as little operator supervision as necessary.

The carbon in a vessel would become saturated with the contaminants following a period of treatment, indicated by samples analyzed from the stream following the carbon cell. The spent carbon would be removed from the treatment vessel and analyzed to determine if it would be a hazardous waste under 40 CFR Part 261. If the spent carbon would be determined to be hazardous, it would be managed according to Federal and State hazardous waste regulations. If the spent carbon is determined to be non-hazardous and if it meets the requirements of the manufacturer, it will be sent back to the manufacturer for regeneration. A fresh volume of carbon would be installed and that vessel put back in service. Removal and replacement of carbon could be accomplished in a period of several hours during non-peak use hours, resulting in minimal disruption of the water supply. Based on the low contaminant loading rate, however, carbon bed life would be anticipated to be approximately three years as a worst-case and up to ten years as a best-case.

The initial construction necessary for Alternative Five would be the preparation of the site for the treatment system. The ground water treatment system would be placed at the Ingalls Well site, in conjunction with the existing water pretreatment equipment. The carbon adsorption system would require a reinforced concrete foundation for the placement of the carbon cells and associated piping. For ease of operation during the winter months, a protective structure would enclose the entire treatment system. Valves, controls and instrumentation would be installed within the climate-controlled structure to facilitate maintenance during inclement weather. Sufficient space would be allowed within the structure to allow easy access when replacing GAC.

The carbon vessels would be fabricated off-site and shipped to the Ingalls Well site from the manufacturer. Installation of the equipment, connecting piping, and associated appurtenances would be completed on site by construction contractors. Construction activities would not require direct contact with the contaminated ground water and will therefore be performed in Level D personal protection equipment. Institutional actions would be initiated during construction to prevent exposure of the general public to dangerous conditions. This would include the fencing of the site prior to construction to restrict access and the implementation of appropriate security measures.

Following the start-up of the treatment system, a monitoring schedule would be initiated at the Ingalls Well treatment system. Regular monitoring would include a daily check of flow rates and pressure drops through the

operating system components. Frequent monitoring of volatile organic concentration in the streams following the carbon vessels would indicate the need for the replacement of carbon. Weekly monitoring of the influent and effluent from the carbon adsorption system would confirm the operating efficiency of the treatment system. Routine sampling and chemical analysis of ground water from nearby monitoring wells would be included to track the levels and types of contamination in the aquifer.

Proper carbon treatment of the drinking water supply at the Ingalls Well would essentially remove the VOC and SVOC contaminant exposure pathways to municipal water users in the Petoskey community. Both direct human contact, and environmental exposures to VOCs and SVOCs due to volatilization and direct contact will be virtually eliminated. Alternative Five would have no effect on private well users if they continue to utilize water from the contaminated aquifer.

Costs for the implementation of Alternative Five have been estimated as part of the FFS. Capital costs for Alternative Five were assumed to include carbon cell fabrication, initial GAC loading, associated equipment and controls, shipping, site preparation, installation, and institutional actions (site fence and system structure). Costs also include indirect capital costs such as engineering, construction management, and a 15 percent contingency. Capital costs for Alternative Five are estimated to be $1,444,000.

Annual operating costs for Alternative Five are estimated to be $206,000 per year. Annual costs include estimated utilities, carbon change out, sampling and analytical costs, and estimated maintenance. Based on a 30 year operating life, the net present value cost for implementation of Alternative Five is estimated to be $4,000,262. The net present value is computed using a constant 7 percent discount rate for the life of the project. For purposes of evaluation in the FFS, the capital cost was amortized as a "one-time" cost at the beginning of the remediation, and the annual costs were initiated in the first year.

8.0 COMPARATIVE ANALYSIS OF ALTERNATIVES: THE NINE CRITERIA

The following nine criteria, outlined in the NCP at Section 300.430(e) (9) (iii), were used to compare the alternatives and to determine the most appropriate alternative for addressing the Ingalls Well contamination in a manner that is protective of human health and the environment, attains applicable or relevant and appropriate requirements (ARARs), is cost-effective and represents the best balance among the evaluating criteria. An alternative providing the "best balance" of tradeoffs with respect to the nine criteria is determined from this evaluation.

8.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

This evaluation criterion provides confirmation of the effectiveness of a remedial alternative in protection of human health and the environment. Evaluation of overall protectiveness of a remedial alternative focuses on whether the alternative achieves adequate protection and how risks posed by the site are minimized via remedial or institutional actions. This evaluation also allows for consideration of unacceptable short-term or cross-media impacts.

The current levels of contaminants present in the Ingalls Well are below Maximum Contaminant Levels (MCLs). The present risk from residential use of the water from the Ingalls Well (2.8 x 106) is within the U.S. EPA's discretionary risk range. However, the higher levels of TCE contamination seen in ground water at monitoring wells near the Ingalls Well that have not yet dissipated indicate that a DNAPL may be present in bedrock fractures. In recent years, levels of TCE in the Ingalls Well have remained at approximately 4 ppb, just below the MCL. This is likely due to the dilution that occurs as the Ingalls Well pumps in both ground water and, indirectly, surface water from Lake Michigan. Because the location of the DNAPL, if present, is unknown and DNAPL behavior is difficult to predict, the U.S. EPA cannot predict the future concentrations of TCE in the Ingalls Well. During periods of peak demand, such as when the Ingalls Well must supply water to the lower pressure district, it is possible that levels of contaminants in the Ingalls Well could rise above the MCLs. Therefore, while the No Action Alternative is considered to be protective of human health and the environment for residential use of water from the Ingalls Well at current levels of contamination, site-specific reasons justify an interim action to fully ensure the protection of the City's water supply from Superfund contamination emanating from the PMC Site.

Based on current levels of VOC contamination in the Ingalls Well, all alternatives, including No Action, would be expected to provide long-term protection for human health. If VOC levels at the Ingalls Well were to increase above current levels, all alternatives, except possibly No Action, would be expected to provide long-termprotection for human health by reducing or eliminating exposure pathways to receptors that utilize water from the Ingalls Well. Alternatives Two and Three would accomplish this by providing a new, non-affected source of water for the community. Alternatives Four and Five would treat the minimally affected ground water Co even lower levels before exposure to the community.

The risk posed by future consumption of ground water from a private well (1.9 x 10-5) is also within the U.S. EPA's discretionary risk range. However, because of possibility that a well could be sited in an area that could be impacted by high levels of residual ground water contamination, the No Action Alternative is not considered to be protective of human health and the environment for future residential use of water from a private well. In fact, none of the alternatives as presented in the FFS will reduce the risk to future users of private wells.

Although no environmental threat has yet been identified with regard to this Site, the alternatives evaluated for the interim action would have slightly different impacts on the environment. Alternatives One, Four and Five require continued use of the Ingalls Well and therefore, indirectly, remove contaminants from the aquifer which discharges into Lake Michigan. Alternatives Two and Three replace the Ingalls Well, and would result in slightly greater amounts of contaminants entering the lake. For all alternatives, however, some contaminants would discharge to Lake Michigan, and no adverse ecological impacts are anticipated.

8.2 COMPLIANCE WITH ARARS

"Compliance with ARARs" addresses how the proposed alternative complies with all applicable or relevant and appropriate requirements of Federal and more stringent State environmental laws (ARARs), and also considers how the alternatives comply with advisories, criteria or other guidance to be considered (TBCs) that do not have the status of laws, but that the U.S. EPA and the State have agreed are "appropriate" for protectiveness or to carry out certain actions or requirements.
Because the universe of ARARs is so large, only ARARs necessary for on-site remedial activities have been identified. In some instances, rules cited contain both substantive and procedural or administrative requirements. Only the substantive requirements are ARARs for the purpose of on-site activities. Examples of administrative or procedural requirements which are not considered ARARs include, but are not limited to, reporting requirements and permit application requirements. A more detailed discussion of Site ARARs is provided in the FFS.

The purpose of all of the alternatives is to ensure a source of clean water to the city. All of the action alternatives are capable of providing a water supply to the city that meets chemical-specific ARARs. None of the alternatives directly addresses cleanup of the ground water in the well field, although the two ground water treatment alternatives indirectly will result in some ground water remediation. ARARs do not apply to no action alternatives and will not be discussed for Alternative One.

The primary chemical-specific ARARs for all action alternatives are the Safe Drinking Water Act Maximum Contaminant Levels (MCLs) and non-zero Maximun Contaminant Level Goals (MCLGs). The Federal drinking water standards promulgated under the Safe Drinking Water Act (SDWA), 40 CFR 141, are applicable to municipal water supplies servicing twenty-five or more people. MCLs are applicable to the evaluation of the Ingalls Well. MCLGs are relevant and appropriate for the evaluation of the Ingalls Well. MCLGs are never applicaIe requirements at a CERCLA response action because they are notenforceable "standards" or "levels of control." Both MCLs and MCLGs are relevant and appropriate for the consideration of possible consumption of ground water from a private well.

Michigan Safe Drinking Water Act - Act 399, P.A. 1976, as amended and administrative rules, provides regulations establishing MCLs for certain contaminants in addition to Federal MCLs and would be applicable for all action alternatives. The Michigan Safe Drinking Water Act is also an action-specific ARAR as it also outlines requirements for well construction and operation of a public water supply. Authority under Superfund, however, does not extend to the correction of existing deficiencies at the Ingalls Well and in the

Petoskey municipal water system that are not related to the contamination at the Site.

The MDNR has promulgated administrative rules governing "Environmental Response Activity" pursuant to the Michigan Environmental Response Act, 1982 PA 307, M.A.C. 299.605 ("Act 307 Rules"). These Act 307 Rules, codified at M.A.C. Rule 299.5101 et seq., contain provisions establishing procedures for response activities (M.A.C. Rules 299.5501-5519), selection of remedial action (M.A.C. Rules 299.5601-5607), and cleanup criteria (M.A.C. Rules 299.5701-5727) at sites of environmental contamination where response activities are taken pursuant to Act 307. Because this Interim Action is not meant to remediate the Site, but is instead an Interim Action meant to ensure that the water supply of the City of Petoskey meets Federal water supply standards for contaminants related to the PMC Site, Act 307 and the Act 307 Rules are not ARARs. Act 307 and the Act 307 Rules would be potential ARARs for the final remedial action at the Site.

Federal Water Pollution Control Act (Clean Water Act) Section 304 provides for the development and publication of water quality criteria for human health and aquatic life. Water quality criteria are not legally enforceable standards and are therefore not applicable. However, a modified water quality criterion for TCE for drinking water consumption would be relevant and appropriate for all action alternatives.

Michigan Water Resources Commission Act 245, P.A. 1929 contains State water quality standards, treatment plant operator requirements, and wastewater reporting requirements. The rules also implement a waste effluent discharge system compatible with NPDES requirements and provide for the non-degradation of ground water. Because NPDES requirements regulate discharge, these water quality standards are applicable to action alternatives that may discharge water to surface water bodies. U.S. EPA has made the determination that since the selected alternative does not require discharge to ground water, Act 245 Part 22 Rules, as interpreted by the State, are not an ARAR for the PMC Site.

40 CFR Part 264, Subpart AA, under the authority of the Resource Conservation and Recovery Act (RCRA), requires that the total organic emissions from air strippers be reduced to less than 1.4 kilograms per hour (kg/hr) and 2.8 megagrams per year (Mg/yr; 3 lbs/hr. and 3.1 tons/year); or that the total organic emissions be reduced by 95 percent by weight. No organic compound is excluded under this regulation due to its photochemical reactivity or nonreactivity. Region 5 has supported the use of this regulation as an ARAR at sites where air strippers have been used for ground water remediation, and the U.S. EPA's authority under RCRA to regulate air stripper emissions was reinforced in the promulgating notice of 40 CFR 264, AA (55 FR 254684 June 21, 1990). For Alternative Four, the maximum emissions from an air stripper at the PMC site is estimated to be 140 pounds of total VOCs per year, well below these limits. Portions of certain State air regulations may also be ARARS for this action. The Michigan Air Pollution Act (including MAC Rules 336.1702, 336.1901, 336.1371-1373, and 336.1201-336.1285) is applicable since emissions from the treatment system would be subject to State and Federal standards for VOCs. Alternative Four could be planned and implemented to comply with action- and location-specific ARARs. Alternative Four must comply with the substantive requirements of an Air Permit. Because the action is considered to be "on site", the permit itself would not be required. Compliance with the substantive requirements of an air permit would not be triggered by the other action alternatives.

RCRA Land Disposal Restrictions (LDRs), 40 CFR Part 268, are applicable for Alternative Five and Alternative Four (if vapor-phase carbon treatment of the off-gas from the air-stripper is necessary). Spent carbon has the potential of becoming characteristically hazardous, and therefore, LDRs are applicable prior to disposal of spent carbon. If characteristic spent carbon is to be land disposed, it must be placed into a Subtitle C landfill or treated to Toxicity Characteristic (TC) treatment standards prior to disposal into a Subtitle D landfill. Portions of the Michigan Hazardous Waste Management Act, 1979 PA 64, as amended, and administrative rules are also ARARs for the management of spent carbon.

Location-specific ARARs for Alternatives Two and Three depend on the particular location selected for the new ground water source or the new Surface Water Intake and Treatment Facility. Assuming that a new Surface Water Intake and Treatment Facility would be placed adjacent to Lake Michigan, the Clean Water Act dredge and fill regulations, the Michigan Great Lakes Submerged Lands Act, the Coastal Zone Management Act, and other ARARs described in the FFS are location-specific ARARs for this alternative.

8.3 LONG-TERM EFFECTIVENESS AND PERMANENCE

The residual risk to users of the Ingalls Well and users of contaminated private wells would be reduced by the No Action Alternative as the natural recharge of the aquifer dilutes contaminants present in the well field. However, if a DNAPL is present, natural attenuation could take a very long time.

Alternatives Two, Three, Four, and Five would all be effective in the long-term, depending on the proper design and operation of the remedial systems.

8.4 REDUCTION OF CONTAMINANT MOBILITY, TOXICITY AND VOLUME THROUGH TREATMENT

No treatment of the ground water will occur in the No Action Alternative and Alternatives Two and Three. Therefore, there will be no reduction in toxicity, mobility, or volume (TMV) through the actions taken. Dilution of the contaminants due to the natural recharge of the aquifer will slowly reduce the contaminant toxicity.

Although the use of Air Stripping and Granular Activated Carbon (GAC) only transfer contaminants from ground water to another media (and thus do not reduce TMV), the regeneration of the filter carbon used in the processes would reduce the TMV through treatment. Alternative Five would therefore reduce the TMV of VOCs found in ground water. Alternative Four would reduce the TMV of VOCs in ground water if levels of contaminants justify the treatment of the system off-gases. Because only low levels of VOCs are present at the Ingalls Well, treatment at the well is not expected to remove large volumes of contaminants; therefore, the amount of TMV reduction for Alternatives Four and Five would be minimal.

8.5 SHORT-TERM EFFECTIVENESS

The potential for exposures to humans and the environment would not be restricted by the No Action Alternative because no action would occur through treatment.

Alternatives Two, Three, Four, and Five are all expected to be effective in the short-term in reducing or eliminating the potential exposure pathways for human contact. Alternatives Four and Five may require more rigorous monitoring and the use of personal protective equipment to ensure that no contaminant exposures to the workers or the community are caused due to the remedial efforts.

8.6 IMPLEMENTABILITY

All of the alternatives can be readily implemented. Each alternative utilizes conventional technologies and readily available materials to complete the necessary objectives. Alternatives Two, Three, Four, and Five would all require lead time to acquire the equipment necessary to initiate the remedial alternative.

Alternatives TWo and Three would take longer to physically implement than Alternatives Four and Five, due to the necessary modifications of the existing city water system. Alternative Two would require the installation of new transmission piping and storage capacity to get water from a new well field. Alternative Three would require the upgrading of the watermain system in place for the Ingalls Well site.

Alternatives Two, Three, Four and Five would require a permitting period with State and local agencies before implementation. For Alternatives Four and Five this period would be used to identify the substantive requirements of permits since the actions are considered to be "on site" and no permits would be required to be issued.

Because of concerns regarding existing construction deficiencies at the Ingalls Well, the implementability of Alternatives Four and Five would be dependant on the approval of the State of Michigan prior to construction.

8.7 COST

Initial capital and annual operating costs were estimated for each of the remedial alternatives under consideration. Capital and operating costs were assumed to include all costs associated with site management.

Capital and operating costs for Alternative One would be zero because no remedial action, institutional controls, or monitoring would be implemented. Therefore, there is no net present value cost associated with implementation of Alternative One.The costs for initiating Alternatives Two and Three, both of which require the installation of extensive new water supply and treatment systems, are high. Capital equipment outlays range from approximately $6,000,000 to $7,000,000, and high operating costs result in 30-year net present value costs greater than $9,500,000 for both alternatives.

Costs for Alternatives Four and Five, which utilize systems to treat the contaminated Ingalls Well water before use, are significantly lower. The 30-year net present value costs are on the order of $3,000,000 to $4,000,000 for these two alternatives.

Alternative Four, treatment of the contaminated Ingalls Well water with air stripping, is the most economical with a 30-year net present value cost estimated to be $3,335,138. This cost should also be more stable than the slightly higher cost for the activated carbon treatment option (Alternative Five) since the operating costs for electricity with air stripping should fluctuate less than the costs of activated carbon over the life of the treatment system.

COST SUMMARY

	Capital Cost	O&M	NPV
Alternative One			
No Action	$ 0	$ 0	$ 0
Alternative Two			
Replacement Wells			
- 1800 gpm capacity	$ 6,128,000	$ 440,275	$ 11,591,111
- 2400 gpm capacity	$ 6,472,000	$ 548,000	$ 13,272,155
Alternative Three			
Surface Water Plant			
- Conventional	$ 7,113,000	$ 225,000	$ 9,905,034
- Direct Filtration	$ 6,069,000	$ 195,000	$ 8,488,763
Alternative Four			
Air Stripping	$ 1,238,000	$ 169,000	$ 3,335,128
Alternative Five			
Carbon Treatment	$ 1,444,000	$ 206,000	$ 4,000,262

8.8 STATE ACCEPTANCE

MDNR concurs with the selected alternative.

8.9 COMMUNITY ACCEPTANCE

Community acceptance is assessed in the attached Responsiveness Summary. The Responsiveness Summary provides a thorough review of the public comments received on the Proposed Plan, and the Agency's responses to those comments.

9.0 THE SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, as amended by SARA, and the NCP, the detailed analysis of alternatives and public comments, U.S. EPA and the State of Michigan have selected Alternative Four as an interim remedy at the Petoskey Municipal Well Field Site. Alternative Five is also selected as a contingent remedy under this ROD should a site-related SVOC exceed an MCL at the Ingalls Well tap within either eighteen months of the date of this Record of Decision or before a replacement water supply becomes

operational, whichever comes first. This eighteen month timeframe is consistent with the timeframe requiring the upgrade or replacement of the water supply due to existing engineering deficiencies and the infiltration of surface water at the Ingalls Well. To confirm the need for carbon treatment, the site-related SVOC MCL exceedance must be detected in two quarters of sampling at the ingalls Well tap.

The detailed evaluation of ground water alternatives found that:

! Based on current levels of contamination in the Ingalls Well, Alternative One is protective of human health and the environment. However, because of the uncertainty associated with higher levels of ground water contamination present in the well field, Alternative One would not ensure the protection of the City's water supply from the contamination emanating from the PMC Site;

! While Alternatives Two and Three may satisfy non-Superfund related concerns of the City of Petoskey, Alternatives Four and Five provide protection from unsafe levels of VOCs at significantly less cost;

! In comparison with Alternative Four, Alternative Five does not increase VOC removal effectiveness in proportion to its higher cost;

! Alternative Five provides treatment of semi-volatile contaminants that the State of Michigan believes could threaten the Ingalls Well in the near future; and

! None of the alternatives as presented in the FFS protects a future user of contaminated water from a private well.

Based on the information available at this time, the U.S. EPA and the State of Michigan believe that the selected alternative, Alternative Four, and the contingent alternative, Alternative Five, will reduce the risks to human health and the environment by removing and treating solvent contamination in the ground water at the Ingalls Well. If U.S. EPA finds that it is necessary to address site-related SVOC contamination at the Ingalls Well tap, carbon treatment will be used to address both VOC and SVOC contaminants. Alternatives Four and Five will also be cost-effective, attain ARARs, and use permanent solutions to the maximum extent practicable.

10.0 STATUTORY DETERMINATIONS

The selected remedy must satisfy the requirements of Section 121 (a-e) of CERCLA, as amended by SARA, to:

a. Protect human health and the environment;
b. Comply with ARARs (or justify a waiver);
c. Be cost effective;
d. Utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable; and,
e. Satisfy the preference for treatment as a principal element or provide an explanation as to why this preference is not satisfied.

The implementation of Alternative Four or Alternative Five satisfies the requirements of CERCLA, as amended by SARA, as detailed below:

a. Protection of Human Health and the Environment

Alternative Four is expected to be protective of human health and the environment at the Ingalls Well by minimizing or eliminating the contaminant exposure potential. If SVOC treatment is found to be necessary, Alternative Five will minimize or eliminate both VOC and SVOC exposure potential. The long-term effectiveness of either alternative depends on the design and operation of the on-site treatment system.

The treatment method (air stripping) transfers contaminants from the liquid phase (water) into the vapor

phase. Therefore, there is the possibility of exposure to the contaminants in the air. Rigorous control measures and the low initial contaminant concentration will minimize or eliminate the airborne contaminant possibility. The contingent treatment method (carbon treatment) transfers contaminants from the water to the granular activated carbon. Control measures will be used to reduce the possibility of contaminant exposure during regeneration or disposal of the spent carbon.

The removal of VOCs by air stripping at the Ingalls Well will eliminate the contaminant exposure pathway to municipal water users in the community. If U.S. EPA finds SVOC treatment to be necessary, carbon treatment will also eliminate the contaminant exposure pathway. However, because this interim action does not directly address contamination in the well field, future users of private contaminated wells will derive little benefit from continued operation of the Ingalls Well with treatment for VOCs and/or SVOCs. However, to reduce the possibility that private well contamination will be a problem, District Health Department #3, which serves Emmet county, has the authority to restrict the installation of private wells in areas known to be contaminated. The District Health Department's well permit program can serve as an institutional control to deter the placement of wells in areas that are or could be impacted by contamination from the PMC Site. No confirmed contamination has been detected in the three existing residential wells near the Site. However, it is anticipated that, as part of the continuing RI/FS, existing private residential wells in the area will be monitored as necessary to ensure protection of
human health.

The interim action at the PMC Site was initiated to evaluate risks resulting from residential consumption of impacted ground water. Environmental risks from the contaminated well field are beyond the scope of this action. If Alternative Four or Alternative Five is implemented, the continued extraction of contaminated ground water at the Ingalls Well will reduce the amount of contaminated ground water that would naturally discharge to Lake Michigan. However, as noted above, low-level VOC contamination will be released into the air with the implementation of Alternative Four. VOCs and SVOCs that will be removed from the water supply with Alternative Five will be transferred to the granular activated carbon, which will require off-site disposal or regeneration.

Short-term risks resulting from the construction of an air stripping or carbon treatment system would be minimal and could be controlled with the use of standard safety measures, such as fencing, use of protective equipment, and air monitoring.

b. Compliance with ARARs

The remedy selected will meet or attain the applicable or relevant and appropriate Federal and State requirements, and will be implemented in a manner consistent with these laws.

The primary chemical-specific ARARs for Alternatives Four and Five are the Safe Drinking Water Act Maximum Contaminant Levels (MCLs) and non-zero Maximum Contaminant Level Goals (MCLGs). The Federal drinking water standards promulgated under the Safe Drinking Water Act (SDWA), 40 CFR 141, are applicable to municipal water supplies servicing twenty-five or more people. The remedy will attain chemical-specific ARARs for contaminants related to the PMC Site.

The Michigan Safe Drinking Water Act provides regulations establishing MCLs for certain contaminants in addition to Federal MCLs and would be applicable for Alternatives Four and Five. The Michigan Safe Drinking Water Act is also an action-specific ARAR as it also outlines requirements for well construction and operation of a public water supply. However, Superfund authorities do not allow U.S. EPA to correct existing deficiencies at the Ingalls Well and in the Petoskey municipal water system that are not related to the contamination at the Site. Superfund authorities also do not extend to construction and operational requirements unrelated to the contamination from the PMC Site.

Michigan Water Resources Commission Act 245, P.A. 1929 implements a waste effluent discharge system compatible with NPDES requirements and provides for the non-degradation of ground water. Because the Air Stripper in Alternative Four may be designed to operate continuously with the excess treated water to be discharged to Lake Michigan, Alternative Four must comply with the substantive requirements iof an NPDES permit. Since the discharge would be Considered to be "on site" for purposes of this CERCLA action, no

actual permit would be required.

40 CFR 264, AA, under the authority of the Resource Conservation and Recovery Act (RCRA), requires that the total organic emissions from air strippers be reduced to less than 1.4 kilograms per hour (kg/hr) and 2.8 megagrams per year (Mg/yr; 3 lbs/hr. and 3.1 tons/year); or that the total organic emissions be reduced by 95 percent by weight. The maximum emissions from an air stripper at the PMC site is estimated to be 140 pounds of total VOCs per year, well below these limits. Alternative Four must comply with the Michigan Air Pollution Act, 1965 PA 348, as amended and associated rules, and the substantive requirements of an air permit.

If Alternative Five is implemented, the granular activated carbon will eventually become saturated with contaminants. The spent carbon will removed from the treatment vessel and analyzed to determine if it is be a hazardous waste under 40 CFR Part 261. If the spent carbon is determined to be hazardous, it witl be managed according to Federal and State hazardous waste regulations. If the spent carbon is determined to be non-hazardous, and, if it meets the requirements of the manufacturer, it will be sent back to the manufacturer for regeneration.

The Federal Coastal Zone Management Act and Michigan's Shorelands Protection and Management Act are location specific ARARs for this alternative.

Alternative Four or Alternative Five can be constructed and operated in a manner that would allow the remedy to comply with all chemical, action and location-specific requirements.

Cleanup standards for the municipal water under Alternative Four or Alternative Five will be MCLs and applicable non-zero MCLGs for VOCs. Since current levels of VOCs in the ground water at the Ingalls Well already meet the cleanup standards, the construction and operation of Alternative Four or Alternative Five would further reduce existing VOC levels and address any higher levels of VOC contamination that may enter the well. Alternative Five would also address SVOC contamination. The point of compliance will be at the point of entry into the distribution system. For surface water discharge of treated water, treatment of VOCs in ground water must meet the approved discharge standards.

Operation of the air-stripping (or carbon) treatment system at the Ingalls Well may be discontinued when the U.S. EPA determines that levels of VOCs (and SVOCs) in the well field no longer impact or threaten the water supply from the Ingalls Well. Treatment at the well may also be discontinued if the Ingalls Well is replaced as a source of drinking water for the City of Petoskey.

c. Cost Effectiveness

A cost-effective remedy is one for which the cost is proportional to the remedy's overall effectiveness. The detailed costs associated with the implementation of ground water alternatives can be found in Section 7, with costs summarized in Section 8.

Alternative Four and Alternative Five are each protective of human health and the environment and will ensure that unacceptable levels of VOC contamination do not impact the users of the Ingalls Well. Alternative Five would also address SVOC contamination that the State of Michigan believes may impact the Ingalls Well within the near future. Alternatives Four and Five can each be implemented utilizing the existing municipal distribution system. Alternative Four is selected over Alternative Five as the treatment technology because the use of carbon treatment, and its associated higher cost, cannot be justified based on the results of non-VOC chemical monitoring performed to date. However, this contingency ROD allows the implementation of Alternative Five if site-related SVOC contamination above an MCL is confirmed at the Ingalls Well tap. Alternatives Two and Three are not cost effective because Alternative Four and Alternative Five can treat the water at the Ingalls Well with significantly less cost than replacing the water supply.

The increased cost of Alternative Four over Alternative One is justified because Alternative Four ensures that the Ingalls Well will be protective of human health even if the possible DNAPL of TCE causes levels in the Ingalls Well to rise. In selecting Alternative Four, the U.S. EPA recognizes its responsibility to

ensure that contamination from the PMC property will continue to have no impact on the Ingalls Well at levels which are considered unsafe. The selected alternative will, if constructed, reduce levels of volatile organic compounds that enter the municipal water distribution system. Because of State of Michigan concerns regarding the possibility that SVOCs my cause a future MCL exceedance at the Ingalls Well tap, the increased cost of Alternative Five would be justified if future sampling at the Ingalls Well tap reveals the need for SVOC treatment in order to ensure the safety of the water supply from site-related contamination.

d. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

U.S. EPA, with the State of Michigan's concurrence, has determined that the selected and contingent remedies meet the statutory requirement to utilize permanent solutions and alternative treatment technologies to the maximum extent practicable for the Petoskey Municipal Well Field Site. Of the alternatives that are protective of human health and the environment and comply with ARARs, U.S. EPA has determined that the selected and contingent interim ground water remedies provide the best balance of tradeoffs in terms of long-term effectiveness and permanence, reduction of TMV through treatment, short-term effectiveness, implementability, cost and State and community acceptance.

The selected and contingent remedies represent the maximum extent to which permanent solutions and treatment can be practicably utilized for this interim action.

e. Preference for Treatment as a principal Element

The selected alternative, Alternative Four, will utilize air stripping to remove contaminants from the ground water. Air stripping transfers contaminants from ground water to air. Current levels of ground water contamination do not indicate that treatment of the off-gases from the air stripper will be necessary. However, if significant levels of VOC contamination are encountered in the ground water, filter carbon will be used to treat the off-gases prior to release to the air. Any regeneration of the filter carbon would reduce the TMV through treatment.
The contingent alternative, Alternative Five, will transfer contaminants from the ground water to the granular activated carbon. Regeneration of the spent carbon would reduce the TMV through treatment.

11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

U.S. EPA reviewed all written and oral comments submitted during the public comment period. Upon review of these comments, it was determined that no significant changes to the remedy as it was originally identified in the Proposed Plan were necessary. However, several minor changes were made in the alternatives presented in the FFS and Proposed Plan.

Cost estimates were revised for Alternatives Four and Five based on comments from the Michigan Department of Public Health (MDPH) and the City of Petoskey. Because U.S. EPA has determined that it is inappropriate to include the capital cost of purchasing property, the cost for land was removed from the cost estimate for Alternative Two. The net present value cost estimates for all alternatives were recalculated based on a 7% discount rate. These revisions of costs did not change the relative costs of the alternatives and thus were not significant changes.

The U.S. EPA's position regarding MERA Act 307 and the Act 307 Rules has changed since issuance of the FFS. In the FFS, Act 307 and the 307 Rules were noted as ARARs for all action alternatives. It was also stated that the ARARs would be waived because: 1) the remedial action is only a part of a total remedial action and the final remedial action will attain ARARs for ground water upon its completion; and 2) compliance with the ARARs Would not provide a balance between protecting human health and the environment and the availability of Superfund money for response at other facilities.

Based upon a reevaluation of the Interim Action and potential ARARs, U.S. EPA has determined that MERA Act 307 and the Act 307 Rules are not ARARs. The Interim Action is not a remedial cleanup, but is instead intended to ensure that the Petoskey Municipal Water Supply is not impacted by unsafe levels of contamination from the PMC Site. MERA Act 307 and the Act 307 Rules would be potential ARARs for the final remedial action

at the Site. This modification of the Agency's position on the potential ARAR does not constitute a significant change in the alternatives and does not impact the choice of the remedy selected in the Record of Decision.

The FFS stated that NPDES and Air permits would be required for the implementation of Alternative Four at the Ingalls Well. U.S. EPA has reviewed its position and determined that NPDES and Air permits would not be required. Since ground water contamination has impacted the Ingalls Well, the location is clearly part of the Superfund Site and the action can be considered "on site." Therefore, Alternative Four must comply with the substantive requirements of Air and NPDES permits, but the permits themselves would be not be necessary.

PETOSKEY MUNICIPAL WELL FIELD
RESPONSIVENESS SUMMARY

This Responsiveness Summary has been prepared to meet the requirements of Sections 113(k) (2) (B) (iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, which requires the United States Environmental Protection Agency (U.S. EPA) to respond "...to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan for remedial action. The Responsiveness Summary addresses concerns expressed by the public and potentially responsible parties (PRPs) in the written and oral comments received by the U.S. EPA and the State regarding the proposed remedy for the Petoskey Municipal Well Field Site.

A. OVERVIEW

I. BACKGROUND/PROPOSED PLAN

The Petoskey Manufacturing Company (PMC) has been identified as the source area for the volatile organic compound (VOC) contamination in the Ingalls Avenue Municipal Well in Petoskey, Michigan. The PMC facility is a small fabricating operation that was established in 1946 as a die cast manufacturer and continued with painting operations in the late 1960's. PMC is still in business at the site.

The disposal of spent solvents and/or paint sludge on the ground surface outside the PMC building has contaminated soils and ground water in the vicinity of the site. Water from the City of Petoskey's Ingalls Avenue Municipal Well (Ingalls Well), located along the shore of Lake Michigan and downgradient of the PMC facility, contains trichloroethene (TCE), and possibly several other VOCs from the PMC site. A ground water contaminant plume has migrated to the well, where it is being drawn into the city's water supply system. The Ingalls Well is still being used to service the population of Petoskey and supplies 60 to 70% of the City's water needs.

In 1993, U.S. EPA proposed that an air-stripper be constructed at the Ingalls Well to reduce existing levels of VOCs, especially TCE, in the well and address higher levels of VOCs that may enter the well. Because the Michigan Department of Natural Resources (MDNR) has not yet completed the RI/FS for the PMC Site, this action was proposed as an interim measure to protect the water supply of the City of Petoskey.

II. PUBLIC COMMENT PERIOD

A public comment period was held from December 1, 1993 to January 29, 1994 to allow interested parties to comment on the Proposed Plan in accordance with Section 117 of CERCLA. On December 2, 1993, a public meeting was held in Petoskey, Michigan at the Petoskey High School. U.S. EPA and Michigan MDNR presented the Proposed Plan, answered questions, and accepted comments from the public. During the 60-day public comment period, U.S. EPA received approximately six sets of written comments and a significant number of oral comments concerning theproposed plan.

B. COMMUNITY INVOLVEMENT

Public interest regarding the Site has been moderate. Petoskey residents are concerned about the presence of contaminants in their drinking water. Various state and local political bodies have expressed concern that the proposed treatment alternative will not be capable of treating all contaminants that have been seen in the groundwater and in the soils at the Site. Some, therefore, feel that the U.S. EPA should fund and/or construct a Surface Water Intake and Treatment Plant to replace the substandard Ingalls Well. There is an apparent expectation that Petoskey should be given the same interim remedy as the City of Charlevoix, where the U.S. EPA funded the construction of a Surface Water Intake and Treatment Plant due to VOC contamination in the Charlevoix well field. It should be noted that since the Charlevoix Interim Action Record of Decision was signed in 1984 and the subsequent final Record of Decision was signed in 1985, treatment technologies have advanced. On-line treatment systems, such as air-strippers, are no longer considered experimental. Such technologies are now considered to be reliable means of addressing the type of contamination found in the Ingalls Well. Other considerations, such as the long-existing noncompliance of the Ingalls Well with

Michigan Department of Public Health (MDPH) regulations, are outside the scope of CERCLA and remain the City of Petoskey's responsibility to address.

C. SUMMARY OF SIGNIFICANT COMMENTS FROM PUBLIC OFFICIALS AND GOVERNMENTAL UNITS

I. Comments were provided by Michigan Governor John Engler.

Comment GOVERNMENT-1

Governor John Engler commented that the contamination of the well field is more extensive than previously thought due to the presence of additional hazardous substances. Governor Engler's comment letter states that U.S. EPA's proposed air stripping remedy will not remove all organic contaminants of concern at the site and is not protective of public health.

Response GOVERNMENT-1

U.S. EPA agrees that 1992 and 1993 MDNR Remedial Investigation sampling has identified additional low-level organic contaminants in the Petoskey Well Field. Based on the factors discussed below, U.S. EPA believes that the levels do not pose a threat to the Ingalls Well. See Table 1 of the ROD for a summary of detections of organic contaminants found in groundwater.

When MCLs are not available for a contaminant, Michigan Act 307 Type B health-based levels are provided in Responsiveness Summary responses solely as points of comparison. Type B criteria are risk-based numbers and will frequently be below method detection limits. In these cases, Michigan generally establishes the cleanup level at method detection limits. This corresponds to Type A criteria, which require cleanup to either background levels or method detection limits.

Of the organic contaminants that would not be addressed by air stripping, only one organic contaminant has been found in the well field that exceeds MCLs in the recent data from the Petoskey Municipal Well Field groundwater. That one contaminant, bis(2-ethylhexyl)Phthalate was found at an estimated concentration of 7 parts per billion (ppb) and is unlikely to cause an exceedance of the 6 ppb MCL at the Ingalls Well tap. However, should site-related SVOCs become a problem in the water supply in the near future, the ROD allows for the implementationof carbon treatment instead of air stripping.

For a thorough discussion of ground water quality, SVOCs in the well field that approach or exceed Type B levels are discussed below. Although Type B levels, and sometimes Type A method detection limit levels, are used as points of comparison, it is important to note that Act 307 is not an ARAR for this interim action.

a. 3,3'-dichlorobenzidine was detected in only 1 of 44 samples taken in the December 1992 and March 1993 sampling events. It was detected at an estimated level of 1 ppb. Although the detection was positive, the quantitation was estimated, and thus "J" qualified, because the contaminant was seen below the method quantitation limit. Although the Act 307 Type B level for 3,3'-dichlorobenzidine is 0.077 ppb, the Type A method detection limit is 20 ppb. The detection of 3,3'-dichlorobenzidine at one location in the well field does not justify the selection of an alternative to address semi-volatile contaminants at the Ingalls Well.

b. Bis(2-ethylhexyl)Phthalate was detected in 13 of 44 samples taken in the December 1992 and March 1993 sampling event. The contaminant is also present in the soils at the PMC facility. The maximum concentration detected in the well field was

estimated at 7 ppb and was seen at two sampling points. The detections were estimated, and thus "J" qualified, because it was seen below the method quantitation limit. The MCL for Bis(2-ethylhexyl)phthalate is 6 ppb. Although the Act 307 Type B level for Bis(2-ethylhexyl)Phthalate is 2.5 ppb, the Type A method detection limit is 5 ppb. Bis(2-ethylhexyl)Phthalate has been seen in the Ingalls Well at very low levels (maximum concentration of 0.5J ppb), but is not expected to exceed the 6 ppb MCL at the Ingalls Well due to the dilution resulting from pumping at the well. Therefore, the presence of bis(2-ethylhexyl)Phthalate at the levels seen to date does not justify the selection of a remedy to address semi-volatile contaminants.

c. Aldrin was seen in 2 of 43 samples taken in December of 1992 and March of 1993 that were analyzed for pesticides. The estimated maximum concentration seen exceeds Type B levels. The Type B level for Aldrin is 0.0021 ppb with an acceptable method detection limit of 0.01 ppb. Aldrin was not detected in the soils at the PMC facility and is not believed to be site related. The detection of Aldrin does not justify the selection of an alternative to address pesticides.

d. Dieldrin was seen in 2 of 43 samples taken in December of 1992 and March of 1993 that were analyzed for pesticides. It was detected at an estimated level of 0.015 ppb. Although the detection was positive, the quantitation was estimated, and thus "J" qualified, because the contaminant was seen below the method quantitation limit. In addition, because there was greater than 25% difference between the two GC columns, the concentration was also "P" qualified. Although the Act 307 Type B level for Dieldrin is 0.0022 ppb, the Type A method detection limit is 0.02 ppb. The estimated maximum concentration of 0.015 ppb is below 0.02 ppb, which is the method detection limit based Act 307 Type A standard. In addition, Dieldrin has not been found in the soils at the PMC facility and is not believed to be site related. The detection of Dieldrin does not justify the selection of an alternative to address pesticides.

e. 4,4'-DDT was seen in 4 of 43 samples taken in December of 1992 and March of 1993 that were analyzed for pesticides. No 4,4'-DDT was found in the samples taken in December of 1992; all 4 detections were from the March 1993 sampling event. 4,4'-DDT was detected at a maximum concentration of 0.027 ppb. The maximum detection seen at the Site does not exceed the Act 307 Type B level of 0.1 ppb. 4,4'-DDT was not seen in the Ingalls Well during the

1992 or 1993 sampling events. It is unlikely that the Act 307 Type B level for 4,4'-DDT would be exceeded at the Ingalls Well. The detection of 4,4'-DDT in the well field does not justify the selection of an alternative to address pesticides.

It is an extremely conservative approach to use maximum concentrations seen in groundwater as a basis for comparison to drinking water standards. Maximum concentrations are not necessarily representative of water quality that would be entering the Ingalls Well on a continuing basis. Even assuming that the maximum concentration is valid for this comparison, the contaminant-specific discussions presented above demonstrate that low-level semi-volatile and pesticide contamination in the well field does not warrant treatment.

In the Governor's comment, he mentions additional hazardous substances that have been found in the well field. The Governor may also be referring to the 1990 hydraulic fluid spill that occurred at the PMC facility. MDNR personnel who conducted ground water sampling in December 1992 observed a "floating product" in several ground water samples taken from near the PMC building. Results of analyses conducted on a sample of the floating product showed 2% oil and grease and low levels of three routine SVOCs. However, the MDNR believes that more specialized analyses may be necessary to provide additional information concerning the composition of the "floating product." The RI has not yet determined the extent of the "floating product" and whether it could have an impact on ground water quality.

II. Extensive written comments were provided by the City of Petoskey through the City's environmental contractor McNamee Industrial Services, Inc. (McNamee).

The submittal from McNamee consisted of a main document entitled "Interim Response Comments For The Petoskey Municipal Wellfield Site On Behalf of The City of Petoskey". The submittal also included the following appendices:

Appendix I - Cost Evaluation
Appendix II - Correspondence Record
Appendix III - Summary Data
Appendix IV - Data From Eder RI Report
Appendix V - Figures from Eder RI Report

Note that the above list of appendices accurately represents the documents submitted. The Table of Contents from the main McNamee submittal omitted listing the appendix which contained the data from the Eder RI report.

Comment GOVERNMENT-2 (McNamee Main Document - January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA. Mr. Italiano is Special Environmental Counsel for the City of Petoskey). Mr. Italiano's letter states that the U.S. EPA has "ignored the public health problem even though Region V has direct and primary jurisdiction and responsibility for the wellfield pursuant to Superfund." Mr. Italiano's letter quotes the transcript from the December 2, 1993 public meeting in which a representative from the MDPH discussed the inclusion of the Michigan Safe Drinking Water Act and the Michigan Air Pollution Act as ARARs for Alternatives Four and Five.

Response GOVERNMENT-2 U.S. EPA disagrees with Mr. Italiano's assertion that the Agency has ignored public health issues relating to the Site. When exceedances at the Ingalls Well were identified in 1982, emergency action was taken by the MDNR to excavate much of the source of the contamination at the PMC property. This action caused levels of contamination to significantly drop at the Ingalls Well.

As a follow-up to the MDNR removal action, U.S. EPA required PMC to conduct groundwater studies at the site and to conduct a Remedial Investigation/Feasibility Study (RI/FS). U.S. EPA directed PMC to cease work on the RI/FS because of unacceptable delays in the development of the work plan and PMC's subsequent filing for bankruptcy and the company's questionable financial ability to complete the work required by the Administrative Order. The U.S. EPA entered into a State Cooperative Agreement with the MDNR in 1990, in

which the U.S. EPA funded the MDNR to perform the RI/FS. MDNR's work on the RI/FS is ongoing.

Because of the U.S. EPA's concern with the potential quality of water entering the Ingalls Well, the U.S. EPA proposed to construct an air stripper at the well as an interim measure to protect the water supply. Construction of an air stripperat the Ingalls Well would treat the volatile organic contaminants (VOCs), including TCE which in the past had exceeded the Maximum Contaminant Level (MCL) of 5 ppb. Since 1990, levels of TCE in the Ingalls Well have been relatively stable at approximately 4 ppb, just below the MCD. With an operational air stripper, TCE and other VOCs would be reduced far below drinking water standards.

The Michigan Safe Drinking Water Act is an ARAR for Alternatives Four and Five. U.S. EPA is not, however, responsible for correcting existing deficiencies at the Ingalls Well and in the Petoskey municipal water system that are not related to the presence of hazardous substances at the PMC Site.

The Michigan Air Pollution Act is an ARAR for Alternatives Four and Five only.

Comment GOVERNMENT-3 (McNamee Main Document - January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) Mr. Italiano paraphrased past correspondence from the State of Michigan to U.S. EPA. He referenced documents which discuss contaminants present in the well field and claims that U.S. EPA ignored these additional contaminants (cis-1,2-dichloroethene, trans-1,2-dichloroethene, methyl-tert-butyl ether, tetrachloroethylene,...1,1,1 trichloroethane, and possibly arsenic and zinc). Mr. Italiano's letter states that the proposed alternative will not address all contaminants in the well field and at the site.

Response GOVERNMENT-3 The Baseline Risk Assessment prepared by U.S. EPA for the interim action looked at data from 1989 to 1991. Data collected prior to 1989 were excluded from these tables because the more recent data were believed to be more representative of present conditions. Data from more recent sampling rounds were not available for inclusion in the Risk Assessment. However, a qualitative discussion has been added to the Record of Decision Summary to account for new information from the most recent sampling events.

Mr. Italiano is correct in that an air stripper will not address all contaminants in the well field and at the Site. Contaminants require treatment only if levels at the Ingalls Well are expected to exceed drinking water standards. Based on levels of contaminants seen in the well field, only VOCs require treatment to ensure that TCE levels in the Ingalls remain below the MCL. Based on current data, SVOCs and inorganics are not expected to enter the Ingalls Well in concentrations exceeding MCLs. Should site-related SVOCs become a problem in the water supply in the near future, carbon treatment may be implemented in lieu of air stripping.

Comment GOVERNMENT-4 (McNamee Main Document - January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) Mr. Italiano states that the air stripper will not address VOCs present as DNAPLS in the well field.

Response GOVERNMENT-4 The air stripper will address VOCs that enter the Ingalls Well and should be capable of handling TCE contaminant levels as high as 100 ppb while assuring that the water entering the municipal supply meets the TCE MCL. Even if contaminant levels at the Ingalts Well increase because of DNAPL movement, the size of the treatment system is adequate. The main purpose of the interim action is not to remediate the aquifer, but to protect the water supply. Therefore, the interim action will not attempt to locate and directly remediate DNAPLs.

Comment GOVERNMENT-5 (McNamee Main Document - January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) Mr. Italiano claims that Region V's lack of action and recommendation of a remedy that will not address all contaminants in the well field is a knowing endangerment of public health.

Response Government-5 U.S. EPA disagrees with Mr. Italiano. U.S. EPA has recommended a remedy to address contaminants that, based on existing ground water data, have the potential of exceeding MCLs at the Ingalls Well. Because the interim action is meant to protect a water supply, the cleanup standards for any treatment system to be installed at the Ingalls Well would be MCLs. Therefore, it would not be a prudent use of public

funds to install a treatment system to address contaminantsthat are not expected to exceed the MCLs.

Comment GOVERNMENT-6 (McNamee Main Document - January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) Mr. Italiano again quotes from the public meeting transcript. He references remarks made by Representative Pat Gagliardi who stated that, "The agency knows that thereare non-volatile organic compounds at the site that will not be removed by air stripping. The agency knows that because it has been told so repeatedly by Department of Natural Resources and the Public Health Department. Yet it continues to hide behind its bureaucratic shield, and persistently insists that its proposed remedy will work."

Response GOVERNMENT-6 As stated in previous responses to comments, U.S. EPA acknowledges that semi-volatile organic compounds are present in the well field. However, the levels that have been seen to date in groundwater do not justify treatment at the Ingalls Well. Some of Representative Gagliardi's concern may stem from the fact that the Michigan Department of Public Health does not accept MCLs as drinking water standards for the Petoskey water supply system. The Department of Public Health would like the U.S. EPA to eliminate allcarcinogens from the Ingalls Well. However, the National Contingency Plan states that U.S. EPA is to use MCLs or non-zero MCLGs as ARARs. MCLGs of zero are not enforceable and not considered to be ARARs by U.S. EPA. It is difficult for many individuals to accept the fact that federal standards allow the presence of low-level carcinogens in their water.

> [Federal Register/Vol.55, No.46/
> March 8, 1990, §300.430 (e) (2) (i) (B), (C)]
> "(B) Maximum contaminant level goals [MCLGs], established under the Safe Drinking Water Act, that are set at levels above zero, shall be attained by remedial actions for ground or surface waters that are current or potential sources of drinking water, where the MCLGs are relevant and appropriate under the circumstances of the release based on the factors in §300.400(g) (2). If an MCLG is determined not to be relevant and appropriate, the corresponding maximum contaminant level (MCL) shall be attained where relevant and appropriate to the circumstances of the release.
>
> "(C) Where the MCLG for a contaminant has been set at a level of zero, the MCL promulgated for that contaminant under the Safe Drinking Water Act shall be attained by remedial actions to ground or surface waters that are current or potential sources of drinking water, where the MCL is relevant and appropriate under the circumstances of the release based on the factors in §300.400(g) (2)."

The Department of Public Health's goal to eliminate carcinogens from water supplies is laudable. Unfortunately, U.S. EPA cannot enforce MCLGs of zero and cannot use the presence of semi-volatile organic contamination below MCLs as a justification for a more aggressive treatment approach. U.S. EPA is not "hiding behind its bureaucratic shield." The Agency is following established regulations and is judiciously managing fund dollars to ensure that resources are spent where they are most needed.

The carbon treatment contingency portion of the Record of Decision addresses the State's concern that SVOCs may impact the well at some time in the future. The carbon treatment contingency is available for eighteen

months from the date of the ROD signature or until a replacement supply is in operation, whichever comes first. The timeframe is consistent with other timeframes requiring the upgrade or replacement of the water supply due to existing engineering deficiencies at the Ingalls Well and the infiltration of surface water.

Comment GOVERNMENT-7 (McNamee Main Document - January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) Mr. Italiano quotes a MDPH official who stated at the Public Meeting that Alternatives Four and Five cannot meet the Michigan Safe Drinking Water Act. Since Alternatives Four and Five do not meet the requirements of the Safe Drinking Water Act, they cannot be implemented because permits for their installation cannot be issued.

Response GOVERNMENT-7 Alternatives Four and Five can meet the chemical-specific requirements of the Michigan Safe Drinking Water Act that relate to contamination from the PMC facility. Alternatives Four and Five will not address the existing construction deficiencies and the fact that the Ingalls Well does not satisfy the location- specific requirements of the Act.

Construction of an on-line treatment system would not correct the existing problems with the well, but treatment of the contamination would certainly improve the overall water quality situation. If the State of Michigan makes the determination that the levels of contamination in the Ingalls Well are not acceptable for the period that it will take for the City to proceed with its plans to replace the water supply and construct a Surface Water Intake/Treatment Plant, the State of Michigan could allow the air stripper to be constructed as an interim measure.

The State of Michigan may make the determination that the levels of contamination are acceptable for the period until the City replaces its water supply. If the State of Michigan concurs with the remedy but believes that the money would be better spent replacing the water supply, the capital cost of the selected remedy may be used by the City to "enhance" the selected remedy and partially fund a Surface Water Intake/Treatment Plant. Therefore, the actual implementation of Alternatives Four or Five (as opposed to the cash equivalent option) is dependant on the State of Michigan.

Comment GOVERNMENT-8 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "The Wellfield has contained elevated levels of TCE for over 11 years."

Response GOVERNMENT-8 U.S. EPA agrees. Levels of TCE in the well field are "elevated". Samples taken from monitoring well PS-C-Deep in March, 1993, showed approximately 78 ppb of TCE. The duplicate sample taken from the same location showed approximately 83 ppb of TCE. PS-C-Deep is located approximately 300 feet south east of the Ingalls Well. As part of its RI/FS, the MDNR will evaluate remedial alternatives for addressing the contamination in the well field.

Comment GOVERNMENT-9 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "The wellfield site includes both the wellfield area and Petoskey Manufacturing Co. (PMC)."

Response GOVERNMENT-9 U.S. EPA agrees. The Site includes both the PMC source area and the contaminated well field. However, the purpose of the interim action is not to address the entire Site. The purpose is to ensure that the Citizens of Petoskey are not exposed to unsafe levels of contaminants in their drinking water. The RI/FS for the entire Site is being conducted by the MDNR, under a Cooperative Agreement with the U.S. EPA.

Comment GOVERNMENT-10 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "Contaminants in the entire wellfield must be addressed."

Response GOVERNMENT-10 As discussed previously, it is not necessary to treat for contaminants that are not expected to exceed MCLs at the Ingalls Well.

Comment GOVERNMENT-11 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr.

Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "Additional carcinogens were discovered in the wellfield last December."

Response GOVERNMENT-11 See Comment/Response GOVERNMENT-1, Comment/Response GOVERNMENT-6, and Comment/Response PUBLIC-1.

Comment GOVERNMENT-12 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "Both the MDNR and MDPH maintain that this site poses an unacceptable risk to the health and residents of Petoskey" [Letter from Russell Harding, MDNR to V. Adamkus, EPA, January 20, 1994]

Response GOVERNMENT-12 Based on current levels of contamination in the Ingalls Well, residential use of water from the Ingalls Well does not pose an unacceptable health risk because the water meets MCLs. However, because of the uncertainty regarding TCE levels in groundwater and the possible presence of DNAPLs very near the well, U.S. EPA cannot be sure that, if no action is taken, levels of TCE in the Ingalls Well would remain below MCLs.

Although the risk to private well users is within the U.S. EPA acceptable risk range, U.S. EPA has made the determination that, if no action is taken, the residential use of a private well could pose an unacceptable risk. This is because of the possibility that an individual would site a well in an area with high residual contamination. In addition, users of private wells constructed in contaminated portions of the well field may not see the same dilution effect from infiltration of surface water that are reducing contaminant levels at the Ingalls Well.

Comment GOVERNMENT-13 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "MDNR and MDPH believe that EPA cost estimates for air stripping and carbon adsorption are significantly understated."

Response GOVERNMENT-13 U.S. EPA has revised cost estimates for Alternatives Four and Five based on comments from MDNR and MDPH. The revision of cost estimates does not alter the relative cost of the Alternatives.

Comment GOVERNMENT-14 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "We believe this site should proceed immediately to remedy selection under the format of a presumptive remedy such as at other sites where there is clearly only one viable option to address the situation." [Letter from Russell Harding, MDNR to V. Adamkus, EPA, January 20, 1994]

Response GOVERNMENT-14 U.S. EPA disagrees. Although a U.S. EPA-funded replacement of the water supply is surely the option most preferred by the State and the City, other alternatives can effectively and reliably address the VOC contamination at the Ingalls Well.

Comment GOVERNMENT-15 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "Monitoring data indicate that contaminants may be moving toward the well."

Response GOVERNMENT-15 U.S. EPA agrees that contaminants in the well field do tend to move toward the Ingalls Well when the well is pumping. At the Ingalls Well, the contaminated water is then diluted from the influence of surface water and the intake of uncontaminated ground water.

Comment GOVERNMENT-16 (McNamee Main Document - One-Page Summary Sheet from January 26, 1994 letter from Mr. Michael Italiano of Bell, Boyd & Lloyd to Mr. Dave Novak of U.S. EPA) "A solution to the water supply contamination will also allow the City to raze the PMC building, help move PMC, and create a park near the waterfront."

Response GOVERNMENT-16 The interim remedy will not address contamination at the PMC source area. MDNR is continuing its investigation at the Site and will evaluate alternatives to address contamination in Site

soils and in the well field.

Comment GOVERNMENT-17 (McNamee Main Document, Section 1.0, Page 2) McNamee states that Alternative One (No Action) is not an acceptable remedial alternative to reduce risks to citizens of Petoskey or reduce groundwater contamination.

Response GOVERNMENT-17 See Comment/Response GOVERNMENT-12.

Comment GOVERNMENT-18 (McNamee Main Document, Section 1.1, Page 2) Based on McNamee evaluation of alternatives (excluding air stripping), construction of a Direct Filtration Water Treatment Plant would allow U.S. EPA to issue a follow-up no action ROD for ground water based on OSWER Directive 9283.1-06 (05-27-92) which allows evaluation of the technical impracticality from an engineering evaluation and determination of alternative remedial action objectives.

Response GOVERNMENT-18 Until MDNR's investigation is complete and alternatives for soil and well field cleanup have been evaluated, it is premature to assume that a No Action ROD could be issued if a Surface Water Treatment Plant were constructed. However, the on-line treatment alternatives, Alternatives Four and Five, would provide a slightly greater basis for a follow-up No Action ROD because the Ingalls Well would act indirectly as a pump and treat well to address a portion of the contaminated aquifer.

Comment GOVERNMENT-19 (McNamee Main Document, Section 3.0, Page 3) Sample results from MDNR activities in 1992 indicate that hazardous substances above Type B levels are still present in the property soils and are contributing to ground water contamination.

Response GOVERNMENT-19 U.S. EPA agrees. However, the interim remedy will not address contamination at the PMC source area. MDNR is continuing its investigation at the Site and will evaluate alternatives to address contamination in Site soils and in the well field.

Comment GOVERNMENT-20 (McNamee Main Document, Section 3.0, Page 4) In 1982, 51 ppb of TCE were found in the Ingalls Well. A high probability exists that for 20 to 30 years, the population of Petoskey has been exposed to TCE in concentrations as high as 50 ppb. Concentrations of TCE have been above MERA 307 ground water cleanup criteria, which are ARARs, since 1981. OSWER Dir. 9355.3-03 includes state standards and MCLGs as relevant and appropriate for the provision of alternate water supplies.

Response GOVERNMENT-20 U.S. EPA agrees that the Ingalls well had likely been contaminated for many years. However, U.S. EPA disagrees that MERA 307 is an ARAR for the Ingalls Well and the Petoskey municipal water system. MCLs are the standards that are applied for water system quality and have been adopted by the State of Michigan under the Michigan Safe Drinking Water Act. MCLGs are non-enforceable goals and, according to the National Contingency Plan (NCP), only non-zero MCLGs may be relevant and appropriate for Superfund Remedial Actions. MERA 307 standards are not standards for the evaluation of water supply quality.

Comment GOVERNMENT-21 (McNamee Main Document, Section 3.0, Page 4) "In 1984, U.S. EPA issued an administrative order directing PMC to conduct further hydrogeological studies. PMC retained an environmental consultant and conducted work under the direction of U.S. EPA and MDNR. In 1987 the U.S. EPA issued its second administrative order to PMC. Under this order, PMC was to conduct a full RI/FS to determine the nature and extent of contamination and appropriate remedial alternatives to address the contamination. PMC started the work plan phase of this administrative order, but the U.S. EPA relieved PMC of conducting further RI/FS work and negotiated a settlement prior to recognition of the risk to the citizens of Petoskey. Prior violations of the NPDES permit and RCRA were ignored. The U.S. EPA entered into a State Cooperative Agreement with MDNR in 1990, in which the MDNR agreed to perform the RI/FS which was completed in draft form in 1994."

Response GOVERNMENT-21 From the language of the comment, it sounds as if the commentor believes that U.S. EPA settled with PMC so as not to disclose the site risks. If this is what the commentor meant to imply, U.S. EPA disagrees. U.S. EPA directed PMC to stop work because of the company's unacceptable performance in preparing the RI/FS Work Plan. In addition, because PMC had filed for bankruptcy after it agreed to conduct the RI/FS, there was information to indicate that PMC would have been unable to fully fund the work it had

agreed to perform.

The commentor states that U.S. EPA ignored prior violations of NPDES and RCRA. Both the NPDES and RCRA programs are delegated to the State of Michigan and the State has the authority to impose penalties for violations. The fact that there were historical violations did not and would not change the fact that PMC failed to perform as required by the Order and that the company was not able to fully fund the Work it had committed to perform.

The commentor states that the MDNR completed the draft RI/FS in 1994. In fact, the MDNR provided the U.S. EPA with a draft RI Report in December of 1993. U.S. EPA made the determination that the document was incomplete and unacceptable and did not approve the RI Report. However, to provide as much information as possible to the community, the data from the investigation was released to the public in January of 1994. U.S. EPA is now working with the State of Michigan to complete limited additional field work during the spring of 1995. MDNR has deferred completion of the FS until results of the 1995 field work are available.

Comment GOVERNMENT-22 (McNamee Main Document, Section 3.0, Page 5) Contaminated ground water is drawn into the Ingalls Well when the pump is operational and is apparently diluted by surface and groundwater infiltration.
Response GOVERNMENT-22 U.S. EPA agrees. See Comment/Response GOVERNMENT-15.

Comment GOVERNMENT-23 (McNamee Main Document, Section 3.0, page 5) McNamee states that other hazardous substances known to be in the well field were not included in the Agency For Toxic Substances and Disease Registry (ATSDR) health assessment or in the Baseline Risk Assessment prepared for the interim action.

Response GOVERNMENT-23 Because the more recent data was not available, the ATSDR health assessment and the U.S. EPA Baseline Risk Assessment for Qround Water did not include the 1992 and 1993 sampling results. The Record of Decision Summary and this Responsiveness Summary qualitatively discuss the presence of other contaminants seen in the more recent sampling events.

Comment GOVERNMENT-24 (McNamee Main Document, Section 3.0, page 5) McNamee states that State correspondence to U.S. EPA documents that the Ingalls Well exceeds the MCLG of zero and the Type B 3 ug/l TCE cleanup level.

Response GOVERNMENT-24 See Comment/Response GOVERNMENT-6 and Comment/Response GOVERNMENT-20.

Comment GOVERNMENT-25 (McNamee Main Document, Section 3.0, page 5) McNamee references a comment letter from A MDNR toxicologist who states that "it would be prudent to discontinue use of the groundwater at this site for residential consumption. Groundwater at this site contains concentrations of contaminants which exceed Type B criteria; there is a high level of uncertainty associated with the analytical data and the risk assessment for this site; and there is potential that the risks associated with this site were significantly underestimated in the risk assessment."

Response GOVERNMENT-25 Although U.S. EPA agrees that there is uncertainty associated with the Baseline Risk Assessment for the Interim Action, sampling results show that the water in the Ingalls Well currently meets MCLs. MCLs are nationally accepted standards for water supply quality. U.S. EPA maintains that on-line treatment of the well would be as effective as replacing the water supply.

Comment GOVERNMENT-26 (McNamee Main Document, Section 3.0, page 5) Information from the RI completed by MDNR in January of 1994 must be included in any evaluation of risk to the citizens drinking groundwater from the Ingalls Well.

Response GOVERNMENT-26 The MDNR has not yet completed the RI. However, the Record of Decision Summary and this Responsiveness Summary include discussions of recent RI ground water monitoring results.

Comment GOVERNMENT-27 (McNamee Main Document, Section 4.0, page 6) The commentor notes that the Baseline Risk Assessment for the Interim Action was performed with the knowledge that there was a "high degree of uncertainty associated with the use of the data". He further notes factors that may have led to an underestimation of the potential risks: insufficient identification of the chemicals present, reliance upon

data gathered during a limited period of time, and not evaluating all of the potential exposure pathways.

Response GOVERNMENT-27 U.S. EPA agrees that there are certain uncertainties associated with the data. See the "Uncertainties" discussion in Section 6.6 of the Record of Decision Summary for further discussion.

Comment GOVERNMENT-28 (McNamee Main Document, Section 4.0, page 6) The Baseline Risk Assessment was based on limited data. "Analytical tests performed do not appear to have considered a number of hazardous substances present in the soil, nor does it appear to have considered the potential degradationby-products of these substances." Results of tests conducted in 1992 and 1993 identified cancer-causing chemicals that were identified for the first time, including: vinyl chloride, methylene chloride and bis(2-ethylhexyl)phthalate.

Response GOVERNMENT-28 The Baseline Risk Assessment included only contaminants that had been seen in ground water and could be related to the Site. As part of evaluating ground water scenarios, it is not appropriate to include contaminants that have been found only in soils. The fact that a substance is present in soils does not necessarily mean that it will migrate to ground water and become a problem. The Baseline Risk Assessment also did not evaluate the presence of potential degradation by-products since these contaminants had not yet been detected. The Baseline Risk Assessment did not include vinyl chloride, methylene chloride and bis(2-ethylhexyl)phthalate since the recent data was not available for inclusion into the document. However, a qualitative discussion of the recent data has been included in the Record of Decision Summary and in this Responsiveness Summary.

Comment GOVERNMENT-29 (McNamee Main Document, Section 4.0, pages 6,7) The commentor discusses the characteristics of vinyl chloride, including its solubility, volatility, mobility and toxicity. The commentor also discusses vinyl chloride as a degradation product of trichloroethylene and dichloroethylene in anaerobic soils and notes that the risk assessment did not consider by-product formation from the degradation of soil contaminants.

Response GOVERNMENT-29 See also Comment/Response GOVERNMENT-28. U.S. EPA agrees that degradation of some chemicals in the soil could create vinyl chloride. Vinyl chloride was analyzed for, but was never detected in the analytical data used for the risk assessment. However, vinyl chloride was detected in only 1 of 64 ground water samples collected during the RI. This is still a concern, but it is not evidence of substantial production of vinyl chloride by degradation of other chemicals.

Vinyl chloride can be addressed by air-stripping. In fact, under the Michigan Safe Drinking Water Act, packed tower aeration (air stripping) is considered to be the Best Available Technology (BAT) for vinyl chloride.

If U.S. EPA determines that future detections of site-related SVOCs at the Ingalls Well tap warrant the implementation of carbon treatment instead of air stripping, it will be important to carefully review future monitoring data for the presence of vinyl chloride. Carbon treatment is not effective in the removal of vinyl chloride.

Comment GOVERNMENT-30 (McNamee Main Document, Section 4.0, page 7) The commentor discusses the characteristics of methylene chloride, including mobility and toxicity. The commentor states that, according to EPA's Office of Drinking Water, a concentration of 0.5 ppb is associated with a 1 x 10-6 risk. This contaminant should be considered in any recalculation of risk.

Response GOVERNMENT-30 Comment noted. See also Comment/Response GOVERNMENT-28. Methylene chloride can be addressed by air-stripping.

Comment GOVERNMENT-31 (McNamee Main Document, Section 4.0, page 7) The Baseline Risk Assessment did not consider the potential for other contaminants (PNAs, Dibenzofurans, Phthalates) to migrate from the soil to the ground water or to the Ingalls Well. TCE and/or Dichloroethylene act as a "carrier" vehicle and can enhance contaminant migration.

Response GOVERNMENT-31 Solvents can act as "carrier vehicles" to enhance the migration of other contaminants. However, it is not reasonable to assume that contaminants will suddenly begin to migrate when,

to date, we have seen little semi-volatile migration into groundwater even though the PMC soils have been contaminated for well over twelve years. See also Comment/Response GOVERNMENT-28.

Comment GOVERNMENT-32 (McNamee Main Document, Section 4.0, page 7) Benzo(a)pyrene has been designated by the EPA as a "Probable Human Carcinogen" and is associated with a 1 x 10-6 risk level at a concentration of 0.003 ppb in drinking water.

Response GOVERNMENT-32 To date, benzo(a)pyrene has not been found in ground water in the well field.

Comment GOVERNMENT-33 (McNamee Main Document, Section 4.0, pages 7,8) Dibenzofurans have been observed in the site soils. The Baseline Risk Assessment did not include chlorinated dibenzo-p-dioxin and chlorinated dibenzofurans.

Response GOVERNMENT-33 To date, dibenzofurans have not been found in ground water in the well field.

Comments GOVERNMENT-34 (McNamee Main Document, Section 4.0, pages 8) High levels of phthalates have been seen in site soils, yet were not included in the risk assessment.

Response GOVERNMENT-34 Phthalates were not identified during the previous sampling rounds evaluated as part of the Baseline Risk Assessment. Phthalates are qualitatively evaluated in the Record of Decision Summary and in this Responsiveness Summary (see Comment/Response GOVERNMENT-1) only to the extent that they were seen in ground water.

Comment GOVERNMENT-35 (McNamee Main Document, Section 4.0, pages 8) The Baseline Risk Assessment excluded trihalomethanes, even though significant amounts of trihalomethanes have been identified in monitoring wells at the site. The presence of trihalomethanes may not be exclusively from chlorination but from actual contamination (or degradation of contaminants) at the site.

Response GOVERNMENT-35 U.S. EPA agrees that recent monitoring data suggest that the presence of trihalomethanes may not be due solely to chlorination. However, levels seen in the well field are very low. To demonstrate this using an extremely conservative comparison, assume that the maximum concentration of each trihalomethane compound found in the well field would impact the Ingalls Well. Even by summing these maximum concentrations of trihalomethane compounds, the total would be far below the 80 ppb MCL for total trihalomethanes.

Comment GOVERNMENT-36 (McNamee Main Document, Section 4.1, pages 8-10) The commentor disagrees with the areas of concern identified in the Baseline Risk Assessment. Data from monitoring wells and data from the Ingalls Well were considered independently in order to evaluate the risks to private well users and risks to individuals who consume water from the Ingalls Well. The commentor believes that the entire well field should be considered when looking at risks to the Ingalls Well. The commentor provided an extensive list of contaminants that should be included as Chemicals of Potential Concern. The commentor further states that a reevaluation of risks with the additional Chemicals of Potential Concern will effect the current evaluation of the risk.

Response GOVERNMENT-36 It is widely known that the Ingalls Well is under the influence of surface water from Lake Michigan. Just how much surface water is drawn in as the Ingalls Well pumps is not known. Because the hydrogeology in the area is so complex, the Ingalls Well's zone of capture is also uncertain. In any event, it is clear that contaminated ground water entering the Ingalls Well is diluted by clean ground Water and surface water. It is therefore not appropriate to assume that levels of contamination in the well field can be directly compared to the levels that would be seen in the Ingalls Well. Therefore, it is appropriate to independently evaluate use of ground water from the Ingalls Well and use of ground water from a private well in the well field.

The results of a qualitative reevaluation of risks based on 1992 and 1993 data have not shown the need to modify U.S. EPA's proposed alternative.

Comment GOVERNMENT-36 (McNamee Main Document, Section 4.2, page 10) The commentor states that the Baseline

Risk Assessment "intentionally did not address potential exposures resulting from recreational and residential activities such as swimming (air, dermal), home gardening (food), or just living in close proximity to the site (vapors, dusts). The justification for excluding these potential pathways was the opinion that they contributed little to the final risk calculations." The commentor states that this is not a valid approach when one considers individual risks and when one looks at the worst-case exposed population (those residents near the current PMC site).

Response GOVERNMENT-36 U.S. EPA is unsure whether the commentor is referring to risks from use of water or from exposure to site soils. Risks from exposure to site soils for individuals in close proximity to the site are not included in the Baseline Risk Assessment for the Interim Action and will be evaluated by the MDNR as partof the overall RI/FS. Risks from use of municipally supplied ground water (or ground water from a private well) for swimming and watering a garden are expected to be minimal. If these activities were included, the risk would still be within the U.S. EPA acceptable risk range.

In response to the commentor's assertion that the approach does not consider individual risks, U.S. EPA disagrees. The entire approach put forward in U.S. EPA Risk Assessment Guidance, and followed in preparation of the Baseline Risk Assessment for the Interim Action, is based on evaluating risks to individuals. The Agency is conservative in its assumptions and considers the reasonably maximally exposed individual and sensitive populations.

The commentor's statement concerning the worst case exposure of individuals near the Site again misses the point of the entire interim action. Risks for the overall site will be evaluated by the MDNR The Baseline Risk Assessment for the Interim Action was meant to evaluate the need for an action to ensure a safe drinking water source. Individuals who are exposed to site soils in addition to their use of municipal water would certainly experience a greater risk; however, this fact does not mean that the water that those hypothetical individuals receive from the municipal supply should be of any different quality than the water that would be received by municipal water users who are not exposed to Site soils.

Comment GOVERNMENT-37 (McNamee Main Document, Section 4.2, page 10) The Baseline Risk Assessment underestimated exposure to volatile contaminants because it did not consider activities such as dish washing, laundering, etc.

Response GOVERNMENT-37 Risks from use of municipally supplied ground water (or ground water from a private well) for swimming and watering a garden are expected to be minimal. The risks associated with showering are 1 to 4 orders of magnitude less than the risks associated with ingestion of the water (see Table 5-1 in the Baseline Risk Assessment for Ground Water). Risks associated with washing will be even less. If these activities were included, the risk from residential use of contaminated water would still be within the U.S. EPA acceptable risk range.

Comment GOVERNMENT-38 (McNamee Main Document, Section 4.2, page 11) The Baseline Risk Assessment did not consider the synergistic effect of exposure to multiple contaminants.

Response GOVERNMENT-38 U.S. EPA agrees with the comment. However, synergistic interactions of chemicals are very poorly known, and there is no technical basis for estimating risks except for a very few chemical combinations. Antagonistic interactions are also possible, but are also poorly known. See the "Uncertainties" discussion in Section 6.6 of the Record of Decision Summary for further discussion.

Comment GOVERNMENT-39 (McNamee Main Document, Section 4.2, page 11) The Baseline Risk Assessment did not consider the past exposure to users of the municipal water supply.

Response GOVERNMENT-39 U.S. EPA acknowledges that residents of Petoskey were exposed to unacceptable levels of TCE in their municipal well water prior to 1982 when the contamination was identified. However, it is not practical to consider past exposure to contaminants when attempting to quantify site risks at Superfund Sites. Superfund was established to remediate those sites that are of greatest risk to human health and the environment. Funds should be directed to those sites where an action can reduce exposure to acceptable levels. No action by the U.S. EPA can mitigate past exposure. The decision of whether or not to take an action to remediate a site depends on the current levels of contamination (and risk) present at the site.

Comment GOVERNMENT-40 (McNamee Main Document, Section 4.3, pages 11,12) The commentor lists objectives of risks assessments and states that U.S. EPA's Baseline Risk Assessment for an interim action failed to meet the objectives. No justification was provided.

Response GOVERNMENT-40 The Baseline Risk Assessment prepared by U.S. EPA for the Interim Action met its objectives. The Baseline Risk Assessment was never intended to evaluate overall site risks and develop site cleanup standards. The assessment was conducted to determine if sufficient risk is present to justify taking an interim action at the Ingalls Well to ensure that the municipal water supply is not impacted by unsafe levels of contamination.

Comment GOVERNMENT-41 (McNamee Main Document, Section 4.4, page 12) When discussing the conceptual model of the Site, the commentor states that PNAs cannot be disregarded due to their limited mobility since the presence of solvents can increase mobility.

Response GOVERNMENT-41 See discussion above in Comment/Response GOVERNMENT-28 and Comment/Response GOVERNMENT-31.

Comment GOVERNMENT-42 (McNamee Main Document, Section 4.4, page 13) The McNamee commentor states that the Site should have two Operable Units. The First would be an interim response to provide a new drinking water source for the Ingalls Well. The Final Response would include a Risk Assessment for soil at the PMC source area and an evaluation of ground water in the well field.

Response GOVERNMENT-42 The Record of Decision for the Ingalls Well is an Interim Action for the Petoskey Municipal Well Field Site. It is not meant to resolve all ground water issues at the Site. An evaluation of both soil and ground water remediation alternatives will be included in the RI/FS to be prepared by the MDNR.

Comment GOVERNMENT-43 (McNamee Main Document, Section 4.5, page 13) The commentor notes a 1990 release of oils into the soil. This was not included in the Baseline Risk Assessment.

Response GOVERNMENT-43 The Baseline Risk Assessment was based on chemical monitoring data. Although there was an observed "floating product" at three wells at the PMC facility, chemical monitoring has not provided much information concerning the possible impact of the observed substance. The "floating product" was analyzed and found to contain approximately 2% oil and grease and low-level SVOCs. The MDNR believes that specialized analyses may be necessary to obtain a better understanding of the problem. The MDNR will be conducting additional field work to determine the extent of the floating product. It is interesting to note that the presence of zinc in the Baseline Risk Assessment may be partly due to the 1990 release of hydraulic fluids. During that period of time some formulations of hydraulic fluids did contain zinc. The floating product itself is believed to be localized and will be investigated in the field work planned for 1995.

Comment GOVERNMENT-44 (McNamee Main Document, Section 4.5, page 13) The commentor states that since the historical data was excluded, synergistic and cumulative effects were not analyzed.

Response GOVERNMENT-44 See Section 6.6 of the Record of Decision Summary for further discussion of Baseline Risk Assessment uncertainties. In addition, see Comment/Response GOVERNMENT-39 for a discussion of the consideration of past exposures.

Comment GOVERNMENT-45 (McNamee Main Document, Section 4.6, page 14) The McNamee commentor claims that the chemicals of potential concern were "preselected to preclude an accurate risk." The limited nature of ground water data increased uncertainty and caused the Baseline Risk Assessment to underestimate risk.

Response GOVERNMENT-45 U.S. EPA acknowledges that the ground water data is limited and agrees that this could cause risks to be underestimated. It is important to note, however, that the use of limited data could also lead to the overestimation of risk. The impact of additional data on site risk calculations would depend on the level and types of contaminants detected. U.S. EPA strongly disagrees with the commentor's assertion that chemicals were "preselected to preclude an accurate risk." Chemicals were selected using best professional judgment, U.S. EPA guidance, and the most data available at the time. It is U.S. EPA's belief

that the commentor has failed to recognize the point of the entire Interim Action. Major areas of technical disagreement include the fact that McNamee appears to believe that it is appropriate to utilize historical data that is not representative of current conditions, that the Baseline Risk Assessment should simulate the presence of contaminants that have not migrated to ground water after being present in site soils for over twelve years, that evaluation of the risks from use of water from the Ingalls Well should be based on levels in the well field that do not acknowledge the dilution that undeniably occurs at the well, and that the evaluation of the risk from residential use of ground
water should consider the possibility of exposure to contaminants at the PMC Site itself.

Comment GOVERNMENT-46 (McNamee Main Document, Section 4.6, page 14) The site sampling plan has not been thorough and consistent. Chemicals may be present for which analyses have not been run.

Response GOVERNMENT-46 Deficiencies of the data base were noted in the Baseline Risk Assessment. The sampling program was designed by the MDNR for the RI/FS. Although sampling events have not routinely analyzed all ground water samples for VOCs, SVOCs, and inorganics, enough sampling has been conductedby MDNR to provide an overall picture of contaminants present in ground water. MDNR will conduct additional analyses during the spring of
1995.

Comment GOVERNMENT-47 (McNamee Main Document, Section 4.6, page 14) Analytical detection limits for some contaminants are above ground water standards, criteria, or other "toxicity reference values". The methods used to calculate Preliminary Remediation Goals (PRGs) were not shown.

Response GOVERNMENT-47 The U.S. EPA guidance document used to calculate PRGs was referenced and the chemicals with sample quantitation limits above the PRGs were identified in Appendix A.

Comment GOVERNMENT-48 (McNamee Main Document, Section 4.6, page 14) Use of more recent RI data coupled with prolonged exposure and synergistic effects substantially increases the risk above the level identified in the Baseline Risk Assessment. The use of MCLGs is "relevant and appropriate".

Response GOVERNMENT-48 Limitations of the data were clearly noted in the Baseline Risk Assessment. With only a few exceptions, there is no technical basis for evaluating synergistic or antagonistic effect in any risk assessment. The chemicals identified in ground water collected during the RI are not known to have any synergistic effects (Casarett and Doull's Toxicoloqy, 1980). The recent data generated by the RI could result in lower as well as higher estimated risk. See the discussion of MCLGs in Comment/Response GOVERNMENT-6 and Comment/Response-20.

Comment GOVERNMENT-49 (McNamee Main Document, Section 4.6, page 14) CERCLA Section 121(d) states that U.S. EPA's remedy should "at a minimum protect public health and the environment." The commentor maintains that U.S. EPA's proposed remedy does not protect public health.

Response GOVERNMENT-49 U.S. EPA disagrees. Construction and operation of an on-line air-stripper will address the presence of VOCs that could exceed MCLs at the Ingalls Well.

Comment GOVERNMENT-50 (McNamee Main Document, Section 5.2, page 15) The commentor notes that TCE, DCE and various phthalates are present in the well field. The commentor further notes that prior to the removal action, monitoring wells, the Ingalls Well and Site soils showed high concentrations of TCE and DCE and that wells near the source area showed high concentrations of phthalates. The mobility of phthalates is increased by the presence of solvents such as TCE and DCE.

Response GOVERNMENT-50 U.S. EPA agrees that contaminant concentrations were significantly higher prior to the excavation of highly contaminated soils from the PMC facility. However, U.S. EPA notes that current levels of phthalates in the well field and in the Ingalls Well are relatively low.

Considering the December 1992 and March 1993 sampling events, the maximum phthalate concentration at the Ingalls Well was the estimated 0.5 ppb seen of bis(2-ethylhexyl)phthalate. The MCL for bis(2-ethylhexyl)phthalate is 6 ppb.

The maximum phthalate concentrations seen in the well field were an estimated 7 ppb of bis(2-ethylhexyl)phthalate and an estimated 7 ppb of Di-n-Octylphthalate. There is no MCL for Di-n-Octylphthalate. However, the Act 307 Type B criteria is 130 ppb.

Comment GOVERNMENT-51 (McNamee Main Document, Section 5.2, pages 15,16) The commentor noted that TCE concentrations in monitoring well PS-11 have increased from 28 ppb in December of 1992 to 40 ppb in March of 1993. In the same period, TCE concentrations in Monitoring Well PS-C-Deep (300' from the Ingalls Well) have increased from 65 ppb to 83 ppb. The commentor. maintains that this is evidence of a DNAPL pool. The commentor further notes that as early as 1983, MDNR noted an increase in 1,2 DCE, a degradation product of TCE.

Response GOVERNMENT-51 From the information gathered to date, it is difficult to determine whether or not a DNAPL is present and causing the variations seen in monitoring wells PS-11 and PS-C-Deep. The increases in TCE and DCE could be the result of normal fluctuations in ground water quality or analytical methods. If a DNAPL were to exist at the Site, the concentrations of dissolved constituents would be anticipated to be three to four orders of magnitude higher based on the solubility of the chemicals.

On the other hand, U.S. EPA agrees that it is curious that concentrations in PS-11 and C-Deep have not yet dropped off. This could indicate the presence of a DNAPL in bedrock fractures.

Although the question of whether of not there is a DNAPL in close proximity to the Ingalls Well has not yet beenanswered, the alternative selected by U.S. EPA in the Record of Decision will address any TCE and DCE present in ground water at the Ingalls Well.

Comment GOVERNMENT-52 (McNamee Main Document, Section 5.2, page 16) The commentor expressed concern over the presence of vinyl chloride in ground water at the Site and expects concentrations to increase as TCE and DCE degrade.

Response GOVERNMENT-52 Vinyl chloride has been detected only once. The contaminant was seen in monitoring well PS-4 during the December 1992 sampling event. However, it is possible that levels of vinyl chloride may increase over time as other chemicals degrade. The remedy selected by the U.S. EPA will effectively remove vinyl chloride from the Ingalls Well. In fact, according to the Michigan Safe Drinking Water Act, packed tower aeration (air stripping) is considered to be the Best Available Technology (BAT) for the presence of vinyl chloride in ground water. Granular activated carbon is not a BAT treatment for vinyl chloride in ground water..

Comment GOVERNMENT-53 (McNamee Main Document, Sections 6.0-6.1, pages 16,17) The commentor states that MERA Act 307 regulations are ARARs. He also states that MERA 307 criteria must be applied at the well field in the ground water rather than at the Ingalls Well or at the drinking water tap.

Response GOVERNMENT-53 Act 307 Rules contain provisions establishing procedures for response activities, selection of remedial action, and cleanup criteria at sites of environmental contamination where response activities are taken pursuant to Act 307. Because this Interim Action is not meant to remediate the Site, but is instead an Interim Action meant to ensure that the water supply of the City of Petoskey meets federal standards for contaminants related to the PMC Site, Act 307 and the Act 307 Rules are not ARARs. Act 307 and the Act 307 Rules would be potential ARARs for the final remedial action at the Site.

Comment GOVERNMENT-54 (McNamee Main Document, Section 7.0, pages 17-19) McNamee presented its own evaluation of alternatives for interim action at the Ingalls Well. This evaluation did not include an alternative for air stripping contaminated ground water. McNamee's alternatives were:

- Alternative One: No Action
- Alternative Two: Development of New Groundwater Source
- Alternative Three: Development of A Lake Michigan Surface Water Supply Intake and Treatment System
- Alternative Four: Treatment of Groundwater From the

Response GOVERNMENT-54 U.S. EPA reviewed this portion of McNamee's comments and identified statements which could be considered as commitments which warrant responses. Note also that U.S. EPA does not agree with McNamee's decision to exclude air stripping treatment as an applicable remedial alternative for the ground water from the Ingalls Well. Air stripping is an appropriate technology for treating the contaminants which are present in the well field and could cause an MCL exceedance at the Ingalls Well.

Comment GOVERNMENT-55 (McNamee Main Document, Section 7.4.1, page 19) McNamee discussed the implementability of an activated carbon system.

Response GOVERNMENT-55 All technologies reviewed in McNamee's document are technically feasible. McNamee has focused on the alternative specifying carbon adsorption for remediation of the ground water. The description of the operations of such a system are adequate and reflect the description given in "Alternative Five: Treatment of Ground Water Using GAC Adsorption" from the initial FFS.

Comment GOVERNMENT-56 (McNamee Main Document, Section 7.4.1, page 19) McNamee provided its cost estimate for construction and operation of an activated carbon system.

Response GOVERNMENT-56 The costs given for the construction and operation of an activated carbon treatment system are significantly higher than the costs developed by U.S. EPA for a similar system. It is U.S. EPA's opinion that an adequate system to treat the contaminated well water, but not replace any existing water department facilities, could be constructed for significantly less capital expense. In addition, U.S. EPA does not see the need for a full-time superintendent and operators at a new treatment facility, since it assumed that the City of Petoskey currently employs such personnel.

According to the National Contingency Plan (NCP), the State has the responsibility for O&M of alternate water supplies constructed with Superfund monies. If Alternative Four or Five were to be built, the State and the City would have to work out an arrangement for O&M.

Comment GOVERNMENT-57 (McNamee Main Document, Section 8.0, pages 20,21) McNamee conducted its own evaluation of the nine criteria.

Responses GOVERNMENT-57 U.S. EPA disagrees with many points made in the McNamee evaluation. Rather than restate the Agency's position with respect to the alternatives and the nine criteria, the reader is directed to the Record of Decision Summary for a discussion alternatives and U.S. EPA's evaluation of alternatives with respect to the nine criteria.

Comment GOVERNMENT-58 (McNamee Appendix I - Cost Evaluation) McNamee submitted its costs for alternatives it believes should be considered for use at the Site. Cost estimates for air stripping were not provided. McNamee calculations indicate that construction and operation of a Direct Filtration Water Treatment Plant (NPV of $9,067,618) will be the least expensive alternative when compared to the development of a new ground water source, construction and operation of a conventional surface water treatment plant, and treatment of ground water using GAC contactors. McNamee calculations also show that the Direct Filtration Water Treatment Plant is the least expensive in terms of the capital investment required ($6,070,000) and the annual operating expenses ($225,000).

Response GOVERNMENT-58 McNamee cost estimates have been reviewed. U.S. EPA maintains that cost estimates presented in this Record of Decision are accurate for purposes of evaluating and comparing alternatives. U.S. EPA does not agree with many assumptions made by McNamee, such as the cost of the structure necessary for carbon treatment and the cost of the carbon treatment equipment, and maintains that the relative costs of alternatives under consideration for the Interim Action are not accurately represented by the McNamee estimates.

Comment GOVERNMENT-59 (McNamee Appendix II - Correspondence Record) McNamee submitted a file of correspondence relating to issues at the PMC Site and a copy of the transcript from the public comment

period. McNamee also included a written statement (typed, with hand written notes) presented by Mr. Gary Molchan at the December 2, 1993 public meeting.

Response GOVERNMENT-59 Copies of correspondence are noted. Responses to comments made during the public meeting are presented in Section E below. U.S. EPA has reviewed Mr. Molchan's written statement and determined that the substantive issues raised are identical to those presented as oral comments at the meeting.

Comment GOVERNMENT-60 (McNamee Appendix III - Groundwater Summary Data) McNamee submitted a summary of ground water and soil data collected from the PMC Site.

Response Government-60 While the summary of data is useful for the review of site data, U.S. EPA must note a few of its observations concerning the information presented.

McNamee's table failed to include the 6 ppb MCL for bis(2-ethylhexyl)phthalate. Readers should note that in the Drinking Water Regulations and Health Advisories published by the U.S. EPA Office of Water, standards and advisories for this compound are provided under the synonym "diethylhexyl phthalate."

U.S. EPA also notes that information concerning McNamee sample points (MWB-1, MWB-2, MWB-3, MW-1, MW-2) was not included in the comment package. At the request of U.S. EPA, McNamee submitted boring logs and a map of sample locations. Note also that the McNamee table contains a typographical error and lists sample point MW-2 twice without listing MW-1. U.S. EPA confirmed with McNamee that the first listing of MW-2 should have been labeled as "MW-1." In addition, the MDNR later informed U.S. EPA that McNamee did not perform a complete inorganic analysis of the samples as is suggested by the data table.

Comment GOVERNMENT-61 (McNamee Appendix IV - Data from Eder Report) McNamee submitted an appendix which included copies of the Remedial Investigation sampling data.

Response GOVERNMENT-61 Submittal noted.

III. Mr. Ira Gabin and Mr. Brad Brogren of the MDPH provided oral comments at the December 2, 1993, public meeting. The oral comments noted that the on-line treatment technologies proposed by U.S. EPA would not meet the requirements of the Michigan Safe Drinking Water Act. Because the comments were not sufficiently specific as to allow an adequate response to the comment to be prepared, the U.S. EPA Remedial Project Manager, Ms. Terese Van Donsel, requested that MDPH prepare additional written comments to specifically address this issue. Follow-up written comments were submitted by MDPH during the comment period and are addressed below.

Comment GOVERNMENT-62 Mr. Gabin noted the areas of major deficiencies in the design outline provided for Alternative Four. These included:

- Failure to meet the requirements of Part 12 of Act 399 Administrative Rules regarding reliability;
- Failure to meet the requirements of Part 10 of Act 399 Administrative Rules regarding treatment systems and pumping facilities; and
- Failure to meet the requirements of Section 4 of Act 399 and Part 13 of the Administrative Rules which state that plans and specifications for alteration of a waterworks system shall not be approved unless they are protective of the public health.

Response GOVERNMENT-62 Comments noted. In a conference call with the commentor, the U.S. EPA Remedial Project Manager confirmed that the above general areas of major deficiencies noted by Mr. Gabin are detailed in the actual list of deficiencies provided in the comment letter. Responses are provided for each noted deficiency.

Comment GOVERNMENT-63 Mr. Gabin commented that firm pumping capacity as required by Part 10 is not provided.

Maximum demands must be met with the largest pumping unit out of service. Since this design utilizes only one high service pump, when it fails, the City's upper pressure district would be without water.

Response GOVERNMENT-63 The initial conceptual design of the air stripping and activated carbon systems included a single new pump to deliver water from the well to the treatment system. Existing pumps were intended to be utilized to move the treated ground water into the City's distribution system. After receiving additional input on the existing equipment, the design for both the air stripping and carbon adsorption systems will utilize two new pumps (one as a backup) to deliver water from the well to the treatment system. New pumps have been specified for water distribution to the high pressure district while the existing pumps would be utilized for distribution to the low pressure district.

Comment GOVERNMENT-64 Mr. Gabin noted that when the Lime Kiln Well is out of service, the Ingalls low pressure pump station is placed into service. Treatment for this pressure district is not provided. When in use, it will continue to pump contaminated water into the lower pressure district. This is not protective of public health as required by Section 4 of the Act and Part 13 of the Rules.

Response GOVERNMENT-64 Based on new information, U.S. EPA understands that the Ingalls Well is utilized for the City's entire demand (2,200 gpm) in the event that the Lime Kiln Well is out of service. The two new well pumps, stripping columns, carbon vessels, and distribution pumps have been redesigned accordingly.

In the original conceptual design, the 50 horsepower pump was intended to deliver water from the Ingalls Well to the top of the air stripper only while the existing pumps were to be utilized for treated distribution. As previously noted in Comment/Response GOVERNMENT-63, a second well pump was added to provide backup and new pumps will be utilized for the distribution system.

Comment GOVERNMENT-65 Mr. Gabin commented that the capability to meet maximum day water demands as required by the reliability provisions of Part 12 is not provided.

The 1600 gpm high service capacity is less than the City's maximum day demand of 2200 gpm. When the Lime Kiln Well is out of service, the Ingalls Well must provide all 2200 gpm. In addition, the specified 50 horsepower capacity of the high service pump is much too small to pump 1600 gpm to the upper pressure district.
Response GOVERNMENT-65 See Comment/Response GOVERNMENT- 64.

Comment GOVERNMENT-66 Mr. Gabin noted that stand-by power is required by Part 12 to provide a continuous supply of water when normal electrical service is interrupted. No provisions are made for a generator to operate the pumps and blowers when the power supply is disrupted.

Response GOVERNMENT-66 A generator has been added to both the air stripping and carbon adsorption treatment scenarios, to provide power when primary electrical service is disrupted. In the air stripping system, the generator will be of sufficient size to operate one blower, one well pump, one high pressure district pump, one low pressure district pump, and the necessary controls, valves, etc. on one stripping column. In the carbon system, the generator will be of sufficient size to operate one well pump, one high pressure district pump, one low pressure district pump, and the necessary controls, valves, etc. on the carbon vessels.

Comment GOVERNMENT-67 Mr. Gabin observed that the design outline did not specify low service pumps and stated that he assumed that the existing high service pumps are to be utilized as low service pumps. Pumps designed to operate at a discharge head of 220 psi cannot be used to operate at a discharge head of 15 psi without extensive modifications, or more likely replacement. He further commented that the 3000 gallon effluent tank is much too small to provide the storage volume needed to equalize low service pumping rates with high service demands. It is unlikely that the system could pump water with a tank this size because the high service pump(s) would continuously break suction.

Response GOVERNMENT-67 Based on information received during the public comment period, new pumps have been specified for the high pressure district while the existing low pressure district pumps will be utilized.

The suction tank, from which the distribution pumps will feed, has been increased in capacity to 5,000

gallons in the revised design. The 5,000 gallon tank acts only as a wet well from which the distribution pumps can pump. It is not intended to be utilized as a storage tank. In the event of the loss of the primary well pump, the distribution pumps would also go off-line while the backup well pump comes on-line. Storage capacity in the City's water distribution network is sufficient to provide an adequate supply for the few minutes required to switch to the auxiliary well pump.

Comment GOVERNMENT-68 Mr. Gabin notes that no provision was made for capture of treated VOCs for the air-stripping alternative. Carbon units are not provided and no mention is made of carbon replacement or regeneration.

Response GOVERNMENT-68 U.S. EPA has determined that the potential maximum release to the atmosphere from the air stripping system would be less than 200 pounds of VOCs per year. This is well below the maximum limit of 3.1 tons per year regulated by 40 CFR 264 AA under the authority of RCRA. The air strippers would need to meet the substantive requirements of the Clean Air Act for operations, but no system to capture or destroy air emissions would be required. Since the Interim Action is "on site", an air permit would not be required but the system must satisfy the substantive requirements of Michigan Air Pollution Act permit.

Comment GOVERNMENT-69 Mr. Gavin commented that the structure provided is too small to enclose the required facilities. The severe winter climate will require enclosure of treatment components to ensure continuous operation and facilitate maintenance.

Response GOVERNMENT-69 The buildings originally specified for the treatment systems were designed to house just the support equipment for the air strippers (blowers, controls, electrical) and both the vessels and support equipment for the activated carbon system. The air strippers themselves were to be insulated and located outside the building. The existing pump house was anticipated to continue to be utilized for distribution pumps.

To accommodate the MDPH's concern regarding access to treatment components, the conceptual design has extended the piping in Alternatives Four and Five to allow the system electrical equipment and controls to be placed within the building.

Please note that the structures in question are anticipated to be insulated Morton buildings or the equivalent. No provision has been made to replace existing Water Department facilities such as offices, locker rooms, etc.

Comment GOVERNMENT-70 Mr. Gavin observed that laboratory facilities were not included in the design outline and cost estimates. He states that a gas chromatograph would be required to monitor treatment efficiency.

Response GOVERNMENT-70 The cost estimates presented in the FFS, and revised for the Record of Decision, included laboratory costs as a part of yearly operation and maintenance. Because purchasing laboratory equipment would likely lead to issues about equipment upkeep, training of operators, repair of faulty equipment, purchase of auxiliary supplies, and certification that QA/QC procedures are being followed, U.S. EPA prefers that monitoring samples be submitted to a qualified laboratory for chemical analysis related to Superfund contamination.

Comment GOVERNMENT-71 Mr. Gavin stated that cost estimates for Alternative Four controls, valving, piping and other appurtenances seem to be for non-potable applications. He states that costs for these items would be higher for municipal applications.

Response GOVERNMENT-71 The costs for controls, valving, and other appurtenances for both the air stripping and carbon treatment systems were based on utilizing existing piping wherever possible. Additional costs have been included for new piping runs between the well and the treatment system. The components are intended to be constructed of standard engineering materials, e.g. general purpose controls/electrical, carbon steel valves, ductile iron pipe, etc. No special requirements are known to U.S. EPA requiring stainless steel or other specialized materials of construction for potable water systems.

The stripping columns are designed to be constructed of UV-stabilized fiberglass reinforced plastic (FRP), which can be obtained in a sufficiently high grade to provide a 30-year operating life. The carbon adsorption vessels are to be constructed of carbon steel.

Comment GOVERNMENT-72 Mr. Gavin stated that the selected alternative must be capable of removing the wide variety of contaminants found at the Site. He further commented that granular activated carbon is the only acceptable alternative for removing organic contaminants from the Ingalls Well.

Response GOVERNMENT-72 As stated in many earlier comments, U.S. EPA has determined that, based on the existing ground Water data, only VOCs require treatment at the Ingalls Well. Air stripping is an appropriate technology for treatment of VOCs.

Comment GOVERNMENT-73 Mr. Gavin states that Alternative Five of the FFS includes design flaws similar to those of Alternative Four.

Response GOVERNMENT-73 The conceptual design and cost estimate of Alternative Five were reviewed and revised in light of MDPH comments.

Comment GOVERNMENT-74 Mr. Gavin notes that the City's consultant has proposed a carbon treatment system which would meet with MDPH approval. Mr. Gavin recommends that U.S. EPA utilize the McNamee carbon treatment system for the cost determination.

Response GOVERNMENT-74 U.S. EPA has had extensive discussions with MDPH regarding the required components for on-line treatment at the Ingalls Well. It is U.S. EPA's opinion that MDPH technical comments have been resolved and that the conceptual designs used for the evaluation of alternatives and preparation of cost estimates would meet the requirements of the MDPH.

IV. Mr. William Bradford, Chief of the MDNR Superfund Section, provided written comments during the public comment period.

Comment GOVERNMENT-75 Mr. Bradford stated that the Michigan Safe Drinking Water Act is an ARAR for the Interim Action. Mr. Bradford noted that it was identified as an ARAR in the FFS, yet not mentioned in the Proposed Plan or at the public meeting.

Response GOVERNMENT-75 Comment noted. Please see the discussion of ARARs in Section 8.2 and 10(b) of the Record of Decision Summary.

Comment GOVERNMENT-76 Mr. Bradford supplemented the list of potential ARARs in the FFS with the following list of potential ARARs:

- The Air Pollution Act, 1965 PA348, as amended and associated rules;
- The Michigan Water Resources Commission Act, 1929 PA 245, as amended, and associated rules. A portion of this has been identified as an ARAR. The portions of Act 245 relating to antidegradation and maintaining ground water quality (including part 22 rules) still apply;
- The Liquid Industrial Waste Removal Act, 1969 PA 136, as amended, and associated rules (requires use of licensed liquid industrial waste hauler);
- The Soil Erosion and Sedimentation Control Act, 1972 PA347, as amended and associated rules (regulations prescribing the requirements for earth changes);

- The Shorelands Protection and Management Act, 1970 PA 245, as amended, (construction of permanent structures in erosion, environmental and flood risk areas);

- The Mineral Well Act, 1969 PA 315 (rules describing permitting requirements for test wells and geophysical holes);

- The Solid Waste Management Act, 1978 PA 641 (Licensing and disposal of solid waste-i.e., carbon); and

- The Michigan Compiled Laws Annotated- Section 257.722 (frost laws).

Response GOVERNMENT-76 Comments noted. Whether or not the above State regulations are ARARs depends, in large part, on what activities will be required for implementation of the selected alternative. For example, the Mineral Well Act may be an ARAR for activities requiring the installation of new wells. However, since no new wells are expected to be necessary in order to construct an air stripper at the Ingalls Well, it is not an ARAR for Alternative Four. Also, Act 245 would not be an ARAR for treatment of the water supply at the Ingalls Well. For a brief discussion of major ARARs, see Sections 8.2 and 10(b) of the Record of Decision Summary for a brief discussion of major ARARs.

Comment GOVERNMENT-77 Mr. Bradford stated that the MDNR cannot support any alternative that does not meet appropriate Michigan environmental statues which are ARARs. Mr. Bradford also stated that the proposed alternative does not meet MDPH requirements under the Michigan Safe Drinking Water Act.

Response GOVERNMENT-77 Comment concerning State concurrence is noted. Alternative Four can meet the requirements of the Michigan Safe Drinking Water Act relating to contaminant treatment. The alternative will not correct the existing construction and location deficiencies currently present in the Ingalls Well. See Section 8.2 and 10(b) in the Record of Decision Summary for additional discussion of Site ARARs.

Comment GOVERNMENT-78 Mr. Bradford notes that compounds are present in ground water that cannot be treated by air stripping. Semi-volatile organic contaminants, including MTBE, pesticides and metals have been seen in ground water. The extent of a 1990 hydraulic fluid release has not yet been determined. Mr. Bradford states that Alternative Five should be selected to address current and potential future contaminants in the Ingalls Well.

Response GOVERNMENT-78 Based on the monitoring data collected to date, U.S. EPA does not agree that contaminants other than volatile organic compounds currently require treatment at the Ingalls Well. See Comment/Response GOVEMENT-1 and Comment/Response GOVERNMENT-43 above and Comment/Response PUBLIC-1 below.

Comment GOVERNMENT-79 Mr. Bradford notes that there is an error in Table 2-2 of the FFS. Table 2-2 discusses Michigan Act 307 Type A and B Surface Water Criteria. Act 307 does not regulate surface water criteria; the Michigan Water Resources Commission Act does.

Response GOVERNMENT-79 The commentor is correct. Error noted.

Comment GOVERNMENT-80 Mr. Bradford noted that FFS Table 2-9 discusses "cleanup" criteria. Mr. Bradford questions why cleanup criteria are discussed in the FFS when the purpose of the Interim Action is to treat contaminated municipal water.

Response GQVERNMENT-80 Comment noted. Mr. Bradford is correct; the Interim Action is meant to treat municipal water to ensure that the water meets MCLs.

D. SUMMARY OF SIGNIFICANT COMMENTS FROM THE PUBLIC

Comment PUBLIC-1

The Tip of the Mitt Watershed Council submitted comments supporting the development of an alternate drinking water supply. The Watershed council expressed concern that the proposed alternative will not effectively remove semi-volatile organic and inorganic contaminants. The Watershed Council states that installation of an air-stripper at the Ingalls Well is not cost-effective due to the vulnerability of the Ingalls Well and encouraged U.S. EPA to work with the City of Petoskey, the MDNR and the MDPH to obtain a safe drinking water supply for the City.

Response PUBLIC-1

U.S. EPA agrees that air stripping will not effectively remove semi-volatile and inorganic contaminants. However, U.S. EPA's review of the groundwater data has not identified a need to treat the groundwater for semi-volatile and inorganic contaminants. Please see the response to the comment from Governor Engler (GOVERNMENT-1) for a discussion of semi-volatile contamination in the well field.

Although the soils at the PMC facility are contaminated with metals, very little inorganic contamination has been seen during ground water monitoring conducted during the Remedial Investigation. Exceedances of MCLs have not demonstrated the need for treatment of inorganics at the Ingalls Well:

a. Zinc was seen at elevated concentrations in several monitoring wells. No MCL exists for zinc; therefore, the Act 307 Type B level will be used solely as a point of comparison. During the December 1992 and March 1993 sampling events, zinc exceeded the Act 307 Type B Level (2300 ppb) in three samples. In December of 1992, well PS-AS was found to have a concentration of 2850 ppb and well PS-6 was found to have a concentration of 8510 ppb of zinc. Subsequent sampling in March of 1993 showed that the zinc level in well PS-AS had dropped to 584 ppb, well below the Type B level. The March 1993 zinc level for well PS-6 also dropped, but at 4380 ppb, remained above the Act 307 Type B Level. Both PS-AS and PS-6 are shallow wells located on the other side of Lake Street south of the PMC facility. While the zinc in groundwater may be site related, the distribution of elevated zinc levels in groundwater does not demonstrate a threat to the Ingalls Well.

b. Arsenic was detected only in well PS-AD (located south of PMC) during the March 1991 sampling. It was not detected in any site wells during the December 1992 sampling event. Arsenic was detected in monitoring well PS- 106 at 2.5 ppb in March of 1993. All detections of arsenic in groundwater were far below the MCL of 50 ppb.

   Arsenic was found at low levels (maximum 4 ppb) in MWB-3 during sampling conducted for the City of Petoskey by McNamee in April of 1993. All arsenic detections were far below the MCL of 50 ppb.

c. Antimony was seen in several monitoring wells and in the Ingalls Well during the December 1992 sampling event. The detection of antimony in the Ingalls Well was estimated at 13.9 ppb and exceeded the 6 ppb MCL.

Follow-up sampling conducted in March of 1993 did not identify antimony above the Contract Required Detection Limit (CRDL) in the wells where antimony had previously been seen or in any monitoring wells at the Site.

Well	December 1992	March 1993
PS-10A	22.4 ppb	ND (CRDL=18.4 ppb)
PS-AS	25.5 ppb (B)	ND (CRDL=19.0 ppb)
PS-6	23.5 ppb (B)	ND (CRDL=19.0 ppb)
PS-4	14.3 ppb (B)	ND (CRDL=18.4 ppb)
Ingalls	13.9 ppb (B)	ND (CRDL=18.4 ppb)

*(B) Data point qualified because the reported value was less than the contract required detection limit, but greater than or equal to the instrument detection limit.

The December 1992 and March 1993 sampling rounds do not provide definitive information concerning the presence or absence of antimony. Sampling conducted by McNamee in the vicinity of the Ingalls Well in April of 1993 also did not detect the presence of antimony.

U.S. EPA samples taken from the Ingalls Well in September 1994 and January 1995 did not detect the presence of antimony. In the September 1994 sampling event, antimony was not detected in either the well tap or the well point at a detection level of 100 ppb. Lower detection levels were requested for the January 1995 sampling event. In that sampling event, no antimony was seen in either the wall tap or well point samples at a detection level of 2 ppb.

Antimony had previously been seen in source area soils and in background soil samples B1 and B3. It is not known if the presence of antimony in soils is naturally occurring or related to Site contamination. If future sampling demonstrates that antimony is indeed present in ground water and is determined to be due to contamination from the PMC source area, the risk to users of the Ingalls Well and the risk to users of contaminated private wells could increase. The possible presence of antimony warrants continued monitoring of inorganics in the well field.

If antimony enters the well in concentrations exceeding the MCL, a determination will need to be made as to whether the antimony is related to the PMC Site. If antimony is found to be site-related, the need for treatment and possible treatment alternatives will be evaluated as part of the final remedy selection process for the Site.

d. Manganese was elevated in one monitoring well at the Site. There is no MCL for manganese, so the Act 307

Type B level will be used solely as a point of comparison. The Act 307 Type-B health-based drinking water value for manganese is 170 ppb. The MDNR has determined that Type B local background level for manganese is 285.5 ppb (based on two rounds of sampling from monitoring well PS-13).

During December 1992 and March 1993, manganese levels in monitoring well PS-10A were found to be 465 ppb and 452 ppb, respectively.

From data collected during the December 1992 and March 1993 sampling events, levels of manganese in the Ingalls Well appear to be below 5 ppb. The presence of manganese does not demonstrate a need for treatment for inorganics at the Ingalls Well.

e. Lead was not seen in monitoring wells above the 15 ppb action level (40 CFR 141 80). The highest concentration seen during the December 1992 and March 1993 sampling events was 6.6 ppb at monitoring well PS-6 south of the source area. The sporadic presence of low-level lead in the well field does not demonstrate a need for treatment for inorganics at the Ingalls Well.

f. Mercury was not seen in monitoring wells during the December 1992 and March 1993 sampling events. Mercury was seen at very low levels (0.2 ppb) at McNamee sample points MWB-1 and MWB-2 near the Ingalls Well during McNamee's April 1993 sampling event. The MCL for mercury is 2 ppb. Monitoring data do not demonstrate that the PMC source area is the cause of the low-level detection of mercury by McNamee or support the conclusion that mercury is a problem in the well field.

Comment PUBLIC-2 Mr. William La Cross commented on the Proposed Plan. He expressed his concern that the proposed alternative of air stripping would remove only one of the many contaminants. In addition, he stated that the remediation technique would not be acceptable to State and City Agencies. He requested that U.S. EPA construct a water system that would work so that the people of Petoskey can be protected.

Response PUBLIC-2 The air stripping technique selected by U.S. EPA will remove a family of chemicals known as volatile organic compounds (VOCs) from water. It is these VOCs that most threaten the water supply of the City of Petoskey. While other contaminants are present in the well field and in the water supply, the levels of contamination seen to date do not warrant treatment.

Because U.S. EPA has determined that treatment at the Ingalls Well is not necessary for these other contaminants, it does not mean that the agency is ignoring their presence. A careful evaluation was conducted of contaminants in ground water that would not be remediated with an air stripper. U.S. EPA found that the levels of these other contaminants are not likely to cause any exceedances of MCLs.

Air stripping is a proven technique for remediation of VOCs in water. According to the Michigan Safe Drinking Water Act, air stripping (also known as packed tower aeration) is one of the two Best Available Technologies (BAT) options for treatment of VOCs in ground water and is the sole BAT option for treatment of vinyl chloride should that contaminant become a concern as TCE degrades.

U.S. EPA understands that the City of Petoskey and the State of Michigan would prefer to see an alternative chosen that would replace the substandard Ingalls Well. However, U.S. EPA must evaluate all alternatives based on the nine criteria and select an alternative that is appropriate for the level and type of contamination present at a site. Because federal and state standards exist which permit "safe" levels of contaminants in water supplies, U.S. EPA cannot justify selecting a more costly remedy to address contaminants that are already at levels which are considered to be safe.

Comment PUBLIC-3 Ms. Rebecca Drake commented on the Proposed Plan. Ms. Drake noted that all levels of government should work together to arrive at a comprehensive solution to the contamination problem of the City's water supply. She stated that the solution should include replacement of the Ingalls Well with a surface water supply that would be free from all toxins. She also noted that care should be taken to ensure that any surface water supply is not impacted by radioactive particles from the Big Rock Nuclear Plant.

Response PUBLIC-3 U.S. EPA agrees that all levels of government need to work together on projects such as this. Governmental units must recognize the needs and limitations of other levels of government. However, any action to be taken by U.S. EPA must be supported by sound technical data and is limited by the authorities under which the Agency acts.

City and State officials would clearly prefer replacement of the Ingalls Well over any type of on-line treatment. Replacement of the water supply would not only eliminate exposure to contaminated ground water, but it would also eliminate the need for the City to address the existing construction and location deficiencies at the Ingalls Well. U.S. EPA is responsible for assuring that unsafe levels of contamination from the PMC source area do not impact the Ingalls Well and has proposed and selected an alternative to do just that. However, the State should not expect the U.S. EPA to "better" the remedy in order to address problems that are unrelated to the Superfund contamination.

Because U.S. EPA recognizes the fact that the City has concerns other than just the well field contamination, U.S. EPA has offered to make the capital cost of the selected remedy available to the City (through the State of Michigan) for use in replacing its water supply. The State and the City could then choose whether it is more beneficial to install treatment at the Ingalls Well or put the funds toward the construction of the Surface Water Intake/Treatment Plant that it has expressed an interest in building. This would not be inconsistent with the selected remedy, but would allow the State to "enhance" the Interim Action.

Comment PUBLIC-4 Mr. George Kurburski submitted comments on U.S. EPA's Proposed Plan. Mr. Kurburski felt that Alternative Two should be selected because it would address the fact that the existing Ingalls Well is vulnerable to contamination from other industries in the area. He stated that it would be inappropriate to use water from Lake Michigan since effluent from the sewer plant is discharge into the Lake within a quarter mile of where the surface water intake would be located.

Response PUBLIC-4 U.S. EPA agrees that the Ingalls Well is vulnerable to contamination from other area industries. However, it is the responsibility of U.S. EPA's Superfund program to address contamination that is already released into the environment. Replacement of the Ingalls Well with another well (Alternative Two) or a Surface Water Intake/Treatment Plant (Alternative 3) cannot be justified simply because the Ingalls Well is vulnerable to future contamination from other sources. However, U.S. EPA recognizes that the City of Petoskey may elect to replace the Ingalls Well because of existing Michigan Safe Drinking Water Act construction and location deficiencies which allow the infiltration of surface water and render the well vulnerable to future contamination.

E. SUMMARY OF SIGNIFICANT ORAL COMMENTS PRESENTED AT THE PUBLIC MEETING HELD ON DECEMBER 2, 1993

I. Mr. Ira Gabin of the Michigan Department of Public Health Division of Water Supply presented extensive oral comments at the public meeting:

Comment MEETING-1 Mr, Gabin stated that the proposed cleanup plan was flawed because it would not meet the requirements of the Michigan Safe Drinking Water Act. Alternative Four, air stripping, will not provide system reliability and would not function hydraulically.

Response MEETING-1 U.S. EPA has worked with the MDPH to arrive at a conceptual design for air-stripping that would meet the requirements of the Safe Drinking Water Act without correcting the existing deficiencies of the Ingalls Well. The description and costs presented in the Record of Decision Summary reflect the changes made based on MDPH comments.

Comment MEETING-2 Mr. Gavin stated that Alternative Four contained no mention of off-gas treatment or capture of the aerated TCE. Mr. David Linnear of the U.S. EPA stated at the meeting that off-gas treatment would be a component of the remedy.

Response MEETING-2 Based on a conservative evaluation of the levels of contamination that would be present in the treatment system influent, it is not likely that an off-gas treatment system would be needed. The maximum emissions from an air stripper at the PMC Site is estimated to be 140 pounds of total VOCs per year, well below the limits that warrant treatment. However, if operation of the air stripper demonstrates that treatment of the off gas is needed, it will be implemented.

Comment MEETING-3 Mr. Gavin stated that the Proposed Plan does not delineate the boundaries of the site. He stated that the Petoskey Manufacturing Company property, the Ingalls Well and the regional aquifer should be included as part of the site.

Response MEETING-3 The "boundaries" of the Site are not relevant to the Proposed Plan that was issued for the Interim Action. The Interim Action is meant to ensure that the City's water supply is not impacted by unsafe levels of contamination from the PMC Site. The Site itself is being addressed as part of a RI/FS being conducted by the State of Michigan. The "boundaries" of the overall RI/FS investigation have not been established as a line on a map, but are instead defined as including the extent of soil and ground water contamination from the PMC facility.

Comment MEETING-4 Mr. Gavin questioned how the U.S. EPA could move ahead with the Proposed Plan when the Remedial Investigation is not yet complete.

Response MEETING-4 The purpose of the Interim Action is to ensure that the City's water supply is not impacted by unsafe levels of contamination. While the Remedial Investigation Report is not yet complete, significant ground water sampling data has been collected and is available for public review. Based on the data collected to date, U.S. EPA believes that an interim action is appropriate at this time to address the VOCs that are known to exist in the ground water and are currently impacting the Ingalls Well.

To specifically address Mr. Gavin's concern about the timing of the Interim Action, the U.S. EPA Remedial Project Manager, Ms. Terese Van Donsel, spoke with Mr. Gabin during a meeting held in Lansing, Michigan, on May 31, 1994. Ms. Van Donsel asked Mr. Gavin whether the MDPH would prefer that the U.S. EPA not issue a Record of Decision until the Site investigation is complete. Mr. Gabin declined and stated that U.S. EPA should proceed with an Interim Action as planned.

It would of course be preferable to have all field work complete and the Remedial Investigation Report finalized and available to the public before taking any remedial action. However, to wait may risk allowing higher levels of contamination to enter the Ingalls Well.

Comment MEETING-5 Mr. Gavin stated that Alternatives Two and Three are clearly superior to alternatives Four and Five in terms of overall protection of human health and the environment because they eliminate exposure of the water supply source to the contaminants on the site.

Response MEETING-5 The No Action Alternative is considered to be protective of human health and the environment based on an evaluation of the current levels of contamination in the Ingalls Well and a comparison with MCLs. U.S. EPA feels that Alternatives Four and Five would also be protective of human health and the environment when properly constructed and operated.

Comment MEETING-6 Mr. Gavin stated that only Alternatives Two and Three comply with ARARs, specifically the Michigan Safe Drinking Water Act.

Response MEETING-6 Because of existing construction deficiencies unrelated to the contamination from the PMC Site, the Ingalls Well does not comply with the Michigan Safe Drinking Water Act. Correction of these deficiencies is not within the authority of U.S. EPA's Superfund regulations. Alternatives Three and Four can be designed and constructed so that the on-line treatment system portion of the water system meets State ARARs.

Comment MEETING-7 Mr. Gavin stated that Alternatives Two and Three are superior to Alternatives Five and Four in terms of long-term effectiveness and permanence.

Response MEETING-7 U.S. EPA believes that Alternatives Two, Three, Four, and Five would all be effective in the long-term, depending on the proper design and operation of the remedial systems.

Comment MEETING-8 Mr. Gavin stated that none of the alternatives address reduction of contaminant toxicity, mobility and volume through treatment.

Response MEETING-8 Alternative Five, and potentially Alternative Four, would indirectly and slightly address the reduction of contaminant toxicity, mobility and volume. Although the use of Air Stripping and GAC only transfer contaminants from ground water to another media (and thus do not reduce TMV), the regeneration of the filter carbon used in the processes would reduce the TMV through treatment. Alternative Five would therefore slightly reduce the TMV of VOCs found in ground water. Alternative Four would reduce the TMV of VOCs in ground water if levels of contaminants justify the treatment of the system off-gases.

Comment MEETING-9 Mr. Gavin stated that Alternatives, Two and Three are superior in terms of short-term effectiveness.

Response MEETING-9 The potential for exposures to humans and the environment would not be restricted by the No Action Alternative because no action would occur through treatment.

Alternatives Two, Three, Four, and Five are all expected to be effective in the short-term in reducing or eliminating the potential exposure pathways for human contact. Alternatives Four and Five may require the use of personal protective equipment (PPE) by workers and more rigorous monitoring to ensure that no contaminant exposures to the workers or the community are caused due to the remedial efforts.

Comment MEETING-10 Mr. Gavin takes issue with U.S. EPA's statement in the FFS that all alternatives can be implemented. Mr. Gavin stated that no alternative can be implemented without the approval and issuance of permits from the Department of Public Health. Mr. Gavin stated that because Alternatives Four and Five do not meet Safe Drinking Water Act requirements, permits cannot be issued.

Response MEETING-10 According to the MDPH, the City of Petoskey has the option of either finding a new water supply to replace the Ingalls Well or of installing treatment at the Ingalls Well to address the infiltration of surface water. U.S. EPA recognizes that continued operation of the Ingalls Well is dependent upon the City's future actions with respect to the Well's existing construction deficiencies. Correction of these deficiencies is not within the authority of the U.S. EPA Superfund program.

Alternatives Four and Five can be designed and constructed in such a manner that they meet the State ARARs. Installation of either treatment system would do nothing to correct existing deficiencies. Because Alternatives Four and Five would be implemented on-site, U.S. EPA would not be required to obtain permits for the construction and operation of the treatment systems. However, the Alternatives would have to comply with the substantive requirements of permits.

Comment MEETING-11 Mr. Gavin stated that Alternatives Four and Five are less expensive than Alternatives Two and Three, but Alternatives Four and Five are based on designs that do not meet Safe Drinking Water Act requirements.

Response MEETING-11 The conceptual designs and cost estimates for Alternatives Four and Five have been reevaluated in light of comments made by the MDPH. Subsequent follow-up conference calls with the MDPH have clarified State concerns. U.S. EPA believes that Alternatives Four and Five satisfy MDPH concerns with

respect to Safe Drinking Water Act requirements relating to contaminant treatment.

Comment MEETING-12 Mr. Gavin stated that Alternatives Two and Three are superior in terms of state and community acceptance.

Response MEETING-12 Comment noted. The State would prefer that U.S. EPA replace the water supply. By replacing the Ingalls Well with another well or with a surface water intake/treatment plant, Alternatives Two and Three eliminate the need for the City to address the existing construction deficiencies at the Ingalls Well. This would save the City of Petoskey a large amount of money and eliminate any rate increase to Petoskey consumers that may be necessary to fund the correction of problems that are unrelated to the contamination from the PMC source area. However, the Superfund cannot be used in this way.

The remedy selected must be appropriate for addressing the Ingalls Well contamination in a manner that is protective of human health and the environment, attains applicable or relevant and appropriate requirements (ARARs), is cost-effective and represents the best balance among the evaluating criteria. Alternative Four, Air Stripping, provides the "best balance" of tradeoffs with respect to the nine criteria.

Comment MEETING-13 Mr. Gavin concludes that Alternatives Two and Three provide the best balance of trade-offs with respect to the nine criteria. The Michigan Department of Public Health has gone on record that Alternative Three, the surface water treatment plant, is the best long-term solution for the City of Petoskey.

Response MEETING-13 U.S. EPA disagrees. Based on the U.S. EPA's evaluation of the nine criteria, Alternative Four provides the best balance of trade-offs with respect to the nine criteria. However, U.S. EPA recognizes that the City of Petoskey has other concerns besides the Superfund Site and acknowledges that the surface water treatment plant may remain the City's preferred option. Therefore, if the State of Michigan concurs with the remedy selected in this Record of Decision, the capital cost of the selected remedy could be made available to the State so that the remedy can be "enhanced."

Comment MEETING-14 Mr. Gavin stated that the solution must address the presence of all contaminants at the site and not just TCE.

Response MEETING-14 U.S. EPA disagrees. See Comment/Response GOVERNMENT-1, Comment/Response GOVERNMENT-6 and Comment/Response PUBLIC-1

Comment MSETING-15 Mr. Gavin stated that the solution must also address the existing construction deficiencies of the Ingalls Well.

Response MEETING-15 U.S. EPA disagrees. The City of Petoskey responsible for the existing construction deficiencies at the Ingalls Well.

II. Mr. Brad Brogren, also of the MDPH Division of Water Supply, spoke after Mr. Gavin and presented excerpts from correspondence concerning the site. Elements of the correspondence quoted by Mr. Brogren that are relevant to the evaluation of alternatives are presented below.

Comment MEETING-16 Mr. Brogren quoted from correspondence that states that it is the MDPH's position that the current 5 ppb Maximum Contaminant Level for TCE is based primarily on the laboratory practical quantification level, and thus a public health basis exists to reduce exposure below the MCL. MDPH has taken the position that water supplies should meet the Maximum Contaminant Level Goal of zero for known or suspected carcinogens.

Response MEETING-16 See Comment/Response GOVERNMENT-6

Comment MEETING-17 Mr. Brogren references correspondence from a MDNR geologist who concludes that there are four different sources of contamination within 1000 feet of the Ingalls Well.

Response MEETING-17 The Interim Action is evaluating the need for action at the Ingalls Well based on

contamination seen at the Ingalls Well and in the well field. Other sources of contamination will be discussed during the RI/FS. At this point in time, the PMC facility is the sole source area being investigated under the Superfund program.

Comment MEETING-18 Mr. Brogren stated that MDPH is concerned with past exposure levels that were higher than today's.

Response MEETING-18 Comment noted. See also Comment/Response GOVERNMENT-39.

Comment MEETING-19 Mr. Brogren stated that the Petoskey Municipal System is unable to blend the Ingalls Well water with the contaminant-free water from the Lime Kiln Well.

Response MEETING-19 Comment noted.

Comment MEETING-20 Mr. Brogren stated that if Lime Kiln were to go down for repair, the Ingalls Well would have to pump at a high capacity, He expressed concern that this higher pumping rate could cause additional contaminants to enter the Ingalls Well.

Response MEETING-20 Comment noted. U.S. EPA agrees that a higher pumping rate could cause levels of TCE in the Ingalls Well to increase. However, based on a conservative evaluation of the maximum levels of SVOC and inorganic contamination detected in the well field, U.S. EPA believes that it is unlikely that an increased pumping rate would cause MCL exceedances at the Ingalls Well for non-VOC contaminants. However, the carbon treatment contingency portion of the ROD addresses the State's concern that SVOCs could cause future MCL exceedances.

Comment MEETING-21 Mr. Brogren referenced a letter from MDPH Director Vernice Davis Anthony in which MDPH stated that U.S. EPA believes TCE to be the only hazardous substance associated with the Petoskey Site. Any proposed treatment of the Ingalls Well must address all area groundwater contaminants.

Response MEETING-21 U.S. EPA does not believe that TCE is the only hazardous substance associated with the Petoskey Site. However, based on ground water monitoring data and a comparison with MCLs, TCE is the only contaminant which seems to warrant treatment in ground water at the Ingalls Well.

Comment MEETING-22 Mr. Brogren stated that health risk assessments are not an exact science and that he does not want the Citizens of Petoskey to be used as guinea pigs for this type of study.

Response MEETING-22 U.S. EPA acknowledges that health risk assessments are not an exact science. U.S. EPA assumes that in mentioning a "study", Mr. Brogren is referring to the selection, construction and operation of an air stripper which would not address low level semi-volatile and inorganic contamination. U.S. EPA strongly disagrees with Mr. Brogren's assertion that selection, construction and operation of an air stripper to ensure that the water from the Ingalls Well would meet MCLs could somehow be considered a study which would use the citizens of Petoskey as "guinea pigs." Selection of an air stripper remedy is appropriate based on a careful review of the ground water monitoring data and an evaluation of the nine criteria. In fact, based on current levels of contamination at the Ingalls Well, the No Action Alternative is also considered to be protective of human health and the environment.

In evaluating the contamination in the well field, U.S. EPA is using MCLs as a basis for determining the acceptability of water for the Petoskey municipal water supply. MCLs are Standards that are consistently applied to all drinking water nation-wide; drinking water that meets the MCLs set forth in the National Primary Drinking Water Standards is associated with little or no risk of adverse health effects and is considered safe for drinking purposes.

U.S. EPA supports the MDPH's goal to work towards achieving MCLGs in all water supplies. However, U.S. EPA cannot require or fund water supply treatment to achieve non-enforceable goals.

U.S. EPA supports that since the promulgation of the Surface Water Treatment Requirements of the Safe Drinking Water Act on June 29, 1989, the State of Michigan had until June 29, 1994, to notify each community

where the water supply was under the direct influence of surface water. MDPH failed to issue its notification to the City of Petoskey by the June 29, 1994, deadline. In fact, no notification had been made as of the signature date of this Record of Decision.

The Ingalls Well is a shallow well dug in the shoreline of Lake Michigan. All parties agree that the well draws in surface water as it pumps, yet the MDPH has failed to provide timely notification to the City of the well's deficiency. Formal recognition of the fact that the well is under the influence of surface water would have allowed U.S. EPA to properly evaluate the need for an action at the Ingalls Well based on solid information concerning the future use of the well.

III. Mr. Bill Bradford presented verbal comments on behalf of the MDNR.

Community MEETING-23 Mr. Bradford stated that the Michigan Safe Drinking Water Act and the Michigan Air Pollution Act are ARARs for Alternatives Four and Five.

Response MEETING-23 As discussed before, The Michigan Safe Drinking Water Act and the Michigan Air Pollution Act are ARARs; however, U.S. EPA is not required to correct existing deficiencies or "better" the well and water distribution system. U.S. EPA's authority under Superfund would also not extend to operational and monitoring requirements unrelated to the air stripping treatment process and to contaminants from the PMC Site.

The Michigan Air Pollution Act is an ARAR for operation of the air stripper.

IV. Mr. Scott Schloegel spoke on behalf of Congressman Bart Stupak.

Comment MEETING-24 Mr. Schoegel stated that the U.S. EPA has not done all it can and that the Agency has been slow to incorporate state standards into consideration. He also stated that Senator Levin and Senator Riegle share Congressman Stupak's concern regarding the site.

Response MEETING-24 The State of Michigan has expressed repeated concern that U.S. EPA is using MCLs as a point of comparison for water quality at the Ingalls Well. However, use of MCLs is consistent with Michigan's Safe Drinking Water Act, which adopted MCLs. U.S. EPA has no authority to enforce MCLGs of zero and does not believe that MDPH policy is an appropriate justification for such an action.

In addition, U.S. EPA's responsibility is limited to those regulations that apply to the alternative selected. For example, the Michigan Safe Drinking Water Act outlines monitoring requirements for coliform bacteria. This is an issue clearly unrelated to the remediation of VOCs at the Ingalls Well and would not be the responsibility of Superfund.

V. Mr. Gary Molchan of McNamee Environmental Consultants,Inc. (McNamee) presented verbal comments. McNamee is the City of Petoskey's environmental consultant engineer.

Comment MEETING-25 Mr. Molchan stated that the U.S. EPA has disregarded correspondence concerning the nature of contamination in the well field. He also stated that U.S. EPA actions have not been "reflective of the positive environmental and social ethics" which he's accustomed to seeing in government.

Response MEETING-25 U.S. EPA has not disregarded correspondence concerning the nature of contamination in the well field. U.S. EPA has reviewed submitted information and has made the determination that levels of inorganic and semi-volatile organic contamination in the well field do not warrant treatment at the Ingalls Well. However, the carbon treatment contingency in the ROD addresses the State's concern that SVOCs could threaten the water supply of the City of Petoskey.

Comment MEETING-26 Mr. Molchan provided a brief history of the RI/FS work at the site. He discussed the original Scope of Work to be completed by PMC and questions why, "six years later, this report, the responsibility of EPA, is not completed and available to the public." He also stated that the presence of hazardous substances in the ground water and at the PMC is "contrary to the 1987 Order".

Response MEETING-26 U.S. EPA notes that the RI/FS is currently being conducted by the MDNR. In September of 1990, the MDNR requested to take the lead on the project and U.S. EPA has provided the funding necessary to perform the work. In December of 1993, U.S. EPA received a draft RI that was not of acceptable quality. U.S. EPA therefore chose not to finalize the document and instead allowed the data to be released. U.S. EPA is working with the MDNR to revise the draft RI so that it will be acceptable for release.

U.S. EPA is unsure how the presence of hazardous substances in ground water at the PMC Site is "contrary to the 1987 Order." The 1987 Order with PMC required the company to investigate Site contamination and evaluate cleanup options. When it became clear that PMC was not able to fulfill its responsibilities under the Order, U.S. EPA funded the MDNR to conduct the RI/FS. That work is still ongoing. Following theprocess outlined in the National Contingency Plan, a Record of Decision will be prepared to select cleanup alternatives for soil and ground water. At that point in time, Remedial Design and Remedial Action will proceed.

Comment MEETING-27 Mr. Molchan stated that EPA is withholding data and refuses to acknowledge information that "would alter the course of this remedy". He stated that the substances in groundwater present an unacceptable risk to the public. Mr. Molchan further stated that the MDNR and the MDPH consider the current and future risk to the public to be unacceptable.

Response MEETING-27 U.S. EPA is not withholding data. Even though the Remedial Investigation Report is not final, RI/FS sampling and monitoring data has been made public.

Comment MEETING-28 Mr. Molchan stated that key information was omitted from the Risk Assessment prepared as part of the Focused Feasibility Study. EPA has ignored synergistic effects of multi-contaminant exposure for the last 12 years and has failed to project possible health effects for residents that have been or will be drinking the water for periods greater than 30 years. EPA has therefore underestimated the risk present at the site.

Response MEETING-28 See Section 6.6 in the Record of Decision Summary for a discussion of uncertainties. See also Comment/Response GOVERNMENT-39.

Comment MEETING-29 Mr. Molchan stated that the proposed system will not treat all ground water in the well field. There are hazardous substances in the well field. Therefore, the proposed action is inconsistent with the NCP.

Response MEETING-29 The logic put forward by the commentor is not supported by the NCP. The Interim Action is meant to ensure that water from the Ingalls Well meets MCLs, which are the chemical-specific ARARs applicable for municipal water supplies. This Interim Action is in no way inconsistent with the NCP.

Comment MEETING-30 Mr. Molchan stated that levels of TCE and other compounds are increasing. TCE is transforming into DCE.

Response MEETING-30 It is misleading to say that levels of TCE and other compounds are increasing without relating that information to specific monitoring wells. Levels of TCE are fluctuating in monitoring wells as the contaminants travel through the well field.

Comment MEETING-31 Mr. Molchan stated that EPA is selectively monitoring and analyzing for hazardous substances. He claimed that "EPA data is consistent in recognizing TCE. But not on DCE and vinyl chloride as hazardous substances that exist on the Petoskey Manufacturing Site, and in the groundwater in the well field."

Response MEETING-31 U.S. EPA did not establish the ground water sampling program at the Site. The data used in the Baseline Risk Assessment for Ground Water were from samples collected and analyzed by the Michigan Department of Public Health and the Michigan Department of Natural Resources between 1989 and March 1991.

The recent ground water monitoring (December 1992, March 1993) that was conducted at the Site was performed by the MDNR and its contractor. This information has been qualitatively discussed in the Record of Decision

summary and in this Responsiveness Summary. U.S. EPA also qualitatively considered the April 1993 sampling data submitted by McNamee, although QA/QC information has not been provided.

Therefore, the fact that additional DCE and vinyl chloride detections were not found does not mean that EPA is selectively monitoring and analyzing for hazardous substances.

Comment MEETING-32 Mr. Molchan stated that the City has reduced pumping rates at the Ingalls Well to reduce the quantity of ground water drawn into the system.

Response MEETING-32 Comment noted.

Comment MEETING-33 Mr. Molchan stated that, "EPA is ignoring the MCL requirements that clean-up levels and proposed remedy must address all hazardous substances throughout the well field. These levels in the well field have exceeded the MCL and Act 307 ARAR requirements continuously since 1984. These are the requirements addressing drinking water quality, which is the basis of EPA's interim response.

Response MEETING-33 MCLs are the chemical-specific ARARs applicable for drinking water quality in the municipal system. The Interim Action is not meant to directly remediate ground water in the well field.

Comment MEETING-34 Mr. Molchan stated that the "deliberate misrepresentation of facts by the EPA and deceitful action by EPA will result in the knowing endangerment of public health if this proposed interim remedy option is implemented."

Response MEETING-34 U.S. EPA strongly disagrees with the statement made by Mr. Molchan. U.S. EPA has selected an Interim Action to ensure that contaminant levels in the Ingalls Well meet MCLs. It is U.S. EPA's opinion that Mr. Molchan has failed to recognize that this is an Interim Action that is not meant to address soil contamination at the Site or remediate the well field.

VI. Mr. Dean Mikulski (Director of Environmental Health, District Health Department Number 3, representing Antrim, Charlevoix, Emmet, Otsego Counties) presented verbal comments.

Comment MEETING-35 Mr. Mikulski stated that the proposed alternative is irresponsible and does not do anything to protect the public health and the future of the citizens of the City of Petoskey. He expressed concern with the presence of carcinogenic contaminants within the plume.

Response MEETING-35 The water in the Ingalls Well currently meets MCLs and is, therefore, acceptable in terms of State and Federal chemical-specific standards. The MDPH, however, has a stated policy of attempting to eliminate all chemical contamination from water supplies in the State of Michigan. U.S. EPA cannot enforce these goals for total elimination of contamination and must rely on enforceable standards to evaluate drinking water quality.

The VOC contamination in the well field has the potential of causing an MCL exceedance at the Ingalls Well. The selected alternative will address the presence of VOCs in the Ingalls Well. Based on the ground water quality data collected to date, it is unlikely that semi-volatile organic contaminants and inorganic contaminants will require treatment in order to satisfy MCL requirements. However, the carbon treatment contingency in the ROD addresses any site-related SVOC exceedances that may occur in the near future.

Comment MEETING-36 Mr. Mikulski said that it was unacceptable for EPA to not look at the vulnerability of the well. He stated that the Ingalls Well "merely is a dug well of 20 feet deep. That is getting, you're getting the water, a shallow source. Some bay water, depending upon the demands of that supply." He further stated that the Safe Drinking Water Act would not let a restaurant serving 25 people today use that supply. Even with air stripping or carbon treatment, the supply would be unacceptable.

Response MEETING-36 U.S. EPA agrees that the Ingalls Well is not an ideal supply for the City of Petoskey and that the well is indeed vulnerable to future contamination. U.S. EPA also agrees with the MDPH's conclusion that the Ingalls Well does not satisfy the requirements of the Safe Drinking Water Act. However, these concerns stem from existing construction deficiencies at the Ingalls Well. The issues are not the

result of contamination from the PMC source area and are not the responsibility of Superfund. The City of Petoskey is responsible for correcting the deficiencies of the well that are unrelated to contamination from the Superfund Site.

Comment MEETING-37 Mr. Mikulski stated that EPA has not attempted to address the multiple contaminants within the ground water. He said that the ground water is moving and the other contaminants would find their way into the water supply. EPA's proposal is "antiquated and obsolete."

Response MEETING-37 The Interim Action is not meant to remediate the well field. It will ensure that unsafe levels of VOCs will not enter the municipal water supply. U.S. EPA agrees with the commentor's statement that ground water is moving. Therefore, current levels of contamination in the Ingalls Well may not be representative of future contaminant levels. In an attempt to conservatively predict contaminant levels at the Ingalls Well, U.S. EPA has reviewed contaminant levels throughout the well field and carefully considered the fact that dilution would occur at the Ingalls Well as it operates. From this evaluation, U.S. EPA has made the determination that air stripping for VOC contamination at the Ingalls Well is the appropriate technology to ensure MCLs are maintained for the water supply.

Comment MEETING-38 Mr. Mikulski stated that the Health Department wants to reduce cancer risk to the lowest possible level. Therefore, there should be no TCE in the drinking water supply.

Response MEETING-38 See Comment/Response GOVERNMENT-6,Comment/Response GOVERNMENT-20, Comment/Response MEETING-22, Comment/Response MEETING-24, and Comment/Response Meeting 35.

VII. Mr. George Korthauer, the Petoskey City Manager, presented oral comments which included a brief history of the City's search for a reliable water supply and a brief history of the City's dealings with EPA.

Comment MEETING-39 Mr. Korthauer stated that there are people drinking contaminated water and instead of taking action the Agency is studying the problem to death. He further stated that "we can't convince the agency that's responsible for that solution to solve the problem."

Response MEETING-39 U.S. EPA is sympathetic to Mr. Korthauer's concern that the Agency is "studying the problem to death." The RI/FS technical process is long and involved but is necessary to gain a complete understanding of the extent of contamination. MDNR is continuing its evaluation of ground water and soil contamination.

Because U.S. EPA recognizes the City's concerns with regard to chemical contamination of the water supply, the Agency proposed and selected the Interim Action to ensure that water from the Ingalls Well will continue to meet MCLs. U.S. EPA does not have the authority to require or fund a cleanup to eliminate all carcinogenic contamination.

VIII. State Representative Pat Gagliardi, representing the 107th House District, presented oral comments at the public meeting. Because he could not remain for the public comment portion of the meeting, his comments were taken after the introduction to the meeting.

Comment MEETING-40 Representative Gagliardi stated that PMC was required to prepare a sampling plan, quality assurance project plan, a data management plan, a hydrogeological study, a surface water investigation study, and a site map (showing wetlands, floodplains, water, future drainage patterns, above- and below-ground utilities). Mr, Gagliargi stated that U.S. EPA was not holding itself to the same standards that it required of PMC when PMC was conducting RI/FS.

Response MEETING-40 When PMC demonstrated that it was not capable of properly conducting the RI/FS, U.S. EPA relieved PMC of conducting further RI/FS work. The U.S. EPA then entered into a State Cooperative Agreement with the MDNR in 1990, in which the MDNR agreed to perform the RI/FS.

The Focused Feasibility Study (FFS) and Baseline Risk Assessment for Ground Water prepared by the U.S. EPA were solely meant to evaluate the need for an interim action at the Ingalls Well. Basically, is the quality of water in the Ingalls Well acceptable? If it isn't, what should be done? The documents referenced by

Representative Gagliardi were not necessary for this interim evaluation.

The MDNR has already prepared many of the documents outlined by Representative Gagliardi (i.e., sampling plan, quality assurance project plan). The MDNR will continue its work on the RI/FS and prepare the additional documents/studies as needed to move the project forward.

Comment MEETING-41 Representative Gagliardi stated that U.S. EPA withheld data and has refused "to acknowledge information provided by the City, the Government, the Department of Public Health, the Department of Natural Resources."

Response MEETING-41 The U.S. EPA has not withheld data. In fact, the U.S. EPA authorized the MDNR to release RI sampling data (ground water results from samples taken in December 1992, March 1993) even though the RI itself was not approved. The U.S. EPA has evaluated information submitted by the City, the MDPH and the MDNR. However, U.S. EPA would like to note that Superfund authority extends only so far, and the U.S. EPA cannot correct problems unrelated to contamination from the PMC Site. It also cannot eliminate all trace contaminants from ground water that are below federal allowable levels.

Comment MEETING-42 Representative Gagliardi stated that U.S. EPA is trying to "force a cheap, unworkable remedy down the throats of the people of the community."

Response Meeting-42 U.S. EPA disagrees. If properly constructed and operated, Alternative Four will work to reduce the levels of VOCs in water supplied by the Ingalls Well. If U.S. EPA finds SVOC treatment to be necessary, Alternative Five will reduce the levels of VOCs and SVOCs in the water supplied by the Ingalls Well.

Comment MEETING-43 Representative Gagliardi stated that, "the agency knows that there are non-volatile organic compounds at the site that will not be removed by air stripping. The agency knows that because it has been told so repeatedly by Department of Natural Resources and the Public Health Department. Yet it continues to hide behind its bureaucratic shield, and persistently insists that its proposed remedy will work."

Response MEETING-43 Representative Gagliardi's statement was quoted by Mr. Michael Italiano in a previous comment and responded to above. See Comment/Response GOVERNMENT-6.

Comment MEETING-44 Representative Gagliardi stated that the U.S. EPA treated both the City of Petoskey and the State of Michigan with disdain during all the discussions concerning the Ingalls Well.

Response MEETING-44 U.S. EPA staff tried their best to explain that much of what was asked of the Agency was beyond the scope of the Agency's Superfund authorities. As discussed above in Comment/Response MEETING-43, U.S. EPA cannot eliminate all low-level contamination from the City of Petoskey's drinking water supply. In addition, the U.S. EPA Cannot correct existing construction deficiencies at the Ingalls Well that are unrelated to the Superfund Site. U.S. EPA hopes that, in the future, all governmental units will be better able to understand each other's authorities and limitations.

U.S. EPA ADMINISTRATIVE RECORD
PETOSKEY MANUFACTURING COMPANY SITE
PETOSKEY, MICHIGAN
ORIGINAL
11/24/93

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2	10/00/92	WW Engineering & Science	U.S. EPA	Baseline Risk Assessment for Ground Water, Revised	117
3	08/00/93	WW Engineering & Science	U.S. EPA	Focused Feasibility Study	111

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1	00/00/00	OHEA	U.S. EPA	Integrated Risk Information System (IRIS) {A Computer-Based Health Risk Information System available Through E-Mail}, Final	0
2	06/16/86	Dept. of Health and Human Services/ATSOR	U.S. EPA	ATSDR Health Assessments on NPL Sites, Draft	14
3	09/24/86	U.S. EPA	U.S. EPA	Guidelines for Carcinogen Risk Assessment (Federal Register, September 24, 1986, p. 33992), Final	13
4	09/24/86	U.S. EPA	U.S. EPA	Guidelines for the Health Risk Assessment of Chemica] Mixtures (Federal Register, September 24, 1986, p. 34014), Final	13
5	10/01/86	OSWER/OERR	U.S. EPA	Superfund Public Health Evaluation Manual, Final, OSWER Directive #9285.4-1	500
6	10/01/88	OSWER/OERR	U.S. EPA	Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Final, OSWER Directive #9355.3-01	390

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3	09/30/85	Adaskus, V., U.S. EPA	U.S. EPA	Charlevoix (MI) Record of Decision (Second Remedial Action)	23
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5	12/00/90	U.S. EPA	Public	Fact Sheet: Drinking Water Regulations under the Safe Drinking Water Act	48
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32	06/15/94	Molchan, G., McNamee Industrial Services Inc.	Van Donsel, T., U.S. EPA	FAX Transmittal re: Boring Logs	5
33	06/15/94	Engler, J., Office of the Governor	Browner, C., U.S. EPR	Letter re: Request for U.S. EPA's Approval of Michigan's Application to Redesignate the Southeastern Region as an Attainment Area for Federal Ozone Standards (Includes Discussion of Petoskey Municipal Well Field)	2
34	08/09/94	Denys, C.	Cleland, J., Michigan Department of Public Health	Letter re: MDPH's Issuance of a Ground Water Under the Influence of Surface Water Determination (UNSIGNED)	1
35	08/24/94	Earth Tech	U.S. EPA	Revised Cost Estimates for FFS Alternatives	13

U.S. EPA ADMINISTRATIVE RECORD
REMEDIAL ACTION
PETOSKEY MUNICIPAL WELL FIELD SITE
PETOSKEY, MICHIGAN
UPDATE #3
05/24/95

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	10/03/94	Ende, L. and Kouris, T., Ecology and Environment, Inc.	Kibeany, G., U.S. EPA	Letter re: Collection of Three Municipal Well Water Samples and One Blank Water Sample from the Ingalls Road Well w/Attached Analytical Data	31
2	03/03/95	Graczyk, L., Ecology and Environment, Inc.	Nabasny, G., U.S. EPA	Letter re: Collection of Six Municipal Well Water Samples free the Ingalls Road Well w/Attached Analytical Data	47
3	03/13/95	Matt, F., MDPH	Harding, R., MDRB	Memorandum re: MDPH's Comments on the U.S. EPA Draft Record of Decision	1
4	03/31/95	Engler, J., State of Michigan/Office of the Governor	Browner, C., U.S. EPA	Letter re: Cleanup of Manistique River and Harbor Site and the City of Peteskey Water Supply w/Attached Governor's Letter of February 10, 1995 Concerning Status of Cleanup Activities	3
5	04/21/95	Earth Tec	U.S. EPA	Capital Costs, Annual Operating Costs, and WPV Calculation for Alternative Four (Treatment of Groundwater Using Air Stripping) and Alternative Five (Treatment of Groundwater Using GAC Adsorption)	6
6	05/04/95	Browner, C., U.S. EPA	Engler, J., State of Michigan/Office of the Governor	Letter re: Cleanup of Manistique River and Harbor Site and Drinking Water at the Petoskey Well Field Site w/Attached Detailed Discussion of Points Raised in the Governor's March 31, 1993 Letter to U.S. EPA	4

UNITED STATES ENVIRONMENT PROTECTION AGENCY
REGION V

DATE: August 8, 1995

SUBJECT: Petoskey Municipal Well Field
Misplaced Comment on Interim Action ROD

FROM: Terese A. Van Donsel, RPM
OSF, Section 4

TO: James Morris, Attorney
SWERB, Section 4

On the morning of Friday, August 4, 1995, I was reviewing and sorting my Petoskey file, document by document. My goal was to reorganize the site file and remove draft ROD documents that are no longer necessary now that the interim action ROD has been signed. During the review of the documents in the site file, I found a one-page public comment form submitted by Mr. Michael Olson of the Petoskey Manufacturing Company. The comment form was found in a file containing inter-agency correspondence.

The comment form is not dated, but was stamped by the post office on December 3, 1993. The document appears to be a copy of an original. The comment was addressed to Mr. Dave Novak in the Office of Public Affairs.

I was provided the files of Mr. David Linnear when I took over the project in early 1994. When I took the site file, the public comments were grouped together. I do not recall seeing the comment from Mr. Olson. I believe that I would have remembered seeing the comment since it was submitted by the President of the Petoskey Manufacturing Company, the facility that has been identified as being the source of the well field contamination.

When I was preparing the Responsiveness Summary I looked through the file to verify that I had all comments. Unfortunately, I did not find the comment page submitted by Mr. Olson. When and how the comment ended up in an inter-agency correspondence file is unknown.

Mr. Olson's comments and agency responses are presented in the attached comment/response document. Mr. Olson's comments do not present any information that would require modification of the Agency's selected remedy. If you need any additional information, please contact me at 3-6564.

Attachment

cc: Administrative Record
Site File

PUBLIC COMMENTS
FROM
MR. MICHAEL E. OLSON
PETOSKEY MANUFACTURING COMPANY

Comment

Mr. Olson stated that the Environmental Protection Agency (EPA) should continue to monitor contaminant levels in the Ingalls Well instead of undertaking a clean-up. He further states that he doubts contaminant levels would exceed EPA limits.

Response

Chemical contaminants found in water from the Ingalls Well tap are below EPA's Maximum Contaminant Levels (MCLs). The contaminant of greatest concern, Trichloroethylene (TCE), has been found in the Ingalls Well tap at between 2 to 4 parts per billion (ppb), below the MCL of 5 ppb. However, relatively high concentrations of TCE have been seen in wells near the Ingalls Well (see Comment/Response GOVERNMENT-8 in the Responsiveness Summary). Because of the uncertainties associated with environmental monitoring and groundwater behavior, EPA has determined that contaminants could exceed MCLs (see Comment/Response GOVERNMENT-5 and Comment/Response GOVERNMENT-12 in the Responsiveness Summary). EPA has therefore determined that treatment at the Ingalls Well is necessary.

Comment

Mr. Olson states that the City's well is outdated and under capacity. He notes that the City of Petoskey "is looking at the RPA as the one with deep pockets to fill their needs that they should have been planning for several years."

Response

EPA agrees that the Ingalls Well is outdated and that the City of Petoskey is likely in need of additional capacity. EPA also agrees that it cannot use federal funds to correct existing deficiencies at the Ingalls Well. However, EPA has determined that there is a need to treat the water at the Ingalls Well to ensure that contaminant concentrations remain below MCLs. EPA has further determined that the State may elect to "enhance" EPA's selected remedy and use the funds towards replacing the Ingalls Well. See also Comment/Response GOVERNMENT-7, PUBLIC-3, MEETING-13).

JOHN ENGLER Governor
DEPARTMENT OF NATURAL RESOURCES
STEVENS T MASON BUILDING, PO BOX 50028, LANSING MI 68909-7528

ROLAND HARMES, Director

June 6, 1995

Mr. Valdas V. Adamkus, R-19J
Administrator, Region 5
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, illinois 60604-3590

Dear Mr. Adamkus:

The Michigan Department of Natural Resources (MDNR), on behalf of the State of Michigan, has reviewed the Record of Decision (ROD) for the Petoskey Manufacturing Superfund site interim action (IA) for the Ingalls Avenue Municipal Well, and the proposed remedy contained in that ROD. Michigan concurs with the IA remedy proposed in the ROD consisting of:

> On-line treatment of groundwater from the Ingalls Avenue Municipal Well through the use of air stripping with the use of carbon treatmant as a contingency in the event that, within 18 months of the signature of the ROD, site-related semi-volatile contaminants exceed maximum contarninant levels in the Ingalls well tap.

The state elects the cost-equivalency option as an alternative to the implementation of the proposed remedy. The state will be entering into an agreement with the City of Petoskey whereby they will agree to:

A. Design and implement the cost-equivalency option.

B. Pay all additional costs associated with the design, construction end operation end maintenence of such an alternate water treatment system beyond the $500,000 already allocated by the MDNR to the City of Petoskey for development of an alternate water supply.

C. Agree not to hold the State of Michigan responsible for payment of any additional funds associated with the alternate water treatment plant beyond the $500,000 already allocated.

The EPA needs to provide the state of Michigan with an explanation of the appropriate mechanism to transfer funds from the EPA to the state of Michigan and identify the responsibilities associated with "...assum[ing] the lead for supervising the design and construction of the new drinking water source, pursuant to the NCP at 40 § 300.515(f)(1)(ii)(B)."

We look forward to working together to accomplish this IA remedy at this site.

If you have further questions, please contact Mr. William Bradford, Chief, Superfund Section, Environmental Response Division, at 517-373-8815, or you may contact me.

Sincerely,

Russell J. Harding
Deputy Director
517-373-7917

cc: Mr. James Mayka, EPA
Ms. Karla Johnson, EPA
Ms. Terese Van Donsel, EPA
Mr. Chad Mcintosh, Governor's Office
Mr. Jeremy Firestone, MDAG
Mr. Alan J. Howard, MDNR
Mr. William Bradford, MDNR