Summary of public comments and questions from the April 28, 1997 public meeting at the town of Ainsworth, Wisconsin with DNR responses.

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Public Concerns Regarding the Proposed Crandon Mine & DNR Responses

A Summary of Public Comments and Questions
from the April 28, 1997
Public Meeting at the Town of Ainsworth, Langlade County, Wisconsin,
with DNR Responses

Wisconsin Department of Natural Resources
Bureau of Integrated Science Services
P.O. Box 7921
Madison, WI 53707

June 17, 1997

LIST OF ACRONYMS AND ABBREVIATIONS

CMC:	Crandon Mining Company
DEIS:	Draft Environmental Impact Statement
DNR:	Department of Natural Resources
EIS:	Environmental Impact Statement
GCL:	Geosynthetic Clay Liner
MODFLOW:	Computerized groundwater flow model
TMA:	Tailings Management Area
TSP:	Total Suspended Particulates, one measure of air quality
USGS:	U.S. Geological Survey

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INTRODUCTION

The Department of Natural Resources (DNR) wishes to thank all of the citizens who attended the April 28 public meeting at the Ainsworth Town Hall. We would especially like to thank the Town of Ainsworth Mining Impact Committee members who thoughtfully prepared in advance written questions on the proposed Crandon Mine. As was intended, the Department received many comments and questions during the meeting. Many of these questions raised issues that the DNR intends to analyze before publication of the Draft Environmental Impact Statement (DEIS).

Additional information is available in a number of recently updated mining information sheets available from the Department's Rhinelander (contact Cathy Cleland at 715-365-8997) or Madison (contact Shannon Fenner at 608-267-2770) offices. These are: *Potential Mining Development in Northern Wisconsin, The Cumulative Impacts of Mining Development in Northern Wisconsin, How a Mine is Permitted, Local Decisions in Mining Projects, Protecting Groundwater at Mining Sites, Reclamation and Long-term Care Requirements for Mine Sites in Wisconsin, How the Department of Natural Resources Regulates Mining, Addressing Public Concerns with Wisconsin's Laws Governing Mining,* and *Wisconsin's Net Proceeds Tax on Mining and Distribution of Funds to Municipalities.*

For a comprehensive description of how mining is regulated, refer to: *An Overview of Metallic Mineral Regulation in Wisconsin*, by Thomas J. Evans, published by the Wisconsin Geological and Natural History Survey (WGNHS) as Special Report 13, 1996 (revised edition). The document is available from the WGNHS office in Madison (phone: 608-263-7389).

The following pages contain DNR responses to the questions and comments that arose at the public meeting. Section I of the document includes answers to the questions submitted by the Ainsworth Town Board Mining Impact Committee. The questions from the Impact Committee are reprinted here as submitted - no attempt was made to alter or correct inaccuracies. Section II of the document includes answers to questions and comments from the audience. The Department has made an effort to include each comment that was raised verbally by reviewing the videotape of the meeting. Unfortunately, not all verbal questions from the audience were audible on the tape.

In the many instances that several individuals asked similar questions, an attempt was made to accurately paraphrase the general question while capturing the essential meaning. Of course, with the magnitude of comments received, it is possible that one or more questions have been accidentally overlooked. This is not the Department's intent, and any questions not answered within this document should be sent to Bill Tans at the following address: Bill Tans (SS/6), Department of Natural Resources, P.O. Box 7921, Madison, WI 53707. The questions and comments are written in bold type, and the Department responses follow each question in regular type. Where Wisconsin Statutes or regulations are paraphrased, the reader is advised to check the original language if more complete information is desired.

I. QUESTIONS PREPARED BY THE AINSWORTH TOWN BOARD MINING IMPACT COMMITTEE:

Water Quantity

1.

Q: The water budget for Rolling Stone Lake is incomplete– most particularly since the drawdown is going to affect its incoming streams. The water budget being used has been pieced together from various years in the 1980's and omits important data–e.g. all of the incoming waters are not included. Is the DNR planning to do a complete and coordinated study?

A: At this time, our ongoing review of the groundwater flow modeling indicates that there would likely be flow reductions to the incoming streams on the north side of Rolling Stone Lake due to the drawdown from mine pumping - these include Pickerel Creek, Creek 11-4, and Creek 12-9. Based on the work to date, the Department's concern is with potential changes in dissolved oxygen input to the lake during the iced-over conditions and not with the overall lake level in Rolling Stone Lake. Therefore, we are presently not intending to undertake a complete water budget for Rolling Stone Lake. Should our future work indicate that a water budget for Rolling Stone Lake is necessary in order to develop the Environmental Impact Statement (EIS) or prepare draft permits for the master hearing, we will ensure the information is collected. In addition, should the project be permitted, Rolling Stone Lake, the influent streams listed above, and the groundwater near the lake would be monitored to detect changes in the hydrologic system due to the drawdown. If changes were detected that would impact public rights to Rolling Stone Lake or its incoming streams, a Department-approved mitigation plan would have to be implemented by Crandon Mining Company (CMC) to remedy the problem.

2.

Q: Crandon Mining Company's (CMC) drawdown contours map figure 4.2.7-3 in its Environmental Impact Report (EIR) shows one foot and two foot contour lines moving away from Rolling Stone Lake in a northeasterly direction. Everyone knows that water flows downhill. Rolling Stone Lake's elevation is 1534 ft. while the one foot contour line is at 1560 ft. What raw field data is there to support CMC's assumption that the water flows away from the lake?

A: The predicted groundwater drawdown contours on figure 4.2.7-3 of the EIR are not water table or elevation contours. The figure does not depict water flowing away from Rolling Stone Lake. The predicted area of drawdown is that area which would experience a lowering of the water table due to groundwater withdrawal. This is in contrast to the area of capture or the "capture zone" of the mine. The capture zone is the area from which the water going into the mine would be drawn - in other words, the water flow could be reversed in this area. This area is much smaller than the area of drawdown and is located directly adjacent to the ore body and Skunk Lake.

3.

Q: Little Sand Lake has a down gradient on its south end. The north end has intermittent groundwater entering the lake plus an incoming stream. A control structure has been proposed at the outlet of Little Sand Lake, which is Creek 12-09, which flows into Rolling Stone Lake as one of its principal feeder streams. This control structure is supposed to maintain the lake level of Little Sand Lake and provide a water budget for Little Sand Lake. How can a water budget be determined by this structure when it can only measure the surface water overflow, and no raw field data has been collected for the down gradient into the groundwater?

A: A water budget for a water body involves accounting for inputs of water, losses of water or "outputs", and changes in storage within the water body. For a lake the primary inputs are direct precipitation, direct runoff, surface water flow and groundwater flow. The primary outputs are evaporation, surface water flow, and groundwater flow. Change in storage is signified by lake level.

For Little Sand Lake, a weir has been proposed to allow measurement of the surface water flowing out of the lake should the project be permitted. This structure would not be designed to control the lake level. If the project is permitted, water levels in the lake and groundwater levels in areas around the lake would be monitored. Evaporation, a difficult parameter to measure, would be estimated from site data or regional information. The main inputs to the lake surface water and direct precipitation would also be monitored. This allows a detailed water budget for the lake to be determined and would allow for greater protection of Little Sand Lake.

4.

Q: Upper Pickerel Creek has a unique ecosystem which is a valuable resource to Rolling Stone Lake and the Town of Ainsworth. Not enough raw field data has been gathered for this unique resource. Will this data be gathered? If not, why not?

A: The Department and others have collected much field data to establish baseline conditions in project area surface waters. A number of data gathering efforts are presently occurring. Since Pickerel Creek has not been proposed to receive treated wastewater, the primary way which it could be impacted is by the drawdown of groundwater. The likely environmental impact trigger in a surface water like Pickerel Creek would be water level or stream flow. If the water level or flow were adversely affected, mitigation would be necessary. If mitigation water were added to Pickerel Creek, it would have to meet all surface water regulations. In a general sense, Pickerel Creek could most likely be represented with data from other surface waters. If a specific reason arises for data collection on Pickerel Creek, the Department would ensure that the necessary data would be collected.

5.

Q: The project has inventoried 256 wetlands. It is our understanding from a recent DNR letter that wetlands will not receive the same mitigation as lakes and streams. How and how many of these wetlands are to be mitigated?

A: In order to clarify terminology used in discussing environmental impacts, "mitigation" and "wetland mitigation" should be differentiated. The term "mitigation" is

generally used to mean the efforts taken to avoid, minimize, and rectify project impacts on the human and natural environment. Numerous "mitigation" measures will be part of the proposal including alternative configurations of facilities to minimize impacts, erosion/sedimentation measures, the surface water mitigation plan, and re-vegetation of facility areas. In contrast, wetland mitigation may be used as a synonym for "compensatory mitigation." As used in this project, compensatory mitigation refers to federal requirements for compensation for unavoidable wetland losses that usually take the form of restoration, creation, or enhancement of other wetlands or former wetlands. Wetland mitigation is currently addressed as part of the permitting process at the federal level, while minimizing impacts to wetlands is addressed at the state level.

The state's mining laws and regulations do not have requirements for wetland compensatory mitigation as they do for lakes and streams. In fact, there is no state authority to consider or require compensatory mitigation for any type of project. The state mining laws require that mining development minimize impacts to wetlands and that the selected alternatives have the least overall environmental impact. Therefore, wetlands are not part of the surface water mitigation plan. Wetland impacts, however, are a major factor in evaluating the overall impacts of the proposal.

The EIS will address potential impacts to wetlands in the study area. Wetland impacts would occur due to the following activities: direct filling and/or excavation for construction of mine facilities; construction related erosion/sedimentation/trampling; trenching for pipelines; changes to surface water and runoff hydrologic conditions in the catchment or watershed of certain wetlands; and changes to groundwater levels due to drawdown associated with mine operation pumping. Our evaluation of expected wetland loss and other wetland impacts is not yet complete.

As part of the federal permitting process related to the proposed impacts to wetlands, CMC has proposed a compensatory mitigation plan to meet anticipated federal permit conditions. CMC has submitted a plan to the U.S. Army Corps of Engineers to restore approximately 57 acres of wetland on a site about 50 miles south of the mine site on the Shawano/Oconto County line. To date, DNR involvement with this proposal has been limited to consideration of Chapter 30 and 31, Wis. Stats., permit applications (permits are required for construction a low head dam in the old ditches) and some technical review of the wetland restoration plans. The outcome of the proposed restoration is not a consideration for the Department's review of the mining permit.

6.

Q: **Natural reproduction areas for brook trout in Creek 12-09, Creek 11-04 and Upper Pickerel Creek are going to be affected by the drawdown. How will this be mitigated?**

A: Based on our review of the groundwater flow modeling to date, it appears that there would be some effects on Creek 12-9, Creek 11-4, and Pickerel Creek from the mine drawdown. The Department has not yet made any predictions on the extent of those effects. In addition, the Department is currently working to identify public rights water levels in those streams so that an assessment of the need for mitigation can be made when the Department completes its predictions for changes in stream flow in those creeks.

The applicant is now developing a basic framework for a surface water mitigation plan. This plan will describe the sources and amounts of water that would need to be added to certain lakes and streams in order to maintain the public rights stage and prevent harm to the

stream. The initial concept that the mining company has proposed to the Department is that groundwater moving toward the mine would be intercepted and routed around the mine by pumping it to the streams and lakes that it would ordinarily reach if there were no mine. Major details of this plan that will need to be resolved include the source of any other water needed, the quality of the water to be used, and what impacts might occur around the source of this water.

In order to be effective at maintaining brook trout reproduction, mitigation water would need to be of sufficient quantity to maintain a continuous flow through spawning habitats during fall and winter. It would also need to maintain ice-free conditions through the winter months during brook trout egg incubation; groundwater is preferable in this regard. Stocking of brook trout to replace natural reproduction is not preferred.

7.

Q: The March 17, 1997 update to the EIR shows an upgradient over the ore body on its west end. In previous data it was located on the east end of the ore body directly below Little Sand Lake. What raw field data has been obtained to change the location of the upgradient?

A: To our knowledge, the bedrock hydrology has consistently shown that groundwater from the glacial aquifer system flows down into the bedrock (a "down gradient") on the east end of the ore body and that groundwater from the bedrock flows up into the glacial material (an "up gradient") on the west end of the ore body. The rate of flow is likely small, but until we have completed our work we will not be able to draw final conclusions.

8.

Q: In the technical meetings with the DNR and all of the other experts, the bedrock hydraulic conductivity has not been resolved. CMC claims that the fractures in the bedrock at the ore body run east and west and are not contiguous. Down hole camera data analysis is available today which would prove or disprove this statement. The size of the fractures and the amount of flow could also be determined. Will the DNR require this technology to be used? If not, why not?

A: In response to a Department request for additional information on the bedrock hydrology, the mining company undertook a packer test analysis of the bedrock in 1995. At this time we are working on our review of the site geology and the information input into the groundwater flow model. Pending the completion and outcome of that review, we will not be requesting additional data collection on the bedrock.

To our knowledge, there is no single downhole geophysical tool that could definitively determine the subsurface hydrologic characteristics in either the bedrock or the glacial material. There are several downhole tools that could possibly provide useful information. However, as with all geophysical techniques, substantial interpretation is required and there is usually no single "answer" determined.

9.

Q: Two crown pillar hydrological studies have been submitted by CMC. Both have been rejected by the DNR. What is the present status of the crown pillar hydrological studies?

A: The mining company is in the process of addressing the concerns the Department has raised with their previous analysis. A new, more detailed analysis of the crown pillar will be submitted by the company for review when it has been completed.

10.

Q: The Early Wisconsin till/saprolite pump test completed in 1994 has had no review by the DNR or other interested parties at the technical meetings in Madison. When will a review be completed?

A: A limited review was completed and mailed to the company and interested parties in a letter dated May 16, 1997.

11.

Q: CMC's current plans do not include the monitoring of groundwater over the ore body. Will the DNR require continuous monitoring wells at this location? If not, why not?

A: There will be monitoring required in the area of the ore body if the project is permitted. It is important to remember that the area directly above the ore body would be de-watered during most of the operational phase of the mine.

12.

Q: Are the various studies cited and proposed for surface water analysis and mitigation available for examination? If not, when will they be available?

A: All final studies and data pertaining to surface water analysis and mitigation are available for examination, but there is not one single coordinated document which contains all of them together. The DEIS issued by the Department would be the best place to review information since it will all be in one document and more efficient to review. The public will be notified upon release of the DEIS, likely in early 1998.

13.

Q: The October, 1984 water table map of the project has been reviewed and has been disagreed upon by the experts at many of the technical meetings in Madison. To date this has not been resolved. Will the DNR request a new water table map? If not, why not?

A: The October 1984 water table map that the mining company has prepared is not a "true" water table map in that wells sampled below the water table were used in drawing the contours. For creating true water table maps, wells must be sampled at the surface of the groundwater. Sampling below the water table can produce readings that are not true reflections of the water table because the readings can be affected by vertical gradients when there is sloping topography. According to the company, this data was used in creating the water table map in order to use as much of the already existing information as possible. Over much of the site, this variation from the true water table is <u>not</u> likely to be significant since the

elevation differences, which would cause differing readings, are small. The importance of using this data for the modeling effort likely outweighs the errors that resulted from sampling below the water table. Therefore, at this time, we do not expect to request that the "water table" map be redrawn.

Water Quality

14.

Q: Waste characterization work is incomplete. Will the DNR know all of the reagents used in the flotation processes for zinc, copper, lead, gold and silver, including their quantities, and what goes into solution coming out of the TMA? In addition, will the DNR require a study that mimics the entire flotation process, simultaneously using the combination of all of the metals, reagents and chemicals that are coming from the Crandon ore body? If not, why not?

A: The Department has requested additional information from CMC in regard to the reagents used in the milling process, including approximations of the volumes of reagents typically used. To date, CMC has identified the reagents proposed for use at the mill and has provided information concerning the potential health and environmental effects of those reagents. Finally, the tailings which have been used for waste characterization studies result from a simulation of the flotation process, using representative reagents. At this point, the Department does not anticipate requiring additional sampling and processing of ore samples.

15.

Q: What about the backfilled mine which will contain 22 million tons of tailings plus all of the reagents, etc. that the TMA will contain ? Are there any plans to remove the pore water from the reflooded area or to fill all of the passageways, shafts, working areas, etc.? In the EIR, CMC uses the term "tight filling." What is "tight filling?" Also, what equipment will be left in the mine?

A: Backfilled stopes (large vertical underground excavations from which ore is removed) would be designed to drain. Uncemented stopes would drain primarily through drainage pipes associated with the bulkheads enclosing the backfill material at the bottom of the shafts. Cemented stopes would be equipped with internal drainage lines in addition to those in the bulkheads. Drainage water would collect in the mine sumps and be pumped to the surface for treatment in the water treatment facility.

Currently, CMC is only proposing to fill the mined-out stopes in the ore body and the vertical shafts from the top of the bedrock to the surface. Other openings underground are not proposed to be filled.

The term "tight filling" refers to a method of backfilling which reduces the amount of open area above a backfilled stope. This is generally accomplished through careful selection of the backfill delivery point so the end of the backfill delivery line is at the highest point of the stope. Parallel breather lines would be run from the delivery point to the nearest bulkhead and slurried backfill would be added to the stope until the slurry flows out of the breather lines. Using this method it is possible to place backfill so there would be less than 2 feet of void space between the top of the backfill and the overlying rock.

The Department has requested, but not yet received, information concerning the types of equipment which might be left underground upon completion of mining.

16.

Q: Pyrite recovery studies have been done by CMC and found by them that pyrite recovery is unprofitable. Pyrite recovery studies should be reconsidered because of the long term problems associated with the tailings ponds and the unprotected backfilled mine. Currently there is no technology to prevent or control acid mine drainage. Will the DNR require additional pyrite recovery studies?

A: The Department must make a finding in regard to the potential marketability of the mine wastes, and profitability does play a role in that finding. However, we agree that profitability is not a key factor if full compliance with environmental standards cannot be accomplished with the applicant's preferred waste management practice. In 1984, the Department contracted with Dr. Andres Trevino to review the Davy-McKee report on waste marketability which examines a number of alternative waste management processes. The results of Dr. Trevino's review are summarized on pages 249-251 of the November 1986 FEIS. Several tailings reprocessing schemes were evaluated, each of which resulted in significant new environmental problems. In the absence of profitability, there was no environmental benefit which would justify pursuing these alternatives at that time.

The Department will revisit this subject in its preparation of the new DEIS, including updated market and technology information. However, our preliminary review indicates that our previous conclusions will not change. Additional pyrite recovery studies will not likely be required, but the original information will be reviewed in light of current situations. It is important to remember that the Department cannot require the company to implement a particular waste treatment technology. Rather, the company's proposals are evaluated on the basis of whether or not they would comply with all relevant environmental laws and regulations.

17.

Q: After researching volumes of data and confirming this with the Mineral Policy Center in Washington D.C., we have learned that there could be radioactive hotspots in this ore body. These hotspots will be treated the same as all other wastes. Why?

A: Based on project-specific analyses and evaluation of the geology of the Crandon Deposit, it is not anticipated that the tailings or other waste material will contain levels of radioactive constituents above what generally occurs as background levels in the area. While it is unexpected, if there were isolated "hot spots" within the ore body, the resultant tailings would be combined with other tailings material and ultimately be covered by subsequent layers of tailings in addition to the engineered cover system. Burial by subsequent layers of tailings and encapsulation by the engineered cover system would likely be effective in controlling the radiologic impacts associated with such isolated material.

18.

Q: CMC's EIR shows that contaminant transport modeling over the ore body will not be performed. This is unacceptable. Will the DNR require this modeling?

A: At this time, the Department has not begun a detailed analysis of the contaminant transport modeling report submitted by the mining company. Therefore, we cannot predict what the outcome of that review will be.

19.

Q: The process which was used to determine the location of the proposed Tailings Management Area (TMA) needs to be re-evaluated. An explanation needs to be provided as to why this location was chosen when: a) this is the highest surface land in the Pickerel Basin; b) this is a recharge area for the basin; c) this is a groundwater divide which sends water in four different directions; d) this is the source of our drinking water and e) it is surrounded by Hemlock Creek, Swamp Creek and a burr oak swamp. We want to have raw field data provided to us as to why all of the other 40 plus locations were not chosen for the TMA.

A: In order to understand the Tailings Management Area (TMA) siting process it is necessary to first consider the applicable rules and regulations. The following is a brief summary of some of the more important siting criteria:

- the physical characteristics, geology, and hydrogeology of the site must support a design that will not result in a violation of surface water or groundwater quality criteria;
- the site must provide for a structurally stable design;
- the site must not be within 1000 feet of a navigable lake, pond or flowage;
- the site must not be within 300 feet of a navigable river or stream;
- the site must not be within a floodplain;
- the site must not be within 1000 feet of a state trunk highway unless screened;
- the site must not be within 1200 feet of a private or public water supply well;
- the site must not be located over a known mineral resource;
- the site must be large enough so that the exterior of the facility berm will not be within 200 feet of any property line;
- site selection criteria must include the minimization of the disturbance to wetlands;
- site topography must allow for provisions for the diversion and management of storm water runoff around the facility;
- If practicable, the site should be located in the same watershed as the mine surface facilities.
- tailings pipelines should be as short as practicable;
- the site must not be within areas having the presence of endangered or threatened species unless these species can be firmly reestablished elsewhere;
- the identification and protection of archeological areas must be accomplished; and
- the parcel must allow for a facility design which will meet all other local, state and federal rules and regulations including local zoning requirements.

In addition to the above, there are some practical siting criteria that the company must consider, including the following:

- the land must be available from a willing seller;
- suitable access routes to the site must be available;
- the parcel must be large enough to contain most if not all of the waste plus provide for up to 1200 feet of buffer area around the facility;
- splitting the waste facility into two separate sites could be considered, but three or more locations would probably be unacceptable because of the extensive network of pipelines and haul roads that would be required; and
- if possible, the site should contain enough suitable soil so that soil from off-site is not required for construction and reclamation.

The initial TMA siting process conducted by Exxon Minerals resulted in the selection of 35 sites, within approximately 12 miles of the mine site, which alone or in combination would be of suitable size. Approximately half of the selected sites were located in wet areas and the Department advised the company that these were unsuitable due to wetland, groundwater and surface water considerations. The remaining sites were evaluated and ranked based on the above criteria resulting in the final selection of the proposed TMA location. None of the other sites were found to have significantly superior soil, geologic or hydrogeologic characteristics that would have resulted in additional protection of the groundwater or surface water if these sites had been selected. Documentation covering the investigation and site selection process is contained in several reports and is available for public review at the Department's regional headquarters in Rhinelander upon request.

20.

Q: The TMA cap and liner described in section 4.2.5.10 of the EIR (revised March 17, 1997) is as follows: "Geo/syntec (Dec. 1996) the HDPE geomembrane liner and cap at the TMA facility should function as designed for a long time (e.g. hundreds of years) without deterioration in performance." This is all that is said. The chemical nature and properties of the liner are never detailed. Also, what are the effects of subsiding over time, temperature and season on the composition of the liner?

A: A more extensive description of the components of the liner and capping systems of the TMA are contained in Addendum No. 3 to the TMA Feasibility Report, dated January 30, 1997. This report is available for review at the Department's Rhinelander and Madison offices. Chapter 4 in that document discusses the P40 till layer and the geosynthetic clay liner (GCL) components, and Appendix F discusses several aspects of the longevity of polyethylene geomembranes.

For the liner, there should be little in the way of subsidence, since the soils in the area of the proposed site are already heavily consolidated. The density and the gradation of the soils in the TMA area, as well as the depth to groundwater, would make for solid construction conditions. Settlement of the tailings is expected, but much of the major settlement would occur during the waiting period prior to placing the final cover. As the tailings de-water, they would consolidate and settle, becoming more physically stable. The leachate collection system would aid this consolidation by removing liquid prior to capping, resulting in reduced settling following capping.

In the long term, burial by till soil cover and tailings would serve to protect the liners of the TMA cells from the effects of seasonal and temperature changes. The tendency of polyethylene geomembranes to expand or contract with temperature is limited by soil cover. In the short term, the sideslopes would be more likely to feel the effects of seasonal changes, since the base grades would be covered by water and tailings soon after each cell is constructed. The sideslopes would likely be subject to freezing for a few years until the tailings cover them. GCLs have been shown to self-heal cracks formed by freeze-thaw effects. The P40 fraction soils should also be resistant to cracking. Both would be protected by the geomembrane and cover soil from the effects of drying. The 4.5 feet of cover soil, vegetation, and snow would protect the capping layer from nearly all freezing temperatures. Occasional freezing would do no damage to the capping layers.

21.

Q: The original plan for the TMA liner called for 3 feet of natural clay liner. We are now down to a GCL which is 1/4 inch of sodium bentonite plus 12 inches of screened Early Wisconsin till and a 60 ml. plastic sheet. This is supposed to last thousands of years, but no one can show us a single facility to date using this method which has not contaminated the groundwater. CMC is asking us to accept unproven technology to protect our groundwater, surface water and drinking water. Is this acceptable to the DNR?

A: The original proposed design for the TMA called for only one foot of natural clay in the liner and final cover. The Department gave CMC a choice of using a more conventional thickness for natural clay (3-4 feet in the liner and 2 feet in the final cover) or to use a combination of GCL and on-site low-permeability granular soils to substitute for the clay. The Department also discouraged CMC from using natural clay, since the amounts required would be enormous and the transport distances likely lengthy. Use of natural clay would lead to considerable disruption at one to several clay borrow sites and would likely lead to the obliteration of numerous wetlands or other protected resources located over the borrow sites. Due to the size of the TMA cells, it would take an extensive length of time to place and compact the clay, and the relatively short construction season on the project site could lead to poor compaction. Also, compacted clay on sideslopes would be more affected by freezing than would GCLs.

Bentonite clay has a very low natural permeability and has been used for containment facilities for decades. For instance, bentonite blended with natural soils has been used in Wisconsin and other states for sewage and water retention lagoons. The use of bentonite clay in the form GCLs is a more recent development, propelled largely by manufacturing innovations and recent changes to federal law dealing with municipal solid waste landfills. Regulatory acceptance of GCLs has similarly become widespread, due to the results of research on their properties when used as liners.

Laboratory tests have indicated that GCLs have lower permeability levels than clay liners. GCLs also have some significant construction advantages and significantly reduce the length of construction of liners. For these reasons, among others, the Department has begun to receive and approve landfill proposals for use of GCLs in liners or final cover systems. These uses are for composite liners or final cover layers, with the GCL used in conjunction with geomembranes. Although the Department does prefer the use of the GCL to the use of natural clay for the above reasons, the acceptability of the current proposal to the DNR has not been determined. The final analysis, when completed, will be presented in the DEIS.

22.

Q: Mercury level studies in groundwater and sediments of Little Sand Lake, Creek 12-09 and Rolling Stone Lake should be performed using the latest low level measurement technique. Is the DNR planning to do these studies? If not, why not?

A: At this time, the Department is not planning to perform low-level mercury studies on these waterbodies. The Department has collected much low-level mercury data from around the state and from many areas related to the mine review. Sufficient data exist for the review of impacts, etc. on these waterbodies. We have found that, for surface waters, the concentration of mercury does not vary to a great extent. Low-level mercury concentrations in groundwater are very difficult to measure accurately. Groundwater mercury has been measured in northern Wisconsin, and efforts are currently underway to measure groundwater mercury nearer to the tailings site. Representative sediment data exist for the review of impacts to surface waters in the area of the site.

23.

Q: There has been no collection of baseline data for the private wells in the Town of Ainsworth pertaining to heavy metals. Will such baseline data be collected? If not, why not? Also, some town residents have wells which are located on and in bedrock and produce low volumes of water. What measures will be taken to prevent impacts to these wells?

A: Groundwater chemistry data from monitoring wells in the site area was collected during the initial Exxon investigation and again by CMC in 1994. This data was verified by the Department through the collection of split samples. The results of this testing provide an indication of the average and range of groundwater quality in the area and is of value for permitting and impact evaluation purposes.

For regulatory purposes including damage claims related to private water supplies, the Department will need fresh data on a well-specific basis. It is intended that this sampling would occur just prior to the start of mine construction, if permits are granted. The extent of private well sampling would be based on the Department's review of the groundwater flow model and resulting forecast of likely impacts.

The Department is aware of the bedrock wells in the area, and we have construction reports filed by the well drillers covering most of these water supplies. We have reviewed the well construction reports along with other hydrogeological testing that has been done in the area. The information indicates that the privately owned bedrock wells would be affected by the mine pumping in the same way that the sand and gravel wells in the nearby area would. This is due in part to the fact that all of the bedrock water supplies are located a significant distance from the proposed mine and, secondly, that water in the upper bedrock fractures is not effectively separated from the water in the sand and gravel aquifer.

The mining company is liable for any damage to water supply quality or quantity caused by its mine pumping activities. Potential impacts would be determined using groundwater flow modelling and long-term monitoring. The Department would, to the fullest extent possible, require the mining company to deepen or replace identified wells prior to the actual impact.

MODFLOW Modeling

24.

Q: The current MODFLOW model has been modified to the maximum without any corresponding peer review. We believe that this is not a proven way of modeling. Is the DNR willing to accept this unproven method of modeling?

A: The Department recognizes that the MODFLOW program has been modified by the mining company in order to complete their analyses. To the best of our knowledge at this time, they kept us informed about the modifications they were making. We are reviewing those modifications as we review the flow model. Should any of the modifications be shown to be inconsistent with principles of groundwater hydrology and what we know about the site, we will require that the changes to MODFLOW be revised or removed. One of the specific modifications made by the company was to the Lake Stage Package, a component used in MODFLOW. We are doing a very detailed review of the revised Lake Stage Package, since it is fundamental to the model's ability to predict lake level changes from the mine de-watering. In addition, we have made it clear to the company that the revised Lake Stage Package should be published in a peer-reviewed journal as soon as possible.

25.

Q: In the geological cross section I-I, which is south of Swamp Creek, CMC made an assumption to change this cross section from coarse outwash to fine outwash based on drill hole No. RR-2, because the model was not converging. Additional raw field data with drillholes needs to be obtained to verify this assumption inasmuch as drill hole No. RR-2 is located considerably north of cross section I-I. Will the DNR request raw field data?

A: During the spring of 1996, the mining company was having difficulty getting the model to calibrate in the area north of the TMA along Swamp Creek. They suggested assuming a low-hydraulic conductivity zone in the glacial outwash in this area, but the Department indicated that making such an assumption in that area without data to support it would be unacceptable. The company then looked at more of the existing field information from that area and found that the RR-series borings showed that the outwash had thinned considerably. Accordingly, they revised cross section I-I' to take that information into account. This enabled them to proceed with the model without having to assume the outwash conductivity had changed in that area. At this time the Department is reviewing site geology and information inputs to the groundwater flow model. Pending the completion and outcome of that review, we will not be requesting additional data collection in that area.

26.

Q: Creeks 13-15 and 13-02, which are trout reproducing creeks and springholes feeding Rolling Stone Lake, are not being used in the model. Why not? Is there raw field data which shows that these springholes will not be impacted?

A: Creek 13-2 enters Rolling Stone Lake just to the south of the public landing. It is on the edge of the area potentially affected by the mine drawdown. For that reason, the Department will be looking at the creek to determine how it should be placed in the project's mitigation plan. The creek, however, is quite small and likely does not play a substantial role

in the regional groundwater system. Therefore, leaving it out of the regional flow model is probably not unreasonable.

Creek 13-15 enters Rolling Stone Lake further to the south and is removed from likely affects from the drawdown. It also is a small creek and likely does not play a substantial role in the regional groundwater system.

27.

Q: CMC has calibrated the groundwater model in EIR Section 4.2.5.2 (revised March 13, 1997) based on the following data:

a. Long term pump test-24 days at Duck Lake (1991-Golder)
b. The drought in the late 1980's
c. Early Wisconsin till/saprolite pump test of 1994 (Foth & Van Dyke)
d. Bedrock pump test-1981 (Camp, Dresser & McKee)
e. Water table map of 1984

This is the foundation of the model. This data has not been agreed upon or accepted by the DNR or the other interested parties at the technical meetings in Madison. When will the DNR revisit this issue?

A: The Department is in the process of reviewing the groundwater flow model. Calibration information data was collected and presented to the Department at various times in the past. The Department oversaw the data collection and reviewed, to some extent, the content of the submitted reports. At this time, we believe the above referenced information to be useful in the modeling work and in the review of the project. The accuracy of all the conclusions or the validity of all the data is not certain. However, that does not mean that the information is of no use in this process. Until and unless further issues regarding this information arise during our review of the model, we do not intend to address the validity of the information in any future technical meetings.

28.

Q: CMC is using data in the model concerning precipitation which is being collected from the North and South Pelican weather stations north of Rhinelander. The evaporation studies are from the Rainbow Flowage in the west central part of the state. In 1986 both Exxon and the DNR used the data from the Laona weather station. Why is the data from the Laona site not being used this time around? Better yet, why has a weather station not been located at the project site?

A: The mining company has chosen to use the information from the Pelican weather stations in their groundwater work. The company has the right to use what they determine to be valid information in their work. The Department has no way to determine the reason the company chose to use the Pelican data over the Laona data. Recently the U.S. Army Corps of Engineers hired a consultant to review available climatological information and to determine the best available data sets. The Department will review that report when it becomes available and will likely use the information recommended by the Corps' consultant.

The company did collect some on-site weather data during the first year of the project. Though the Department requested otherwise, the company decided to remove the installation.

In order to have a detailed precipitation record, the Department has requested that the U.S. Geological Survey (USGS) set up a precipitation gauge on their lake gauge on Little Sand Lake during ice-free periods.

29.

Q: CMC shows in its contaminant transport model for particle tracking in the reflooded mine that the particle comes out of bedrock at the west end in approximately 600 years [Practical Worst Case (PWC) scenario]. The particle was placed at the bottom of layer 6. Why wasn't it placed at the top of layer 5 which is beneath the crown pillar? Is the DNR going to rerun the model with the particle at the top of layer 5?

A: At this time, the Department has not begun a detailed analysis of the contaminant transport modeling report submitted by the mining company. Therefore, we cannot predict what the outcome of that review will be.

Air Quality

30.

Q: The air quality in our community is pristine, per your DNR 1995 Air Quality Study. For example, particulate matter (total suspended particles or TSP) has a numerical reading of 9 according to the air monitor which was installed at the site where Creek 12-09 enters Rolling Stone Lake. This is the best in the state. CMC proposes in their Practical Worst Case (PWC) to bring this reading up to 116.5. At the Flambeau mine, which is basically a large gravel pit with no milling processes or tailings ponds, the particulate matter reading was 191 in December, 1995. The maximum allowable standard is 150. With a reading of 116.5, CMC will be permitted to contaminate our air by nearly 1200%! We are concerned about the health, safety and welfare of our people, our wildlife and our vegetation. What is the DNR's position on this issue?

A: The National Air Quality Standard for protection of human health regarding total suspended particulates (TSP) is set at 150 $\mu g/m^3$/hr. CMC has indicated in their submittals that the worst case analysis predicted a TSP 24-hour average value of 116.5 $\mu g/m^3$. This worst case hourly average meets the standards, but does indicate a potential increase in TSP concentrations within the study area. The Air Management program is conducting its own analysis of project related TSP emissions. These results will be presented in the DEIS.

The commenter is confusing the estimated <u>annual</u> average "9 $\mu g/m^3$" value reported in the Wisconsin 1995 Air Quality Report with the worst case air impact analysis conducted by CMC's air consultant which provides results as both <u>annual</u> and <u>24 hour</u> averages. Annual averages are expected to have substantially lower values than 24 hour event averages because 24 hour values are significantly affected by extreme meteorological conditions. The same 1995 air quality report source used by the commenter indicates the three TSP monitors in the area near the proposed mine captured existing 24-hour averages ranging between 137 and 52 $\mu g/m^3$.

The results of the DNR's work in modeling air contaminant transport will be released in the DEIS. If it is shown that the project would exceed air quality standards under the Federal Clean Air Act and State air quality regulations, it could not be permitted.

31.

Q: **Methyl/mercury air deposition studies have not been completed. When will they be?**

A: CMC has not been required by the Department to collect atmospheric sampling of methyl mercury because the proposed mine/mill is not expected to be a source of atmospheric methyl mercury.

Socio-economic

32.

Q: **A socioeconomic study of our area must be performed before issuing the WDNR Draft Environmental Impact Statement (DEIS) and the results should be included in the DEIS. CMC's study in the EIR shows no impacts to our area, either environmentally or economically. This is not the case.**

A: The Department agrees that the potential socio-economic effects of the mine must be studied for inclusion in the DEIS. To do this, the Department has hired two consultants with expertise in the area of social and economic impacts. Both consultants are with the University of Wisconsin - one from the Rural Sociology department and one from the Agricultural and Applied Economics department. These two consultants will be assisting the Department with review of CMC's studies, review of the relevant literature, and further study of the region around Crandon. The results of their work will be included in the DEIS.

33.

Q: **The Town of Ainsworth receives forest crop revenues. What happens to our forest lands with reduced air quality and water quality and groundwater drawdown in future years? The effect on these revenues is an indirect impact to the town which has not been addressed.**

A: Based on our preliminary calculations of air quality impacts to the Town of Ainsworth, assuming the Crandon mine were built, there would be no measurable effects on tree growth and resultant income from timber harvest. Air quality impacts should be limited to an area two or three miles from the mine and should not be visible impacts. Similarly, changes in surface water quality resulting from the project would be small and local and should not affect tree growth and timber harvest.

Most forest land in the township depends on rain and snow for the water necessary for growth, not groundwater. Some forested wetlands located where groundwater is discharged to the surface could be affected by the groundwater drawdown. However, these wetlands are some of the least productive in terms of timber harvest, and some of them would benefit from surface water mitigation that would be required of the Crandon Mining Company. Therefore, economic impacts to Ainsworth Township from reduced timber harvest would likely be negligible.

34.

Q: Property values in our area are a direct result of our clean air and water. The mine and its impacts will degrade both our air and water quality, and thus negatively affect our property values. Who will resolve this?

A: Our draft EIS will contain an analysis of impacts to property values should the project be developed. Development of an industrial facility in a woodland setting such as at the Crandon project site would change local land uses. As a result, there could be both positive and negative effects on land values close to the project site and along the main transportation corridor. Some tracts of land, such as developable land in favorable locations, may become more valuable because of their potential for more intensive uses. Other tracts, subject to noise, prolonged development, increased traffic or visually affected by the project, could decrease in value, although we believe this zone would be limited to areas within one to two miles from the mine.

The laws and rules that apply to air quality and surface water and groundwater protection, for example, are comprehensive. Therefore, we would not expect property values to decline in the Town of Ainsworth from environmental impacts of the mine, because such impacts should be prevented by existing regulations.

35.

Q: Our two main local industries are logging and tourism. These will be negatively affected with the degradation of our clean air and water and increased noise levels due to the mine. In addition to our concerns about water quality and quantity and air quality, we request that a four season 24 hour per day noise study be completed.

A: Any air and water quality impacts on tourism and logging will be addressed in the DEIS. However, the DNR has no authority to regulate noise. Noise impacts are regulated by local authorities, not by the DNR. A noise study was conducted in the 1980s by Exxon Coal & Minerals for their previous permit application.

36.

Q: The mine and its inflow of people will have an effect on the Elcho School District, our volunteer fire department, our volunteer rescue squad and our local roads. How will this be addressed?

A: Refer to Response #32 in Section L. You are correct in that additional people would move to the three county region and that some of them would likely choose to live within the Elcho School District, should the Crandon project be approved and built. The Department will provide estimates of the numbers of workers (and their family members) who would move to each municipality, and thus into each school district, and evaluate the impacts to each municipality. To make this determination, factors that may attract workers to settle in any one area would be considered. These include access to shopping centers, proximity to quality schools, available and affordable housing, distance to project site, and quality of roads. The company predicts that relatively few new residents would choose to settle within the Elcho School District, and thus the impacts to the school district, fire department and rescue squad should be minimal. If this were the case, the very small traffic increase in the Town of Ainsworth should have no more than a negligible affect on road maintenance. The

Department, with the help of its socio-economic consultants, will be evaluating these claims and including the analyses in the DEIS.

37.

Q: The mining project will require great volumes of reagents and chemicals to be transported to the mine site to be used in the mining and milling process. Is it known which mode of transportation and routes will be used to transport these reagents and chemicals? Local communities will need to have personnel who are properly trained in the case of an accident en route. Who will be responsible for training these people?

A: The actual routes and mode of transportation for various chemicals and reagents would depend on which suppliers are selected by CMC. These arrangements have not been made and would generally not be finalized until closer to the onset of operations, if the project is actually developed. CMC has indicated that the materials would either be shipped by rail or truck and would most likely originate from Chicago, Green Bay, Milwaukee, St. Paul or Duluth. Materials must be shipped using licensed transporters and in accordance with all applicable regulations, particularly those administered by the Department of Transportation. Under DOT regulations, the transporter must take immediate action to contain any spills and is also responsible for subsequent cleanup and the elimination of hazards to the environment and public health as a result of a spill. The DOT regulations also require that emergency response information accompany any shipping papers, so that local response agencies would be aware of the immediate threats posed by any spilled material as well as the initial methods for handling the spilled material.

Q: So, in summary, we feel that the socioeconomic issue has not been addressed. Will the DNR require that a new and complete socioeconomic study of the Town of Ainsworth be performed? If not, why not?

A: The socioeconomic impacts to the Town of Ainsworth have been evaluated as part of the company's socioeconomic impact analysis in the Forest-Oneida-Langlade County region. We are conducting an analysis of that study and may arrive at somewhat different conclusions, but a separate study of Ainsworth is not likely warranted due to the relatively low level of impacts forecasted.

General

38.

Q: Currently Broken Hill Proprietary Co. Ltd of Australia (BHP) has been granted an exploration permit near Bishop Lake by the Town of Nashville. This location is approximately 1/2 mile north of the Town of Ainsworth and approximately one mile west of the proposed Crandon mine. Are there going to be any studies by the DNR as to the possible cumulative impacts?

A: The Department will evaluate the potential of cumulative impacts relating to mine development in its DEIS. However, mining exploration occurring in a particular location has almost no bearing on future mining development. A valid cumulative analysis must be

based on what is known now, not on speculation. Following nearly 30 years of mineral exploration, only four ore bodies have been discovered in Wisconsin (one, the Flambeau ore body, has been mined, and site reclamation is occurring) along with a number of other areas of mineralization. The approximately 20 areas of mineralization are either too small in tonnage or too poor in mineral grade to be considered economical to mine in the foreseeable future.

39.

Q: The wastewater treatment plant will remove contaminants that cannot be transported to the Wisconsin River. These contaminants will be placed into the TMA. The TMA will leak forever into our groundwater. Why is it acceptable to put these contaminants into our groundwater and drinking water, but not acceptable to put them into the Wisconsin River?

A: The fate of wastewater contaminants would be as follows: Contaminants removed by the wastewater treatment system would accumulate in the solids that settle out in the clarifier or would be captured in the sand filter. The solids would consist of metals that precipitate out in the lime and sulfide treatment system as metal hydroxides and metal sulfides. The clarifier solids and backwash from the filter system would be pumped to the tailings ponds for disposal.

For the metals to contaminate groundwater, two things would have to happen. First, the metals must redissolve, which could occur under acidic conditions. And second, there would have to be a substantial leak from the tailings ponds. The TMA must minimize the formation of acid, be lined to minimize leakage, and have a leachate collection system to capture drainage from the tailing ponds before it could leak out. If a leak occurs, metals in an ionic state would likely attach to the soil and be relatively immobile.

While the Department has not yet completed its groundwater impact analysis, it probably would be acceptable to dispose of the wastewater treatment solids in the TMA because that proposed facility should be capable of isolating wastes from the environment for the long-term. The composite liner beneath the TMA would allow only tiny amounts of leakage to ultimately reach the groundwater and then move over a period of many years away from the site. By law, the tailings ponds must provide containment to prevent the release of the metals back into the environment at concentrations exceeding groundwater quality standards beyond the compliance boundary. Also, the Department would not allow the contamination of drinking water supplies. Groundwater contaminant transport modelling would predict whether groundwater and drinking water quality standards would be complied with.

40.

Q: In EIR Section 2.2 (revised September 29, 1995) CMC is requesting an exemption from testing for "organic substances, turbidity, radioactivity, asbestos, fluoride, bacteria, color, corrosivity, foaming agents and odor." Has any raw field data been submitted to verify that these items will not occur at the proposed Crandon project? Is this requested exemption valid?

A: These exemptions would not be granted or denied until the master hearing process. CMC would be wholly responsible for justifying such exemptions. The Department has not made any determinations on the validity of such exemptions. Possible justification for

the one of the requests might include existing information showing no asbestos fibers and no significant amounts of radioactivity above background levels. Therefore, testing for these may not be necessary.

The company must provide evidence to support its requested exemptions at the master hearing. All parties may provide relevant information addressing the exemptions. The decision-maker may only grant an exemption if no other environmental protection law or rule would be violated and if the exemption is consistent with the provisions of the mining law.

41.

Q: Currently state groundwater quality protection standards allow a 1200 ft. compliance boundary in areas where mining wastes will be stored. No other activity or a private citizen is allowed this, including hazardous waste facilities. Does the DNR support this excessive compliance boundary?

A: The current rules and the recently proposed revisions to Ch. NR 182 include a 1,200 foot distance to the compliance boundary and the design management zone, respectively. In light of the manner in which mining waste facilities are evaluated and monitored, the Department feels that the dimensions of the compliance boundary and design management zone are reasonable and provide for protection of the groundwater. An owner of a mining facility may not cause adverse impacts to groundwater under adjacent properties, may not adversely affect another property owner's water supply, and may not cause adverse impacts to surface water quality.

Langlade County Zoning Ordinances & Town of Ainsworth Metallic Mining Regulations

42.

Q: Little Sand Lake is located partially in Langlade County and the Town of Ainsworth. This section of the lake as well as the Town of Ainsworth are covered by Langlade County zoning ordinances and the Town of Ainsworth Metallic Mining Regulations concerning the degradation of ground and surface waters, wetlands and air quality. In addition, noise pollution, lake levels and stream levels are covered. How can this project conform to the Langlade County zoning ordinances and the Town of Ainsworth Metallic Mining Regulations?

A: Typically, ordinances are intended to apply only to activities located within the jurisdiction of the municipality which has adopted the ordinance. The extent to which the County and the Town are empowered to enforce their ordinances on an activity which is physically located outside their jurisdictions must be answered by the attorneys for the County and Town. They, not the Department, are responsible for providing legal advice on enforcement of their ordinances. One additional point is worth mentioning. Municipalities can only enforce those regulations which they are empowered to administer. The Wisconsin Supreme Court has regularly stated that waters of the State are held in trust by the State of Wisconsin. Municipalities have only very limited authority to enforce ordinances which attempt to regulate uses of state waters. See also response #43, Section I.

43.

Q: What plans of mitigation for the loss of aquatic habitat and fish in Creek 12-09, Creek 11-04, Upper Pickerel Creek and Martin Springs and the reduction in dissolved oxygen levels in Rolling Stone Lake due to the drawdown are being contemplated? How will these mitigation efforts be coordinated with our current non degradation standards in our (Ainsworth, Langlade County) mining ordinances and regulations?

A: Should Rolling Stone Lake need mitigation for the loss of dissolved oxygen during ice-covered periods due to mine drawdown, the most likely scenarios involve either adding water to creek flows or installing an aerator in the lake. There are also other potential mitigation options that the mining company may propose. At this point, since we are still reviewing the groundwater flow model, we are not certain mitigation would be necessary. However, under the mitigation plan, the company would likely be required to identify possible mitigation systems for all three creeks identified in the question.

The Department is unfamiliar with the "non degradation standards" in Town of Ainsworth and Langlade County mining ordinances and regulations. However, if these standards are intended to apply to waters of the State, they are likely unenforceable. The Wisconsin Supreme Court has regularly ruled that local municipalities have only very limited ability to regulate waters of the State. Those limited powers must be expressly authorized by the Legislature. If there is any doubt regarding the validity of these local ordinances and regulations, the attorneys representing the Town and County should be consulted.

II. QUESTIONS & STATEMENTS FROM THE AUDIENCE:

The DNR'S Responsibility

1.

Q: The DNR and the State can't make decisions about polluting our groundwater and surface water - this is our water, not yours.

A: The law clearly states that both surface and groundwater are "waters of the State" and belong to all citizens of the state, present and future. Accordingly, the state Legislature is responsible for protection of the waters of the State. It, in turn, assigns regulatory responsibility to various state and local governmental bodies. By interpretation of the Wisconsin Supreme Court, under what is called the Public Trust Doctrine, almost all decisions regarding surface waters have to be made at the state level of government. The strongest statement by the Court was made in 1951 in Muench v. Public Service Commission. This decision has only been strengthened by subsequent Court rulings. Under these Supreme Court decisions, it would be unconstitutional for the Legislature to delegate significant decision-making regarding surface waters to local units of government.

As with surface waters, the Legislature is also responsible for protection of groundwater. However, it has greater discretion as to which units of government it may assign responsibility for groundwater protection. In fact, the Legislature has provided for a greater level of county involvement in groundwater protection than exists for surface water protection. Nevertheless, the Legislature has assigned most of the responsibility for protection of groundwater to state agencies. With regard to mining activities that could affect groundwater, the Legislature has given explicit direction in the form of state statutes that the Department of Natural Resources is responsible for assuring that groundwater standards are adopted and maintained in order to protect the public health, safety and welfare.

2.

Q: Who is the DNR working for - the mining company or the people of Northern Wisconsin? Why don't we people of northern Wisconsin have a say in whether or not mining will be allowed?

A: The Department, as an executive agency, works for all the people of Wisconsin. As implied by the Constitution of the State of Wisconsin, the will of the people is expressed in the laws passed by the elected legislature and approved by the elected governor.

All interested parties will have the opportunity to participate in the Master Hearing process from which a decision on this project will be made.

3.

Q: Why is the DNR working with the company to make sure its plans can be permitted? You should just say no if their proposal wouldn't meet requirements.

A: An applicant for any permit, license or approval from the Department of Natural Resources has the right to know how the Department interprets its laws and regulations, and how it intends to regulate the proposed activity. The DNR wants to be very clear with an applicant on what the laws and regulations require. Because of Wisconsin's thorough and

comprehensive regulations, a mining applicant must obtain a large number of permits, approvals, and licenses from the DNR in order to mine. It takes several years for an applicant to plan for the design, construction, operation, closure, reclamation and long-term care of a mining site that meets these requirements. In addition, it could be a waste of our time not to completely explain our regulatory authority if it meant an applicant had to redo a study or analysis or gather additional data. The bottom line is that if the mining proposals cannot meet the standards, we must just say no.

4.

Q: How can the Department do a proper job of protecting the environment, when it is the product of a union between the Wisconsin Conservation Department and the former Department of Development? It seems like the two arms pursue different goals.

A: In the late 1960s, the Wisconsin Conservation Department was merged with a number of programs within the Department of Resource Development to form the existing Department of Natural Resources. This change was made to promote closer cooperation between state programs that had direct impacts on natural resource management in the state. The remainder of the Department of Resource Development exists in the present-day Department of Commerce, which promotes economic development in the state.

Everything the Department of Natural Resources does is based upon laws passed by the legislature that govern the management of our state's natural resources. If a law is passed by which established programs would operate at cross purposes, and the heads of the agencies involved cannot agree on a solution satisfactory to citizens, then it would most likely need to be resolved through action by the Legislature, or by the Legislature's Joint Committee on Administrative Rules.

5.

Q: In over 15 years, the Department still doesn't have the answers to our concerns. How long will it take?

A: In the mid-1970s, Exxon Corporation initiated the mining permit review process, which was extended by a major review of the mining law. In late 1986, the company withdrew its application and the Department ceased to work on it. It has been only about three years since the current mining permit application review and EIS process began. As everyone can appreciate, evaluating the potential impacts of mining is a very complex process. The Department, as a part of its review, has sometimes required that Crandon Mining Company provide additional information on underground geological conditions, stream flows, rare plants and animals, etc., which requires additional time. Hiring outside expert consultants to assist the Department in its review also requires additional time. Furthermore, those involved in the Department's review process are highly recognized professionals with other commitments that may prevent them from giving necessary reviews their immediate attention.

The Department will have more detailed answers to the more technical questions posed during this review process once groundwater modeling issues are settled. We anticipate release of a Draft Environmental Impact Statement in early 1998. This date is an estimate, not a deadline, and may be extended. Overall, Department staff will be able to answer the balance of the many questions raised by this project only after staff are satisfied that we have looked into every conceivably important aspect of this project.

6.

Q: There are valuable wetlands here, and lots of publicity on the importance of protecting wetlands. How can DNR allow wetland destruction by the mining company when it won't allow the public or other industries to harm wetlands?

A: Primary authority for wetlands regulation is with the federal government under Section 404 of the Clean Water Act. In Wisconsin, there is no single comprehensive wetland protection law. However, wetlands protection occurs through several administrative codes and authorities.

For most projects that will impact wetlands, though the federal government (US Army Corps of Engineers) has permitting authority, the state has significant influence over decisions through what is called state water quality certification. That is, before a federal permit can be granted, the state must certify that the project meets state water quality standards.

It is not true to say that the DNR won't allow harm to wetlands, since projects can be permitted if the project proponent can show that there is not a "practicable" alternative that avoids wetland impacts *and* that the project will not result in significant adverse impacts to wetland functional values. Projects that meet these legally established standards are permitted.

The laws protecting wetlands are different for metallic mining than for other activities since a mineral deposit is set in a fixed geographic location and some impacts to nearby wetlands as a result of mine development may be unavoidable. The state mining regulations (specifically Chapter NR 132, Wis. Adm. Code) specify that impacts to wetlands must be minimized. This is accomplished in several ways: 1) through selection of facility (e.g. tailings management area, mill, transportation corridors, pipelines and utility rights-of-way) placement alternatives that reduce wetland impacts; 2) through detailed evaluation of the functional values and characteristics of wetlands within a proposed mining project to be certain that, where viable alternatives are available, wetlands with the highest values receive the least amount of impact; and 3) through a showing by the applicant, with DNR agreement, that the area selected as the mining waste site is one with the "least overall environmental impact." Impacts to wetlands are a major factor in evaluating the overall impacts of the proposal.

In conclusion, to meet wetland protection requirements, the proposed mine project will need to address the requirements of NR 132 to meet State law, and those under Section 404 of the Clean Water Act, to meet Federal law.

7.

Q: The DNR does have decision-making power about the regulations. What about the DNR's obligation to recommend better standards to the Legislature if the public demands it?

A: It is the responsibility of the Department to implement directives it has received from the Legislature. This is accomplished in Department actions and decisions consistent with statutory language. If the statutory language requires further clarification or criteria development, the Department promulgates administrative rules, which have the effect of law. In addition, the Department regularly makes recommendations to the Legislature regarding the need for legislation. Those initiatives usually relate to matters of a technical nature about which the Department has special expertise. However, most of the discussion regarding changes in laws associated with mining involve <u>policy</u> issues. In our representative form of

government, when citizens believe policy changes are needed, it is their responsibility to petition their legislators. It is through this process that the will of the public is evaluated. For this reason, agencies in the administrative branch of government should await the legislative decisions, then implement them as the Legislature has directed.

The Department has recently proposed changes to the mining rules. Statewide hearings on the two proposed revisions were held in May. First, the proposed change to NR 132, Wisconsin Administrative Code, would require a mining permit holder to establish a trust fund to guarantee the availability of funds for necessary remedial actions. This fund would assure the availability of funds for implementation of necessary preventative measures and remedial actions in the case of unanticipated environmental contamination. The trust agreement would cover costs associated with occurrences such as spills, releases from the mine and waste facilities, damaged water supplies and periodic replacement, if necessary, of waste facility containment features (such as a cover system).

Second, proposed changes to NR 182, Wisconsin Administrative Code, would relate to the groundwater quality requirements for mining projects. The Department is revising the rule so that mining operations would be subject to the groundwater quality provisions of ch. NR 140, the rule which implements the state's groundwater law. This is the same rule that applies to other regulated activities in the state, such as landfills and wastewater treatment facilities. Under the proposed revisions, mining sites would be required to be designed and operated in a manner which would comply with the same numerical groundwater standards as other industries.

These proposed rule changes were proposed by the Department as a result of petitions from legislators requesting that the DNR analyze these existing rules and recommend changes.

The Mine

8.

Q: **Exactly what "state-of-the-art" technology is being proposed for this mine? (And for analyzing its impacts??) Why would any of them be able to prevent the type of mining-disaster that has taken place historically?**

A: The basic principals of environmental control and reclamation have been available for a long time. The problem was that until about twenty years ago, no one forced mining (and many other industries) to employ the environmental control technology that today everyone accepts as being essential. While it is true that the environmental revolution has produced some significant improvements in environmental control and analytical technology, most of what is being proposed could have been accomplished fifty years ago using materials and equipment that were available at that time if the public, by law and regulation, had insisted that environmental protection at today's standards was necessary.

Wisconsin has comprehensive requirements in its laws and rules relating to mining projects that mandate environmental protection before approval and construction of a mine. If a mining project were approved, intensive environmental monitoring is required during and long after operations. We have the ability to intercede in the event of early evidence of an unexpected problem. Finally, the state's requirements for financial responsibility, bonding, insurance, reclamation, long-term care and perpetual liability will help to ensure that

environmental disasters will not occur and that the state's citizens would not have to pay financially.

9.

Q: How big is the ore body? Is it on the surface or underground?

A: The ore body and proposed mine would be underground. The 55 million ton ore body runs east-west for a length of approximately 4,900 feet, has an approximate width of 100 feet (N-S), and extends to a depth of about 2,200 feet below the surface. It is covered by 100 to 230 feet of unconsolidated glacial drift.

10.

Q: Is a short-term economic gain worth the risk of a long-term environmental catastrophe?

A: The mining laws and natural resource protection laws that guide the Department's review of the mining proposal reflect the general public consensus that short-term economic gain is in no way worth the cost of long-term resource harm. What is at issue is whether the best means available to predict the impacts of any particular mining plan are able to provide us with an accurate picture of what would happen. As we have stated many times before, if the mining proposal cannot meet the environmental protection standards in state laws and administrative codes, the Department cannot issue a permit to mine.

11.

Q: What recourse is available to citizens once the permits are issued and the mine begins operation?

A: Let's assume that the master hearing is over and the written decisions have been issued. The decisions on permit issuance or denial or on EIS adequacy may be appealed either to the Department Secretary or, more likely, to the Circuit Court. The Circuit Court decision may be appealed to the Appeals Court, and ultimately to the Supreme Court if one or more of the litigants wishes to pursue a challenge.

Now let's assume that court actions on the permitting decisions and EIS adequacy have been resolved, and the project is being constructed or operated. Under these circumstances, citizens may initiate a lawsuit against the mining operator, if they believe that mining laws are being violated, or against the DNR if they believe the DNR is failing to appropriately regulate a mining operator.

There are other ways citizens can utilize the legal system if they are affected by mining operations. Sections 107.30-107.35, Wisconsin Statutes, define the special provisions governing the liability of mining operations for damages they cause to persons or property. Mining-related damages are defined to be death or injury to a person or property caused by environmental contamination from emissions, seepages, leakages or other discharges from mining operations, and encompass injury as a consequence of land surface subsidence. The law specifies the procedure for filing mining damage claims. The mining law also provides a recourse for individuals who claim their water supply has been damaged by a mining operation. Such individuals may receive relief in the form of an alternative water supply and limited financial compensation based on the review of their complaint by the DNR.

12.

Q: Crandon Mining Company won't be around forever. When they leave or go out of business, what recourse would people have to recover any economic losses or correct any environmental damage?

A: Environmental damage and economic losses are two separate issues. In the case of environmental damage, the state would be responsible for recovering the necessary money from the company to repair the damage. Should CMC go out of business, its parent companies, Exxon Coal & Minerals and Rio Algom, would become responsible for the site. This means that they would be required to mitigate any environmental damages.

In addition, the bonds and other financial sureties held by the state for this purpose are independent of the company, and are available to the state regardless of the solvency of the mining company. Recent proposed changes to the mining rules include a provision for a dedicated trust fund that would be funded by the mining company prior to and during operations. A financial institution would manage the trust, and only the Department could withdraw funds. The trust fund would be designed to be self-sustaining and remain in place after operations ceased, for as long as needed. Its purpose is to serve as a backup source of funding to cover remedial actions related to unanticipated spills, releases from mining waste facilities, and replacement of damaged water supplies.

Even if the company were sold, the new owner would be responsible for any environmental problems. However, the original operator might still be held liable for costs related to environmental contamination which occurred as a result of their actions. In regard to the long term, an owner's responsibility for management of a mining waste site never ends.

Economic losses would be addressed at the discretion of the State Mining Impact Fund which is funded by the net proceeds tax while the mine is operating.

13.

Q: What would be the cumulative impacts of more than one mine in operation?

A: In Wisconsin, four ore bodies (areas of mineralization that may be economically feasible to mine) have been located and defined. One, the Flambeau Mine near Ladysmith, is nearing the end of production and will be closed and reclaimed well before any other mine could open. Therefore, the maximum impact mining scenario that can currently be foreseen would occur if all three remaining ore bodies were mined simultaneously, although since exploration is continuing, it is possible that one or more additional ore bodies could be found. However, to speculate that ore bodies might be discovered in the future would be without basis. Also, the Department's experience demonstrates that even if another ore body were found today, it could not become operative for a minimum of seven to ten years. The four known ore bodies are located across 100 miles of northern Wisconsin in Forest, Oneida, Rusk, and Taylor Counties. If all were ever developed, no mine would be closer than 30 miles to the next nearest mine.

Cumulative natural resource impacts would be expected to be minimal, since each individual mining project would have to meet state requirements protecting surface water, groundwater, and air quality. The total acreage potentially disturbed by mining development at the four known ore bodies would be approximately 1,400 acres. Natural habitat, including forests, swamps, wetlands, and other types would be destroyed during the mining projects. However, Wisconsin's mining law requires reclamation of the mining site and waste disposal

standards at the compliance boundary or property line, whichever is closer, the proposed design cannot be permitted.

Groundwater recharge under the lined portion of the TMA would essentially be eliminated by the liner and cover systems. Storm water runoff from the cover is proposed to be directed to adjacent wetlands where it would contribute to local recharge and runoff. The lined portion of the TMA represents less than 3% of the total available recharge surface area of the local groundwater system.

18.

Q: None of the technologies being proposed for this project have been proven. Has the TMA liner material been tested over a long period of time? Has the proposed TMA liner material been tested holding tailings from sulfide mines? Has it been tested in similar soil conditions? Why should we risk our clean water to unproven technologies?

A: As noted in Response #8, Section II, the basic principals of environmental control and reclamation have been available for a long time. While it is true that the environmental/technological revolution has produced some significant improvements in environmental control and analytical technology, most of what is being proposed by CMC today could have been accomplished fifty years ago using materials and equipment that were available at that time. However, until about twenty years ago, no one forced industries or municipalities to employ the environmental control technology that today everyone accepts as being essential. The major technological difference would be in the improved precision for the monitoring of all phases of the design, construction, operation and closure and the ability to analyze this data with the use of high speed computers.

Like many other industrial technologies in current use, the liner material has been tested for durability using accepted simulation methods. The individual components have each been used successfully in other waste disposal systems. However, the overall TMA design is one that has not been used before. The processed till layer and bentonite in the GCL are natural materials that have already survived for thousands of years and would not be expected to change. The polyethylene geomembrane and polypropylene or polyesther geotextiles have expected survival lives of several centuries under buried conditions.

The mine cannot be permitted if it is determined that it would violate groundwater and surface water protection standards, even if the violation would not be expected to occur for hundreds of years into the future.

19.

Q: What can be done when our air and soil are polluted?

A: If this project is permitted, it would have an extensive environmental monitoring program that would require detailed groundwater and surface water monitoring on and around the facility. In addition to groundwater and surface water monitoring, the mine and tailings facility would be monitored closely to make sure they are performing as designed and predicted. This monitoring should detect discharges of contaminants to groundwater or surface water quickly. Should a significant release of contaminants occur that is not quickly detected, the monitoring program would find it prior to movement outside the watershed. At that point, a clean-up program would be initiated. Depending on the type of release, clean up could involve repair of the tailings facility, installation of cutoff walls, pumping of groundwater

for treatment or to control movement, installation of reactive walls, or many other techniques.

20.

Q: How would freeze-thaw damage to the TMA liner be prevented, considering that frost depth can be as great as eight feet?

A: The upper surface of the tailings may freeze, but the depth of freezing would be limited, since wet tailings would take longer to freeze than dry soil. The continued discharge of tailings during the winter months would limit the depth of freezing as well. The tailings surface that freezes one winter would be buried and protected before the next winter. Actually, freezing tailings has beneficial effects, since this would aid in densifying the tailings and reducing the moisture content. The tailings would not freeze directly to the top of the geomembrane, since the geomembrane would be protected by a layer of till soil.

Successive winters would result in freezing during the winter of the upper few feet of the final cover system on the top of the TMA and the soil embankments on the sides of the TMA. The soils would thaw each spring. The effects of freeze-thaw patterns on these soils would be the same as on other soils in the area. The depth of freezing on these soils would not be as deep as might be expected around buildings, since foundations artificially deepen the zone of freezing. The capping layer would be protected by enough soil to prevent freezing conditions from reaching it during most winters. None of the components of the capping layer would likely be damaged by occasional freezing.

21.

Q: While doing monitoring around the mine site and TMA, how would the Department determine how much seepage and pollution of groundwater is too much?

A: Assuming the project were permitted and operating, groundwater beneath and around the TMA would be monitored. If there were changes from the baseline water quality, the company would have to evaluate the source and future impacts of the change. We would compare the actual change to the predicted change. Based on this analysis, we would make predictions on whether the groundwater standards would be met at the compliance boundary. The same process would be followed for monitoring groundwater quality around the abandoned mine. If changes in water quality were predicted to exceed standards, the mining company would have to implement an acceptable remediation program or would be required to cease the activity causing the problem.

The Groundwater Drawdown and Well Impacts

22.

Q: What will be the impact to shallow (15 to 35 feet) and deep (down to 225 feet) wells if the drawdown will be one foot or more? How will we still have any water left in our wells with all the groundwater that will be withdrawn? Who will replace the water if our wells go dry?

A: Impacts to water wells depend on the amount of the groundwater drawdown at the well site, the depth of the well, the depth to water, and the location of the pump relative to

the groundwater table or surface. The DNR will make worst-case predictions of groundwater drawdown and compare the predictions to the locations of known water wells. We would require the Crandon Mining Company to provide an alternative water supply to the dozen or so potentially affected wells prior to significant underground mine development.

Monitoring of the groundwater levels would continue as underground mining begins. Should the groundwater drawdown extend further than predicted, we would require the company to take action on the additional affected wells. Based on this course of action, we would not expect anyone to lose their water supply.

In addition, the mining law includes a process through which landowners may seek relief if they feel the quality or quantity of their water supply has been affected by a mining operation. If the mining operation is found to be the cause of the problem, the operator would be ordered to provide an alternate source of water of comparable quality and quantity.

23.

Q: In the 1980's the predicted drawdown of Little Sand Lake was 6 feet. Now the prediction is .6 feet. Why the dramatic change?

A: In the 1986 FEIS, the Department predicted that, without mitigation, the proposed mine pumping would result in a lowering of the average lake level in Little Sand Lake by 6.9 feet. Such an impact would have been unacceptable and mitigation would have been required if a mining permit had been issued. Additional information regarding the lake bed sediments and local hydrogeology has been gathered since 1986 and this information will be used along with more advanced modeling techniques to develop a new forecast. In the ongoing permitting process, the mining company has made a new prediction that the lake level in Little Sand Lake would drop by 0.07 feet under their Best Engineering Judgement scenario and 0.48 feet under their Practical Worst Case scenario. The Department's review of the groundwater flow modeling has not yet been completed, so the Department has not made any new forecasts regarding impacts to the local lakes and streams.

24.

Q: Why can't the company treat the water well enough to discharge at the mine site?

A: The Department has no authority to dictate the location of any industrial or municipal discharge. It does have the authority to require that any discharges meet all applicable surface water quality standards. Although technology exists to treat the mine drainage water to a greater degree, it is quite expensive and more difficult to operate such systems. Presumably for these reasons, the company has requested to discharge into the Wisconsin River. This discharge could only be permitted if it would be able to protect the water quality standards of the Wisconsin River, thereby protecting human uses of the river and the most sensitive aquatic life.

25.

Q: How can the Wolf River withstand the loss of flow from groundwater drawdown and the resulting increase in water temperature?

A: Public rights in the Wolf River tributaries of Swamp Creek and Pickerel Creek

must be protected during this project. If Swamp and Pickerel Creek are protected, then we believe the Wolf River would also be protected. Once the Department completes its determination of how groundwater and stream flows could be affected, we will compare the projected impact to the Wolf River with the identified public rights stages. (See the discussion on "public rights stages" in Response #28 in Section II.) If the mine de-watering would reduce the stream flow below the public interest stage, then the mining company would be required to add enough clean water (probably to affected tributaries) to make up the difference.

26.

Q: Where would the surface mitigation water come from? Won't pumping groundwater for mitigation dry up the springs in the vicinity of the wells? This will only make the drawdown worse.

A: There are three main potential sources of mitigation water: intercepted (uncontaminated) mine water, treated mine wastewater, and specially pumped groundwater. The Department has indicated its preference that intercepted mine water and treated wastewater be used whenever possible where mitigation is necessary. Use of those two water sources would reduce the water to be pumped through the pipeline to the Wisconsin River and it would limit the additional impacts from specially pumping mitigation water. There is no question that specially pumping mitigation water would increase the drawdown.

27.

Q: How accurate is the DNR model, in light of the inaccuracies of recent North Dakota flood flow predictions?

A: A surface water flow model and a groundwater flow model are significantly different, but both are computer operated mathematical models. Any mathematical model is no better than the information that is put into it. The Department is determined to fully verify the Crandon flow model construction and input data. Wherever there is any doubt regarding data validity, we will use conservative estimates in order to produce an appropriate worst-case forecast of potential impacts.

28.

Q: It won't take much drawdown to turn Rollingstone Lake into a mud hole. How can this be allowed?

A: The preliminary results of the groundwater modeling indicate that Rolling Stone Lake would be unaffected by the mine-related drawdown. This will be further discussed in the DEIS. Laws safeguarding public rights in state waters prohibit the Department from allowing such major impacts to occur.

Department staff are in the process of defining the range of public rights in all waters that could potentially be affected by groundwater drawdown. These rights include navigation, enjoyment of scenic beauty, healthful water quality, swimming, fishing, and others. As part of this process, the Department will determine a surface water elevation (for lakes) or a stream flow (for streams) necessary to protect public rights (called a "public rights stage"). This required water level or flow will likely vary with natural seasonal fluctuations necessary to maintain shoreline plant communities, spawning habitat, etc. (as opposed to being one

constant year-round elevation or flow).

The Department would require the operator of any mine to mitigate surface water losses due to mine inflow by replacing lost water with an amount and quality sufficient to maintain the public rights stage. Frequent monitoring of water levels and flows would be required so that the need for mitigation water can be predicted in advance. The public rights stages, mitigation water sources, and other details would all be contained in a surface water mitigation plan that the mining company will have to prepare, with Department oversight and approval.

29.

Q: When groundwater levels recover after mine closure, would the groundwater still be of excellent quality?

A: Compliance with groundwater quality standards have to be predicted to be maintained throughout time by this project - or the project cannot be permitted. At this time, the Department has not yet begun a detailed analysis of the contaminant transport modeling report submitted by the mining company. Therefore, we cannot predict what the outcome of that review will indicate about expected groundwater quality following recovery of groundwater levels.

Air Quality:

30.

Q: Our air quality is the best (rated at "9") in Wisconsin. Can DNR guarantee that it will remain as clean? How about 30 years from now?

A: The mine/mill complex would be required to meet all applicable air quality rules and permit conditions if permits are issued to construct and operate the proposed facility. If the mine/mill is constructed, it would have its most noticeable air quality impacts in the immediate vicinity of the facility. Air quality in the region will undoubtedly change over the next thirty years, whether this project is permitted or not. These differences will be due to changes in population, tourism, life styles of the residents, modes of transportation, industrial activities (e.g., mining (metallic and sand/gravel), pulp/paper, wood products and other sources as well as regional and global sources of carbon dioxide, mercury, ozone and other atmospheric pollutants). Without knowing the actual developments that might occur, discussions of air quality changes in 30 years are purely speculative.

The "9" value referred to by the commenter is 9 $\mu g/m^3$, which is an estimated annual mean for ambient TSP (Total Suspended Particulates) and PM10 (particles smaller than 10 microns in diameter) based on sampling near the proposed Crandon mine site. The number is reported in the DNR-Air Management program's Wisconsin 1995 Air Quality Report. This annual average is the same for both TSP and PM10. This number only considers those two factors - it does not consider compliance with any other air pollutant standards. See Response #30 in Section I for more details.

31.

Q: Are train exhaust, hopper car ore dust, and other pollutants due to the increased vehicle and train traffic factored into the air quality model? The DNR should look at increased air pollution along all the major transportation routes that would be affected by the mine, like the Wolf River corridor.

A: The DNR air quality modeling will assess potential changes in the existing air concentrations of the air pollutants which are regulated by existing federal and state laws. These include suspended particulates, PM10 (particles smaller than 10 microns in diameter), nitrogen oxides, carbon monoxide, and lead. Additional modeling is being conducted on metal deposition from the proposed facility. The primary focus has been on earth moving, mining, and blasting activities. Additional consideration has been given to the potential for dust from the tailings ponds. No modeling of metal dust blowing from the hopper cars is being conducted because the concentrates would be moist and the cars would be covered.

The modeling is focused on the access road, rail spur to the proposed site and the proposed activities at the mine/mill. If the project is constructed, there would be additional hydrocarbons released from cars and trucks in the area. The number of additional vehicle miles and truck traffic, however, is not considered significant in relation to the existing and anticipated growth in highway traffic occurring from other uses.