

LEGISLATIVE REFERENCE LIBRARY

TN872.Z6 K62 1985ax

- Koch Refining Company crude expans



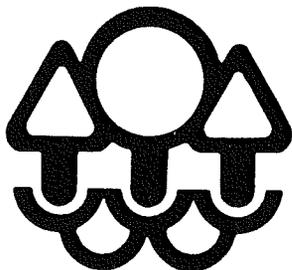
3 0307 00063 4165

850867

# KOCH REFINING COMPANY CRUDE EXPANSION PROJECT

Rosemount, Minnesota

April 1985



Minnesota  
Pollution Control Agency

## FINAL ENVIRONMENTAL IMPACT STATEMENT

TN  
872  
.Z6  
K62  
1985ax

## TABLE OF CONTENTS

	Page
1.0 Summary	
1.1 Purpose and Format of the Final EIS .....	1-1
1.2 Proposed Action .....	1-1
1.3 Permits/Approvals Required for the Project .....	1-1
1.4 Environmental Impacts and Mitigation .....	1-2
1.5 Public Hearing and Draft EIS Comments .....	1-2
2.0 Environmental Impacts and Mitigation Supplement	
2.1 Project Description .....	2-1
Solid and hazardous waste disposal .....	2-1
Co-disposal waste .....	2-1
Other special wastes .....	2-1
Process, tank bottom, and miscellaneous wastes due to the expansion .....	2-5
2.2 Air Quality .....	2-5
2.2.1 Refinery Air Emissions .....	2-5
Sulfuric acid mist, hydrogen sulfide, and reduced sulfur compounds .....	2-5
Qualitative health effects of significant criteria and noncriteria pollutants emitted by the refinery .....	2-5
2.2.2 Mitigation for Noncriteria Pollutant Emissions .....	2-9
2.3 Transportation .....	2-9
2.3.1 Potential Water Vapor Emissions Impacts .....	2-9
2.3.2 Mitigation .....	2-10
2.4 Noise .....	2-10

## TABLE OF CONTENTS

	Page
2.4.1 Potential Noise Sources and Impacts at Nearby Residences .....	2-10
2.4.2 Mitigation .....	2-11
2.5 Groundwater Availability .....	2-11
2.5.1 Potential Impacts of Increased Groundwater Appropriation .....	2-11
Effect of increased groundwater appropriation on drawdown at nearby residential wells .....	2-11
Effect of increased groundwater appropriation on contaminated plume spread to nearby residential wells .....	2-12
2.5.2 Mitigation .....	2-12
Groundwater drawdown - well interference .....	2-12
Contaminated groundwater plume spread .....	2-13
2.6 Solid and Hazardous Waste .....	2-13
2.6.1 Solid and Hazardous Waste Impacts .....	2-13
Impact of the land treatment system (landfarm) .....	2-13
Stormwater retention basin sediment impacts .....	2-13
Firewater basin sediment impacts .....	2-14
2.6.2 Mitigation .....	2-14
Landfarm mitigation measures .....	2-14
Landfarm alternatives .....	2-15
Stormwater retention basin sediment mitigation, disposal options, and alternatives .....	2-20
Firewater basin sediment disposal options, mitigation, and alternatives .....	2-20
2.7 Groundwater Quality .....	2-21
2.7.1 Potential Groundwater Contamination Sources .....	2-21

## TABLE OF CONTENTS

	Page
Stormwater retention basin (coker pond) impact .....	2-21
Firewater pond impact .....	2-21
2.7.2 Mitigation .....	2-21
Stormwater retention basin (coker pond) mitigation .....	2-21
Firewater pond mitigation .....	2-22
3.0 Responses to Draft EIS Comments	
3.1 Summary of Public Meeting Comments and Responses .....	3-1
3.2 Comment Letters not Requiring Response .....	3-9
3.3 Comment Letters and Responses .....	3-18
Table 1 Post-Expansion Process Equipment, Tank Bottom, Co-Diposal and Miscellaneous Wastes .....	2-2
Table 2 Mechanical Dewatering Alternatives .....	2-17
Table 3 Incineration Alternatives .....	2-18
Revised Table 2-5 Miscellaneous Wastes .....	2-4
Revised Table 3-57 Chemical Analysis for Monitoring Wells Nos.4, 5, 6, 7 .	3-67
Figure 2-4 Existing Refinery Layout .....	3-71
Figure 3-10 Wells in the Immediate Vicinity of the Koch Refinery .....	3-72
Figure 3-16 Potential Contamination Sources .....	3-73



## 1.0 SUMMARY

### 1.1 Purpose and Format of the Final EIS

This final environmental impact statement (EIS) has been prepared in accordance with the Minnesota Environmental Quality Board (MEQB) rules, Minnesota Rules Part 4410.0300-4410.7800. As is required by the MEQB rules, the Minnesota Pollution Control Agency (MPCA), as the responsible governmental unit (RGU), has prepared responses to the timely, substantive comments on the draft EIS consistent with the scoping decision for the project.

The purposes of the final EIS are to:

- Provide technical information supplementing or revising the draft EIS.
- List potential impacts and commitments to mitigation measures for the proposed project.
- Respond to draft EIS and public hearing comments.

The contents of this final EIS are presented in the following order:

- Environmental Impacts and Mitigation Supplement
- Response to Draft EIS Comments

The final EIS consists of this document plus the draft EIS.

### 1.2 Proposed Action

The Koch Refining Company's crude expansion project will consist of the construction of new facilities and expansion of existing facilities at its refinery complex in the Pine Bend Industrial District in the City of Rosemount, Minnesota. Sufficient land is available at the existing refinery complex to accommodate the entire expansion.

An increase in refinery crude capacity of approximately 50 percent, from 137,000 barrels per day (B/D) to 207,000 B/D, will occur with the expansion. The project will enable the refinery, which is operating at or near capacity, to increase production of gasoline, home heating oil, jet fuel, and asphalt from sour crude oil. New facilities will be constructed and many existing facilities will be expanded at a cost of approximately \$200 million. Project construction will occur over the next three to five years in two phases. The first phase, scheduled for construction in the spring of 1985, will increase production to 175,000 B/D by 1986. The second phase, scheduled to be completed in 1988, will increase production to 207,000 B/D.

### 1.3 Permits/Approvals Required for the Expansion

Before construction or operation of the crude expansion project, Koch Refining Company must apply for and receive the following governmental permits, licenses, or approvals.

## MPCA

Storage tank(s) permit  
Total facility air emission permit  
National Pollutant Discharge Elimination System permit amendment

## MDNR

Water Appropriation permit modification (if necessary, to prevent the spread of groundwater contaminant plume in the project area or if there is an increase of 10 percent or more from the current permit in terms of the quantity of groundwater to be appropriated for the expansion).

## City of Rosemount

Building permit for tanks and structures

## Dakota County Department of Health Services

On-site treatment system permit  
Hazardous waste treatment, storage, and disposal license

### 1.4 Environmental Impacts and Mitigation

This final EIS supplements the draft EIS analysis with technical information and mitigative measures, where appropriate, for the following topics:

Project Description  
Air Quality  
Transportation  
Noise  
Groundwater Availability  
Solid and Hazardous Waste  
Groundwater Quality

### 1.5 Public Hearing and Draft EIS Comments

A public meeting to obtain comments on the adequacy of the draft EIS was held in Rosemount on February 20, 1985. Written comments were also received during an official comment period following distribution of the draft EIS, which ended on March 13, 1985. Section 3.0 of this final EIS includes a summary of the comments received at the public meeting and Agency responses, and contains responses to letters of comment on the draft EIS, and the letters received which didn't need a response.

Primary areas of concern commented on for the draft EIS included the potential for well interference (drawdown) and spread of the contaminated groundwater plume in the project area due to the increased water pumpage by Koch Refining Company with the expansion. Other significant areas of concern are discussed in the Environmental Impacts and Mitigation Supplement and include noise, transportation, solid and hazardous waste, and groundwater quality issues.

2.0 Environmental Impacts and Mitigation  
Supplement

## ENVIRONMENTAL IMPACTS AND MITIGATION SUPPLEMENT

This Environmental Impacts and Mitigation Supplement is a supplement to the draft EIS prepared for the Koch Refining Company crude expansion project. It and the response to comments on the draft EIS and the draft EIS constitute the final EIS for the project.

The supplement contains technical information on solid and hazardous wastes and refinery air emissions not covered in the draft EIS, and a description of potential environmental impacts and mitigation measures associated with air quality, transportation, noise, groundwater availability, solid and hazardous waste and groundwater quality issues associated with the expansion.

### 2.1 Project Description

#### Solid and Hazardous Waste Disposal

Not all types of solid and hazardous wastes generated at the refinery were included in Chapter 2.0, the project description in the draft EIS. Some of these wastes are subject to MPCA review, while others are subject to county review with regard to handling and disposal procedures.

This section contains a description of two types of solid and hazardous wastes not discussed in the draft EIS on pages 2-14 through 2-20: co-disposal wastes (draft EIS Table 2.5 has been amended to include these wastes), and other wastes generated due to maintenance activities at the refinery. In addition, a new table (Table 1) has been prepared in which anticipated changes in process equipment, tank bottom, and miscellaneous waste quantities are identified for the expansion.

#### Co-Disposal Wastes

Special solid wastes generated during the operation and maintenance of the refining facilities include solid wastes disposed of at the Pine Bend landfill under co-disposal approval of the MPCA. Co-disposal wastes include sulfur spill material, fuel oil dryer salt, spent FCC catalyst, spent sulfur recovery unit waste, scrap refractory brick, asphalt samples, asphalt spill materials, and spent DES catalyst from the refinery. Refer to revised draft EIS Table 2-5 for a listing of the quantities of these co-disposal wastes. All of these wastes are disposed at the Pine Bend sanitary landfill. Expansion of the refinery will result in an increase in generation of these as co-disposed solid wastes by approximately 50%.

#### Other Special Wastes

During the course of maintaining operating facilities at the refinery, mechanical equipment to be repaired is dismantled and process oils are drained from the equipment. This material is drained into the oily water sewer (OWS), recovered in the slop oil recovery system, and returned as raw material for product manufacture. When equipment is solvent rinsed, a nonchlorinated solvent is used. Most of this solvent evaporates during use. The oily residue from the solvent tank is discharged to the OWS for oil recovery and reuse as above. Expansion of the refinery will result in an increase in generation of these special wastes by approximately 10%.

TABLE 1

Post-Expansion Process Equipment, Tank Bottom, Co-Disposal, and  
Miscellaneous Wastes

<u>Waste</u>	<u>Anticipated % Increase</u>	<u>Rationale</u>
Flareline and drum sludges	+50%	Assumed directly proportional to increase in production capacity increase
Heat exchanger bundle cleaning sludges	+50%	directly proportional to increase in production capacity increase
Alkylation acid sludge	no change	The process generating this waste will not be altered or throughput increased
Spent poly catalyst	no change	The process generating this waste will not be altered or throughput increased
Spent flake caustic	no change	The process generating this waste will not be altered or throughput increased
Spent amines	no change	The process generating this waste will not be altered or throughput increased
Neutralizer sludge	+50%	Assumed increased water use directly proportional to production capacity increase
Cooling tower sludge	no change	No cooling towers are to be added.
Nickel filter solids	no change	The process generating this waste will not be affected by the expansion.
PCB wastes	no change	The process generating this waste will not be affected by the expansion.
Leaded tank bottoms	no change	No change in leaded tank storage or leaded gas production from expansion.
Non-leaded bottoms	included with flare line and drum sludge	Assumed increase directly proportional to production capacity increase. In actuality is less since the number of new tanks will increase less than 50%.
Oil spill cleanups	+50%	Assumed increase directly proportional to refinery production capacity increase.
Stormwater pond sediment	+25%	Assumed proportional to increase in runoff area.

TABLE 1 continued

<u>Waste</u>	<u>Anticipated % Increase</u>	<u>Rationale</u>
Firewater pond sediment	no change	No assumed increase because sediment now removed at neutralizer.
WWTP lagoon sludge (old WWTP lagoons)	no change	This was a one time generation at the time of lagoon closing.
Terate waste	no change	This was a one time generation only. No future waste generation.
Co-disposal landfill wastes at Pine Bend landfill	+50%	Assumed increase directly proportional to refinery production capacity increase.

TABLE 2-5 (Revised)  
MISCELLANEOUS WASTES

<u>Waste</u>	<u>Designation<sup>a</sup></u>	<u>Quantity<sup>b</sup></u>	<u>Comments</u>
Stormwater Pond Sediment	Nonhazardous	2,400 yds <sup>3</sup> /cleaning	Cleaning once every one to two years. Disposed onsite as fill material.
Firewater Pond (Final Lagoon)	Nonhazardous	25,000 yr <sup>3</sup> /cleaning	Cleaning once every 7 to 10 years. Removed waste has been chemically fixed and is stored onsite for dike construction at the tank farms.
WWTP Lagoon Sludge (Old WWTP Lagoons)	Hazardous	6,000 yd <sup>3</sup>	One time generation at the time of lagoon closing. Removed waste has been chemically fixed rendering it nonhazardous. Presently stored onsite or is used in dike construction at the tank farms.
Terate Waste	Hazardous	1 ton	One time generation. Drummed and shipped offsite to disposal facility.
Sulfur Spill Material	Nonhazardous ("chunk form")	10 tons/yr	Accidental sulfur spills estimated to amount to about 10 tons/years. Disposed in Pine Bend Landfill.
Fuel Oil Dryer Salt	Nonhazardous	20 tons/yr	Special waste generated during operation and maintenance of the refining facility. Disposal in Pine Bend Landfill.
Spent FCC Catalyst	Nonhazardous	4 tons/yr	Special waste generated from operations and maintenance. Approximately 12 tons generated once in a 3-year period. Disposed in Pine Bend Lanfill.
Spent Sulfur Recovery Unit	Nonhazardous	20 tons/yr	Wastes generaed from operations and maintenace. To be disposed twice annually at a rate of 20 tons/year.
Scrap Refractory Brick	Nonhazardous	4 tons/yr	Maintenance wastes disposed at Pine Bend Landfill.
Asphalt Samples	Nonhazardous	1/2 ton/yr	Lab wastes disposal at Pine Bend Landfill.
Asphalt Spill Materials	Nonhazardous	20/tons/yr	Accidental spill material estimated at 20 tons/year to be disposed in the Pine Bend Landfill.
Spent DES Catalyst	Nonhazardous	12 tons/yr	Maintenance waste disposed at Pine Bend Landfill.

<sup>a</sup>Designations are based on KRC handling practices.

<sup>b</sup>Quantities are based on KRC estimates handling records.

GLT263/110

## Process, Tank Bottom, and Miscellaneous Wastes Due to the Expansion

Only expected waste volumes from the expanded wastewater treatment plant were identified in the draft EIS. Anticipated increases in waste generation rates due to the expansion for process equipment, tank bottom, co-disposal, and miscellaneous wastes are presented in the following table (Table 1).

### 2.2 AIR QUALITY

#### 2.2.1 Refinery Emissions

##### Sulfuric acid mist, hydrogen sulfide, and reduced sulfur compounds

It was stated in the scoping decision for the project that sulfuric acid mist, hydrogen sulfide, and total reduced sulfur and reduced sulfur compound emissions would be described in the EIS with regard to compliance of the expansion with federal and state rule and policy requirements. However, these pollutants are not of concern with regard to the expansion.

Sulfuric acid mist is only emitted from the Koch Refining Sulfuric Acid Unit (KSAU) which is not a part of the expansion. These sulfuric acid mist emission levels are well within both US EPA and MPCA emission limitations. Hydrogen sulfide and reduced sulfur compounds are not emitted from point sources at the refinery. All fuels or process gases containing sulfur compounds are combusted in heaters or incinerators so that sulfur emissions to the atmosphere are generally as sulfur dioxide. These emissions are monitored by continuous emission monitors to ensure compliance with applicable standards and emission limitations.

##### Qualitative health effects of significant criteria and noncriteria pollutants emitted by the refinery

The health effects of the criteria air pollutants: particulates, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead are fairly well known and documented. The primary site of action is the respiratory system. Health effects include increased respiratory disease, such as bronchitis, reduced lung capacity, irritation of nasal passages and lungs, cardiovascular stress and, at high concentrations, shortening of life expectancy. Lead will affect the blood forming system and the nervous system. Carbon monoxide will act on the central nervous system (CNS) and the cardiovascular system.

The effects of ambient air concentrations of the pollutants are less well known. The levels that cause effects are more commonly found in industrial work place environments. Hydrogen sulfide will affect the respiratory system. Toluene, biphenyl, and xylene irritate the eyes, respiratory tract, and skin, and may cause central nervous system depression. Benzene and formaldehyde are carcinogens.

The concentrations of toxic air pollutants that are expected after the expansion are below levels that demonstrate a clinical health effect and also below concentration limits for worker exposure. The criteria air pollutants are below the ambient air quality standards which are health-based, including a margin of safety to protect sensitive populations.

## Biphenyl

Repeated exposure to dust may result in irritation of the skin and respiratory tract. The vapor may cause moderate eye irritation. With acute exposure, biphenyl exerts a toxic action on the central nervous system, the peripheral nervous system, and the liver. Symptoms of poisoning are headache, diffuse gastrointestinal pain, nausea, indigestion, numbness and aching of limbs, and general fatigue. Liver function tests may show abnormalities. Chronic exposure is characterized primarily by central nervous system symptoms, fatigue, headache, tremor, insomnia, sensory impairment and mood change. Such symptoms are rare, however.

## Hydrogen Sulfide

Low concentrations (20-150 ppm) cause irritation of the eyes. Slightly higher concentrations may cause irritation of the upper respiratory tract, and if prolonged exposure occurs, pulmonary edema may result. Direct irritation of the respiratory tract may cause rhinitis, pharyngitis, bronchitis, and pneumonia. Hydrogen sulfide may penetrate deep into the lungs and cause hemorrhagic pulmonary edema.

Acute exposure may cause immediate coma which may occur with or without convulsions. Death may result with extreme rapidity from respiratory failure (800-1000 ppm). Subacute exposure results in headache, dizziness, staggering gait and excitement suggestive of neurological damage, and nausea and diarrhea suggestive of gastritis. Long-term effects of acute exposure may include tremors, weakness, and numbness of extremities. Systemic effects from chronic exposure to hydrogen sulfide have not been established. With repeated exposures to low concentrations, conjunctivitis, photophobia, corneal bullae, tearing, pain and blurred vision are the most common findings. Chronic poisoning results in headache, inflammation of the conjunctivae and eyelids, digestive disturbances, loss of weight, and general debility.

## Benzene

Acute effects of low levels of benzene (50-150 ppm) include headache, lassitude and weariness. At higher levels, effects include loss of consciousness, irregular heartbeat, dizziness, headache, and nausea. The concentration of benzene in air that may be lethal is 20,000 ppm. Acute exposure to benzene results in central nervous system depression. Exposure to vapor may produce primary irritation to the skin, eyes, and upper respiratory tract. Chronic exposure to benzene produces more serious adverse effects. Benzene is known to cause leukemia and other blood disorders. Chronic human exposure to benzene causes myelocytic anemia, thrombocytopenia, leukopenia, and damage to the chromosomes in bone marrow cells.

## Formaldehyde

Formaldehyde is an irritant and can cause local damage to the eyes, respiratory tract, and skin when inhaled. The effects of formaldehyde may not be limited only to these tissues, since it forms conjugates with biological chemicals that may affect tissues that are remote from the respiratory tract. Under controlled exposure conditions, formaldehyde irritates the eyes, nose, and throat in healthy humans at concentrations as low as 0.2 ppm. Effects would be expected to be more severe and to occur at lower concentrations in subpopulations that include the elderly or the infirm under conditions of chronic exposure.

Exposure to formaldehyde in homes and in work places may result in signs and symptoms attributed to the exposure, such as headache, dermatitis, chronic airway obstruction, and menstrual, reproduction and sexual dysfunction, in addition to irritation of the eyes, skin and mucous membranes of the nose and throat. However, there may be confounding variables in these reports.

Several epidemiological studies revealed significant increases in cancer of the prostate, digestive system, and upper respiratory tract associated with exposure to formaldehyde. All these studies had limitations. However, formaldehyde should be regarded as posing a carcinogenic risk to humans.

### Xylene

Xylene vapor may cause irritation of the eyes, nose, and throat. Repeated exposure may cause drying of the skin. Acute exposure to xylene vapor may cause central nervous system depression and minor reversible effects upon the liver and kidneys. At high concentrations, xylene vapor may cause dizziness, staggering, drowsiness, and unconsciousness. Also at very high concentrations, breathing xylene vapors may cause pulmonary edema, anorexia, nausea, vomiting and abdominal pain.

### Toluene

Toluene may cause irritation of the eyes, respiratory tract, and skin. Acute exposure to toluene predominantly results in central nervous system depression. Other than central nervous system depression, the inhalation of toluene at less than 2000 ppm has produced no adverse effects. The major metabolite of toluene is benzoic acid which is considered relatively nontoxic. Results of long-term industrial exposures show little detectable change in blood characteristics or liver function. The human exposure data suggest that some effects of narcosis are evident at around 200 ppm. At this level, impairment of coordination and reaction time may occur.

### Nitrogen Dioxide

NO<sub>2</sub> exerts its primary toxic effect on the lungs. High concentrations, greater than 100 ppm, are lethal to most animal species with most deaths resulting from pulmonary edema. NO<sub>2</sub> can be correlated with increased respiratory disease at concentrations of 0.06 to 0.11 ppm. Chronic exposure may result in pulmonary dysfunction with a decrease in vital capacity, maximum breathing capacity, and lung compliance, and increased residual volume. Exposure to NO<sub>2</sub> in ambient air has been associated with an increase in the frequency of acute bronchitis among infants and children. There is some evidence that suggests decreased susceptibility to infection.

### Sulfur Dioxide

The current evidence indicates that, for the most part, the effects of the oxides of sulfur on health are related to irritation of the respiratory system. Gaseous sulfur dioxide is particularly irritating to mucous membranes of the upper respiratory tract. Chronic exposure may result in nasopharyngitis, fatigue, an altered sense of smell, and chronic bronchitic symptoms such as dyspnea on exertion, cough and increased mucous excretion.

The potentiation by particulate matter of toxic responses to sulfur dioxide has been observed under conditions which would promote the conversion of

sulfur dioxide to sulfuric acid. Episodes of acute elevation of oxides of sulfur and other pollutant concentrations have been associated with a greater number of deaths than expected. Those predominantly affected were individuals with chronic pulmonary disease or cardiac disorders or very young or old individuals. One-day exposures of 0.20 ppm can cause the accentuation of symptoms in persons with chronic respiratory disease. Short-term exposure to low levels (0.11-.19 ppm) has resulted in increases in breathlessness, throat and eye irritation. Long-term exposure to low levels have been associated with demonstrable health effects, such as an increase in childhood respiratory infections and subsequent development of adult bronchitis.

### Ozone

Ozone is irritating to the eyes and all mucous membranes. In human exposures, the respiratory signs and symptoms in order of increasing ozone concentrations are: dryness of upper respiratory passages; irritation of the mucous membranes of nose and throat; choking, coughing and severe fatigue; bronchial irritation, substernal soreness; and cough. Exposure has resulted in a decreased vital capacity. Symptoms and signs of subacute exposure include headache, malaise, shortness of breath, drowsiness, reduced ability to concentrate, slowing of the heart and respiration rate, visual changes and decreased desaturation of oxyhemoglobin in capillaries.

### Particulates

For the most part, the effects of particulate air pollution on health are related to injury to the surfaces of the respiratory system. Such injury may be permanent or temporary. It may be confined to the surface, or it may extend beyond, sometimes producing functional or other alterations. Particulate material in the respiratory tract may produce injury itself, or it may act in conjunction with gases, altering their sites or their mode of action. Large dust particles may cause transient eye irritation. Effects on humans depend upon chemical and physical properties of the particulate matter. Corrosive materials such as acids exert direct chemical action. Inert particles induce a physiological response by slowing ciliary beat and mucous flow in the bronchial tree. Sorption of gases on small particulates increase the effect, particularly if the particulates penetrate to deeper portions of the lungs. Particulates in conjunction with other pollutants can potentiate the effect of the pollutants.

### Lead

The major impact of lead on the body is on the hematopoietic (blood forming) and neurological systems. Anemia, which can be caused by lead-induced deformation and destruction of erythrocytes and decreased hemoglobin synthesis, is often the earliest clinical manifestation of lead intoxication. Subchemical effects include a lead-related elevation of erythrocyte protoporphyrin. Lead interferes with the process of heme synthesis in the blood, which suggests interference with the production of heme proteins in the renal and neurological systems. Lead will damage the central nervous system at high levels. At lower levels, it will cause a consistent pattern of impaired neural and cognitive functions. Children represent a sensitive subgroup to lead exposure.

## Carbon Monoxide

Human exposures to low levels of CO have resulted in deleterious effects on the CNS and cardiovascular systems. While a 9-hour exposure to 17 to 21 mg/m<sup>3</sup> (15 to 18 ppm) CO affected cardiovascular systems, concentrations of CO as low as 29 to 34 mg/m<sup>3</sup> (25 to 30 ppm) affected behavior and the central nervous system. Additionally, visual sensitivity may be dose-related, and a CO exposure resulting in 5-6 percent carboxyhemoglobin reduces the capacity of persons to perform maximal work.

Fetuses, persons with cardiovascular or central nervous system defects, sickle cell anemics, young children, older persons, persons living at high altitudes, and those taking drugs comprise groups at special risk to CO exposure.

### 2.2.2 Mitigation for Noncriteria Pollutant Emissions

The Division of Air Quality will include requirements for an odor/hydrocarbon/noncriteria pollutant emissions study as part of the air quality total facility permit for the expansion. The study will contain requirements for the identification of sources, rate of release and ambient concentrations of significant odor, hydrocarbon and noncriteria pollutant emissions. It will also require an evaluation of the technical and economic feasibility of reducing these emissions. As part of the study plan, a detailed listing of significant noncriteria pollutants, those that have a potential adverse impact on public health, welfare or the environment will be developed and subject to further evaluation to determine effective control measures for these pollutants. The air quality permit is required before construction of the expansion can begin.

## 2.3 Transportation

### 2.3.1 Potential Water Vapor Emissions Impacts

An analysis of the impact of refinery caused excess moisture and fogging on nearby highways is required by the scoping decision for the project. It was stated at page 3-102 of the draft EIS that "no apparent or unusual conditions (i.e., fog) exist in the area that contribute to vehicular accident rates." The accident rate in the project area is 14 percent lower than the district average for similar roadways. The draft EIS analysis of the maximum area of impact due to water vapor emissions from stacks and vents at the refinery defined the maximum area of impact as only 400 feet from the refinery. The conclusion reached in the draft EIS was that there was only a limited potential that these emissions would affect travel on U.S. Highway 52, since the distance between the refinery and the property boundary is greater than 400 feet.

Opposing comments were received on the potential impact of these emissions by different governmental agencies. MnDOT District 9 staff in a recent phone conversation have stated that there is no safety problem due to fogging and icing on U.S. Highway 52 near the refinery and that they don't believe there is a need to conduct a study of the relationship between periods of fogging/precipitation due to the refinery and the accident rate on roads in the project area. On the other hand, the Dakota County Human Services Board has commented that existing

conditions (water vapor emissions from Koch Refining Company) result in considerable fog and low cloud formation, ice, and ice crystal pellets, beyond the refinery's property.

Based on the comments received on this issue, the MPCA staff believes that the area of impact due to Koch's water vapor emissions may extend further than 400 feet from the refinery under adverse meteorological conditions.

### 2.3.2 Mitigation

No permits or approvals for the expansion specifically deal with the water vapor issue. However, the MPCA recommends that the county staff work with MnDOT to resolve this issue. The county staff should register their complaints with the District MnDOT office when they note adverse roadway conditions due to the refinery plume.

A study could be conducted to determine if water vapor emissions from the refinery cause adverse road conditions with localized adverse weather conditions, or whether the problem occurs independently. It must also be determined if there is a correlation between these emissions and a safety hazard (accidents) on nearby roadways. The study should consist of the following tasks:

- conduct observation studies to determine the origin and frequency of ice and fog and its relationship to road travel in the area,
- determine the degree of correlation of accident data with the incidence of fogging in the refinery vicinity,
- determine the appropriate mitigation measures if the refinery is proven to significantly contribute to a safety hazard in the area.

Mitigation measures such as installation of warning signs or the sanding of sections of U.S. Highway 52 near the refinery when fogging or icing occurs should be implemented by MnDOT, if necessary.

## 2.4 Noise

### 2.4.1 Potential Noise Sources and Impacts at Nearby Residences

The noise analysis discussed on pages 3-113 through 3-117 of the draft EIS was based on the results of noise monitoring conducted at the refinery under common or usual noise conditions associated with the refinery production process. In some cases, unusual short-term operational changes could increase noise levels. Those noise levels are not expected to be significant but could result in a nuisance condition.

At the public meeting, there was a comment suggesting that a piece of machinery operating on the west side of the refinery oftentimes creates a loud rumbling noise. Koch was unable to identify a piece of process equipment that might be causing such a noise except that generated at the safety flare. Steam is injected into the flare to promote complete combustion and to eliminate the smokey appearance when process gases are being flared on an emergency basis. Sometimes after the emergency flaring has ceased, steam in the flare can cause a noisy rumbling sound.

## 2.4.2 Mitigation

Planned improvements at the flare and flare gas recovery system as a result of the expansion are expected to reduce noise from this source. This system refinement, and improved plant management can reduce the frequency of noisy episodes due to the flare. The Division of Air Quality staff will further evaluate the situation and, if necessary, conduct monitoring to determine if the state noise standards are being violated due to the operation of the refinery. If the state noise standards are being violated, noise mitigation measures will be required.

## 2.5 Groundwater Availability

### 2.5.1 Potential Impacts of Increased Groundwater Appropriation

Two primary concerns were raised during the public review process for the draft EIS regarding the potential impacts of increased groundwater appropriation with the expansion. These included the effect of increased groundwater appropriation on 1) drawdown at nearby residential wells, and 2) spread of the contaminated groundwater plume in the project area.

#### Effect of increased groundwater appropriation on drawdown at nearby residential wells

The draft EIS on pages 3-119 through 3-130 contains an analysis of the impacts of current and future groundwater use by the refinery. The impacts of additional drawdown due to the expansion were evaluated and for cases where all or part of the pumpage was from the upper aquifer, the additional drawdown was minor. In the case where all additional refinery groundwater would be obtained from the lower aquifer, a greater drawdown impact could be expected, although this may still be considered minor. However, it was concluded that the impact on small water users located to the northwest of the Koch site could not be determined because some of these wells are located in the overlying unconsolidated deposits overburden.

The impact of refinery groundwater withdrawals has also been modeled on a preliminary basis by Barr Engineering Company. Barr Engineering concludes that the drawdown in Unit 1, the Prairie du Chien-Jordan aquifer, resulting from increased pumpage in Unit 2, the Mount Simon-Hickley aquifer, will result in less than 0.3' of drawdown in the upper unit. They also conclude that the drawdown at the nearest well in the Prairie du Chien aquifer off the refinery property is 1.4 feet when the increased pumping by the refinery occurred in wells 1 through 3 in the Prairie du Chien-Jordan aquifer. Barr Engineering concludes that these decreases in water levels are minor in terms of impact on pump setting and are certainly within the range of normal groundwater level fluctuations.

The staff believes that these preliminary studies do not identify a significant drawdown problem due to the increase in groundwater pumpage predicted to be necessary for the expansion. More thorough predictions would require an extensive and expensive study of local subsurface hydraulic conditions. A more thorough assessment of the geohydrology of the project area will be conducted in the Superfund Remedial Investigation/Feasibility Study, data from which can be used to further assess the impact of the expansion groundwater appropriation on well users in the area.

## Effect of increased groundwater appropriation on contaminated plume spread to nearby residential wells

The expansion of the refinery has the potential to further contaminate domestic wells in the project area since the additional groundwater pumpage necessary for the expansion could cause the spread of the contaminated groundwater plume in the project area. However, under the state Superfund Act (ERLA) and the federal Superfund Act (CERCLA), Koch Refining Company is providing additional information on the geohydrology/aquifers in the project area to help identify the sources(s) of contamination and identify remedial actions to mitigate the contamination problem. This information can be used to assess if pumping the additional water from the upper or lower aquifer is preferred from a plume spread standpoint.

Since the construction of Phase I facilities for the expansion will take one or more years to complete, increased water appropriation is expected to occur gradually beginning in 1986 or possibly 1987. The results of the Superfund investigations should be available in the summer of 1987 and remedial actions to cleanup sources of contamination implemented by the end of 1987. As such, the contamination issue is expected to be resolved before the final phase of the refinery expansion is completed in 1988.

### 2.5.2 Mitigation

The following section contains an enumeration of mitigation measures for groundwater availability intended to supplement those discussed at pages 3-128 and 3-129 of the draft EIS:

#### Groundwater drawdown - well interference

The Minnesota Department of Natural Resources (MDNR) is the agency responsible for issuing water appropriation permits for high capacity groundwater users. Koch has two permits (#54-71 and #72-977) from the MDNR for the main existing refinery water usage (the Koch sulfuric acid unit, not part of the expansion project has a separate permit). An amendment to Koch's current water appropriation permits would be needed for the expansion if an increase of 10 percent over the existing permitted amount is appropriated with the expansion. However, this great an increase in the appropriation is not expected.

The MDNR staff has determined that Koch Refining Company should continue to withdraw water as specified in their current water appropriation permit (in the quantity and from the wells specified) until further studies have been conducted through the federal Superfund (CERCLA) and state superfund (ERLA) investigations identifying sources of groundwater contamination and hydrogeologic factors in the project area. The MPCA staff will keep the MDNR staff apprised of the status and results of this investigation. The MDNR staff will evaluate the results of this investigation, and at that time, determine if a modification of Koch's existing groundwater appropriation permit is needed to protect domestic users against contamination of their well water. It is expected that the CERCLA/ERLA investigations will be completed before Koch's expansion is completed in 1988.

The MDNR, under Minnesota Statute Chapter 105, Section 41, regarding the appropriation and use of state waters, has promulgated rules covering well interference problems involving groundwater appropriation (Public Water Resources 6115.0730). Under this rule, if complaints are made to the MDNR

Commissioner by private domestic well owner(s) or the public water supply authority, regarding the effects of an existing permitted water appropriation on domestic water supplies, the MDNR Commissioner must provide complaint forms, investigate and assess the complaint, conduct a field investigation, if necessary, and can require additional hydrologic tests. If adverse effects on domestic wells are substantiated, the water appropriator, in this case Koch Refining Company, can request that the Commissioner modify or restrict the water appropriations permit to ensure an adequate domestic water supply, negotiate a reasonable settlement with the affected well owners, or request a public hearing to settle the issue. Koch Refining is legally obligated to abide by the conditions of this regulation.

The MPCA staff also recommends that the MDNR spot check groundwater usage at the refinery and that all refinery production wells be metered for accurate assessment of groundwater appropriation at the refinery.

### Contaminated plume spread

Users of contaminated wells are protected under the liability section 115B.05 of Minnesota Statute Chapter 115B, the Environmental Compensation and Liability Act (ECLA). Under this section, "liability for economic loss, death, personal injury and disease; limitations and defenses," any person who is responsible for a release of a hazardous substance from a facility is liable for damage caused to person or property. Koch Refining Company, to the extent that it is culpable for the groundwater contamination in the project area, would be liable for personal or property injury or loss due to well contamination and would have to provide a source of noncontaminated water.

## 2.6 Solid and Hazardous Waste

### 2.6.1 Solid and Hazardous Waste Impacts

#### Impact of the Land Treatment System (Landfarm)

The draft EIS on pages 3-140 and 3-141 did include a worst case situation for hydrocarbon migration, 1.56 feet/year vertical migration as computed by equations included in the U.S. EPA document entitled "Waste Oil Storage," WH-565. The depth of penetration would be less than 10 feet considering the landfarm has been operating for six years.

The draft EIS did not, however, present alternatives to landfarming or clearly identify mitigative measures for landfarming impacts.

The available data are insufficient to define the extent of hydrocarbon migration from the landfarm. In addition, the existing groundwater monitoring program does not account for individual organic constituents that may be present in the waste and have the potential to contaminate the groundwater at low concentrations. Therefore, it could be assumed under worst case conditions that groundwater contamination is imminent or occurring as a result of the existing landfarm operations.

#### 2.6.1 Stormwater Retention Basin Sediment Impacts

No discussion was presented in the draft EIS on disposal of sediment from the stormwater retention basin following the expansion. Although the expansion is

expected to have only a minimal effect on waste generation, there is a need to ensure proper management of this waste in the future given the concern about post-waste management practices.

Sediment which accumulates in the stormwater retention basin is removed periodically, about once every two years. Detailed analyses are not available for the sediment. However, Koch Refining Company claims that it consists primarily of coke fines which enter the basin with runoff from the product coke piles located nearby. Available information is insufficient to define appropriate means for handling or disposal of the sediment. This depends upon whether the waste is classified as hazardous and upon the composition and characteristics of the waste.

The stormwater retention basin sediment may be considered a hazardous waste if the stormwater basin is operated as a hazardous waste surface impoundment. The stormwater basin sediment could be a nonhazardous solid waste that presents an environmental concern or it may present no concern at all if the basin is not operated as a hazardous waste surface impoundment.

#### Firewater Basin Sediment Impact

This discussion is being provided on the disposal of the firewater basin sediment to ensure that this waste be managed properly following expansion of the refinery.

Firewater basin sediment is cleaned at a frequency of about once every seven to ten years. The sediment consists of precipitates from the non-oily wastewater treatment system and sediment contained in the stormwater retention basin water which at times has been discharged to the firewater basin. There is a question as to whether the stormwater basin water will continue to be discharged to the firewater basin following the expansion. (Refer to Section 2.7 on ground water quality for a discussion of the potential impact of the stormwater basin water and mitigation proposed.)

If the stormwater retention basin water continues to be discharged to the firewater basin, there is the possibility that the firewater basin sediment could be classified as a hazardous waste. If the firewater basin sediment is not a hazardous waste, it would be handled as a solid waste.

#### 2.6.2 Mitigation

Mitigation measures/alternatives recommended for the landfarm, stormwater retention basin sediment, and firewater pond sediment would be implemented through the RCRA permitting process.

#### Landfarm Mitigation Measures

Landfarming is recognized as an acceptable means to treat refinery wastes. However, more data are required to fully develop an adequate landfarm operation at the Koch site. These will be gathered as part of the final RCRA permitting process for the landfarm. As part of the process a treatment demonstration will be required to assure the adequacy of the land treatment system and other related concerns.

Migration of waste constituents is directly related to the amount of infiltration of liquids. It is recommended that the wastewater treatment plant sludge

and slop oil emulsion be dewatered in order to reduce excessive liquids in those wastes. Also, Koch's program for runoff control involves storage of runoff water in the landfarm cells prior to removal by vacuum truck to the storm water (coker) pond. Koch should minimize temporary runoff storage in the landfarm cells and develop an alternative runoff management practice.

Land treatment of wastes is very minimal during winter months. Koch should provide waste storage facilities in accordance with the solid waste and hazardous waste rules for waste storage during the winter months to reduce reliance on the land treatment facility during minimal treatment periods.

Soil and groundwater investigations need to be completed to define the extent of hazardous waste constituent migration. Recommended response actions are as follows:

1. If groundwater impact is not imminent and contamination is limited to depths where complete removal of contaminated soils can be reasonably accomplished, then the following steps should be followed:
  - excavate contaminated soils to background levels
  - evaluate present landfarm operational practices and institute changes to prevent future soil contamination
2. If groundwater contamination is not imminent or occurring and contamination is to depths where complete removal of contaminated soils is unreasonable:
  - excavate contaminated soils to a reasonable depth
  - conduct continuing monitoring to ensure groundwater impact does not become imminent or occur.
  - evaluate present operational practices and institute changes to prevent future soil contamination
3. If the soil and groundwater investigations indicate that an adverse groundwater impact is imminent or occurring, then corrective actions for groundwater contamination associated with the landfarm should be instigated. This may result in closing of the existing landfarm.

### Landfarm Alternatives

Koch Refining Company also has the option of pursuing alternative waste management practices instead of landfarming. Some of these alternatives are discussed below.

#### Alternative 1 - Sludge Dewatering

Currently large amounts of water are being conveyed to the landfarm via the wastewater treatment plant (WWTP) digester sludge. In 1988, projected digested sludge quantities to the landfarm are 8,000 tons per year of which 99.5 percent is water. Koch Refining Company is proposing to add sludge dewatering facilities to the WWTP to reduce the volume of water in the digester sludge. This measure would significantly reduce the volume of water being conveyed to the landfarm, for example, dewatering the digester sludge to 15 percent solids would remove 97 percent of the water from the sludge. Following dewatering, the sludge could be sent for further treatment, such as incineration, or be disposed of directly as appropriate.

Sludges may be dewatered by mechanical means. However, certain biological sludges may be difficult to dewater by mechanical means. This problem can normally be overcome by chemical conditioning of the sludge prior to dewatering.

Applicable mechanical dewatering processes include solid bowl centrifuges, horizontal belt filters, vacuum filters, and plate and frame pressure filters. Each of these processes is described briefly in Table 2. Actual process selection is dependent on sludge characteristics and normally requires bench-scale or pilot-scale testing.

### Costs and Implementation

In the absence of pilot test and site-specific data, it is not possible to accurately estimate capital or operation and maintenance costs. Therefore in Table 2, costs are compared on a relative basis. Implementation of this alternative is anticipated to take six to twelve months.

### Alternative 2 - Incineration

Incineration greatly reduces the solid volume by thermally oxidizing organic matter to primarily carbon dioxide and water. Incineration processes applicable to solid waste (primarily sludges) currently being landfarmed by Koch are multiple hearth, fluidized bed, and rotary kiln furnaces. Each process is described briefly in Table 3. Insufficient characterization of the solid waste materials is available to determine the preferred process. Process selection will be dependent upon the volatile content, heating value, and viscosity of the materials to be incinerated.

Incineration of sludges generally requires an auxiliary fuel source. The auxiliary fuel requirements for incineration are dependent on the heating value of the sludge and the temperature requirement for complete, odorless combustion. Since landfarmed wastes contain large quantities of oil, the heating value of these materials should be relatively high and may not require an auxiliary fuel source. On the other hand, the presence of refractory compounds will require high temperatures for odorless combustion.

Incineration requires ancillary processes for ash handling and flue gas scrubbing to meet air pollution requirements. Flue gases may be cleansed either mechanically or with wet scrubbers. Ash would be disposed of at an MPCA approved landfill. Wet scrubbers are generally employed because they are cheaper than bag filters or precipitators. Sludge dewatering may also be required prior to incineration to reduce auxiliary fuel requirements and enhance incinerator performance. Sludge stabilization (i.e., anaerobic or aerobic digestions) is not recommended prior to incineration as it will reduce the volatile content and heating value of the sludge.

### Costs

Capital costs associated with the incineration of all solid waste material presently being landfarmed is expected to range from 1 to 2 million dollars. Annual maintenance costs of \$40,000 to \$80,000 dollars are anticipated. Incineration processes are complex and are expected to require two operators per shift.

Because many of the wastes being landfarmed are classified as hazardous waste, a formal permitting process under RCRA would be required. The total

TABLE 2

## Mechanical Dewatering Alternatives

Type	Capital Cost	O&M Labor Cost	Sludge Conditioning Cost	Cake Solids (%) <sup>a</sup>	Ease of Operation and Maintenance	Performance	Sludge Conditioning
Horizontal Belt Filters <sup>b</sup>	Low	Medium	Low	15-20	Automated continuous operation; process operation visible; requires greater operator attention for proper sludge conditioning; blinding of belts or sludge extrusion between belts can occur; requires more frequent washdown; belt life of 2,000 to 3,000 hours.	Good; dependent on proper sludge conditioning; belt type important; susceptible to decrease in solids recovery with changes in feed flow or solids characteristics.	Cationic and anionic polymers.
Vacuum Filter <sup>c</sup>	Low	Low	Low	15-20	Automated continuous operation, process operation visible; requires greater operator attention for sludge conditioning; must precoat filter.	Good, dependent on proper sludge conditioning and pre-coating of filter	Diatomaceous earth equivalent to 15% of dry solids. Disadvantage is increase in total dry solids.
Solid-Bowl Centrifuge <sup>d</sup>	Medium	Low	High	10-20	Automated operation; process enclosed and, therefore, not visible to operator; scroll tip replacement is major maintenance item; life of tips reported to be 20,000 hours; less attention required than belt filters or pressure filters.	Good dependent on proper sludge conditioning, but generally better consistency than belt filters; solids recovery most dependent on polymer conditioning.	Cationic and anionic polymers.
Diaphragm Pressure Filter <sup>e</sup>	High	High	Medium	-	Automated batch operation, which requires the most operational time of systems considered; filter cloths can blind; enclosed process.	Poor when utilizing only polymers, but would be good with lime and ferric chloride conditioning; filtrate relatively independent of sludge conditioning.	Requires use of ferric chloride or lime. Disadvantage is increase in total dry solids.

<sup>a</sup> Cake solids does not include diatomaceous earth.

<sup>b</sup> Sludge dewatered on continuous horizontal belt(s). Either gravity pressure, capillary action, or shear forces, or some combination act to dewater sludge.

<sup>c</sup> Cylindrical drum covered with belt or filter medium. Drum partially immersed, as drum rotates part of circumference subject to vacuum that draws sludge to and water through medium. Sludge air-blown or removed with knife from drum.

<sup>d</sup> Sludge fed into rotating chamber, separates into solid cake and dilute liquid stream (centrate). Sludge cake removed by internal auger.

<sup>e</sup> Sludge pumped into spaces between a series of rectangular plates, recessed on both sides and covered with filter medium. Increasing pressure applied until water no longer passes through filter medium (up to 120 psi). Plates opened one at a time to allow sludges to fall out.

TABLE 3

## Incineration Alternatives

<u>Type</u>	<u>Description</u>	<u>Comments</u>
Multiple Hearth	Cylindrical steel shell with a series of refractory grades around a central shaft. Sludge fed from top of hearth where it is raked and falls downward through the series of grates.	Complex operation, O&M problem with sticky sludges; not heat efficient
Fluidized-Bed	Sludge is fed into a hot suspended bed of sand. Ash exits reactor with flue gas.	Complex operation; more heat efficient than multiple hearth furnace; high levels of heavy-metals may result in caking of sand media.
Rotary Kil	Sludge enters at end of horizontal cylindrical chamber. Sludge moves down-chamber as chamber rotates.	Less complex operation; more versatile than multiple hearth and fluidized-bed furnaces, can handle solids.

implementation period for this alternative is anticipated to be two to three years.

### Alternative 3 - On-Site Landfilling of Hazardous Materials

This alternative considers construction of a RCRA approved landfill cell on the Koch Refining Company property. On-site landfilling of hazardous materials is viewed as a short-term (5-year) solution, should future landfarming of hazardous materials at the Koch refinery be prohibited. Landfilling would be practiced during the implementation period of a long-term solution (i.e., incineration) for disposal of hazardous materials. Materials landfilled during the interim period would be permanently stored at the refinery facility. Only those materials currently being landfarmed that are classified as hazardous wastes would be disposed of in the landfill.

This alternative was developed in accordance with currently promulgated RCRA regulations. In general, the 1984 RCRA Reauthorization Act will make requirements for landfilling of wastes containing free water and certain organic compounds more stringent. The U.S. EPA is currently developing new regulations for landfilling of these wastes. The future regulations may prohibit or strictly control the landfilling of many hazardous materials.

Construction and operation of a landfill cell would require RCRA permitting. MPCA suspects that current landfarm practices are contributing to groundwater contamination in the vicinity of the Koch refinery. If groundwater contamination attributable to refinery operations is confirmed, RCRA permitting of an additional land-based disposal unit (landfill cell) may be looked upon unfavorably by the regulatory authorities.

Current RCRA regulations prohibit the landfill disposal of materials containing free water. Therefore, sludges would have to be solidified prior to disposal. Solidifying agents include cement, lime, fly ash, thermoplastics, organic polymers, and emulsifiers. Bench-scale testing would be required to determine the appropriate solidifying agent(s).

#### Costs and Implementation

The estimated order-of-magnitude capital cost for this alternative is \$600,000. The cost estimate is based on a 5-year operating period and projected 1988 (draft EIS Table 3-56 and final EIS Table 1) waste generation rates. The estimate includes costs for permitting and construction of the landfill (excluding Koch Refining Company's labor and administrative costs). Operating and maintenance (O&M) costs were not estimated. Short-term O&M requirements would include daily spreading and covering of waste materials, run-on and run-off management, leachate collection and treatment, and monitoring. Long-term O&M requirements include monitoring, cap maintenance, and leachate collection and treatment.

Because of the required permitting, it would require an estimated two to three years before the landfill cell would be operational. A disadvantage of this alternative is that it takes as long to implement as the permanent disposal alternative, incineration (Alternative 2).

### Alternative 4 - Off-Site Disposal of Sludge

This alternative considers disposal at an off-site RCRA landfill of those materials currently being landfarmed that are classified as hazardous

wastes. This discussion assumes that nonhazardous wastes would continue to be treated at the landfarm. However, nonhazardous wastes may also be landfilled. Landfilled hazardous materials would be solidified prior to disposal. Future off-site landfilling of these materials may be affected by the 1984 RCRA Reauthorization Act.

### Costs and Implementation

Annual order-of-magnitude costs of this alternative are expected to range from 1 million to 1.5 million dollars per year. The estimate is based on future (1988) waste generation rates. The cost estimate consists primarily of the hauling and waste disposal costs. The estimate does not consider Koch's administrative costs. The lower estimate considers disposal at a RCRA facility 400 miles from the refinery. The higher estimate considers disposal at a facility 750 miles from the refinery.

This alternative would be the quickest disposal alternative to implement should future landfarming of hazardous wastes be prohibited. It is anticipated that arrangements for off-site disposal of hazardous wastes could be completed within one to two months.

### Stormwater Retention Basin Sediment Mitigation, Disposal Options, and Alternatives

Mitigative measures should include the following:

1. Evaluation of the waste is necessary to define the waste composition and characteristics before selecting waste handling and disposal options.
2. Before cleaning of the basin sediment and depending on the outcome of mitigation measures and whether the basin is a hazardous waste surface impoundment, proper waste handling and disposal practices can be determined.
3. If on-site waste treatment, storage, or disposal is conducted, approvals or permits are required by the MPCA.

Appropriate handling or disposal of this waste will depend upon the composition and characteristics of the sediment. It may be possible to use the material as a product. If the sediment is predominantly coke fines, it could possibly be sold as a fuel source, like the original product. It may also be possible to use the sediment as fill material, as has been done in the past, provided the waste is nonhazardous and does not present an environmental or health concern.

- treatment to render the waste nonhazardous and disposal at a permitted solid waste disposal site
- shipment off-site to a permitted hazardous waste landfill
- shipment off-site to a permitted hazardous waste incinerator facility
- disposal on-site at the land treatment facility.

If the sediment is a nonhazardous waste that has the potential to pose an environmental or health concern, the same types of options mentioned above for hazardous waste would also be applicable, primarily incineration or disposal at a permitted on-site or off-site facility.

### Firewater Basin Sediment Mitigation, Disposal Options, and Alternatives

The mitigative measures for this waste would be the same as for stormwater retention basin sediment.

The disposal options and alternatives for this waste would be the same as for the sediment for the stormwater retention basin.

## 2.7 GROUNDWATER QUALITY

### 2.7.1 Potential Groundwater Contamination Sources

#### Stormwater Retention Basin (Coker Pond) Impact

The stormwater retention basin was discussed briefly in the draft EIS at page 3-157. The discussion and mitigative measures for groundwater quality concerns related to the stormwater retention basin are expanded upon below to supplement the draft EIS section. Wastewaters entering the basin will be affected by the expansion proposal.

The stormwater retention basin (coker pond) receives plantside runoff water including spilled materials, quenching water from coking operations, and landfarm runoff. Because of current landfarm runoff management practices, the landfarm runoff may be a hazardous waste and thus the basin a hazardous waste surface impoundment. In addition to the concern related to landfarm runoff, there is the concern that the water in the basin could regularly contain constituents capable of polluting groundwater. Even if the basin does not regularly contain such constituents, there is a potential for intermittent contamination from spills or other sources of runoff from the refinery.

If the basin is designated as a hazardous waste impoundment or regularly contains constituents of groundwater contamination concern, the existing asphalt liner is considered inappropriate.

#### Firewater Pond Impact

As with the stormwater retention basin, the firewater pond was only briefly discussed in the draft EIS. Additional discussion is being provided because the pond will continue in operation following the expansion and also to resolve concern on the part of commenters. This pond may be affected by the expansion proposal.

The firewater pond receives effluent from the non-oily wastewater treatment system and the stormwater retention basin. Because the non-oily wastewater consists only of wastes from water softening, and noncontact heating and cooling waters and is treated prior to entering the pond, it is not considered of concern from a groundwater quality standpoint. However, the firewater pond also has the capability to, and has received water from the stormwater retention basin (coker pond) discussed above. The discharge of the stormwater retention basin water to the firewater pond may be eliminated as part of the expansion. If this mitigative measure is instituted, the firewater basin is not expected to constitute a groundwater quality concern related to the expansion.

### 2.7.2 Mitigation

Mitigation measures/alternatives recommended for the stormwater retention basin and firewater pond would be implemented through the RCRA permitting process.

#### Stormwater Retention Basin (Coker Pond) Mitigation

The following are mitigation measures required for the stormwater retention basin (coker basin). The types of mitigative measures to be implemented are

dependent on the designation types of wastes present in the pond and their potential effect on groundwater.

1. Detailed investigations should be completed to determine if the landfarm runoff is hazardous and to define constituents in the stormwater retention basin that may constitute a groundwater protection concern. Groundwater monitoring should also be instituted at the basin.
2. If the basin does not typically have constituents present that pose a groundwater concern, only groundwater monitoring is necessary.
3. If the basin regularly or frequently contains constituents which pose a groundwater protection concern, the basin should be lined with an appropriate liner (synthetic or clay) and groundwater monitoring instituted.
4. If hazardous waste is placed in the basin, hazardous waste requirements for surface impoundments which include retrofitting with a double liner, installation of a leak detection system, and monitoring of groundwater are required.

#### Firewater Pond Mitigation

The following mitigative measures apply for the firewater pond:

1. Eliminate the discharge of stormwater retention basin water to the firewater pond and have all stormwater basin water pass through the oily wastewater treatment system.
2. If the discharge of stormwater retention basin water to the firewater pond is not eliminated, the mitigative measures of the stormwater retention basin will apply.

### 3.0 Responses to Draft EIS Comments

### 3.0 RESPONSES TO DRAFT EIS COMMENTS

#### 3.1 Summary of Public Meeting Comments and Responses

A public meeting was held regarding the adequacy of the draft EIS in Rosemount on February 20, 1985. The comments from the transcript of the meeting were summarized and organized under the general areas of concern listed below. Responses to the comments are presented on the following pages and are numbered to correspond to the comment numbers.

<u>TRANSCRIPT COMMENT</u>	<u>COMMENTER</u>	<u>TRANSCRIPT PAGE NOS.</u>
<u>Draft EIS Section 3.1 Air Quality</u>		
1. Concern and confusion about formaldehyde standards. "What's the difference between a standard and a guideline?"	Benson	76-84
2. EIS difficult to understand; wanted a section on the health effects of air pollutants on humans.	Schniech	26
3. Concern that NO <sub>2</sub> , CO, and toxic increases in air emissions may not be adequately addressed.	Loeding	7
4. Air pollution in the area getting worse. Questioned air monitoring process. Showed mistrust of the air monitoring system.	Karneski Pollock	31-33 95-96
5. Concern about air modelling and its ability to accurately reflect existing or future conditions.	Benson	30
6. Concern about the time air quality is monitored; the frequency of air monitoring may not be adequate to pick up all pollutants.	Oberg	87
7. Concern regarding "blue" emissions seen near the refinery.	Benson	30
<u>Draft EIS Section 3.2 Water Quality</u>		
8. Concern about Koch's self-monitoring of the water quality of the wastewater treatment plant effluent.	Lewanski Benson	46-53 53
9. Concern about the contamination of fish in the Mississippi River due to Koch's wastewater treatment plant effluent	Lewanski Karneski	54 31
<u>Draft EIS Section 3.3 Socioeconomics</u>		
10. Inference that Koch cannot sell the oil they produce. Do they need to expand?	Koehnen	23
11. Quality of life in the area appears to be on the decline	Pollock	95-96

<u>TRANSCRIPT COMMENT</u>	<u>COMMENTER</u>	<u>TRANSCRIPT PAGE NOS.</u>
12. Concern that the assessment of economic and infrastructure impact is inaccurate that some financial figures have not been disclosed by Koch	Schniech	101-102
<u>Draft EIS Section 3.5 Noise</u>		
13. Concern that all noise sources were not considered in the assessment.	Schniech	102-103
<u>Draft EIS Section 3.6 Groundwater Availability</u>		
14. Hydrogeological map appears to conflict with the U.S Geological Survey and other existing reports and surveys of groundwater flow.	Oberg	111
15. Concern about how the expansion may affect groundwater drawdown and surrounding private wells; agencies should assess impact on small water users before approving the expansion.	McCarthy Schniech Benson Krein	69-74 57-58 39, 69-70 39
16. Who does one call when a well dries up?	Schniech	57
<u>Draft EIS Section 3.8 Groundwater Quality</u>		
17. Concern that expansion will further impact groundwater contamination in the area.	Loeding Rechtzigel Schniech	7-8 62-63 58-59
18. Concern about the firewater pond as a contamination source	Lewanski	48-56
19. Need provisions for damages for groundwater contamination in the EIS; will people get guarantees or help if their wells become contaminated? What is Koch's responsibility or liability to the public? What is the public's legal recourse for the problem?	Davis Groth Koehnen McCarthy Lewanski Schniech	110 44,72,106 45 106 110 57
20. Agencies must establish "baseline before expansion. Too many unanswered questions; must have more tests and studies before expansion proceeds. Agencies should assess impact on small water users before approving the expansion.	Benson McCarthy Krein Oberg	24,25, 39,85 105 39,108 111-113
<u>Draft EIS General Concerns</u>		
21. Concern that the public had little advanced information about the project--had to rely on the press.	Koehnen	22

## RESPONSE TO COMMENTS RECEIVED AT THE FEBRUARY 20, 1985 PUBLIC MEETING

### Transcript Comment #

1. As is stated in the draft EIS in Section 3.1 regarding air quality on page 3-13, federal and state agencies have not established ambient air quality standards for toxic air pollutants, such as formaldehyde. Different states have only developed policies (guidelines) or technical methods for determining acceptable emission rates from noncriteria pollutant sources. The MPCA is using the Michigan policy and other risk assessment policies in assessing the risk of new sources.

The monitored levels of formaldehyde in the draft EIS toxic air pollutant study were reviewed by the Minnesota Health Department and determined to be of no concern. Formaldehyde is a ubiquitous chemical emitted from almost any combustion source. Moreover, the highest formaldehyde concentration was monitored upwind not downwind of the refinery indicating at least at that monitoring time on that day that the refinery was not a significant source of formaldehyde in the area. It is probable based upon the upwind/downwind concentration gradient and typical urban levels of formaldehyde measured in other cities, that the formaldehyde concentration measured was either a background level or emanated from a source other than Koch Refining Company. Refer to Section 2.2.2 Mitigation for noncriteria pollutant emissions in the final EIS. Further study of noncriteria pollutant emissions will be required as part of the air quality total facility permit for the expansion.

2. The qualitative health effects of significant criteria and noncriteria pollutants are discussed in Section 2.2.1 of the final EIS.
3. Refer to Section 2.2.2 of the environmental impacts and mitigation supplement of the final EIS for a discussion regarding further study of noncriteria pollutants to be required in the air quality permit for the expansion. The agency staff believes that criteria and noncriteria air pollutants have been adequately addressed in Section 3.1 Air Quality of the draft EIS.
4. Air monitoring has been conducted at MPCA site 0420 since the early 1970's. Refer to draft EIS Figure 3-1 for the location of this MPCA monitor directly southeast of the refinery. Ambient sampling has been conducted for SO<sub>2</sub>, NO<sub>2</sub>, particulate, hydrocarbon, and H<sub>2</sub>S emissions. No violations of the H<sub>2</sub>S or NO<sub>2</sub> ambient air quality standards have been monitored. SO<sub>2</sub> and particulate levels have improved significantly and are now in compliance with the ambient air quality standards. In general, the air pollution problem near the refinery is much improved.

Summaries of the ambient monitoring data for particulates, sulfur dioxide, hydrocarbons, ozone, and lead are presented in Tables 3-2 through 3-6 of the draft EIS. Currently, there are five air monitors located in the project area: four are run by Koch Refining Company and one by the MPCA. The air monitoring was conducted according to U.S. EPA guidelines. Monitors are placed where they will show the highest concentrations of

pollutants based on a company's stack locations and prevailing wind directions. The best location for a monitor is at nose height (at a person's breathing level) and, in general, the highest concentrations occur at the property boundary.

5. The dispersion modeling conducted for the draft EIS is discussed in the project air quality technical report, which is available for review at the MPCA offices. In general, the validity of air quality modeling has been proven through studies comparing monitored versus modelled pollutant concentrations. EPA approved models were used for the modelling in the draft EIS. In general, modelling is the only way of predicting whether a new facility or expansion will comply with federal and state ambient air quality standards.
6. Air quality monitoring is discussed in the draft EIS on pages 3-6 through 3-12. Air monitoring for SO<sub>2</sub> is currently conducted continuously at four locations. Particulates are measured once every sixth day for 24 hours. Hydrocarbons and odors are not currently monitored routinely but will be included in the noncriteria pollutant study required by the air quality permit for the expansion.
7. Refer to Section 2.2.2 of the environmental impacts and mitigation supplement of the final EIS regarding the noncriteria pollutant study plan to be required as part of the air quality permit for the expansion.
8. Water quality legislation has placed the cost or burden of water quality monitoring on the industrial sector or the discharger, not on governmental agencies. Although Koch does self-monitor their wastewater treatment plant discharge, the MPCA polices their work by making regular checks, many of them unannounced, where the agency performs its own inspections and sampling. In addition, wastewater samples are usually split, one is analyzed by Koch's lab and the other by an independent lab, for comparison. If discrepancies are found, more frequent inspections are required. If industry is fraudulent in their reporting, fines can be imposed or the plant closed. This system of monitoring has worked well in practice.
9. Koch's discharge has been the subject of two previous bioassays: one conducted by the EPA in 1976 and another by the MPCA in 1980. The 1976 bioassay demonstrated acute toxicity to aquatic life largely attributable to the molecular forms of ammonia and cyanide. The 1980 bioassay was not acutely toxic. MPCA believes the effluent requirements being developed for ammonia and cyanide which will apply to phase 2 of the expansion will alleviate any acute toxicity problems. In addition, cyanide does not bioaccumulate in fish.

There is no indication from analytical or biological data that Koch is responsible for any downstream water quality violations. Because the wastewater effluent is discharged into the main channel of the river not along the shoreline, and is warmer than ambient river water temperatures, the discharge is fairly well mixed and diluted with the river water. The discharge point minimizes potential effects of bioaccumulation and fish contamination. The only existing fish consumption advisory in Pool 2, in Koch's discharge area, is for PCB's, which are not a constituent of Koch's discharge.

10. Due to a recent decline in Upper Midwest refining capacity (Upper Midwest refineries have been closing facilities or reducing production), Koch Refining Company is currently marketing all the products it makes and is operating at full capacity. Koch believes that declining production capacity elsewhere in the United States, coupled with slowly increasing demand, will require additional crude refining capacity and that the proposed expansion is needed to satisfy the demand for refined petroleum products in the Upper Midwestern states. (Refer to pages 1-6 and 1-7 in the draft EIS for a discussion regarding the project purpose.)

Since some of the products produced at the refinery are consumed on a seasonal basis, the commenter may have observed that some product storage tanks are full and incorrectly assumed that this indicated products could not be sold. However, the refinery operates on a continuous basis, and product storage volumes fluctuate as seasonal demands dictate.

11. The Koch Refining Company project site is located in the Pine Bend Industrial District, which is fairly remote from the densely populated sections of the metro area. In addition, the pollution controls required for the expansion will ensure that, in general, the environmental quality in the area will remain, at a minimum, as is and in some instances improve with the refinery expansion.
12. Certain assumptions were made for the analysis of the socioeconomic benefits for the Koch expansion in the draft EIS in Section 3.3 on pages 3-81 through 3-100. One assumption was that the new refinery work force would be distributed widely around the metropolitan area as is the current work force. Another assumption was that the work force would be hired from the existing labor force and, as such, the immigration of new populations would be minimal. With these two assumptions, the impact on community services and utilities would be minimal. Infrastructure impacts occur because new populations must be accommodated into the existing urban fabric or populations shift from one area to another. Neither of these impacts are expected to occur with the Koch expansion.

The payroll dollars earned by the construction workers and refinery employees will be spent and respent in the economy. Moreover, the economic benefits like the distribution of the employees will be widespread. The economic effects will be felt throughout the metro area, not in one locale.

The Koch Refining Company as a privately held corporation, can decide not to publically disclose financial information. Koch has chosen to retain from public scrutiny financial information that they consider to be confidential. This practice is common for private corporations. It is important to note that the data in draft EIS Table 3-45 are a summation of the data in draft EIS Tables 3-43 and 3-44. The property tax values shown in table 3-45 are for direct and indirect property taxes for employees and/or suppliers. It is shown that Koch's expansion will contribute little in the way of property taxes because the expansion will largely consist of the addition of process equipment, which is exempt from taxation.

13. Refer to final EIS Section 2.4.2 regarding mitigation proposed for additional short-term impact noise sources not covered in the draft EIS.
14. Figure 3-11 in the draft EIS represents the most up-to-date integration of site-specific hydrological data. It is believed to be the best available representation of general site conditions that is currently available. (Refer to response #45 of Section 3.3, Comment Letters and Responses.)
15. Refer to Section 2.5.2 on groundwater drawdown mitigation measures of the final EIS.
16. Complaints regarding well interference should be directed to the Minnesota Department of Natural Resources (MDNR), Water Allocation Unit. In the event of well interference, the priority of use is considered. For example, residential or domestic use has a higher established priority than industrial use. Once the priority is established, the MDNR brings the complainants and the alleged offender together to resolve their differences with a concrete proposal or resolution. If this proves unsuccessful, the MDNR then serves as a mediator and recommends the course of action to be followed.

Refer to Section 2.5.2 of the final EIS which contains a discussion on mitigation measures for groundwater drawdown available under the well interference rule promulgated by the MDNR.

17. The expansion of the refinery has the potential to lead to further contamination of domestic wells in the project area, since the additional groundwater pumpage necessary for the expansion could cause the spread of the contaminated groundwater plume in the project area. However, under the state Superfund Act, the Environmental Response and Liability Act (ERLA) and the federal Superfund Act, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), Koch is providing additional information on the geohydrology in the project area to help identify the source(s) of contamination and identify remedial actions to mitigate the contamination problem. The results of these investigations should be available in the summer of 1987 and remedial actions to cleanup sources of contamination implemented by the end of 1987. As such, the contamination issue should be resolved before the expansion of the refinery is completed in 1988.
18. Refer to parts 2.6.1 and 2.6.2 of the final EIS for a discussion of the firewater pond as a potential contamination source at the refinery and recommended mitigation measures.
19. Koch Refining Company is liable for any costs for damage to property or personal injury resulting from groundwater contamination due to operation of the refinery, under the state and federal Superfund Acts. Koch, if proven to be a culpable source, would have to provide new wells and/or a supply of noncontaminated water to affected parties. Refer to Section 2.5.2 (the groundwater availability mitigation section) of the final EIS for additional discussion of this issue.
20. It is important to note the difference between the environmental review and permitting processes for the project. The permitting process

necessarily includes much more detailed data and review than does the environmental review process. An EIS must contain a description of the potential environmental impacts and mitigation measures associated with the project, and describe reasonable alternatives to the project with the data available for the project. These elements are defined during the scoping process for the EIS and incorporated into the scoping decision for the project. The Environmental Quality Board rules acknowledge that at times, information desirable for the EIS analysis may be incomplete or unavailable, and defines a course of action to follow. When the data needed for an evaluation of an environmental impact or alternative is incomplete or unavailable, it must be made clear in the EIS that the information is lacking and that further study is needed, and in instances where the data is essential for a reasoned choice among alternatives, the EIS must contain a worst case analysis of the situation. This has been done in the draft and final EIS.

For example, existing data was used to examine the effects of increased pumpage at Koch. This approach was considered reasonable, since there have been no reported well interference problems in the area. Three different scenarios were used to examine the effects of pumping. Drawdown curves showed that the potential effects could be greater in the upper aquifer than the lower aquifer. It was presumed, though not verified, that well interference in the shallow aquifer could be a potential problem. The potential impact was identified and can only be confirmed with more exhaustive study and modeling. The EIS process identified the problems and the studies needed to pinpoint well interference; that is the function of the EIS. After this analysis, the timing of future studies becomes an issue. The next step is to move the issue from the EIS process to the permitting process. To be issued a new permit or amendment to a permit for a specific environmental area, all significant data must be available to the permitting agency, and the project must be acceptable to the agency (the project must comply with all applicable laws, rules, policies) before a permit can be issued. For this step, the permitting agency has the option to require further study in advance of permitting or to issue the permit with a condition of further study.

With regard to groundwater quality in the project area, groundwater contamination occurs in the vicinity of the refinery. Three sites have been named as potential sources of contamination (U of M Research Center, Pine Bend Landfill, and the Koch Refinery) and are on the Superfund National Priorities List. The groundwater contamination issue is far broader than Koch itself and involves very expensive long-term studies to arrive at answers that will identify sources of contamination and effective cleanup measures. Therefore, the concern that increased water pumpage by Koch may in some way draw contaminants toward nearby well users is very difficult to resolve at this point since the questions that are being asked can only be addressed with a comprehensive, areawide, and costly investigation. An investigation of this magnitude will be part of the overall federal and state Superfund investigations. As part of these studies, the Koch expansion scenario will be investigated, and it will be determined if increased pumpage might affect the direction of the contaminated plume. These studies are anticipated to be completed prior to the completion of construction of the expansion.

21. The EIS process, as legislated and adopted by the State of Minnesota, is designed to give the public and decision makers the opportunity to review the project details and their environmental consequences prior to issuance of permits and approvals for construction of the project. The law was born out of the need to have the environmental consequences of large public works or industrial projects publicly reviewed before approval and construction. The required procedures for providing public notice have been followed by the MPCA throughout the environmental review process from the scoping step in March, 1984 to the final EIS issuance in April, 1985. In addition to required public notices and public meetings, the media (newspapers) have played an important role in developing public awareness about the project.

Public notices were issued on the project and published in the EQB Monitor for the scoping environmental assessment worksheet (EAW) in February, 1984, announcing EIS preparation in June, 1984, and the availability of the draft EIS in January, 1985. The availability of the final EIS was published in the EQB Monitor on April 8, 1985.

Mailing lists have been developed for member agencies of the Environmental Quality Board, other governmental agencies who may potentially be concerned/affected by the project, and all interested parties.

Newspapers carrying articles on the project have included the Minneapolis Star and Tribune, the St. Paul Dispatch/Pioneer Press, the Hastings Star Gazette, and the Virginia-Mesabi Daily News in St. Louis County, among others.

### 3.2 Comment Letters not Requiring a Response

Several comment letters were received during the draft EIS comment period that required no response. Letters were also exchanged concerning the extension of the draft EIS comment period. These letters are listed below and reprinted on the following pages.

1. Minnesota Historical Society, dated February 1, 1985
2. Request for extension to the draft EIS comment period:
  - a. Dakota County Human Services Board, dated February 26, 1985
  - b. Koch Refining Company, dated February 28, 1985
  - c. Minnesota Pollution Control Agency, dated March 1, 1985
3. Metropolitan Council, dated February 25, 1985, and attachment letter from the Metropolitan Waste Control Commission dated February 8, 1985
4. Minnesota Department of Natural Resources, dated March 5, 1985

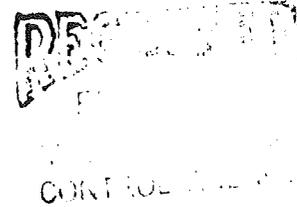


FOUNDED IN 1849

# MINNESOTA HISTORICAL SOCIETY

690 Cedar Street, St. Paul, Minnesota 55101 • 612/296-6126

1 February 1985



Ms. Deborah R. Pile  
Director, Office of Planning & Review  
Minnesota Pollution Control Agency  
1935 West County Road B2  
Roseville, Minnesota 55113-2785

Dear Ms. Pile:

RE: Koch Refining Company  
Crude Expansion Project  
Rosemount, Minnesota

MHS Referral File Number: N-772  
(PLEASE REFER TO THIS NUMBER IN  
ALL FUTURE CORRESPONDENCE)

Thank you for the opportunity to review and comment on the above project. It has been reviewed pursuant to responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the National Advisory Council of Historic Preservation (36CFR800).

This review reveals the location of no known sites of historic, architectural, cultural, archaeological, or engineering significance within the area of the proposed project. There are no sites in the project area which are on the National Register or eligible for inclusion on the National Register, and, therefore, none which may be affected by your proposal.

Again, thank you for your participation in this important effort to preserve Minnesota's heritage.

Sincerely,

6- Russell W. Fridley  
State Historic Preservation Officer

HUMAN SERVICES BOARD  
DAKOTA COUNTY, MINNESOTA

Date: February 26, 1985

Motion by Commissioner Streefland      Second by Commissioner Voss

---

85-27

BE IT RESOLVED that the Human Service Board authorize the Chairman to sign a letter to Thomas Kalitowski, Executive Director, Minnesota Pollution Control Agency, requesting that the public comment period be extended until March 13, 1985, on the draft EIS for Koch Refining Company Crude Oil Expansion Project.

	YES	NO
Harris	x	Harris
Hollenkamp	x	Hollenkamp
Voss	x	Voss
Loeding	x	Loeding
Streefland	x	Streefland

---

State of Minnesota:

: ss

County of Dakota :

I hereby certify that I have compared the foregoing copy of a resolution with the original minutes of the proceedings of the Human Services Board, Dakota County, Minnesota, at their session held on the 26th day of February, 1985, and have found the same to be a true and correct copy thereof.

*Shirley Wasti*  
Shirley Wasti, Secretary  
February 26, 1985

*Koch EIS  
Minnesota*



February 28, 1985

Minnesota Pollution Control Agency  
Office of Planning and Review  
1935 West County Road B2  
Roseville, Minnesota 55113

Attention: Koch EIS Project Manager

We have received your letter of February 27, 1985 noting that the Environmental Health Services Division of Dakota County has requested a one week extension of the comment period from March 6 to March 13.

We are concerned about slippage of the EIS schedule, but feel that we can cooperate to allow a better understanding of our plans and the EIS's assessment of them. Contingent on maintenance of the schedule as further noted in your letter we can agree to the delay.

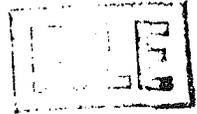
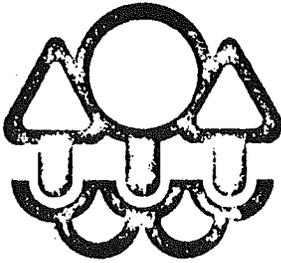
Sincerely,

A handwritten signature in cursive script that reads 'R. D. TenNapel'.

R. D. TenNapel  
Vice President  
Minnesota Operations

RDT:bms

cc: Steven G. Loeding, Chairman  
Dakota County Human Services Board



## Minnesota Pollution Control Agency

March 1, 1985

Steven Loeding, Chairman  
Dakota County Board of Commissioners  
Dakota County Government Center  
1600 Highway 55  
Hastings, Minnesota 55033

Dear Mr. <sup>Steve</sup>Loeding:

Thank you for your letter requesting a one-week extension to the comment period for the draft environmental impact statement for the Koch Refining Company's crude expansion project.

The Minnesota Pollution Control Agency grants your request for an extension to the comment period, an extension from March 6 to March 13, 1985. Koch Refining Company has approved of this extension in a letter to the agency dated February 28, 1985.

Sincerely,

Thomas Kalitowski  
Executive Director

TK:es

c: Tom Segar, Koch Refining

Phone: 296-7301

1935 West County Road B2, Roseville, Minnesota 55113-2785

Regional Offices • Duluth/Brainerd/Detroit Lakes/Marshall/Rochester

Equal Opportunity Employer

3-13



Metropolitan Council  
300 Metro Square Building  
Seventh and Robert Streets  
St. Paul, Minnesota 55101

Telephone (612) 291 6359

February 25, 1985

Deborah R. Pile, Director  
Office of Planning and Review  
Minnesota Pollution Control Agency  
1935 West County Road B-2  
Roseville, Minnesota 55113-2785

RE: Draft Environmental Impact Statement  
Rock Refining Company  
Crude Expansion Project  
Metropolitan Council Referral File No. 11972-2

Dear Ms. Pile:

At its meeting on February 14, 1985, the Metropolitan Council considered the Draft Environmental Impact Statement (DEIS) on Rock Refining Company's proposed crude expansion project in the Pine Bend Industrial District in Rosemount, Minnesota.

The Council has reviewed this project for possible environmental impact issues in air quality, increased wastewater discharge into the Mississippi, noise, groundwater quality, groundwater withdrawal, and solid and hazardous waste generation. The DEIS adequately addresses these issues and it appears consistent with the Council's plans and policies.

Attached is a copy of a letter from the Metropolitan Waste Control Commission commenting on this DEIS.

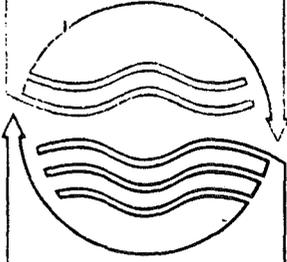
Sincerely,

  
Sandra S. Gardebring  
Chair

SSG:sb

cc: Dean R. Johnson, Planning Director, City of Rosemount  
Louis J. Breimhurst, Chief Administrator, MWCC  
Dick Osgood, Metropolitan Council Staff

METROPOLITAN  
WASTE  
CONTROL  
COMMISSION  
Twin Cities Area



February 8, 1985

Mr. John Rutford  
Referral Coordinator  
Metropolitan Council  
300 Metro Square Building  
St. Paul, MN 55101

Dear Mr. Rutford:

RE: Metropolitan Council Referral File Number 11972-2

The Metropolitan Waste Control Commission has reviewed the Draft Environmental Impact Statement for the Koch Refining Company Expansion located in Rosemount.

Our review indicates that the Koch Refining Company has their own wastewater treatment facility and does not now use nor expect at a later date to use the Metropolitan Disposal System facilities for treatment of wastewater. Therefore, the Koch Refining Company is not included in Rosemount's approved Comprehensive Sewer Plan. The Commission has no objection to this expansion, providing the additional wastewater treatment requirements are met which comply with state and federal regulations governing the discharge of wastewater.

Sincerely,

Louis J. Breimhurst  
Chief Administrator

LJB:RWJ:CLL

300 METRO SQUARE BLDG.  
17TH & ROBERT STREET  
ST. PAUL, MN 55101  
50 222-8700



2.14  
CR



STATE OF  
**MINNESOTA**  
DEPARTMENT OF NATURAL RESOURCES

*note  
Koch Refining Co.*

BOX 100, 500 LAFAYETTE ROAD • ST. PAUL, MINNESOTA • 55146

DNR INFORMATION  
(612) 296-6157

March 5, 1985

Ms. Marlene Voita  
Office of Planning and Review  
Minnesota Pollution Control Agency  
1935 West County Road B2  
Roseville, Minnesota 55113

RE: Koch Refining Company Crude Expansion Project  
Draft Environmental Impact Statement (DEIS)

Dear Ms. Voita:

The Department of Natural Resources (DNR) has reviewed the above-referenced document and we offer the following comments for your consideration.

We are concerned about this project's effects on the proposer's water appropriation authorization and on the water quality of the Mississippi River. The DEIS adequately addresses these issues, however we do have some additional comments.

The proposed water appropriation volume of 5,500 acre-feet is well within the 8,060 acre-feet limit established by the existing DNR permit. The DNR Water Use Management Section will be reviewing this permit in view of the proposed increase in withdrawal. If permit modifications are required, they will contact the proposer.

We are concerned about reductions in the water quality of the Mississippi River as a result of the effluent discharge from the expanded refining facility. The fishery in the river has been improving concurrent with the improvement in the general water quality. We agree with the DEIS conclusion that improvements in the wastewater treatment process associated with the refinery are required.

Thank you for the opportunity to review this project.

Sincerely,

*Thomas W. Balcom*

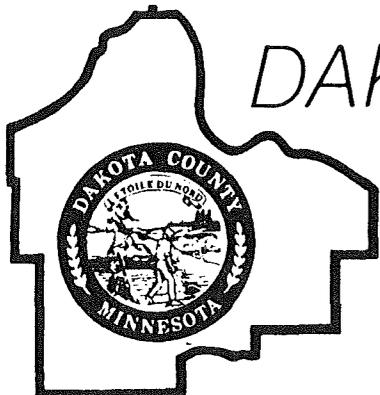
Thomas W. Balcom  
Environmental Review Coordinator

pje 329  
c: Kathleen Wallace  
Ron Harnack  
Hedia Rieke  
Gregg Downing - EQB  
Thomas Segar - Koch Refining Company

3-16

AN EQUAL OPPORTUNITY EMPLOYER





# DAKOTA COUNTY

FREDERICK W. JOY, JR.  
COUNTY ADMINISTRATOR

(612) 437-0418

DAKOTA COUNTY GOVERNMENT CENTER

1560 HWY. 55 - HASTINGS, MINNESOTA 55033

February 26, 1985

Thomas Kalitowski  
Executive Director  
Minnesota Pollution Control Agency  
1935 West County Road B-2  
Roseville, MN. 55113

Dear Mr. Kalitowski,

On February 26, 1985, the Dakota County Human Services Board passed a resolution requesting the Minnesota Pollution Control Agency to extend the comment period for the Draft Environment Impact Statement on the Crude Oil Expansion Project at Koch Refining Company. We are formally requesting that the deadline be extended to March 13 to permit County Environmental Health Services staff to complete their review of available information and data and permit coordination of our comments with your staff and the proposer.

We understand that your staff, as well as Koch Refining Company, is in favor of the extension and that it has been informally approved. We appreciate your consideration of our request and the opportunity that you have afforded county staff to work with your staff on this important issue.

Sincerely,

*Steve Loeding / dma*  
Steven G. Loeding, Chairman  
Dakota County Human Services Board

Enclosure

### 3.3 Comment Letters and Responses

Four comment letters were received for which responses were required. These letters are listed below and reprinted on the following pages. Specific comments in the letters for which responses were developed are noted in the margins and numbered. The numbers correspond to the numbers on the responses to comment letters immediately following the four letters.

1. North American Water Office, Earth Protector, Inc., letter dated February 19, 1985
2. Minnesota Department of Health dated March 1, 1985
3. Dakota County Human Services Board letter dated March 12, 1985
4. Minnesota Department of Transportation letter dated March 11, 1985

# North American Water Office

1519 A East Franklin Ave Minneapolis, MN 55404

(612) 872-1097

February 19, 1985

In conjunction with the North American Water Office, Earth Protector, Inc. submits the following comments on the Koch Refinery Expansion Draft EIS.

1. The EIS should identify and quantify all inputs and waste streams associated with the expansion. Among the inputs and waste streams not identified and quantified by the Draft EIS are those associated with increased electrical requirements. The electrical consumption analysis should include:
  - 1 A. Capacity (kw) and consumption (Kwh) increases.
  - 2 B. Air emission increases resulting from increased coal combustion at the electrical generator.
    1. SO<sub>2</sub>
    2. NO<sub>x</sub>
    3. Particulate
    4. Metals
  - 3 C. Effluent increases associated with increased electrical usage.
- 3 The analysis of electrical consumption should also examine potential relationships between these increased emissions and emission reductions that may be required because of the MN Acid Deposition Control Act.
- 4 2. The EIS should examine the potential to increase overall energy efficiency and reduce overall waste production by employing cogeneration. Cogeneration technology would appear to be compatible with refinery requirements, as exemplified by recent cogeneration developments at the Arco Petroleum Product Co.'s refinery in Houston. (Power Magazine Vol. 129, No. 2, February 1985, "Cogeneration Financing: Third Parties Will Adopt Any Project" p.84).
- 5 3. In order to adequately document environmental impacts of the expansion, a thorough understanding of impacts resulting from present and past operations of the facility is required. For this reason, the Refinery's contribution to ground water contamination in the Pine Bend region should be identified and quantified in the EIS. The local community should not bear the burden (as is presently the case) of documenting these impacts. Likewise, the EIS should include  
6 an analysis of river-bottom sediments at, and just down-stream from the refinery's discharge pipe into the Mississippi River.

7 | 4. Presently, emitters are allowed to "bank" emissions. They "own" the right to pollute a certain amount of air over a given period of time, and if they don't pollute as much as their "pollution ownership" allows, they can pollute more later or sell the increment between actual and allowed emissions to some one else. Koch Refinery engages, or wants to engage, in this "banking" activity. The EIS should therefore include a description of the banking process, and relate that process to operations at the facility.

8 | 5. Emissions modeling turned up ambient air quality standard violations for SO<sub>2</sub> at several points around the refinery in late 1984. The Koch expansion cannot proceed unless such violations are eliminated. The violations will be eliminated, it appears, by fencing the area in which the violations occurred, thereby removing that area from the jurisdiction of ambient air quality standards.

The EIS should delineate this procedure for resolving air quality problems, and provide documentation of property ownership for the fenced area.

  
George Crocker  
North American Water Office

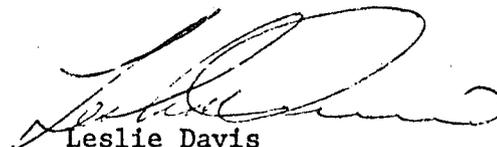
  
Leslie Davis  
Earth Protector, Inc.

7 | 4. Presently, emitters are allowed to "bank" emissions. They "own" the right to pollute a certain amount of air over a given period of time, and if they don't pollute as much as their "pollution ownership" allows, they can pollute more later or sell the increment between actual and allowed emissions to some one else. Koch Refinery engages, or wants to engage, in this "banking" activity. The EIS should therefore include a description of the banking process, and relate that process to operations at the facility.

8 | 5. Emissions modeling turned up ambient air quality standard violations for SO<sub>2</sub> at several points around the refinery in late 1984. The Koch expansion cannot proceed unless such violations are eliminated. The violations will be eliminated, it appears, by fencing the area in which the violations occurred, thereby removing that area from the jurisdiction of ambient air quality standards.

The EIS should delineate this procedure for resolving air quality problems, and provide documentation of property ownership for the fenced area.

  
George Crocker  
North American Water Office

  
Leslie Davis  
Earth Protector, Inc.



minnesota department of health

717 s.e. delaware st. p.o. box 9441 minneapolis 55440

(612) 623-5000

March 1, 1985

Ms. Marlene Voita
Minnesota Pollution Control Agency
Office of Planning and Review
1935 West County Road B2
Roseville, Minnesota 55113

Dear Ms. Voita:

This letter contains comments relating to the draft EIS for the Koch Refining Company crude expansion project, proposed for the Pine Bend Industrial District in Rosemount, Minnesota.

9 Review of the EIS document, the relevant scientific literature, and emission inventories of similar industrial processes indicates the necessity for a more comprehensive consideration of the toxic air emissions related to this proposed expansion project.

The air pollutants of particular health concern include metals and polynuclear aromatic hydrocarbons (PAHs) documented in the literature as refinery emissions, and listed as carcinogenic substances by the EPA Carcinogen Assessment Group. These substances include:

Table with 2 columns: PAHs and METALS. PAHs list: Benz(a)anthrene, Benzo(a)pyrene, Benzofluoranthrene, Chrysene. METALS list: Arsenic, Beryllium, Cadmium, Chromium, Nickel.

These toxicants represent unknown factors relating to possible health impacts, since they were not included in the EIS air toxicant listings. It would seem prudent to make some provision for addressing this issue during the application process. One possible option for accomplishing this objective would be monitoring requirements integrated into the permit for this project.

If you have any questions regarding these comments, please contact Robert Kreiger (623-5228) or myself.

Sincerely,

Raymond W. Thron
Raymond W. Thron, Ph.D., P.E.
Director of Environmental Health

RWT:RQK:ao



# DAKOTA COUNTY

FREDERICK W. JOY, JR.  
COUNTY ADMINISTRATOR

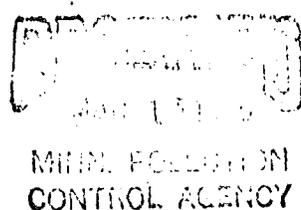
(612) 437-0418

DAKOTA COUNTY GOVERNMENT CENTER

1560 HWY. 55 - HASTINGS, MINNESOTA 55033

March 12, 1985

Thomas Kalitowski  
Executive Director  
Minnesota Pollution Control Agency  
1935 West Cty. Road B-2  
Roseville, MN 55113



Dear Mr. Kalitowski,

Dakota County has reviewed the Draft Environmental Impact Statement (EIS) prepared by the Minnesota Pollution Control Agency (MPCA) on the proposed Crude Oil Expansion Project at Koch Refining Company (KRC) in the Pine Bend Industrial District of Rosemount. We support the expansion project for both socioeconomic and environmental reasons. The latter reason includes additional monitoring, controls and abatement strategies to be implemented to reduce KRC's impact on the environment and to help protect the public health and safety of our citizens.

We are responding to the question of adequacy of the Draft EIS and herewith enclose our staff's technical comments addressing those areas found to be inadequate. The comments are the results of a month-long effort to work with MPCA staff, KRC staff, and both MPCA's and KRC's consultants to discuss the substantive issues raised. Since the cooperative effort yielded substantial agreement, we anticipate the incorporation of the technical comments in the final EIS. The scope and extent of the technical comments are presented as follows to assist you and your staff:

1. Overview. The general nature of the Draft EIS understated many substantive issues either because little or no information and data were available or because the issues involved the Superfund (CERCLA) investigation or the Resource Conservation and Recovery Act (RCRA) permitting which require additional studies. The absence of specific information and data limits the overall environmental review and makes choices between alternatives difficult.
2. Scoping Decision Document. The scoping decision document approved by the MPCA Board on April 24, 1984, limited the issues that must be covered in the draft EIS. Staff has concluded that a number of items required by the scoping document were either not addressed or were not sufficiently addressed in the draft EIS. These items have been discussed by County staff with the MPCA and are included in written comments.

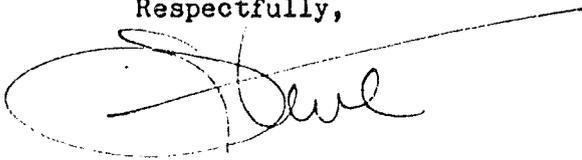
3. Air Quality Impacts. Staff believes that inadequate odor tests have been conducted. The odor impact estimate done is misleading because only hydrocarbon data was used for the assessment. Further study is needed to confirm the sulfur emissions model for which only sulfur dioxide data was available. The EIS did not address toxic air emissions and provide a toxic air emissions risk assessment for area populations. MPCA is including additional requirements in the air quality permit for the expansion. Staff raises questions about the conclusion that water emission impacts to the highway are currently negligible and will continue to be so after expansion. The report did not address sulfuric acid mist, total reduced sulfur and reduced sulfur compound emissions from the refinery. KRC has agreed to further investigate its emissions and ambient air quality impacts.
4. Wastewater Treatment Plant. The expansion project will cause the wastewater flow to approximately double. The present plant must be upgraded to handle this increased flow. The scoping decision document called for the treatment plant design expansion to be included in the draft EIS, the design will be submitted in the permit application by Koch's contractor during the first half of 1985. Staff's written comments include requests for additional sampling and testing of effluent to the Mississippi River including priority pollutants and additional metals, improved operations and maintenance to eliminate failures, and groundwater monitoring around the treatment and storage ponds.
5. Groundwater Availability. The Draft EIS did not adequately address the existing and future impacts of groundwater appropriation with respect to the 2.63 billion-gallon annual withdrawal permitted by the Minnesota Department of Natural Resources (MDNR), and the variable effects of pumping from two aquifers (Unit 1 and Unit 2). Considering limited possibilities for future water conservation at the expanded refinery, the existing trend of increasing annual appropriations and the water supply demands of the expanded facility may result in the possible overdrafting of the permitted quantities. Additionally, the pumping effects on the water level in the upper aquifer (Unit 1) are incorrectly modelled requiring more study to anticipate possible shallow well dewatering and alterations to the direction, velocity, dispersion, etc. of contaminant plumes in the upper aquifer. KRC's hydrogeological consultant has addressed this issue, and a copy of the report has been provided to staff for review.
6. Transportation. The Draft EIS did not adequately address the existing and future impacts of water vapor emissions from KRC on adjacent transportation routes. Water vapor emissions generate or exacerbate fog and ice fog, low stratus clouds, contact or rime ice, ice crystals and pellets, and snow crystals and pellets which directly or indirectly affect traffic flow and safety. According to Mn/DOT records, the accident rate in the Pine Bend area is 14 percent below similar Minnesota highways. It is recommended that the Minnesota Department of Transportation (Mn/DOT) undertake a study to determine what effects water vapor emissions may be having currently and that KRC determine what mitigative measures may reasonably minimize negative impacts.

7. Solid and Hazardous Wastes. The Draft EIS did not adequately inventory all solid and hazardous wastes generated by KRC and did not adequately address the existing and future impacts of waste generation, collection, storage, treatment, shipment and disposal. KRC will be utilizing 15 additional acres of the 31-acre interim status land treatment system. Although not part of the expansion, the land farm has not yet been demonstrated to effectively treat approximately 10,000 tons per year of hazardous and non-hazardous wastes which consist of predominantly oily sludges with organic and heavy metal hazardous constituents. KRC will conduct a treatment demonstration for the final RCRA permit application. Intermittent monitoring of the unsaturated and saturated zones (i.e., above and below the water table) is insufficient to determine if leachate is migrating from the treatment zone, but soil borings have detected oil and grease at depths to five feet, the maximum depth allowed for final permitting. Although no alternatives to the existing land farm were presented, MPCA indicates that a mitigative measures and alternatives section will be added to the final EIS.
8. Groundwater Quality. The Draft EIS did not adequately address the existing and future impacts of surface impoundments and solid and hazardous waste storage, treatment and disposal sites. For example, the stormwater or coker ponds receive contaminated water from the refinery and standing water from the land farm cells. A determination must be made as to whether or not the waters are hazardous. No unsaturated or saturated zone monitoring is conducted at the impoundment to determine if infiltration of hazardous wastes is occurring. KRC is undertaking a study to determine what actions should be taken.

We appreciate the cooperation and time your staff has extended to our staff during this review.

Enclosed is our Human Services Board resolution concerning this project. If you have any questions regarding the enclosed technical comments, please have your staff contact Ron Spong, Dakota County Environmental Health Supervisor, at 437-0233.

Respectfully,



Steven G. Loeding  
Chairman  
Dakota County Human Services Board

encl.

cc Frederick W. Joy, Jr.  
Donna M. Anderson  
Ronald C. Spong  
Marlene Voita, Office of Planning and Review, MPCA  
Tom Segar, Koch Refining Company

HUMAN SERVICES BOARD  
DAKOTA COUNTY, MINNESOTA

Date: March 12, 1985

Motion by Commissioner Voss

Second by Commissioner Streefland

85-45

WHEREAS, the Minnesota Pollution Control Agency (MPCA) has prepared a draft Environmental Impact Statement (EIS) for the crude oil expansion project at Koch Refining company; and

WHEREAS, MPCA has extended the public comment period until March 13, 1985; and

WHEREAS, County staff has reviewed the draft EIS and met with staff of MPCA and Koch Refining Company to discuss their concerns and comments;

WHEREAS, County staff has prepared general and technical comments on the draft EIS.

NOW, THEREFORE, BE IT RESOLVED, that the Human Services Board authorize the Chairman to sign a letter to MPCA, as presented on March 12, 1985, transmitting general and technical comments; and

BE IT FURTHER RESOLVED, that the Human Services Board encourage MPCA to make all permitting processes more publicly accessible; and

BE IT FURTHER RESOLVED, that staff be directed to participate in public information meetings and/or hearings called to review the EIS or permits concerning Koch Refining Company; and

BE IT FURTHER RESOLVED that the Human Services Board supports the expansion of the Koch Refining company which is expected to substantially increase the tax base of the county provided that the environmental concerns related on March 12, 1985 by the Dakota County staff can be resolved and with the understanding that mitigative efforts related to the expansion will resolve some existing environmental problems.

	YES	NO
Harria	x	Harria
Hollenkamp	x	Hollenkamp
Voss	x	Voss
Loeding	x	Loeding
Streefland	x	Streefland

State of Minnesota:

: ss

County of Dakota :

I hereby certify that I have compared the foregoing copy of a resolution with the original minutes of the proceedings of the Human Services Board, Dakota County, Minnesota, at their session held on the 12th day of March, 1985, and have found the same to be a true and correct copy thereof.

*Shirley Wasti*  
Shirley Wasti, Secretary  
March 12, 1985



# DAKOTA COUNTY

COMMUNITY HEALTH SERVICES DIVISION

DONNA M. ANDERSON

DIRECTOR

(612) 437-0533

HUMAN SERVICES DEPARTMENT

DAKOTA COUNTY HUMAN SERVICES BUILDING 1600 HWY. 55 - HASTINGS, MINNESOTA 55033

## TECHNICAL COMMENTS

ON THE DRAFT EIS FOR THE PROPOSED CRUDE OIL EXPANSION  
PROJECT AT KOCH REFINING COMPANY, ROSEMOUNT

submitted by the Dakota County Environmental Health Services Staff

### OVERVIEW

10 | The general nature of the Draft Environmental Impact Statement (EIS) understated many substantive issues either 1.) because little or no information and data were available, 2.) because the issues involved the Superfund (CERCLA) investigation or the Resource Conservation and Recovery Act (RCRA) permitting, or 3.) because the issues would be addressed in the application for and the review of the Air Quality permit and the National Pollutant Discharge Elimination System (NPDES) permit. The absence of specific information and data limits the overall environmental review and makes choices between alternatives difficult. More importantly, however, it diminishes the effectiveness of the public process in evaluating such proposals.

The multiple, simultaneous nature of the MPCA's regulatory oversight with respect to KRC over the past, present and future time span is illustrated in County Figure 1-1. However, the functions are not mutually exclusive since many operations (e.g., the Landfarm) are being considered under several areas. County staff's review and comment have addressed those issues that are directly or indirectly related to the proposed expansion project but which have little or no information and data to evaluate impacts and determine mitigative measures and alternatives (County staff figure 1-2)

In requesting more studies, information and data without consideration of a Supplemental EIS, the MPCA may not be following the EIS process, as well as 6 MCAR s 3.031.I. (EQB Rules) which calls for a Supplemental EIS whenever "substantial new information or new circumstances that significantly affect potential environmental effects which have not been considered in the final EIS" or "significantly affect the availability of prudent and feasible alternatives with lesser environmental effects." Without such studies, information and data, County staff can not properly evaluate the potential impacts of the proposed expansion let alone determine which of several alternatives is most prudent and feasible from an environmental protection perspective. Therefore, the following recommendations are presented:

1. Provided that public participation is encouraged through public meetings properly noticed, the presentation of studies and new data and information for the Air Quality permit application (Spring 1985) and the Water Quality (NPDES) permit application (Fall 1985) may suffice if all existing information and data are provided in the Final EIS;

2. Where no other public forum is available in addition to the EIS process, then the Final EIS must address all substantive issues and provide all required data and information in order for reviewers to properly evaluate the adequacy of the document; and

11

3. If a substantial body of information and data is not presented in the EIS process and permit application/review process and, therefore, not publically reviewed, then it is the duty and responsibility of the RGU to determine the need for a Supplemental EIS. Considering the proposed two-phase construction project over the next 5 years, this choice is not advantageous to the proposer.

# OVERVIEW OF DRAFT EIS REVIEW OF THE KRC CRUDE OIL EXPANSION PROJECT

FIGURE 1-1. SCOPE OF DECISION-MAKING AT KRC

TYPE OF AGENCY OVER-SIGHT KRC TIME SPAN	SUPERFUND (CERCLA) RI/FS RAP	RCRA (RESOURCE CONSERVATION & RECOVERY ACT): MPCA/EPA		MPCA REQUIRED PERMITS 1. AIR QUALITY (AQ) 2. NPDES (WQ)	EIS ENVIRONMENTAL IMPACT STATEMENT (RGU: MPCA)
		ISS (INTERIM STATUS STANDARD) RCRA Part 265	FINAL PERMIT RCRA Part 264		
<b>PAST</b> NOT DONE NOW; PROCESS OR PRACTICE NO LONGER USED	GREAT NORTH-ERN OIL Co. (1955-1969) ↓ KOCH 1969 ↓	Land farm initiated 1978 ↓ Submission of RCRA Part A application 1980 ↓			
<b>PRESENT</b> DONE NOW; PROCESS OR PRACTICE USED	RI/FS RAP 1985 ↓	Compliance with ISS (less restrictive) ↓	Submission of RCRA Part B application June 1984 ↓	Existing Permits ↓	Draft EIS Jan. 1985 ↓ Final EIS April 1985 ↓
<b>FUTURE</b> 1. CONTINUED PROCESS OR PRACTICE 2. NEW PROCESS, CONTROL, OR PRACTICE	REMEDIAL ACTIONS 1985 → UNTIL RESOLVED	Limited regulation ↓ CLOSURE & FINAL PERMIT REQUIRED →	Treatment Demonstration Review ↓ Final Permit 1989 ↓	Expansion Permits AQ-Spring 1985 WQ-Fall 1985 ↓	ADEQUACY DETERMINED CONSTRUCTION INITIATED UPON ISSUANCE OF AIR QUALITY PERMIT OPERATION AFTER NPDES PERMIT

FIGURE 1-2. RELATEDNESS AND ADEQUACY

RELATIONSHIP OF EXISTING OPERATIONS TO PROJECT EXPANSION EIS REVIEW AND COMMENT	RELATIONSHIP TO EXPANSION PROJECT		
	CLEARLY NOT RELATED	RELATED	
		INDIRECTLY RELATED	DIRECTLY RELATED
DETERMINATION OF ADEQUACY			
COMPLETE AND ACCURATE DATA & INFO NOT PROVIDED (NEEDED FOR EVAL/DECISION)?			
NO			
NOT COMPLETE AND/OR INACCURATE RATE-LIMITED EVALUATION			
YES, SUFFICIENT FOR EVALUATION AND DECISION	3-20	COUNTY STAFF'S DETERMINATION OF ADEQUACY FOR FINAL EIS	
			MPCA staff's determination of adequacy DRAFT EIS

Koch Refining Company Crude Expansion  
EIS Scoping Decision Document

<u>Scoping Decision Outline Number</u>	<u>Issue &amp; Resolution</u>
12   I. A 3 f	failed to identify the pre-RCRA leaded gasoline tank bottom sludge disposal sites - identify leaded tank bottom disposal sites in Figure 3-16 and explain status in text.
13   g	failed to define routes of crude pipelines on KRC property - identify on-site pipeline routing in Figure 2-4.
14   B10	possibility for further expansion was inadequately addressed - explain further expansion mitigative measures and alternatives on page 1-17.
15   B12	wildlife impacts were not adequately addressed - given existing and proposed conditions, demonstrate negative impacts on page 1-13.
16   II. A 2 d	health risk assessment not addressed in draft EIS - technical paper on air quality insufficiently addressed assessment (summarized on pages 3-14 to 3-18) - expand health risk assessment as part of Toxic Study Plan for Air Quality Permit.
17   A 3 a	the following emissions from KRC were not quantified and compliance was not described: sulfuric acid mist, total reduced sulfur and reduced sulfur compound emissions - KRC will describe in detail those items on pages 3-5 to 3-6
18   A 3 g2	inadequate literature search and no evaluation of health risks from upsets - require more information and assessment on page 3-35.
19   A 5 b	inadequate evaluation of impacts of excess moisture and fogging of highways - include appropriate impacts and recommend Mn/DOT study as well as addressing mitigative measures on pages 3-110- to 3-111.
20   B 1	inadequate evaluation of impact on groundwater by increased pumpage by the refinery - provide more data, conduct more comprehensive study, and correct assumptions and mitigative measures on pp. 3-123, etc.
21   B 2	inadequate evaluation of data available - correct Table 3-57 and upgrade monitoring parameters from Table 3-58 to

include nickel, zinc and oil/grease for testing; collect more data, evaluate and modify conclusions and mitigative measures.

- 22 | B 3 inadequate addressed intraplant movement of products - specify all intraplant movement by table and diagram (p. 3-162).
- 23 | B 4 b did not address expansion impact on efficiency of WWTP - complete WWTP study and submit for review and comment.
- 24 | 4 e inadequately identified expansions' effluent quality and load to the river for permit parameters and cyanide - conduct additional testing and reevaluate data (examine characteristics of WWTP influent and compare); recommend additional parameters.
- 25 | II. B 4 g inadequately identified specific production rates for the expansion for the refinery which are needed to determine loads - specify by elaborating on table and presenting flow diagram (Table 2-6) as well as comment in text.
- 26 | II. C 1 discussion of need for more land area of landfarm was very brief - evaluate and expand on discussion including mitigative measures and alternatives (including no-option alternative) pp. 2-18 to 2-19 and 2-26.
- 27 | C 3 descriptions are inadequate - waste inventories, sites, operations, spill control and convention, alternatives, etc., require considerable discussion with revision of Tables 2-4 and 2-5 as well as others; no discussion in chapter 2.7 other than Landfarm and even on Landfarm, no alternatives (no-option, etc.) provided (pp. 3-131, etc.).

### 3.1 Air Quality

- 28 | Page 3-22 Minn. Rule 7005.0900 to 7005.0960 require that odor values do not exceed four odor units at Kochs property line. Table 3-13 indicates these values are exceeded significantly in the north and east directions tested during a three day period conducted by Interpoll Inc. Odor samples were not tested to the south and west, yet a significant population may be at risk. The testing should be expanded to obtain test results to the south and west.
- 29 | Page 3-25. Table 3-14 should be expanded to predict the net change in odor units due to the expansion (see comments page 3-34).
- 29 | Page 3-34 indicated that the pollutants associated with odors from refineries are 1. Hydrocarbons 2. Mercaptans 3. Hydrogen sulfide 4. other sulfur compounds. The report indicates that only hydrocarbon emissions data is available and this will decrease by 16 percent "therefore" the report states "odor concentrations are estimated to change in a direct ratio to hydrocarbon emissions". The above is misleading. The truth is that an odor estimate can not be assigned to the expansion because of the unknowns regarding mercaptans, hydrogen sulfide and other hydrocarbons. As concluded on page 3-39 further monitoring studies of odor standards are needed. They should be long term in nature.
- 30 | Page 3-30. The ram urban model was selected to evaluate SO2 conditons. The initial results predicted violations of State 1 hour SO2 standards in the area immediately southeast of the sulfuric acid plant. The model was then negotiated so that the new modeling predicted no violation. Perhaps such negotiations are reasonable, yet the model is only a tool which must be verified by actual field data. It is recommended in the report that the Koch readjust the existing SO2 monitoring network to verify the model conclusions. Rather than readjust the ambient SO2 monitoring network, a new monitoring device for SO2 should be established immediately shoutheast of the sulfuric acid plant. This would allow for continuous uninterrupted background data in the general area of Koch Sulfuric Acid Plant.
- 31 | Page 3-36. The number of after expansion breakdowns will increase from 22 to 33 per year. The report concludes that "the effect on public health should not alter because operation shutdown is required by regulation if the public health is at risk" It may be argued that more breakdowns do increase public health risk because it increases the chance that a breakdown problem will be of a catastrophic nature which is beyond "regulation".
- 30 | Page 3-39. Indicated that "further studies are recommended to more fully define existing conditions with respect to compliance with the State 1 hour SO2 and air pollutants. These studies should be incorporated into the supplemental EIS.
- 29 | Page 3-32. A risk assessment to area population should be conducted for toxic air pollutants as identified in the EAW.
- 32 | The report failed to address sulfuric acid mist. Total reduced sulfur and reduced sulfur compound emissions as required by the scoping document item IIA3a were not addressed.

## 3.2 WATER QUALITY

### 3.2.1 Existing Plant

P.3-41 The existing treatment plant has a capacity of 2.5 mgd (page 2-12). In 1983, combined discharges averaged 2.3 million gallons per day with a maximum of 4.0 mgd discharge (p.3-41). The existing treatment plant is operating at or above its hydraulic capacity. The MPCA "would consider that there was significant noncompliance for 8 months" (p.3-57) of the 22 month period from January 1983 to October 1984.

P.3-67 Major problems include pH control, ammonia discharges, discharges of phenolics and excessive BOD and solids discharges. In the draft EIS, Koch attributes the repeated violations to poor equipment maintenance, equipment malfunctions, production unit upsets, and severe weather. The MPCA gave Koch a NOV in 1983 and believes additional improvements are necessary to improve the performance. Koch believes the effluent violations of BOD and solids are due to incomplete oil removal in pretreatment (p.3-67). If this is true, it is reasonable to assume the entire plant has been affected by excess oil with reduced efficiencies throughout.

33 | P.3-52 The existing facility has uncovered water storage and treatment in the shot pond, the API oil/water separators, the firewater pond, the rapid mix tank, the equalization basins, the DAF, and the activated sludge units. Volatilization of organic compounds and aerosolization of droplets of wastewater are probable from these containment and treatment areas. The current treatment plant flow diagram (Figure 3-2, p. 3-54) shows the firewater pond capable of receiving oily wastewater from overflow conditions of stormwater runoff. This may have happened in periods of high flow and high rainfall. The firewater pond effluent does not flow into the treatment plant; it flows to the river.

34 | No biological monitoring is mentioned in the draft EIS, although staff has learned that two bioassays have been done in the past.

35 | Table 3-23 Twelve parameters are listed as NPDES effluent parameters, with chromium and hexavalent chromium as the only metal species tested. No repeated testing on a regular basis for priority pollutants or testing for organic compounds common to petroleum refineries has been done.

35 | Table 3-53 The sludge disposed at the landfarm was tested for lead, chrome, zinc, iron, cadmium, and nickel. Metals not included in information but which may reasonably be expected are selenium, manganese, barium, boron, and arsenic. No downstream sampling data was reported.

36 | It has been indicated the Koch WWTP discharge is to the bottom of the channel. If the discharge is laden with the permitted parameters, especially phenolics, and other organic compounds not tested, the density of the discharge may be such that little mixing in the channel will occur for some distance downstream.

37

P.3-49 The permit is based on federal BPT and BAT guidelines as well as Minnesota Rule 7050 regarding effluent limitations as listed on page 3-49 and shown in Tables 3-19, 22-24. The most stringent of the standards applies. MN Rule 7050.0210 Subp. 7 designates the permit to be based on the seven day, ten year low flow, a flow that will be exceeded 90% of the time. At this flow level, water quality standards will be maintained with the level of discharged effluent from the Koch WWTP. The impact of the pollutant loading to the river was estimated by the MPCA in the draft EIS using the mean of the monthly daily maximum value (Table 3-32). Use of this statistic is questionable. No attempt is made to recover information on the spread of the values comprising the population for each parameter. Daily values are not transmitted to the MPCA, but are kept at KRC. In the case of certain Koch parameters, such as pH, ammonia, BOD, or TSS, the spread during certain months is large. A different statistic, possibly utilizing the median and definitely using variance or standard deviation, is urged, both for correctness of the effluent permitted to the river, and also to better follow the day-to-day operation of the WWTP.

### 3.2.2 Impact

38

Table 3-33 The proposed expansion will have a hydraulic load of 4.3 mgd process waters and 1.0 mgd of noncontact waters. No plant design has been completed. When completed, County staff believes the plant should be capable of handling 1.5 times the expected loading and should be sized near 8 mgd. Koch has stated (page 3-73) the plant expansion will create new waste streams, some of which are more water intensive. Increased sizing is therefore necessary.

P.3-74 Many of Koch's planned changes, such as the increased slop oil prior to re-refining, will increase the load of medium to high strength liquors to the head of the plant.

P.3-67 Necessary to the design of the new plant are better pH control devices and improved acid/alkali feed mechanisms. The release of unionized ammonia and the treatment plant upsets may in part be related to incomplete control of pH. Accompanying new pH control mechanisms should be an improved ammonia stripper (foul water stripper) to remove ammonia from the process water. Improved removal of oil during pretreatment is a necessity. The current plant is operating at reduced efficiencies due to poor oil/water separation using the API separators. With better separation, the operation of the entire plant should improve, decreasing the number of permit violations.

Since the expansion treatment facility design has not been included in the draft EIS, it is impossible to comment on the design features included. The scoping decision document required a particular design to be included (section 1.B.8). The draft EIS defers the design requirements to the permit review procedure "during the first quarter of 1985" (p.3-79).

P.3-76 The ammonia and cyanide additive equation (p. 3-70) is designed to ensure the two parameters will remain below a stricter limit. As ammonia is frequently released at levels in violation of the current permit, it is obvious the new permit will also be exceeded without stricter design controls.

39

Since the firewater pond has some oily water added to it occasionally and an asphalt liner, it is not inconceivable to expect substantial leakage into the subsoils, due both to oil's dissolution of asphalt and the freeze/thaw effects on exposed asphalt above a lowered water line. With this in mind, groundwater monitoring should be periodically undertaken around this pond.

### 3.2.3 Mitigation

40

P.3-79 The compliance record of the Koch treatment plant is poor. After expansion, it is hoped future compliance is much improved. With the new permit, with a lowered ammonia limit and the ammonia-cyanide additive equation, additional noncompliance is likely without improved treatment facilities. Biological monitoring below the discharge should be done during the permit review process.

Priority pollutant testing will be done prior to granting a new permit. It is strongly suggested testing for the priority pollutants is done on a regular basis. Additional metals should be added to the permit, especially those which may be used as additives in various refinery products. Sludges should also be tested for these metals and also metals known to be constituents of crude oil. Downstream monitoring should be instituted to follow the impact of the discharge on the river channel. Basing the permit on the mean of the daily maximum statistic should be modified to include use of standard deviation to better measure the spread of values, especially during months with releases to the river.

39

Monitoring wells should be placed near the firewater pond to check for groundwater infiltration from this source.

### 3.4 TRANSPORTATION

1. p. 3-102, p.3-110

41 Water vapor emissions from Koch Refining Company result in considerable fog, and low cloud formation (stratus fractus, etc.) and precipitation during favorable meteorological conditions throughout the year well beyond the refinery's property. During the winter months, sublimation of the water vapor emissions results in the deposition rime ice, ice crystals pellets, and snow crystals and pellets in downwind areas, as well as producing ice fog during very cold weather. Since there has been no attempt to correlate such incidences with traffic accidents and incidents, the existing impacts of water vapor emissions on transportation are unknown. Due to the heavy truck traffic in the area, as well as the major interchange of highways 52 and 55, congestion decreases highway speeds and makes the drivers more cautious. Control of water vapor emissions (nature, amount, stack height, etc.) may reduce the number and severity of traffic accidents and incidents, especially after the expansion due to the substantial increases in water vapor emissions. The apparent lower accident rate may be an artifact due to the definition and description of "the district average for similar roadways", as well as congestion, interchange and weather factors.

The existing conditions impact transportation by (1.) reducing horizontal, as well as vertical, visibility to less than 1000 feet, and (2.) depositing ice crystals and pellets, snow crystals and pellets and rime ice on roadways, traffic signs, and vehicles reducing the safe operation of such vehicles. (Personally monitored by EHS staff since June 1983). It is recommended that the Minnesota Department of

41

Transportation (Mn/DOT) undertake a study to determine what effects water vapor emissions may be having currently, as well as impacts after expansion, and that Mn/DOT and KRC determine what mitigative measures may reasonably minimize those impacts.

#### TRANSPORTATION

p. 3-104, pp. 3-110 to 3-111

42

Railway traffic to and from KRC temporarily (up to 15 minutes at times) impedes road traffic on 117th Street and 140th Street, especially emergency equipment such as police, fire, ambulance, etc. In addition, truck traffic to and from Pine Bend Landfill (largest remolition Landfill in Minnesota).

p. 3-104, pp. 3-110 to 3-111

43

Barge traffic must consider KRC terminal downstream of Lock and Dam No. 2 as well as the Spring Lake facility. Also, empty barge traffic, docking and fleeting must be considered with respect to overall traffic management.

### 3.6 GROUNDWATER AVAILABILITY

44 1. (pp. 3-119, etc.) Figure 3-10 must be upgraded to include all refinery wells including production, private and monitoring wells, as well as any such wells that have been abandoned (give date and status of abandonment).. Well #8 completed in the Mount Simon-Hinkley aquifer (unit 2) in 1982 adjacent to "A" Street south of the refinery complex is not included. Also, wells numbered 4, 22, 24 and others mentioned in refinery documents are not depicted on the map. Monitoring wells numbered 1 through 7 at the landfarm southwest of the refinery complex are excluded, as well as others. Private wells owned by the refinery in the immediate area should be included, such as the Henning well (#22) and the Genz well (#24). Improperly constructed or abandoned wells must be noted to assure proper corrective action (e.g. reconstruction and maintenance; permanent abandonment procedures) and to identify possible areas of multiaquifer contaminations, etc.

45 2. (pp. 3-119, etc.) Figure 3-11 is not representative of the bedrock surface elevations or the regional water table elevations given available data or sufficient time to collect new, contemporaneous data respectively.

a. The availability of recent soil boring and well log data significantly changes the approximate bedrock surface contours presented by Reeder and Norvitch, 1974, suggesting that the buried bedrock topography in the area is comprised of St. Peter sandstone outliers and surrounding Prairie du Chien dolostone valleys tributary to the large

45

buried valley oriented west-northwest to east-southeast and located to the north of the refinery's boundary and/or to the glacial river valley presently containing the Mississippi River to the east. The complexity of the buried bedrock surface topography underlying the refinery may assist in the determination of the shallow groundwater flow direction and ultimately the possible paths of contaminant plumes not wholly influenced by the regional groundwater flow direction. Also, such information will assist in the determination of which of the refinery's production wells completed in Unit One may be impacted, as well as provide guidance in the location of additional monitoring wells both upgradient and downgradient of the identified contaminant plumes' infiltration to the phreatic (saturated) zone. Existing soil boring data, as well as additional borings and recommended surface geophysical mapping (resistivity, etc.), will provide more information on the continuity of clay, silt, sand and gravel layers underlying the site, the occurrence of discontinuities, etc., and the possible infiltration rates and characteristics.

b. The groundwater surface elevation map prepared by Sunde, 1984, for the CERCLA investigation of groundwater contamination at Pine Bend Landfill was considered a draft because of insufficient data on static water levels in area wells and limited field checking. Also, the map represents only generally the regional upper aquifer gradients, and the map should be so qualified. Since the number of wells, especially commercial production wells completed in Unit One, has increased substantially in the area, a groundwater surface elevation map based upon contemporaneous static water levels is essential in determining the

regional and local gradients.

46 3. (pp. 3-123 etc.) Existing groundwater appropriation data are available for all production wells (except well #4, which has been abandoned) for the period 1976 to 1984. County Figure 3-1 depicts the cumulative appropriations of the wells by each well, by Unit 1 and Unit 2, and by total groundwater appropriation.

47 a. Representing nine years of data, a trend line analysis (linear regression) of the total groundwater appropriation suggests an average increase of 67 gallons per minute (gpm) per year. Projection of the current use rate to the year 2000 estimates that given the no-expansion option between 3720 and 4410 gpm per year (one standard deviation either side of the mean) of groundwater may be appropriated. Given an estimated increase of 656 gpm per year (assumed to be an average value) for the proposed project option, it can be projected that total groundwater appropriations may exceed the permitted 5000 gpm (8060 acre-feet per year) usage in the decade of the 1990's considering the variable appropriation rates (one-standard deviation of the mean). However, the draft EIS states that the existing permitted groundwater appropriation of 5000 gpm is sufficient to adequately handle the water supply needs of both the existing facility and proposed expansion. The draft EIS does not consider any alternatives or mitigative measures other than requesting more study.

48 b. (p. 2-28) Historically, the water demand at the refinery has ranged from a low in 1978 of 3792 acre-feet (2354 gpm) to a high in 1984 of 5195

48

acre-feet (3225 gpm) and not from 3850 to 5040 acre-feet. Only 1982 (3124 gpm or 5040 acre-feet) and 1983 (2384 gpm or 3850 acre-feet) data were utilized for the "historical" data. The 1983 groundwater appropriation data supplied by the refinery are disproportionately low when compared with past groundwater appropriation and refinery production. Prior to more recent water conservation measures, the refinery's records indicate groundwater appropriations exceeding 2 billion gallons per year (3805 gpm or 6130 acre-feet). It is recommended that all refinery production wells be metered and that the MDNR spot-check to assure compliance.

49

c. County Figure 3-1 also illustrates that withdrawals of groundwater from the Mt. Simon-Hinkley aquifer (Unit 2) are increasing on the average of 106 gpm per year in contrast to the decreasing the appropriations from the Prairie du Chien-Jordan aquifer (Unit 1). The effects of the increased pumpage of groundwater from Unit 2 which is only approximately one-third as productive as Unit 1, as well as the effects of the decreased appropriation of groundwater from Unit 1, have not been studied and modelled with respect to groundwater availability in neighboring wells and to alterations in the direction, flow, dispersivity, etc., of the migration of area contaminant plumes impacting the shallow aquifers.

50

d. County Figure 3-2 compares crude oil throughput with groundwater appropriated for the years 1977 to 1983 (see Table 2-2). There is no overall correlation between crude oil processed and groundwater used since another independent variable (high water useage) is operating. It is apparent that the variable may be groundwater use at the wastewater

**TABLE KOCH REFINING Co.: GROUNDWATER APPROPRIATION DATA 1976-84 AND TREND-LINE ANALYSIS INCLUDING ESTIMATES ( $\pm 1$  Std. Deviation) FOR 1985 AND BEYOND (TOTAL WITHDRAWAL MAXIMUM 5000 gpm/year)**

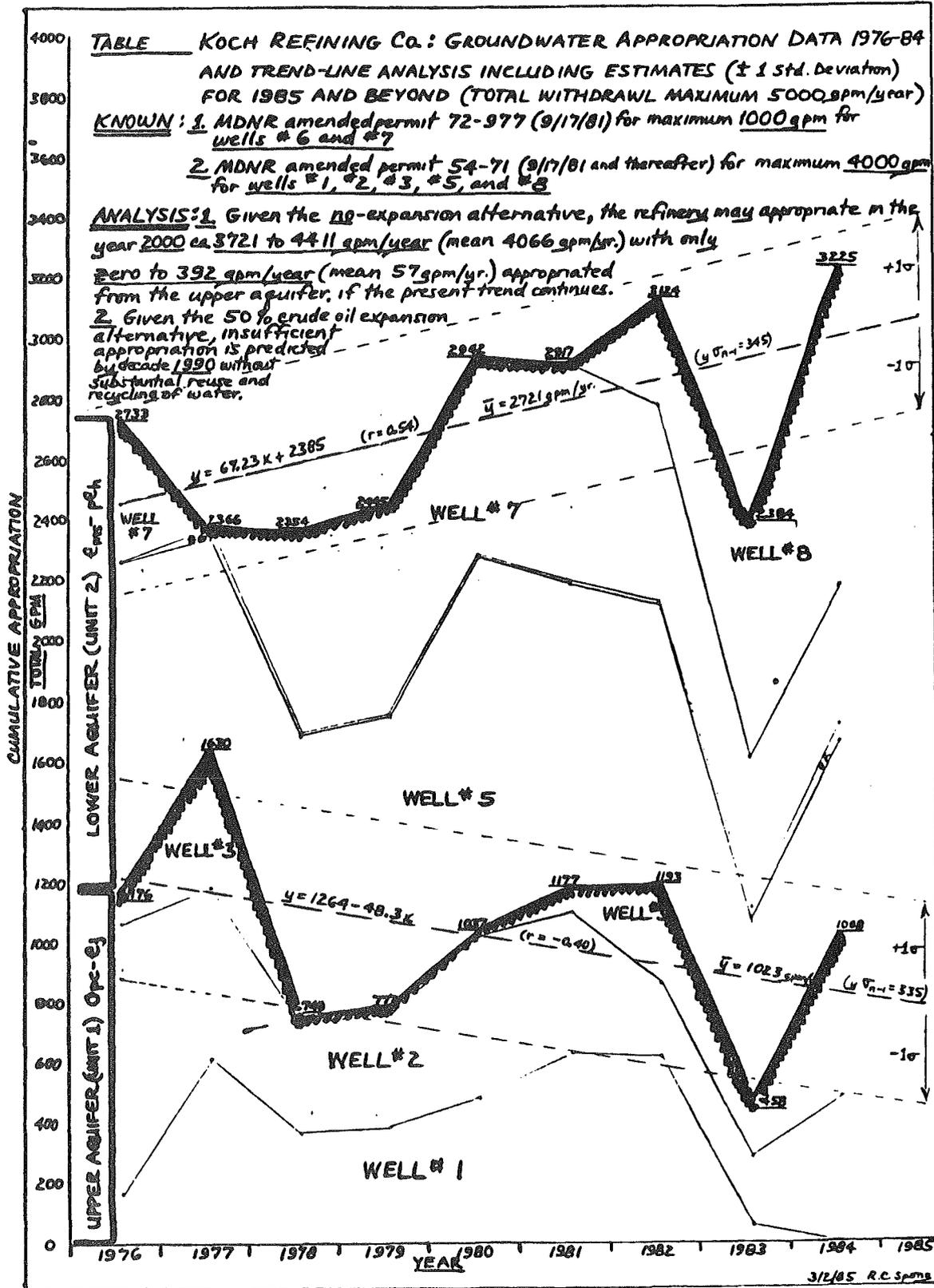
**KNOWN: 1. MDNR amended permit 72-977 (9/17/81) for maximum 1000 gpm for wells #6 and #7**

**2. MDNR amended permit 54-71 (9/17/81 and thereafter) for maximum 4000 gpm for wells #1, #2, #3, #5, and #8**

**ANALYSIS: 1. Given the no-expansion alternative, the refinery may appropriate in the year 2000 ca. 3721 to 4411 gpm/year (mean 4066 gpm/yr.) with only**

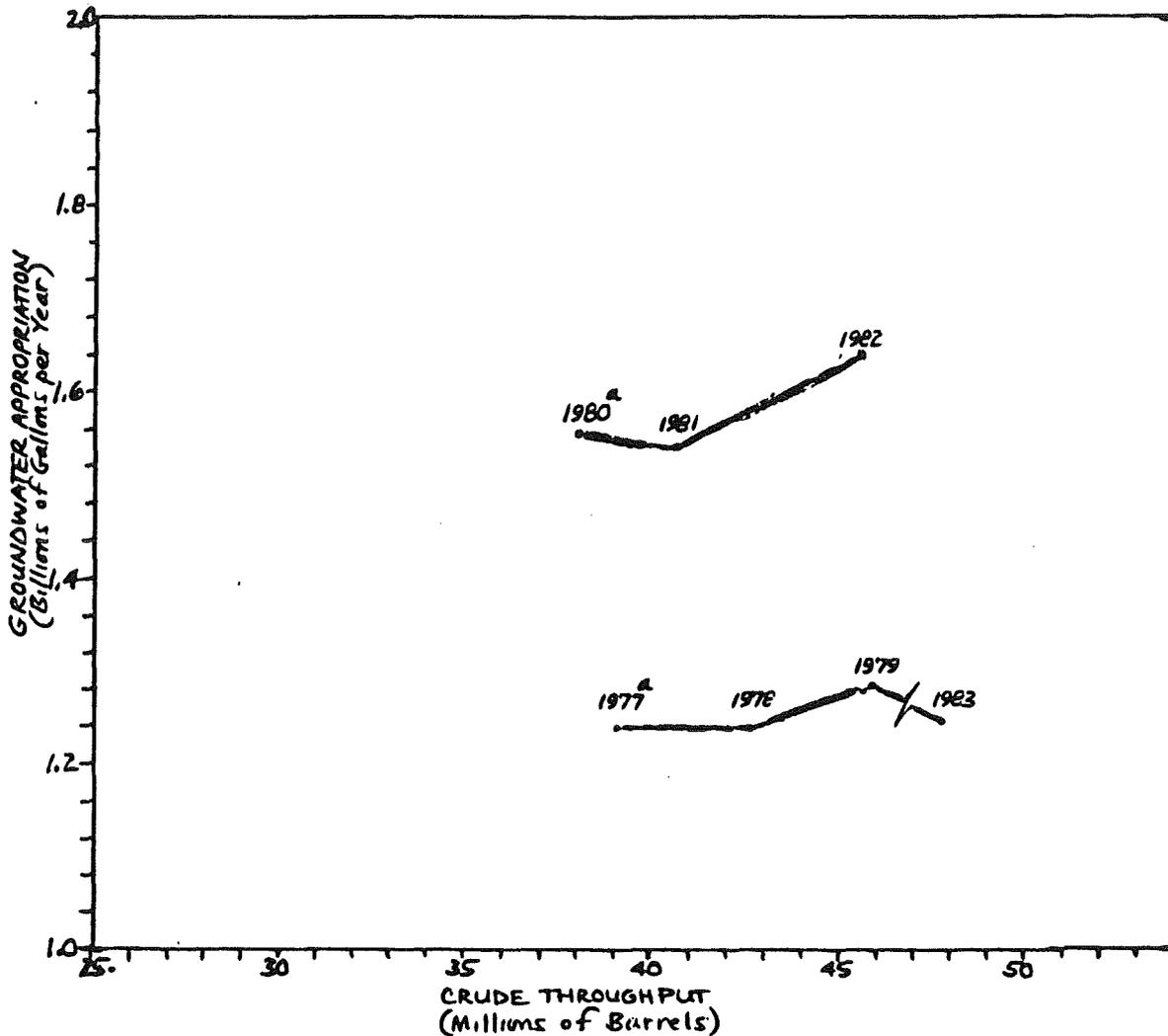
**zero to 392 gpm/year (mean 57 gpm/yr.) appropriated from the upper aquifer, if the present trend continues.**

**2. Given the 50% crude oil expansion alternative, insufficient appropriation is predicted by decade 1990 without substantial reuse and recycling of water.**



**FIGURE 3-2: PATTERNS OF GROUNDWATER USEAGE WITH RESPECT TO CRUDE THROUGHPUT**

DATA SOURCES: KRC Draft EIS, 1985, p. 2-5 (Table 2-2)  
Koch Groundwater Appropriation Data for years 1976 to 1984 (2/25/85)



**ANALYSIS:** There appears to be no direct correlation between groundwater useage and crude throughput because a significant variable independent of crude refining is operating on groundwater useage. For example, the years of high water useage may reflect significant water useage at the WWTP independent of crude refining. The successive annual pattern of use, i.e., 1977 & 1979 and 1980 & 1982, may yield the answer upon close inspection of records of high water-use operations. Weather was not found to be a factor.

**NOTE:** Superscript 'a' from Table 2-2, KRC Draft EIS

"...low throughput reflects significant maintenance requirements or modifications in process equipment causing extended periods of shutdown."

R. Spang 3/5/85

50 treatment (WWTP) plant. The annual trends of groundwater use and grouped suggesting that close scrutiny of WWTP records for 1980 to 1982 may find disproportionate effluent discharge with respect to influent loading.

Accurate record keeping is required, and groundwater use to dilute effluent discharge is prohibited.

4. (pp. 3-123, etc.) The simplifying assumptions used in the calculation of anticipated drawdowns in the Prairie du Chien-Jordan aquifer (Unit 1) are based on insufficient and out-of-date data, as well as being incorrectly applied.

51 a. Unit 1 is nonhomogeneous (an upper fractured and cavernous dolostone layer and a lower medium sandstone layer), partially anisotropic (upper dolostone layer), variably thick (weathered and partially truncated upper dolostone layer), gradually sloped (approximate 30 feet per mile dip to the north), and unconfined (water table aquifer). Also, the flow regimes in the upper dolostone layer do not necessarily obey Darcy's law, especially where secondary porosity (bedding planes, fractures, solution conduits, etc.) is significant. This results in a reported range of porosities from 1 to 30 percent. Production wells #1, #2, and #3 are cased and lined into the top of the upper dolostone layer with an open hole constructed into the lower confining layer (St. Lawrence formation an aquitard). The open holes are considered to be fully penetrating the aquifer for the purposes of the evaluation.

b. Due to the steep hydraulic gradients in the vicinity (50 to 200 feet per mile) and the significant permeabilities (average of 40 feet per day)

51 as estimated by Reeder and Norvitch (1974), properly designed pumping tests must be conducted taking into account the gravity drainage (specific yield) of the aquifer (anisotropic conditions where the vertical flow component is significant), as well as specific storage during initial and prolonged pumping phases, and utilizing the type curves developed by Prickett (1965) and others. A worst case (maximum appropriation) must be presented to adequately predict local water table lowering in the drift, outwash and Prairie du Chien-Jordan aquifers.

52 c. At a joint meeting on March 7, 1985, KRC staff indicated that additional studies of the groundwater appropriation problem are and will be undertaken. In addition, if any area wells are dewatered or affected by a contaminant plume reasonably associated with KRC's groundwater appropriation, then KRC will assume responsibility for the costs of compensating the affected persons. Such mitigative measures must be included in the Final EIS.

53 d. On March 11, 1985, County staff received a hydrogeologic report from KRC's consultant, Barr Engineering Company. The report concludes that additional groundwater appropriations (656 gpm) be initially withdrawn from Unit 2 aquifer pending determination of the additional pumping effects on the Unit 1 aquifer (dewatering and contaminant plume perturbations). County staff is evaluating this assessment and requests copies of all calculations, etc. to verify those conclusions.

54 5. The hydraulic potential between Unit 1 and Unit 2 is significantly increased by the drawdown effects of the industrial wells completed in

54

either aquifer enhancing vertical recharge through the interjacent leaky confining layers (aquitards). Pumping tests utilizing carefully placed single or nested observation wells in the upper aquifers, as well as idled conventional wells with known construction details (preferably fully penetrating or screened at depth of average head), are necessary before any conclusions can be made. Modelling based on insufficient, noncurrent data must be updated, as well as incorporate more representative assumptions conforming to actual site conditions.

### 3.7 Solid and Hazardous Wastes

#### General Discussion

pp. 3-131 Only the solid and hazardous wastes treated at the land farm are discussed in this section. It should be all inclusive of existing solid and hazardous waste management practices (including waste types, quantities, process or other sources, waste handling and storage, waste treatment, disposal and off-site shipment), future impacts, alternatives and mitigative measures.

p. 2-16 to 2-17, pp. 3-131, etc.

Tables 2-4 and 2-5 list wastes that are not land-farmed and that are not addressed in this section. The designation "nonhazardous" is not supported by any analyses. They are as follows:

- a. Heat exchanger bundle cleaning sludges hazardous (34 tons/year) - if unacceptable for land treatment, that portion is drummed and shipped for off-site disposal
- b. Nickel filter solids - hazardous (3 tons/year) - drummed and shipped for off-site disposal.
- c. PCB wastes - hazardous (1 ton/year) - drummed and shipped for off-site disposal or incineration.
- d. Leaded tank bottoms - hazardous (10 tons/year) - volume reduction and chemical oxidation followed by drumming and shipping for off-site disposal.
- e. Oil spill cleanups - nonhazardous (22 tons/year) - some materials drummed and shipped for off-site disposal.
- f. Storm water pond sediment - nonhazardous (2400 cubic yards per cleaning once every two years) - disposed on-site as fill material
- g. Firewater pond sediment (final lagoon) - nonhazardous (25,000 cubic yards per cleaning once every 7 to 10 years) - chemfixed waste stored on-site for dike construction at tank farms.
- h. Wastewater treatment plant lagoon sludge - hazardous (6,000 cubic yards generated one time at time of lagoon closing) - chemfixed waste stored on-site for dike construction at tank farms.
- i. Terate waste - hazardous (1 ton - one time generation) - drummed and shipped for off-site disposal.

pp. 2-16 to 2-17, pp. 3-131, etc.

Excluded from Tables 2-4 and 2-5 and from discussion in the section were the following wastes submitted to the MPCA for approval for codisposal at the Pine Bend Landfill (SW-45):

- a. Codisposal request form completed on March 15, 1984:
  1. Sulfur spill material - nonhazardous if in "chunk" form (10 tons per year)
  2. Fuel oil dryer salt - nonhazardous (fuel oil 0.5%) - (20 tons per year).
- b. Codisposal request form completed on May 2, 1984:
  1. Spent FCC (fluid catalytic cracker unit) catalyst - nonhazardous (12 tons once in 3 year period)

55

- 2. Spent SRU (sulfur recovery unit) catalyst - nonhazardous (40 tons to be disposed of twice per year at a rate of 20 tons/year)
- 3. Scrap refractory brick - nonhazardous (4 tons per year)
- 4. Asphalt samples - nonhazardous (1/2 ton per year)
- 5. Asphalt spill material - nonhazardous (20 tons per year).

KRC indicates that the asphalt spill material has been subdivided into bulk asphalt spill and asphalt spill mixed with sand and soil.

c. Other codisposals requested or secured and not included above.

pp. 2-16 to 2-17, pp. 3-131, etc.

Also excluded from tables 2-4 and 2-5, as well as the discussion in this section, are other solid and hazardous wastes either known to be generated by the refinery but not disclosed or anticipated to be generated by the refinery (API industry review, expansion and/or process changes, etc.). A complete inventory of all wastes currently or intermittently generated by the refinery must be provided in the appropriate tables, as well as discussed in this section. For example, waste oils, parts cleaning solvents, grease, petroleum additives, spill cleanups, and other solid and hazardous wastes must be included. New wastes, as well as construction and start up wastes, must be included separately. All known or confirmed (by appropriate testing) hazardous wastes must be disclosed to the MPCA and the County, and a revised waste management plan must be submitted. A separate table listing all such hazardous wastes, including types, sources, quantities, hazardous nature and disposition must be included in the Final EIS.

p. 2-16, pp. 3-131, etc.

Excluded from consideration in the Draft EIS is the hazardous waste storage area (see Table 2-4). If any free liquids are present in the wastes, the storage site must be lined and appropriately monitored. Since more than one hazardous waste storage area is utilized (e.g., PCB's stored separately in a building; liquids, sludges and bottoms from parts cleaning solvents, as well as other solvents, paints, etc., stored separately), a description of those storage areas must be given. All existing hazardous waste storage areas must be identified and located on a map of the plant using a number or letter designation (e.g., annotation of Figure 2-4). Indicate if new hazardous waste storage sites will be necessary and how and where they will be constructed.

56

p. 3-131 The proposed expansion will continue the following solid and hazardous waste practices which must be addressed in detail in this section:

- a) Stormwater pond (coker pond) sediment - since potentially hazardous wastes are stored in the impoundment before being treated at the WWTP, the sediment may also contain hazardous constituents. Require compositional analysis, ASTM water leach and EP Toxicity tests on the sediment before land disposal. County may require a special waste disposal facility license for the sediment if deemed nonhazardous. Address mitigative measures and alternatives if hazardous waste stream (water pumped from land farm) is separated from refinery stormwater runoff.

57

58

- b) Firewater pond (final lagoon) sediment - Unless diverted and maintained as a separate waste stream as noted above, the firewater pond sediment may also contain possible hazardous constituents from the stormwater pond (coker pond) since wastes are precipitated through caustic soda treatment. Require compositional analysis, ASTM water leach and EP Toxicity tests on sediment. Since Chemfixing is the continuing method of treatment, land disposal would require the same testing after treatment. It should be noted that although there is no groundwater monitoring around the past two Chemfixed disposal sites, two private wells (Gen 2, KRC #22, and Henning, KRC#24) within one-quarter mile downgradient of the disposal sites consistently demonstrated contamination of the shallow groundwater above the primary and secondary Safe Drinking Water Standards (SDWS) (sulfate 250 mg/L; specific conductance 700, umho/cm; phenol 0.001 mg/L, etc.) from 1972 through 1980. MPCA staff determined that the origin of the sulfate and phenols was KRC's Chemfixed disposal site and that phenols were "positively identified as leaching at a rate greater than 10 times the (SDWS)." Also, "cyanide and PCB's were not analyzed at levels low enough to make a positive identification. Further analysis for these parameters is necessary." (MPCA, 1981)

#### Land Farm

##### Land-farmed solid and hazardous waste records and testing

p. 2-16, pp. 3-131, etc.

Table 2-4 is based upon the refinery's estimates and materials handling records suggesting that historically an average of 9919 tons per year are land applied. Table 3-54 indicates that in 1982, 8957 tons of waste were land applied, but Table 3-53 details that in 1984 approximately 24,086 tons of waste will be sent to the land farm. There appears to be little relationship between the annual quantity of crude oil processed, and the amount of waste land farmed. The primary variables are the types and quantities of waste generated by the wastewater treatment plant. The 1984 land-farmed tonnage is significant in that it suggests that the historical 10,000-ton average may not be representative. Concise recordkeeping is necessary as operational estimates tend to be conservative. (e.g., estimates from front-end loader buckets must be improved), and mass balancing of waste loading to landfarm soils is difficult to accomplish with any reasonable precision or accuracy.

59

p. 2-16, pp. 3-131, etc.

Table 2-4 includes a designation column listing a waste as hazardous or nonhazardous based upon refinery handling practices. All wastes must be representatively sampled (composites) and analyzed for hazardous constituents by composition, ASTM water leach and EP Toxicity (acetic acid and modified test utilizing appropriate solvent). Limited data are available on hazardous constituents (heavy metals, organics, etc.) and must be updated on a regular basis. Additional testing for organic hazardous constituents was not accomplished requiring the use of existing oil and grease data which are inadequate. The various processes

producing the waste and the operating practices at the land farm encourage the volatilization of certain organic constituents reducing the concentration of volatile organic compounds in the amended soil. The EPA and API have recommended organic constituent parameters and analytical methods including both volatile and non-volatile organics.

**Application Rate.** The 10 to 12 percent application rate of hazardous and nonhazardous wastes is in excess of the API and EPA recommended rates. A majority of studies reviewed by staff indicate that under appropriate conditions, an application rate of 1 to 5 percent achieved efficacious treatment. Given existing soil conditions, weather and climate, etc., the high application rate appears to be excessing such that minimal soil treatment may be occurring. During the winter months, no land application should take place as no land treatment is occurring. Instead, a separate, secure hazardous waste storage area should be provided to safely stockpile the wastes.

**Overall treatment.** Soil borings have demonstrated the presence of oil and grease to depth of 5 feet beneath the land farm. Since RCRA land treatment final permitting defines treatment as occurring in the top 5 feet of soil, some existing wells may be deemed to be hazardous waste disposal cells rather than treatment cells. The ISS (Interim Status Standards, RCRA Part 265) will permit the operation of the land farm until the final permitting by the MPCA in 1989. However, there are no mitigative measures or alternatives presented in the Draft EIS to discuss the possible non-option or other-option alternatives if the land farm should not be permitted. Also, mitigative measures for dealing with the land farm cells utilized by that time would have to be discussed.

**Microbial Degradation.** The degree to which microbial degradation may be occurring in the land treatment system is unknown. Bacterial (Pseudomonas and other genera) and fungal (Actinomycetes, etc.) degradation is dependent upon aerobic soil pore conditions in the treatment zone. Excessive soil moisture or wetness, microbiocidal conditions (toxic organics and metals) etc., may minimize aerobic degradation. No testing for carbon dioxide, organic metabolic intermediates (aldehydes and organic acids), and other indicators of aerobic degradation have not been done. The treatment demonstration must be completed for the RCRA Final Permit, but there has been no significant indication that substantial microbial degradation of the oily sludges is occurring under existing conditions with the present high application rate. Mitigative measures and alternatives should focus on current operating practices which may minimize such degradation. Specific testing for organics is essential to verify degradation steps.

**Fate of Heavy Metals.** The heavy metals may be adsorbed and transported by the oil and grease through the treatment zone because of the high area that is not coated with oil and grease. Also, the anaerobic soil pore microenvironment beneath the aerobic treatment zone may have a more acidic pH, as well as being under reducing condition. A combination of factors may mobilize certain heavy metals, such as cadmium out of the

treatment zone. Due to inadequate records, metals mass balance analysis may be too inaccurate and imprecise to judge loss and potential groundwater contamination without a more comprehensive unsaturated and saturated zone monitoring plan. Additional metals (antimony, boron, selenium, etc.) analysis may be necessary to properly evaluate the treatment process or its failure.

### 3.8 GROUNDWATER QUALITY

pp. 3-156, 3-157

60 | 1. Coking ponds (storm water ponds). Located north of the landfarm with asphalt and protective skirting (PVC liner) on the encircling dikes, the ponds receive run-on and run-off surface water from the landfarm contaminated with organic and inorganic wastes.

Although diverted, the pond water may infiltrate through pores and fractures in the asphalt liner (disintegration and fracturing) and potentially contaminate the groundwater. Since the contaminated water drawn off the landfarm is considered a hazardous waste, the biannual physical inspection and intermittent permeability testing of a core of the asphalt liner is inadequate with respect to Part 265, RCRA (ISS), as well as Part 264. Address suitable testing of liner, soil cores, soil pore water, etc., to determine the infiltration of contaminants, establish an unsaturated and saturated zone monitoring plan, and satisfy all other applicable requirements as needed.

61 | The sediment removed from the basin biannually must be evaluated before it can be disposed of as a fill material. The sediment is contaminated soil and may require handling as either a solid or as a hazardous waste.

Fig. 3-2, p. 3-54)

62 | 2. Firewater pond (Final lagoon). Located north of the wastewater

62 | treatment plant (WWTP), the pond receives non-oily waste water through a caustic neutralization basin but may also receive stormwater run-off diversions. The sediment is chemfixed once every 7 to 10 years, stored onsite for weathering and eventually used for dike construction at the tank farm. The sediment is contaminated soil and must be evaluated before chemfixing is allowed and use as a diking material is permitted.

63 | Tables 3-57, 3-58

3. Existing Land Farm Groundwater Monitoring. Tables 3-57 contains several errors (transposing of numbers, etc.). Please refer to copy of table enclosed. Total coliform bacteria reported as "TNTC" must be footnoted to define acronym as "Too Numerous to Count" and to indicate that it exceeds the Safe Drinking Water Standard (less than one colony per 100 milliliters).

## 4.0 Evaluation of Alternatives

64 | P.4-1 Four alternatives to the proposed expansion are discussed. The overall treatment of the three "build alternatives"; limited expansion, change in crude, and change of product mix, was simplistic and did not take into account the wide variety of options available.

65 | Table 4-1 Shows the overall impact of the No Action alternative is represented by a total score of 2364.3, the lowest (best) score of the comparisons (proposed project and the four alternatives). No Action received a better rating than the proposed project in the following areas; Surface Water Quality, Groundwater Quality/Availability, Transportation, and Noise, and received an equivalent score in Solid and Hazardous Wastes. The proposed project received a total of 2414.0 with better ratings in Air Quality and Socioeconomics.

66 | P.4-11 If the No Action alternative is not acceptable because of the excess water applied to the landfarm, then the sludge dewatering equipment should be factored into the equation, and the alternative reconsidered.

67 | P.4-11 The Economics section is written in a confusing manner. Stating the Limited Expansion Alternative would cause a slight increase in employment in the area but a net loss in jobs is unclear.



Minnesota Department of Transportation  
Transportation Building, St. Paul, MN 55155

RECEIVED  
14 1985  
MINNESOTA POLLUTION  
CONTROL AGENCY

March 11, 1985

Phone 296-1652

Marlene Voita  
Minnesota Pollution Control Agency  
Office of Planning and Review  
1935 West County Road B2  
Roseville, Minnesota 55113

Re: Koch Refining Company Crude Expansion Project  
Draft Environmental Impact Statement (DEIS)  
District 9 (Rosemount - Dakota County)

Dear Ms. Voita:

The Minnesota Department of Transportation (Mn/DOT) has completed a review of the above referenced Draft EIS. We offer the following comments for your consideration in developing the Final EIS on the proposed project.

68 | Although we anticipate that the project will not adversely impact traffic movement on our transportation systems, we are concerned about the discussion on page 3-110 regarding water vapor. In some areas, vapor from stacks, as described in the EIS, has resulted in serious fogging and icing problems on our highways. The EIS states that impacts on Trunk Highway 52 in the vicinity of the refinery would be limited, but Mn/DOT would like an additional discussion of this issue in the Final EIS. The EIS should contain information regarding past occurrences of roadway fogging and icing as a result of vapor being released in the project area and mitigative measures that might be pursued if the problem currently exists or continues to exist. We also are not sure if the refinery expansion includes additional towers and vents, how many are planned, and where they will be located. We suggest you contact our maintenance office at Mn/DOT's District Office in Oakdale to discuss this issue.

69 | We didn't see any discussion of carbon monoxide level projections due to traffic generated by the proposed facility. Although page 3-6 states that dispersion modeling is required, none is given for carbon monoxide from traffic.

70 | We are aware that the project is in a non-attainment area for particulates. Therefore, some clarification of why PCA believes the non-attainment is caused by area sources and not industrial sources would be a useful addition to the EIS.

Marlene Voita  
Page 2  
March 11, 1985

In addition, we have some non-transportation related comments:

- 71 | 1. We are curious under what circumstances the suggested groundwater study outlined on page 3-129 of the EIS will be carried out. We believe this form of mitigation to be very necessary, especially if wells in the region are finished in the Mt. Simon-Hinkley aquifer.
- 72 | 2. Section 3.6 Groundwater Availability suggests that a groundwater model be developed to describe the potentiometric surface. A simple model for steady state pumping, we agree, would provide more definite information than the Theis Method of computing drawdown.
- 73 | 3. Sections 3.7 Solid and Hazardous Wastes and 3.8 Groundwater Quality seem to downplay the impact of the expansion on these two environmental areas. There appears to be a past history of poor waste management practices which may have resulted in an impact to water quality beneath the site. We are concerned that this problem be addressed as a foundation for expansion.

For additional information concerning Mn/DOT's geologic comments or to discuss issues raised, please contact John Dustman in Mn/DOT's Central Office, phone number 296-1640.

"Thank you for the opportunity to review and comment on the Draft EIS for the Koch Refinery Expansion.

Sincerely,



Cheryl Heide  
Office of Environmental Services

## RESPONSES TO COMMENT LETTERS

(NOTE: Numbers correspond to those noted in the margin on the comment letters.)

1. Electrical power needs for the expanded refinery are discussed on page 2-28 of the draft EIS.
2. The response below is taken from a letter from Northern States Power Company dated March 6, 1985, (a copy of this letter is available for review in the MPCA files) and from MPCA staff, where there was a difference of opinion on the estimates.

Future emission increases for sulfur dioxide can range from approximately 650 tons per year to 3,100 tons per year due to the electrical power needs of the expansion of the refinery. The range of SO<sub>2</sub> emissions for the expansion was calculated using potential future load alternatives within the available electric power network. Air emissions of NO<sub>x</sub> associated with the expansion will range from approximately 100 tons per year to 1,000 tons per year. The lowest estimate in each case is based on all electrical power being obtained from Sherco 3. Air emissions of particulate and metals and effluent increases associated with the expansion can be obtained from the Sherco 3 certificate of need hearings (Section 8.5), the Sherco 3 EIS, and from the Sherco 3 air quality installation permit review and hearings (testimony of J.L. Bechtold).

Construction of new generating facilities will not be required for the Koch expansion. Power will be obtained from existing facilities operating within the provisions of previously issued permits. The impact of these facilities on the environment was taken into account through the development of those permits and associated environmental review. The Koch expansion is an example of a future load requirement taken into account in the Sherco facility certificate of need proceedings.

3. Existing and permitted levels of sulfur dioxide emissions and their effect on acid rain in the state will be evaluated during the MPCA conducted acid deposition hearings which are expected to begin on July 31, 1985.
4. Co-generation generally consists of combustion of fuel to produce steam. This steam is then used in high pressure form to run a turbine to generate electricity. Low pressure steam is extracted from the turbine and used in other process applications. Generally, it is more efficient to use this low pressure steam than to burn fuel to produce steam through a condensing turbine.

Koch Refining Company produces high pressure steam in boilers and produces high pressure and low pressure steam due to heat recovery in the process units. That is, after using fuel combustion heat to heat process fluids, excess heat still available in the flue gas is used to produce steam. This steam is utilized in other process areas and is used to power steam turbines in lieu of electric motor drives. This energy utilization is generally equal to or more efficient on an overall basis than is strict co-generation.

5. Refer to final EIS section 2.7.2, the section on groundwater quality mitigation measures for the expansion, and the public meeting transcript response number 20.

6. Koch Refining Company's impact on Mississippi River water and bottom sediment has been investigated by the MPCA in Waste Load Allocation Studies in 1974 and 1980. These studies and resultant public hearings concluded that the only wastewater treatment plant discharge that has a significant impact on the river quality is that from the Metropolitan Waste Control Commission Pig's Eye waste treatment plant. All other downstream dischargers, including Koch Refining Company, have a negligible impact on water quality.

Koch Refining Company, through its National Pollutant Discharge Elimination System (NPDES) permit, must meet Best Available Technology (BAT) effluent limitations imposed by EPA on petroleum refinery discharges and, where applicable, more stringent effluent limitations under MPCA's effluent discharge regulations.

7. The Clean Air Act of 1977 required that states adopt a permit program to ensure that new source construction in nonattainment areas would not cause a net increase in emissions or a delay in meeting the ambient air quality standards. A method of allowing construction in such areas is to "offset" new emissions with reductions in emissions from existing facilities. In most cases, the offsets are from within the same plant.

The Koch Refining Company plant area is designated as a nonattainment area for sulfur dioxide. A request for redesignation to an attainment area for sulfur dioxide has been submitted to EPA based on recent ambient monitoring data and dispersion modeling of known stack emission rates, but for the purposes of present new source review, the area must be considered nonattainment until the area is redesignated.

If the reduction in existing emissions is greater than what is considered reasonable further progress toward becoming an attainment area, the excess emissions can be "banked." Banked emissions can be saved for future use or transferred to another source in the general area wishing to expand or modify. In some areas of the country where there is a concentration of industry, banking systems have been set up where emissions are traded or sold. Minnesota has not set up a formal banking system at this time, but banked emissions could be transferred through the permit by federally enforceable conditions.

8. The 1979 State Implementation Plan (SIP) between Koch Refining Company and the MPCA required emission reductions to be implemented by the end of calendar year 1982 to meet federal ambient standards. The modeling protocol used in 1979 determined that meeting a total emission limitation of 32.5 tons per day SO<sub>2</sub> would achieve compliance with the standards. After completion of the emission reduction program in 1982, compliance with the standards was demonstrated by monitored compliance at both the MPCA monitor site and the new monitors installed by Koch Refining Company. With this documentation, Koch petitioned MPCA to seek redesignation of the Rosemount area as attainment for SO<sub>2</sub> ambient standards. MPCA has submitted the petition to U.S. EPA for redesignation.

EPA's guidelines for ambient monitoring changed between 1982 and 1984 such that under identical source and ambient conditions, the model now predicted ambient exceedances where none were predicted before. Calculating ambient concentrations under these more stringent EPA modeling guidelines showed exceedances to the west of the refinery on property owned by Koch Refining for a number of years but just recently transferred to Koch Refining's

name. Both MPCA and EPA regulations define ambient air as air to which the public has access. Property owned by a source may be limited to public access. Minnesota Rule Part 7005.0020 prohibits emission of a pollutant in a manner that will cause or contribute to an air quality standard violation beyond the property line provided the general public is denied access to the property. U.S. EPA guidelines state that there must be a physical barrier to access. Therefore, to resolve the calculated exceedances using EPA guidelines, Koch must install a fence around the affected property to the west of the refinery.

A letter dated January 24, 1985 from Thomas Segar of Koch Refining Company to Mike Valentine of the Division of Air Quality (available at the MPCA offices) includes a legal description of the property owned by Koch Refining Company, which documents Koch's ownership of the property to the west of the refinery. Since Koch owns the land in question and has provided documentation of ownership, and has agreed to fence the land, it is MPCA's opinion that Koch Refining Company will be in compliance with Minnesota SO<sub>2</sub> ambient air standards.

9. Refer to final EIS section 2.2.2, Mitigation for Noncriteria Pollutant Emissions, included in Section 2.2 on air quality in the environmental impacts and mitigation supplement of the final EIS.

The metals and polyaromatic hydrocarbons of concern to the health department staff will be included in the odor/hydrocarbon/noncriteria pollutant emissions study of the air quality permit if it is determined that they could have a potential adverse impact on public health, welfare or the environment. Although there is information that suggests that these compounds are present in refinery emissions, there is currently no indication that ambient concentrations of these compounds around refineries is unhealthy.

10. The public also has the opportunity to comment on the expansion during the permitting process, in particular at the public meetings to be held for the air quality total emission facility, NPDES, and Resource Conservation and Recovery Act permits expected to be issued for the Koch expansion within the next five years.
11. The MPCA staff believes that all significant and relevant issues associated with the expansion will be addressed during the state agency permitting and county and local permitting and licensure processes. The final EIS contains recommendations for additional mitigative measures, lists areas needing further study (for which existing data is inadequate for the proper evaluation of a significant issue) and explores alternatives for worst case scenarios.

Minnesota Rules Part 4410.3000 address the preparation of a supplement to a final EIS. A supplement to a final EIS is prepared for a project when it is determined by the responsible governmental unit, in this case the Minnesota Pollution Control Agency, that substantial changes have been made in the proposed project that affect the potential significant environmental effects of a project or there is substantial new information or new circumstances that significantly affect the potential environmental effects from the proposed project. The MPCA will prepare a supplement to the final EIS if, in its judgment, one or both of these conditions arises.

12. Refer to final EIS revised Figure 3-16, which identifies the pre-RCRA leaded gasoline tank bottom sludge disposal sites. The status of these sludge disposal sites is explained at pages 3-153 and 3-154 in the text of the draft EIS under the section entitled "Potential Contamination Sources at the Koch Oil Refinery."
13. Refer to final EIS revised Figure 2-4 which identifies the on-site pipeline routing.
14. The discussion relating to the possibility for further expansion is included on page 1-7, not on page 1-17. It is not within the realm of the scoping decision for the Koch EIS to discuss further expansion mitigative measures and alternatives. If environmental review mandatory category thresholds are triggered by the further expansion of the refinery, an environmental assessment worksheet, an EIS, or a supplement to this EIS would be prepared on the project. Alternatives discussed in Chapter 4 of the draft EIS, "Evaluation of Alternatives," include a change in product mix alternative and a change in crude oil supply alternative for the proposed 207,000 barrels per day expansion. These alternatives were identified during the draft EIS scoping process in March of 1984.
15. The staff believes that they have adequately addressed this issue because the expansion will occur on existing refinery property and the MPCA has received no comments of concern on this issue from the Minnesota Department of Natural Resources or the U.S. Fish and Wildlife Service. The project site is not located on the Mississippi River bluff and, as such, bluff habitat, which may be a significant area of concern from a wildlife impact standpoint, is not included in the project area. As has been stated in the draft EIS, no known state or federal threatened or endangered species have been observed near the site.
16. Health risk was addressed on pages 3-14 through 3-18 and 3-32 through 3-34 of the draft EIS. Refer to response number 9, the response to the comment letter from the Minnesota Department of Health for further discussion of this issue.
17. Refer to final EIS section 2.2.1 for a discussion regarding sulfuric acid mist, total reduced sulfur and reduced sulfur compound emissions at the refinery.
18. As is stated in the draft EIS at page 3-35, the consultant couldn't find any information in the literature or from the EPA which defines typical refinery malfunctions and resultant air emissions. The air quality permit for the expansion will require Koch Refining Company to develop an operation and maintenance plan to be submitted to the Agency this fall, the intent of which is to limit the frequency and duration of breakdowns. A second provision requires Koch to notify the Agency of the occurrence of a breakdown, the cause of the breakdown, and the expected duration of the breakdown. Koch Refining Company is also required to maintain a log of breakdowns, corrective actions and maintenance activities.
19. Refer to final EIS Section 2.3, for a discussion of this issue.
20. Refer to final EIS Section 2.5 on Groundwater Availability.
21. As is stated in the draft EIS at pages 3-162 to 3-165, the groundwater monitoring data are insufficient to positively determine the extent and

origin of the contamination noted in groundwater below the refinery, and more data from unsaturated zone monitoring are necessary to allow reliable conclusions to be reached on the landfarm treatment efficiency. More data will be collected and evaluated during the RCRA land treatment demonstration, and CERCLA and ERLA investigations, and mitigative measures will be required to abate groundwater contamination in the project area.

22. Refer to final EIS revised Figure 2.4 for the location of the hazardous waste haul route from the wastewater treatment plant to the landfarm.
23. When the project was first proposed, it was anticipated that the existing wastewater treatment facility would be adequate for the expansion. As noted on page 2-25 of the draft EIS, in August of 1984, U.S. EPA proposed rules that would require treatment of contaminated runoff. Given this and other preliminary flow estimates, it was clear that the facilities would have to be expanded. Consequently, the impact of the expansion on the efficiency of the existing facility was not evaluated.
24. Staff believes that the identification in the EIS was adequate. The comments on data reevaluation and additional parameters directly relate to the information to be gathered and clarifications needed for the NPDES permitting process.
25. The MPCA staff has identified the specific production rates for the expansion in Table 2-6 of the draft EIS. Again, these comments directly relate to the information to be developed in specific detail for use in the NPDES permitting process.
26. Refer to final EIS Section 2.1 for a discussion of the pollution control facilities for solid and hazardous waste disposal at the existing refinery.
27. This section contains a discussion about co-disposal wastes at the refinery. Draft EIS Table 2-5, which lists miscellaneous wastes, has been amended to include special solid wastes disposed of at the Pine Bend landfill, which are under co-disposal approval by the MPCA.

Refer to Final EIS Section 2.6 for an expanded discussion about the landfarming alternative for disposal of solid and hazardous waste. Section 2.6.2 contains a summary of mitigative measures for the landfarming of wastes. Section 2.6.2 also includes a discussion about reasonable alternatives to landfarming, which can be implemented if the RCRA land treatment demonstration indicates that the landfarming method used by Koch does not effectively treat wastes from the refinery.

28. Odor samples were taken for the EIS based upon the prevailing wind directions during the sampling period. It is probable that odor samples taken to the south and west of the refinery under appropriate wind conditions would yield similar results.
29. Air quality testing completed to date indicates that odor and hydrocarbon air quality standards are exceeded near the refinery. The limited noncriteria pollutant testing performed for the EIS indicated that monitored levels were below air quality health based "guidelines," although an apportionment study based upon total hydrocarbon monitoring data indicated that higher ambient levels are possible. As indicated in the EIS, the refinery expansion, because of a cover installed on the API separator, will result in lower hydrocarbon emissions. Because this source is also a significant

source of noncriteria pollutants and odors, ambient levels of these compounds should also decrease.

The MPCA staff intends to include in the Koch Refining Company air quality permit, a requirement for a literature review of noncriteria pollutants emitted from refineries followed by an analysis of the sources and ambient concentrations of hydrocarbons, odors, and noncriteria pollutants. When the exposure to various noncriteria pollutants is measured, a more accurate assessment of risk will be possible. The study will also include an analysis of the feasibility of control of these sources, if necessary. Based upon the results of this study, the Koch air quality permit will be modified, if necessary.

30. There remains some uncertainty regarding the appropriate methodology for modeling one hour SO<sub>2</sub> ambient concentrations. Because there is no federal one hour standard, there are no EPA guidelines for this analysis. To assure that the one hour standard is not exceeded, one of the existing Koch monitors will be moved to the location of the highest expected one hour SO<sub>2</sub> concentration. This monitor, which was located west or south of the refinery (depending on the seasonal winds) during the past two-year period, has recorded SO<sub>2</sub> levels well below the SO<sub>2</sub> standards. A supplement to the final EIS is not anticipated at this time (see response #11).
31. The number of refinery malfunctions and breakdowns is expected to increase with the refinery expansion. An increase or decrease in air pollution levels can result with shutdown of various process units, depending on where the process gases/emissions are routed. For instance, if more gas is routed through the refinery flare, more air pollution can result. There are two provisions which will be included in the air quality permit for the expansion related to refinery equipment breakdowns. One requires Koch Refining Company to develop an operation and maintenance plan to be submitted this fall to the Agency, the intent of which is to limit the frequency and duration of breakdowns. A second provision requires Koch Refining Company to notify the Agency of the occurrence of a breakdown, the cause of the breakdown and the expected duration of the breakdown. Koch Refining Company is also required to maintain a log of breakdowns, corrective actions and maintenance activities.
32. Sulfuric acid mist is not expected to be emitted from the refinery. Reduced sulfur compounds may be emitted from leaks and other sources which are difficult to quantify. Reduced sulfur compounds are not expected to be emitted in quantities that could cause health problems, although they do contribute to odor problems. Reduced sulfur compounds will be addressed in the noncriteria pollutant study required by the Koch permit (see final EIS Sections 2.2.1 and 2.2.2).
33. Refer to final EIS Section 2.7, the Groundwater Quality section, for a discussion regarding firewater pond impacts and mitigation.
34. Refer to transcript response number 9.
35. EPA conducted priority pollutant sampling on many of the nation's refineries as part of their process of developing technology based effluent limitations that address toxic pollutant controls. This data is included in the Development Document for the Petroleum Refining Category (EPA 440/1-82/014). The MPCA compared this data with Koch's NPDES application data submitted for

the last reissued permit. This data included quarterly sampling for up to 39 priority pollutants submitted under a previous permit. Koch will again submit priority pollutant analyses with their application for a permit modification with the expansion. All data will be evaluated and monitoring required where justified. The evaluation of Koch's discharge has progressed beyond routine monitoring of whole priority pollutant scans and will be targeted to specific compounds. (Also see response number 6.)

36. Koch's wastewater treatment plant effluent discharge is warmer than ambient river temperatures. As such, the discharge plume is less dense and will tend to rise, forcing mixing with the river. Also, the discharge area is subject to additional mixing by passing barge traffic. If the discharge had been located along the shoreline, the comment would have had some merit, but the discharge is directly into the main channel.
37. The statistical approach suggested by Dakota County is not applicable to the permit effluent limitations. Average treatment plant performance and variability is built into the technology based effluent limitations used in Koch's permit. The more restrictive state limitations are based on 30-day average limitations as specified by state rule, and the daily maximums have by convention largely been set at twice the 30-day average. This may be as restrictive or more restrictive than a 95% upper bound probability statistic applied to Koch's discharge data for conventional pollutants. The MPCA staff will check into this issue during the NPDES permitting process.
38. The scoping decision did call for the specific performance and design criteria and facilities, not the specific design for the wastewater treatment plant (WWTP) for the expansion. The specific design information was not and still is not available for the expansion. Instead, the bottom line for operation of the WWTP was defined for the expansion in the draft EIS--the federal and state WWTP effluent limitations. However, the specific design, the plans and specifications for the WWTP, must be provided and evaluated by the MPCA staff before the NPDES permit is issued for the expansion.
39. Refer to final EIS Section 2.7.
40. The applicable WWTP effluent standards have to be met for the NPDES permit to be issued by the MPCA. (Also refer to responses 35 and 36 and to transcript response number 9.)
41. Refer to final EIS Section 2.3.
42. The delay of road traffic due to railroad traffic from Koch Refining Company on 117th and 140th Streets is an existing condition that would not substantially change after the expansion. The expansion would not increase the frequency of trains but could be expected to increase the duration of the traffic delay. There has been no apparent effort to remedy the existing traffic delays. If these delays are not acceptable, adjustments in train schedules or other approaches should be explored.
43. Additional barge movements from the expansion will not have a significant effect on boat traffic in the Mississippi. As noted in the draft EIS, it is estimated that the barge traffic for the expansion would not be any greater than the combined barge movements of crude and product in the early 1980's, since crude is now shipped to the plant completely by pipeline.

44. Data on nearby wells were obtained from the Minnesota Geological Survey and the Department of Natural Resources well files. Location information provided for these sources was used to generate Figure 3-10 (from page 3-121 of the draft EIS).

Refer to final EIS revised Figure 3-10 which has been updated to include the location and status of the wells noted in your comment. Also included are the abandoned water supply wells.

Well abandonment does not have any particular relevance in this EIS. This issue does, however, have relevance to the Superfund investigation work planned for the area and such data should be collected and evaluated under that investigation. The location of monitoring wells numbered 1 through 7 was given in Figure 3-17 on page 3-158 in the Groundwater Quality Section 3.8 of the draft EIS.

45. Draft EIS Figure 3-11, Regional Water Table and Top of Bedrock Contour Map, represents the most up to date integration of site-specific data. It is believed to be the best representation of general site conditions that is currently available. The discrepancy between the water table surface illustrated in this figure and that presented in the most recent USGS publication can be attributed to the differences in the data used and purpose. The USGS regional map was based on two to four monitoring wells located in the region; the Sunde map is area-specific and is based on more site-specific data. If additional data are provided to the MPCA which will significantly change the conclusions of the study, Figure 3-11 could be modified appropriately. However, the additional studies proposed do not fall within the scope of this EIS. Figure 3-11 was originally labeled "Generalized Regional Water Table and Bedrock Surface Contour Map." The term "Generalized" should be added to the title again.

The suggestion for data collection for the purpose of developing an updated regional water table map and/or potentiometric surface has been considered by the MPCA. This activity is included in the description of suggested additional investigations contained in the draft EIS. Further collection and evaluation of hydrogeologic data will occur through the federal and state Superfund investigations to identify culpable contamination sources and groundwater flow characteristics in the project area.

46. The MPCA staff are aware of these data.
47. Dakota County staff's Figure 3-1 illustrates the general variability of water use over time. The trend analysis presented has several weaknesses and should not be used to predict future water usage at the Koch Refinery. The linear regression correlation coefficients are small, suggesting that a linear relationship between time and withdrawal rate cannot be used to accurately predict future withdrawal rates. The analysis ignores the stochastic nature of water use and actual modifications in water use practices at Koch over time.

The existing data show no evidence that the water supply in the area is (or will be) in short supply. Therefore, there is no apparent reason to evaluate water use scenarios and mitigative measures if these are not identified as being a problem. However, if the water appropriation by Koch increases by 10 percent over the permitted amount, the Minnesota Department of

Natural Resources will require that the refinery's existing water appropriation permit be reevaluated. However, additional studies have been recommended in the draft EIS at pages 3-129 and 3-130. If, as a result of these studies a water shortage is identified, then alternative and/or mitigative measures must be evaluated by Koch. Future water appropriation permit reauthorization by the Department of Natural Resources will be predicated on the implementation of appropriate measures. (Refer to Section 2.5.2 of the final EIS for mitigation required if a water shortage is identified).

48. The 1982 and 1983 water data were chosen to represent historical data because these numbers reflect current water use conditions at the facility. Refer to Section 2.5.2 of the final EIS, which contains the recommendation that the Minnesota Department of Natural Resources 1) spot check water appropriation at the refinery and 2) require that all refinery production be metered for assessing groundwater usage at the refinery.
49. In addition to the analysis contained in the draft EIS, the impact of refinery groundwater withdrawals has also been modeled on a preliminary basis by Barr Engineering Company. The analysis (letter to Koch Refining Company, March 8, 1985) concludes that the drawdown in Unit 1 resulting from increased pumpage in Unit 2 will result in less than 0.3' of drawdown in the upper unit. More thorough predictions would require an extensive and expensive study of local subsurface hydraulic conditions. A more thorough assessment of these conditions under present and likely future water use scenarios will be addressed in the Superfund Remedial Investigation/Feasibility Study (refer to final EIS Section 2.5.2).
50. It is understood that there is considerable variability in water demand and use in the refinery process over time. It is highly unlikely that Koch Refining Company's increased use of appropriated groundwater during certain years was due to use of groundwater for dilution of wastewater treatment plant effluent. Koch would not have anything to gain with this practice since both federal and state wastewater effluent limitations are based on the mass loading of pollutants, not volume concentration of pollutants going to the Mississippi River.
51. The simplifying assumptions used in the drawdown analysis are justified when making regional, long-term estimates of the impact of pumpage on aquifer water levels. Theoretical methods have not been incorrectly applied. No claim has been made that the predicted drawdown represents short-term or local precise predictions of drawdown in specific wells.
52. Minnesota Statutes provide specific mechanisms for the processing and resolution of complaints involving well interference problems (Minnesota Statutes, Section 105.41, 6115.0730-6115.0750). These statutes provide for review of well interference complaints by the Minnesota Department of Natural Resources (MDNR) which administers all groundwater appropriation permits. These statutes provide a specific mechanism for investigation of interference complaints and a well defined dispute resolution mechanism, including an opportunity for a public hearing on specific complaints, if necessary. Since Koch Refining Company is permitted to withdraw groundwater under an MDNR groundwater appropriation permit, they are legally bound by these regulations and would be required to resolve any well interference problems according to the procedures outlined in these regulations.

The draft EIS on pages 3-129 and 3-130 contains a suggested list of studies designed to address several questions which cannot be completely answered,

given the current level of data. The MDNR is currently in the process of reviewing Koch's groundwater appropriation permit. MDNR will be making decisions regarding the type and level of detail of studies necessary to determine permit conditions to minimize well interference problems. Also refer to final EIS Section 2.5.2 for a discussion of MDNR mitigation for well interference problems.

53. Barr Engineering Company's report and calculations regarding Koch Refining Company's additional groundwater appropriation are available at the MPCA offices upon request.
54. Refer to response number 49.
55. Refer to final EIS Section 2.1 for information (revised tables and discussion) about special solid and hazardous wastes generated during the operation and maintenance of the refinery, including co-disposal wastes (special solid wastes disposed of at the Pine Bend landfill under co-disposal approval by the MPCA). Table 2-5 from the draft EIS, which contains a list of miscellaneous wastes, has been revised to include both types of wastes. In addition, the MPCA staff has prepared a new table (Table 1) which lists predicted quantities for wastes, other than wastewater treatment plant wastes, due to the expansion. The wastes listed in Table 1 are process equipment wastes, tank bottoms and miscellaneous wastes to be generated with the expansion. Wastewater treatment plant wastes for the expansion are included in the draft EIS.
56. Some hazardous wastes are stored on-site. Virtually all of the stored wastes are placed in metal drums. None of the stored wastes have any free liquid with the exception of PCB's. The wastes with no free liquid are stored in drums placed on pallets in an outdoor storage area shown in final EIS Figure 2-4. The PCB wastes are also stored in drums, but as a further precaution are placed in a building with a curved concrete floor. The building is located in the area where the other wastes are stored. Koch does not store any waste solvents or sludges. Koch plans to continue their current waste storage practices. Expansion of existing or construction of new storage facilities are not warranted for the expansion.
57. Refer to final EIS Section 2.6, which contains a discussion about the impact, disposal options, and mitigative measures necessary for the storm-
58. water retention basin (coker pond) sediment and firewater pond sediment generated by cleaning these holding areas.
59. All of these issues will be addressed through the RCRA permitting process and the land treatment demonstration and evaluation required for that permit. Also refer to final EIS Section 2.6 for a discussion on the impact of the landfarm and mitigation measures and alternatives to landfarming.
60. Refer to Final EIS Section 2.7, which contains a description of the storm-water pond (coking pond) impacts and mitigation.
61. Refer to final EIS Section 2.6.
62. Refer to final EIS Section 2.7, which contains a description of the fire-water pond impacts and mitigation.
63. Refer to final EIS revised Table 3-57 which has been corrected as noted.

64. The EIS process requires that reasonable alternatives to the project be evaluated. "Reasonable alternative" can be defined as alternatives that are comparable in terms of technology, timing, and scope. The Minnesota Environmental Quality Board (MEQB) rules state that reasonable alternatives may include locational considerations, design modifications, including site layout, magnitude of the project and consideration of alternative means by which the purpose of the project could be met. The alternative of "no action" must be addressed.

As is stated in the draft EIS on page 4-1 in Chapter 4.0, the evaluation of alternatives, the alternatives included in the draft EIS were identified during the scoping process in March of 1984. The suggested alternatives were evaluated by the MPCA staff, who concluded that four alternatives deserved consideration in the draft EIS. Among them was the no action alternative as required by the MEQB rules.

Alternatives such as solar energy and hydroelectric power, for which the proposer has no expertise, and those which would require further technological development, economic incentives or modification in personal preference, or alternatives which would require long lead times for development, were eliminated from consideration.

65. It is acknowledged that the no action alternative received the lowest score based on the criteria used in the evaluation of alternatives.
66. The alternatives evaluation did not conclude that the no action alternative was unacceptable. The no action alternative was ranked as the most environmentally acceptable, based on the criteria used. Improving the landfarm practice would cause the overall evaluation score to be lower, thus more acceptable. Therefore, there is no need to reconsider the no action alternative.

The no action alternative scored poorly in the area of socioeconomics. The no action alternative option does nothing to improve the supply of refined oil products in the Upper Midwest, maintain competitive oil product prices, or improve employment in the metropolitan area.

67. The limited expansion alternative would generate new employment. This would include about 150 new refinery personnel, 250 construction jobs over a period of three years, and an additional 15-20 turnaround jobs for a total of 420 jobs. Brockway Glass, a neighboring industry, closed its plant, laying off 450 people. Therefore, even with the limited refinery expansion, an overall job deficit occurs in the area.
68. Refer to final EIS Section 2.3, for a discussion about potential impacts and recommended mitigation measures for the effects of water vapor emissions on nearby roadways.
69. On page 3-6 of the draft EIS, it is stated that dispersion modeling is required under the Prevention of Significant Deterioration (PSD) for a major point source with a significant emission increase. The 14 ton/year increase in CO emissions from the expansion is not significant as defined by EPA. In addition, PSD rules apply only to point sources, not traffic sources. Because employment will only increase by about 270 employees and the level of service on vicinity roadways is generally very good, an analysis of CO from traffic was not performed.

70. Although the area is classified as nonattainment for particulates, there have been no standard violations since 1980. A microscopic analysis performed on air samples collected in 1980 did show significant fertilizer levels in the particulate matter. Particulates in this area are, on an average basis, attributed largely to area sources. The major source based on filter analysis, however, is not Koch Refining Company. In addition, Koch's particulate emissions are projected to decrease with the expansion.
71. If the MDNR determines that additional studies are needed on groundwater drawdown in the project area, Koch Refining Company would be responsible for conducting them, as they are under the state and federal Superfund acts.
72. The suggestion has been made that a groundwater model be used to predict the steady state potentiometric surface as a substitute for the drawdown calculations presented in the draft EIS. It should be pointed out that those drawdown calculations did represent steady state, long-term predicted drawdowns. A model prediction of the potentiometric surface resulting from additional Koch pumpage is only as good as the input data used in the modeling effort. The input data required to accurately represent initial and boundary hydrogeologic conditions and the pumpage at other sites in the area are not available. The expense of computer modeling in the absence of the additional data generation studies suggested in the mitigation section (Section 3.6 of the draft EIS) could not be justified for the draft EIS analysis.
73. Refer to final EIS Sections 2.6, Solid and Hazardous Wastes, and 2.7, Groundwater Quality, for an expanded discussion on the potential impacts and mitigation measures for potential groundwater contamination sources on-site.

Revised

Table 3-57 (page 1 of 2)  
 CHEMICAL ANALYSIS FOR MONITORING WELL NOS. 4, 5, 6, AND 7  
 October 1984

Analysis	Well No. 4	Well No. 5	Well No. 6	Well No. 7
Mercury, (filtered), ug/L as Hg	2.2 <sup>a</sup>	2.0 <sup>a</sup>	2.6 <sup>a</sup>	0.5
Fluoride, ug/L as F	0.13	0.04 <sup>b</sup>	0.17	0.04
Nitrates, ug/L as H	1.6	12 <sup>b</sup>	4.1	2.8
Endrin, ug/L	<0.1	<0.1	<0.1	<0.1
Lindane, ug/L	<0.1	<0.1	<0.1	<0.1
Methorchlor, ug/L	<0.1	<0.1	<0.1	<0.1
Toxaphene, ug/L	<1.0	<1.0	<1.0	<1.0
2.4 D, ug/L	5.5	2.3	5.7	<0.2
2 4.5 TP (Silver) ug/L	<0.1	<0.1	<0.1	<0.1
Total Coliform Bacteria, nc./ 100 mL (Membrane Filter)	0	0	0	0
Chloride, mg/L as Cl	20	15	15	15
Phenol, mg/L	<0.002	<0.002	<0.002	0.011
Sulfate, mg/L as SO <sub>4</sub>	90	53	90	24
Gross Alpha, picocuries/L	4+/-3	8+/-6	4+/-3	3+/-2
Gross Beta, picocuries/L	9+/-3	17+/-6	5+/-2	7+/-3
Silver, (filtered), ug/L as Ag	<0.04	<0.04	<0.04	<0.04
Arsenic (filtered), ug/L as As	<1	2	3	<1
Barium, (filtered), mg/L as Ba	<0.25	<0.25	<0.25	<0.25
Cadmium (filtered), ug/L as Cd	0.04	0.04	0.28	0.04
Total Chromium (filtered, ug/L as Cr	14	1.2	14	1.4
Total Iron, (filtered), mg/L as Fe	<0.05	<0.05	1.9	<0.05
Manganese, (filtered), mg/L as Mn	<0.03	0.03	0.48	0.03
Sodium, (filtered), mg/L as Ma	13	8.6	7.2	3.6
Lead (filtered), ug/L as Pb	<1	1	3	<1
Selenium, (filtered) ug/L as Se	<1	3	4	1
pH	3.3	7.2	7.2	6.8
Depth, feet	43.90	45.37	56.94	52.45
Specific Conductance, umbo's at 25°C	344	511	424	391

Revised  
Table 3-57 (page 2 of 2)

<u>Analysis</u>	<u>Well No. 4</u>	<u>Well No. 5</u>	<u>Well No. 6</u>	<u>Well No. 7</u>
Total organic carbon, mg/L as TOC	17	16	17	11
Total organic Halide, ug/L	7	37	10	6
Radium 226, picocuries/L	<0.6	.9+/- .7	1.3+/- .9	<0.6
Radium 228, picocuries/L	<1	<1	<1	<1
pH	8.3 <sup>c</sup>	7.2 <sup>c</sup>	7.2 <sup>c</sup>	6.8 <sup>c</sup>
Specific Conductance, umho's at 25°C	344 <sup>c</sup>	511 <sup>c</sup>	424 <sup>c</sup>	402 <sup>c</sup>
Total organic carbon, mg/L as TOC	17 <sup>c</sup>	15 <sup>c</sup>	18 <sup>c</sup>	17 <sup>c</sup>
Total organic Halide, ug/L	7 <sup>c</sup>	36 <sup>c</sup>	11 <sup>c</sup>	6 <sup>c</sup>

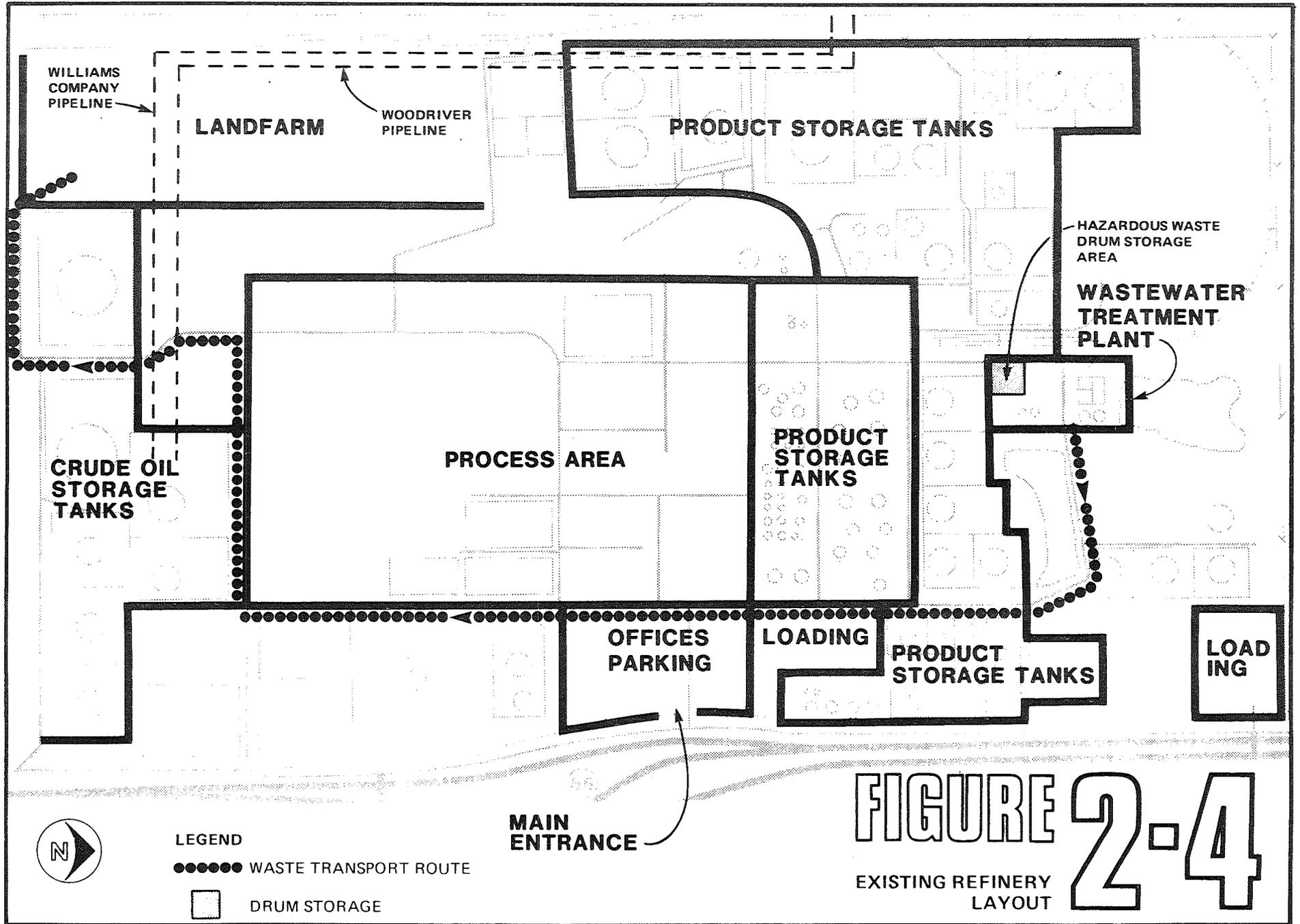
<sup>a</sup> Equals or exceeds the drinking water standard for mercury of 2.0 µg/L.

<sup>b</sup> Equals or exceeds the drinking water standard for nitrate-nitrogen of 10 µg/L.

<sup>c</sup> The average value of three duplicate samples.

GLT263/108-2

GLT263/108-2



**FIGURE 2-4**  
EXISTING REFINERY LAYOUT



