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CITGO Petroleum Corporation

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Lemont, IL 60439-3659

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1000459

June 4, 2010

Mr. Steve Nightingale, P.E. Manager
Permit Section
Bureau of Land
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, IL 62794-9276

Intent to Close Land Treatment Facility

Dear Mr. Nightingale:

This is in response to recent discussions between Rob Watson of the IEPA and Kevin Moss of the CITGO-Lemont Environmental Department concerning renewal of the RCRA permit for the Lemont Refinery. Specifically, the CAMU option at the Land Treatment Facility (LTF) as outlined in the original RCRA permit will not be pursued. Based on the information gained during the past several years of Corrective Action (CA) investigations it has been determined that a CAMU will likely not be needed to manage CA wastes. Therefore, the intent of the refinery is to proceed to closure of the LTF and not pursue the CAMU option.

As discussed a formal withdrawal of the CAMU permit modification request is not needed (or requested) at this time.

If there are questions or if additional information is required, please contact Kevin Moss at (630) 257-4452 or me at (630) 257-4450.

Sincerely,

C. W. Harmon

C. W. Harmon, Manager
Health, Safety, Security & Environmental

KJM/PLM

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June 9, 2010

Stephen F. Nightingale, P.E.
Manager, Permit Section, Bureau of Land
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1021 North Grand Avenue East
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1978030004 – Will County
Lemont Refinery
ILD 041 550 567
Log. No.: B-162R
Supplemental Information in Response to IEPA Requests

Dear Mr. Nightingale:

On April 23, 2007, a Resource Conservation and Recovery Act (RCRA) Part B Permit Renewal Application (Renewal Application) was submitted for the CITGO Petroleum Company, LLC, Lemont Refinery (the Refinery). The supplemental information provided is in response to April 20, 2010 and May 14, 2010 email requests. The specific requests included:

- **A map added to the Corrective Action section of the Permit Application (Section K) "...that details all the pertinent information regarding the corrective action activities at the site (GMZ, remedial activities (such as the French Drain, groundwater recover wells, skimmer wells etc.), GWM wells, piezometers, surface water gauges, etc.)."**

- **An additional table of information to be added to Section K regarding construction details for monitoring wells included in the Site Wide Groundwater Monitoring Program**

- **Corrections to the Table of Contents for Tables in Section I**

In addition to these changes, several associated editorial revisions were included. These revisions include updating Section 4.0 of the Introduction as well as additions to several Tables of Contents.

Attachment 1
Replacement Pages

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RENEWAL PART B PERMIT APPLICATION
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Remove Cover Page
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RCRA PERMIT RENEWAL APPLICATION
THE LEMONT REFINERY
CITGO PETROLEUM CORPORATION

Lemont, Illinois

Submitted by:

The Lemont Refinery

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April 23, 2007
Revised July 31, 2007; August 10, 2007; June 3, 2010

RENEWAL PART B PERMIT APPLICATION
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LIST OF ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius (Centigrade)
%CV	Relative Standard Deviation
°F	Degrees Fahrenheit
1990 Decision Guide	Illinois EPA RCRA Part B Permit Application Decision Guide (December 1990)
2006 Decision Guide	Illinois EPA RCRA Part B Permit Application Decision Guide (July 2006)
2006 Checklist	Illinois EPA RCRA Part B Hazardous Waste Permit Application Completeness and Technical Evaluation Checklist (July 2006)
AAS	Atomic Absorption Spectrometry
AASHO	American Association of State Highway Officials
ACL	Alternate Concentration Level
Act	Illinois Complied Statutes Environmental Safety Environmental Protection Act
AEL	Appropriate Exposure Limit
Agency	U.S./Illinois Environmental Protection Agency
amsl	Above mean sea level
ANPR	Advanced Notice of Proposed Rulemaking
AOC	Area of Concern
API	American Petroleum Institute
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
atm	Atmospheres
bbl	Barrels
bgs	Below ground surface
BTZ	Below Treatment Zone
bpd	Barrels per Day
BTEX	Benzene, Toluene, Ethylbenzene, And Xylene
BIF	Boilers and Industrial Furnace
BOD_5	Five-Day Biological Oxygen Demand
BP	Boiling Point
BTC	Background Threshold Concentration
BTU	British Thermal Units
BTZ	Below Treatment Zone
C	Ceiling
CAA	Clean Air Act
CAAPP	Clean Air Act Permit Program
CAMU	Corrective Action Management Unit
CAS	Chemical Abstracts Service Registry
CBT	computer-based training

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

CCR	Current Conditions Report
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CO	Carbon Monoxide
COC	Contaminants of Concern
COD	Chemical Oxygen Demand
COLIWASA	Composite Liquid Waste Sampler
CSM	Conceptual Site Model
CSSO	Central Security Services Office
CV	Coefficient of Variation
CWA	Clean Water Act
DOT	Department of Transportation
DQL	Data Quality Level
DRO	Diesel-Range Organic
ECD	Electron Capture Detector
EEGL	Emergency Exposure Guidance Limit
EI	Environmental Indicator
E&I	Electrical and Instrument
EPA	Environmental Protection Agency
EQL	Estimated Quantitation Limit
ERPG	Emergency Response Planning Guidelines
ERT	Environmental Response Team
ELUC	Environmental Land Use Controls
FCC	Fluid Catalytic Cracking Unit
FCCU	Fluid Catalytic Cracking Unit
FEMA	Federal Emergency Management Agency
FID	Flame-Ionization Detector
FIRM	Flood Insurance Rate Map
FOIA	Freedom of Information Act
g	Gram
gal.	Gallon
GC	Gas Chromatography
GDU	Gasoline Desulfurization Unit
GPD	Gallons Per Day

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

GPRA	Government Performance and Results Act
GRO	Gasoline-Range Organic
GMZ	Groundwater Management Zone
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBL	Health-Based Level
HDPE	High-Density Polyethylene
HEBCA	Heat Exchanger Bundle Cleaning Area
HEXB	Heat Exchanger Bundle(s)
HF	Hydrofluoric
HF alky	Hydrofluoric alkylation (neutralization basin)
hPa	HectoPascals
HPLC	High-Performance Liquid Chromatography
HSA	Hollow Stem Auger
HSWA	Hazardous and Solid Waste Amendments
HWMF	Hazardous Waste Management Facility
HWMU	Hazardous Waste Management Unit
HSS&E	Health, Safety, Security, and Environmental
IAC	Illinois Administrative Code
IBC	Intermediate Bulk Container
ICPES	Inductively Coupled Plasma Emission Spectrometry
ICP-MS	Inductively Coupled Plasma – Mass Spectrometry
ID	Identification
IDL	Instrument Detection Limit
IDLH	Extremely Dangerous to Life or Health
IDOT	Illinois Department of Transportation
IL ELAP	Illinois Environmental Laboratory Accreditation Program
Ill. Rev. Stat.	Illinois Revised Statute
Illinois EOU	Illinois Emergency Operations Unit
IPCB	Illinois Pollution Control Board
IR	Infrared Spectrometry
kPa	KiloPascals
lb.	Pound
lbs.	Pounds
LCS	Laboratory Control Sample
LDR	Land Disposal Restriction
LEL	Lower Explosive Limit
LIMS	Laboratory Information Management System
LOQ	Limit of Quantitation
LTA	Land Treatment Area
LTF	Land Treatment Facility
LTL	Lower Tolerance Limit

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

MDEA	Monodiethanol amine
MDL	Method Detection Limit
MEA	Monoethanol amine
mg/kg	Milligram/kilogram
Misc.	Miscellaneous
mL	Milliliter
MOSC	Mobile Oil Sludge Coking
mph	Miles per hour
MPRSA	Marine Protection, Research, and Sanctuaries Act
MS	Mass Spectrometry
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
MTBE	Methy Tert-Butyl Ether
MTR	Minimum Technology Requirement
MW	Molecular Weight
NA	North America (or Not Applicable)
NACE	National Association of Corrosion Engineers
NAPL	Non-aqueous Phase Lliquids
NCDC	National Climatic Data Center
NELAP	National Environmental Laboratory Accreditation Program
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFA	No Further Action
NFPA	National Fire Prevention Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Testing
NP	Not Performed
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
NTUS	Nephelometric Turbidity Units
OJT	On-the-Job Training
OPA	Oil Pollution Act
OSHA	Occupations Safety and Health Administration
Pa	Pascals
PAC	Powdered Activated Carbon
PAH	Polynuclear Aromatic Hydrocarbons
P.E.	Professional Engineer
PID	Photo Ionization Detector
PMP	Perimeter Monitoring Program
POC	Point of Compliance
PPB	Parts Per Billion
PPE	Personal Protective Equipment

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

ppm	Parts per million
ppm_v	Parts per million by volume
PQL	Practical Quantitation Limit
PSD	Prevention of Significant Deterioration
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RCRIS	RCRA Information System
Refinery	Lemont, Illinois, Refinery
Renewal Application	RCRA Part B Permit Renewal Application
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RGN	Reactivity Group Number
RO	Remediation Objective
RPD	Relative Percent Difference
SCBA	Self-Contained Breathing Apparatus
SCFPU	Special Coker Feed Preparation Unit
SDWA	Safe Drinking Water Act
SG	Specific Gravity
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasures
SPEGL	Short-Term Public Emergency Guidance Level
SPLP	Synthetic Precipitation Leaching Procedure
SR	State Route
STEL	Short-Term Exposure Limit
SVOC	Semivolatile Organic Compound
SW-846	*Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods* (U.S. EPA, Office of Solid Waste, Third Edition)
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
TACO	Tiered Approach to Corrective Action Objectives
TCLP	Toxicity Characteristic Leaching Procedure
TLV	Threshold Limit Value
TOC	Total Organic Carbon
TOX	Total Organic Halides
TPH	Total Petroleum Hydrocarbons

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

TRPH	Total Recoverable Petroleum Hydrocarbons
TRMA	Three Rivers Manufacturers' Association
TSDF	Treatment, Storage, and Disposal Facility
TU	Temporary Unit
TWA	Time-Weighted Average
UEL	Upper Exposure Limit
ug	Micrograms
ug/kg	Microgram/kilogram
UHC	Underlying Hazardous Constituent
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper Tolerance Limit
UTS	Universal Treatment Standard
UZM	Unsaturated Zone Monitoring
VCA	Voluntary Corrective Action
VHF	Very High Frequency
VOC	Volatile Organic Compound
VP	Vapor Pressure
VSI	Visual Site Inspection
WCSA	Waste Container Storage Area
WWTP	Wastewater Treatment Plant
WWTU	Wastewater Treatment Unit
ZOI	Zone of Incorporation

RENEWAL PART B PERMIT APPLICATION
VOLUME 1, INTRODUCTION

Remove page 7 in Introduction Section
and replace with attached page 7.

July 31, 2007, Modification—On July 31, 2007, the Refinery submitted to the Illinois EPA a response to Notices of Deficiency (NODs) identified by the Illinois EPA during their initial completeness review. The response was prepared so as to incorporate the requested information into the Renewal Application in the appropriate sections. Each modified page is indicated with a revision date of July 31, 2007.

August 10, 2007, Modification—On August 10, 2007, the Refinery submitted a supplemental information package related to the response to NODs submitted on July 31, 2007. This supplemental information package provided a revised list of analytical parameters for groundwater monitoring at the LTF. The revised list includes indicator parameters as well as waste constituents selected based on detections in the past five years of unsaturated zone monitoring at the LTF.

June 3, 2010, Modification—On June 3, 2010, the Refinery submitted a supplemental information package related to specific requests for information from the Illinois EPA. This package provided a new figure for Section K depicting locations of items associated with corrective action (Figure K-2), a new table for Section K listing construction details for wells associated with the Site Wide Groundwater Monitoring Program (Table K-4), and a correction for the Table of Contents for Tables in Section I.

RENEWAL PART B PERMIT APPLICATION
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LIST OF ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius (Centigrade)
%CV	Relative Standard Deviation
°F	Degrees Fahrenheit
1990 Decision Guide	Illinois EPA RCRA Part B Permit Application Decision Guide (December 1990)
2006 Decision Guide	Illinois EPA RCRA Part B Permit Application Decision Guide (July 2006)
2006 Checklist	Illinois EPA RCRA Part B Hazardous Waste Permit Application Completeness and Technical Evaluation Checklist (July 2006)
AAS	Atomic Absorption Spectrometry
AASHO	American Association of State Highway Officials
ACL	Alternate Concentration Level
Act	Illinois Complied Statutes Environmental Safety Environmental Protection Act
AEL	Appropriate Exposure Limit
Agency	U.S./Illinois Environmental Protection Agency
amsl	Above mean sea level
ANPR	Advanced Notice of Proposed Rulemaking
AOC	Area of Concern
API	American Petroleum Institute
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
atm	Atmospheres
bbl	Barrels
bgs	Below ground surface
BTZ	Below Treatment Zone
bpd	Barrels per Day
BTEX	Benzene, Toluene, Ethylbenzene, And Xylene
BIF	Boilers and Industrial Furnace
BOD_5	Five-Day Biological Oxygen Demand
BP	Boiling Point
BTC	Background Threshold Concentration
BTU	British Thermal Units
BTZ	Below Treatment Zone
C	Ceiling
CAA	Clean Air Act
CAAPP	Clean Air Act Permit Program
CAMU	Corrective Action Management Unit
CAS	Chemical Abstracts Service Registry
CBT	computer-based training

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

CCR	Current Conditions Report
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CO	Carbon Monoxide
COC	Contaminants of Concern
COD	Chemical Oxygen Demand
COLIWASA	Composite Liquid Waste Sampler
CSM	Conceptual Site Model
CSSO	Central Security Services Office
CV	Coefficient of Variation
CWA	Clean Water Act
DOT	Department of Transportation
DQL	Data Quality Level
DRO	Diesel-Range Organic
ECD	Electron Capture Detector
EEGL	Emergency Exposure Guidance Limit
EI	Environmental Indicator
E&I	Electrical and Instrument
EPA	Environmental Protection Agency
EQL	Estimated Quantitation Limit
ERPG	Emergency Response Planning Guidelines
ERT	Environmental Response Team
ELUC	Environmental Land Use Controls
FCC	Fluid Catalytic Cracking Unit
FCCU	Fluid Catalytic Cracking Unit
FEMA	Federal Emergency Management Agency
FID	Flame-Ionization Detector
FIRM	Flood Insurance Rate Map
FOIA	Freedom of Information Act
g	Gram
gal.	Gallon
GC	Gas Chromatography
GDU	Gasoline Desulfurization Unit
GPD	Gallons Per Day

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

GPRA	Government Performance and Results Act
GRO	Gasoline-Range Organic
GMZ	Groundwater Management Zone
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBL	Health-Based Level
HDPE	High-Density Polyethylene
HEBCA	Heat Exchanger Bundle Cleaning Area
HEXB	Heat Exchanger Bundle(s)
HF	Hydrofluoric
HF alky	Hydrofluoric alkylation (neutralization basin)
hPa	HectoPascals
HPLC	High-Performance Liquid Chromatography
HSA	Hollow Stem Auger
HSWA	Hazardous and Solid Waste Amendments
HWMF	Hazardous Waste Management Facility
HWMU	Hazardous Waste Management Unit
HSS&E	Health, Safety, Security, and Environmental
IAC	Illinois Administrative Code
IBC	Intermediate Bulk Container
ICPES	Inductively Coupled Plasma Emission Spectrometry
ICP-MS	Inductively Coupled Plasma – Mass Spectrometry
ID	Identification
IDL	Instrument Detection Limit
IDLH	Extremely Dangerous to Life or Health
IDOT	Illinois Department of Transportation
IL ELAP	Illinois Environmental Laboratory Accreditation Program
Ill. Rev. Stat.	Illinois Revised Statute
Illinois EOU	Illinois Emergency Operations Unit
IPCB	Illinois Pollution Control Board
IR	Infrared Spectrometry
kPa	KiloPascals
lb.	Pound
lbs.	Pounds
LCS	Laboratory Control Sample
LDR	Land Disposal Restriction
LEL	Lower Explosive Limit
LIMS	Laboratory Information Management System
LOQ	Limit of Quantitation
LTA	Land Treatment Area
LTF	Land Treatment Facility
LTL	Lower Tolerance Limit

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

MDEA	Monodiethanol amine
MDL	Method Detection Limit
MEA	Monoethanol amine
mg/kg	Milligram/kilogram
Misc.	Miscellaneous
mL	Milliliter
MOSC	Mobile Oil Sludge Coking
mph	Miles per hour
MPRSA	Marine Protection, Research, and Sanctuaries Act
MS	Mass Spectrometry
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
MTBE	Methy Tert-Butyl Ether
MTR	Minimum Technology Requirement
MW	Molecular Weight
NA	North America (or Not Applicable)
NACE	National Association of Corrosion Engineers
NAPL	Non-aqueous Phase Lliquids
NCDC	National Climatic Data Center
NELAP	National Environmental Laboratory Accreditation Program
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFA	No Further Action
NFPA	National Fire Prevention Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Testing
NP	Not Performed
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
NTUS	Nephelometric Turbidity Units
OJT	On-the-Job Training
OPA	Oil Pollution Act
OSHA	Occupations Safety and Health Administration
Pa	Pascals
PAC	Powdered Activated Carbon
PAH	Polynuclear Aromatic Hydrocarbons
P.E.	Professional Engineer
PID	Photo Ionization Detector
PMP	Perimeter Monitoring Program
POC	Point of Compliance
PPB	Parts Per Billion
PPE	Personal Protective Equipment

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

ppm	Parts per million
ppm_v	Parts per million by volume
PQL	Practical Quantitation Limit
PSD	Prevention of Significant Deterioration
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RCRIS	RCRA Information System
Refinery	Lemont, Illinois, Refinery
Renewal Application	RCRA Part B Permit Renewal Application
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RGN	Reactivity Group Number
RO	Remediation Objective
RPD	Relative Percent Difference
SCBA	Self-Contained Breathing Apparatus
SCFPU	Special Coker Feed Preparation Unit
SDWA	Safe Drinking Water Act
SG	Specific Gravity
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasures
SPEGL	Short-Term Public Emergency Guidance Level
SPLP	Synthetic Precipitation Leaching Procedure
SR	State Route
STEL	Short-Term Exposure Limit
SVOC	Semivolatile Organic Compound
SW-846	*Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods* (U.S. EPA, Office of Solid Waste, Third Edition)
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
TACO	Tiered Approach to Corrective Action Objectives
TCLP	Toxicity Characteristic Leaching Procedure
TLV	Threshold Limit Value
TOC	Total Organic Carbon
TOX	Total Organic Halides
TPH	Total Petroleum Hydrocarbons

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

TRPH	Total Recoverable Petroleum Hydrocarbons
TRMA	Three Rivers Manufacturers' Association
TSDF	Treatment, Storage, and Disposal Facility
TU	Temporary Unit
TWA	Time-Weighted Average
UEL	Upper Exposure Limit
ug	Micrograms
ug/kg	Microgram/kilogram
UHC	Underlying Hazardous Constituent
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper Tolerance Limit
UTS	Universal Treatment Standard
UZM	Unsaturated Zone Monitoring
VCA	Voluntary Corrective Action
VHF	Very High Frequency
VOC	Volatile Organic Compound
VP	Vapor Pressure
VSI	Visual Site Inspection
WCSA	Waste Container Storage Area
WWTP	Wastewater Treatment Plant
WWTU	Wastewater Treatment Unit
ZOI	Zone of Incorporation

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius (Centigrade)
%CV	Relative Standard Deviation
°F	Degrees Fahrenheit
1990 Decision Guide	Illinois EPA RCRA Part B Permit Application Decision Guide (December 1990)
2006 Decision Guide	Illinois EPA RCRA Part B Permit Application Decision Guide (July 2006)
2006 Checklist	Illinois EPA RCRA Part B Hazardous Waste Permit Application Completeness and Technical Evaluation Checklist (July 2006)
AAS	Atomic Absorption Spectrometry
AASHO	American Association of State Highway Officials
ACL	Alternate Concentration Level
Act	Illinois Complied Statutes Environmental Safety Environmental Protection Act
AEL	Appropriate Exposure Limit
Agency	U.S./Illinois Environmental Protection Agency
amsl	Above mean sea level
ANPR	Advanced Notice of Proposed Rulemaking
AOC	Area of Concern
API	American Petroleum Institute
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
atm	Atmospheres
bbl	Barrels
bgs	Below ground surface
BTZ	Below Treatment Zone
bpd	Barrels per Day
BTEX	Benzene, Toluene, Ethylbenzene, And Xylene
BIF	Boilers and Industrial Furnace
BOD_5	Five-Day Biological Oxygen Demand
BP	Boiling Point
BTC	Background Threshold Concentration
BTU	British Thermal Units
BTZ	Below Treatment Zone
C	Ceiling
CAA	Clean Air Act
CAAPP	Clean Air Act Permit Program
CAMU	Corrective Action Management Unit
CAS	Chemical Abstracts Service Registry
CBT	computer-based training

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

CCR	Current Conditions Report
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CO	Carbon Monoxide
COC	Contaminants of Concern
COD	Chemical Oxygen Demand
COLIWASA	Composite Liquid Waste Sampler
CSM	Conceptual Site Model
CSSO	Central Security Services Office
CV	Coefficient of Variation
CWA	Clean Water Act
DOT	Department of Transportation
DQL	Data Quality Level
DRO	Diesel-Range Organic
ECD	Electron Capture Detector
EEGL	Emergency Exposure Guidance Limit
EI	Environmental Indicator
E&I	Electrical and Instrument
EPA	Environmental Protection Agency
EQL	Estimated Quantitation Limit
ERPG	Emergency Response Planning Guidelines
ERT	Environmental Response Team
ELUC	Environmental Land Use Controls
FCC	Fluid Catalytic Cracking Unit
FCCU	Fluid Catalytic Cracking Unit
FEMA	Federal Emergency Management Agency
FID	Flame-Ionization Detector
FIRM	Flood Insurance Rate Map
FOIA	Freedom of Information Act
g	Gram
gal.	Gallon
GC	Gas Chromatography
GDU	Gasoline Desulfurization Unit
GPD	Gallons Per Day

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

GPRA	Government Performance and Results Act
GRO	Gasoline-Range Organic
GMZ	Groundwater Management Zone
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBL	Health-Based Level
HDPE	High-Density Polyethylene
HEBCA	Heat Exchanger Bundle Cleaning Area
HEXB	Heat Exchanger Bundle(s)
HF	Hydrofluoric
HF alky	Hydrofluoric alkylation (neutralization basin)
hPa	HectoPascals
HPLC	High-Performance Liquid Chromatography
HSA	Hollow Stem Auger
HSWA	Hazardous and Solid Waste Amendments
HWMF	Hazardous Waste Management Facility
HWMU	Hazardous Waste Management Unit
HSS&E	Health, Safety, Security, and Environmental
IAC	Illinois Administrative Code
IBC	Intermediate Bulk Container
ICPES	Inductively Coupled Plasma Emission Spectrometry
ICP-MS	Inductively Coupled Plasma – Mass Spectrometry
ID	Identification
IDL	Instrument Detection Limit
IDLH	Extremely Dangerous to Life or Health
IDOT	Illinois Department of Transportation
IL ELAP	Illinois Environmental Laboratory Accreditation Program
Ill. Rev. Stat.	Illinois Revised Statute
Illinois EOU	Illinois Emergency Operations Unit
IPCB	Illinois Pollution Control Board
IR	Infrared Spectrometry
kPa	KiloPascals
lb.	Pound
lbs.	Pounds
LCS	Laboratory Control Sample
LDR	Land Disposal Restriction
LEL	Lower Explosive Limit
LIMS	Laboratory Information Management System
LOQ	Limit of Quantitation
LTA	Land Treatment Area
LTF	Land Treatment Facility
LTL	Lower Tolerance Limit

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

MDEA	Monodiethanol amine
MDL	Method Detection Limit
MEA	Monoethanol amine
mg/kg	Milligram/kilogram
Misc.	Miscellaneous
mL	Milliliter
MOSC	Mobile Oil Sludge Coking
mph	Miles per hour
MPRSA	Marine Protection, Research, and Sanctuaries Act
MS	Mass Spectrometry
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
MTBE	Methy Tert-Butyl Ether
MTR	Minimum Technology Requirement
MW	Molecular Weight
NA	North America (or Not Applicable)
NACE	National Association of Corrosion Engineers
NAPL	Non-aqueous Phase Lliquids
NCDC	National Climatic Data Center
NELAP	National Environmental Laboratory Accreditation Program
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFA	No Further Action
NFPA	National Fire Prevention Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Testing
NP	Not Performed
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
NTUS	Nephelometric Turbidity Units
OJT	On-the-Job Training
OPA	Oil Pollution Act
OSHA	Occupations Safety and Health Administration
Pa	Pascals
PAC	Powdered Activated Carbon
PAH	Polynuclear Aromatic Hydrocarbons
P.E.	Professional Engineer
PID	Photo Ionization Detector
PMP	Perimeter Monitoring Program
POC	Point of Compliance
PPB	Parts Per Billion
PPE	Personal Protective Equipment

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

ppm	Parts per million
ppm_v	Parts per million by volume
PQL	Practical Quantitation Limit
PSD	Prevention of Significant Deterioration
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RCRIS	RCRA Information System
Refinery	Lemont, Illinois, Refinery
Renewal Application	RCRA Part B Permit Renewal Application
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RGN	Reactivity Group Number
RO	Remediation Objective
RPD	Relative Percent Difference
SCBA	Self-Contained Breathing Apparatus
SCFPU	Special Coker Feed Preparation Unit
SDWA	Safe Drinking Water Act
SG	Specific Gravity
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasures
SPEGL	Short-Term Public Emergency Guidance Level
SPLP	Synthetic Precipitation Leaching Procedure
SR	State Route
STEL	Short-Term Exposure Limit
SVOC	Semivolatile Organic Compound
SW-846	*Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods* (U.S. EPA, Office of Solid Waste, Third Edition)
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
TACO	Tiered Approach to Corrective Action Objectives
TCLP	Toxicity Characteristic Leaching Procedure
TLV	Threshold Limit Value
TOC	Total Organic Carbon
TOX	Total Organic Halides
TPH	Total Petroleum Hydrocarbons

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

TRPH	Total Recoverable Petroleum Hydrocarbons
TRMA	Three Rivers Manufacturers' Association
TSDF	Treatment, Storage, and Disposal Facility
TU	Temporary Unit
TWA	Time-Weighted Average
UEL	Upper Exposure Limit
ug	Micrograms
ug/kg	Microgram/kilogram
UHC	Underlying Hazardous Constituent
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper Tolerance Limit
UTS	Universal Treatment Standard
UZM	Unsaturated Zone Monitoring
VCA	Voluntary Corrective Action
VHF	Very High Frequency
VOC	Volatile Organic Compound
VP	Vapor Pressure
VSI	Visual Site Inspection
WCSA	Waste Container Storage Area
WWTP	Wastewater Treatment Plant
WWTU	Wastewater Treatment Unit
ZOI	Zone of Incorporation

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Remove pages 17 and 18
and replace with the attached pages 17 and 18.

K.4.2.3 Solid Waste Management Units

A detailed discussion of each of the SWMUs identified and addressed in the original RCRA Part B Permit is included in this section along with a discussion of two SWMUs that have been added since the original permit. The discussion of each SWMU contains the following items:

- A detailed description of each SWMU of concern including details such as construction/operating details, types of waste managed at the unit, etc.;
- A scaled drawing showing the location of the unit within the facility (Figure K-1);
- A summary of the investigation/remediation efforts completed to date; and
- A discussion of any investigation/remediation efforts which must still be carried out to complete corrective action responsibilities for the unit.

A summary of each SWMU is provided in Table K-3. A summary of construction details of site wide groundwater monitoring program wells is provided in Table K-4. Figure K-1 is a scaled drawing showing the location for each of the SWMUs mentioned below. Figure K-2 presents locations of items associated with corrective actions as requested by IEPA.

SWMU 1 – Former Empty Drum Storage Area

SWMU 1 was located near the west gate of the Lemont Refinery west of the First Street and Western Avenue intersection. This SWMU was used as a container storage area located outdoors on an asphalt pad. This SWMU was operational from the 1970s until 1980. The pad and stained soils were removed in 1980. The wastes managed in this unit consisted of lubrication oils, but the quantity of wastes stored on the unit is unknown. It is not known if these wastes were considered hazardous wastes or if they contained potential hazardous constituents. There were no known releases in SWMU 1.

A work plan for the soil investigation at SMWU 1 was submitted to the Illinois EPA on October 13, 2001. On January 30, 2004, the Lemont Refinery submitted a "SWMU 1 Investigation" report to the Illinois EPA which detailed the results of the seven soil samples which were collected on November 19, 2001. The Illinois EPA requested that additional pH samples be collected at SWMU 1. The Lemont Refinery collected the two samples on March 11, 2004, and submitted the results to the Illinois EPA on May 6, 2004. After review of the soil investigation report and the additional pH sample data, a No Further Action (NFA) status for this SWMU was issued on June 1, 2004, by the Illinois EPA.

SWMUs 2A to 2E – Former Process Wastewater Line (Big Inch)

SWMUs 2A to 2E, consist of five sumps located within 100 feet of the I&M Canal along the former Process Wastewater Line (also known as the Big Inch). The former Process Wastewater Line extends from the northernmost process unit within the Lemont Refinery to the SWB. Beginning in 1983, the sumps were installed along the line to recover oil entering the line due to backflow when water levels in the SWB were high. The sumps minimized oil seepage from the line. The locations of the sumps are identified along the wastewater line in Figure K-1.

SWMUs 2B to E are operational units: however, in April 1991, process wastewater was removed from the line and only storm water is currently conveyed in the line.

Oily wastewater had been known to seep from the line during periods when the water level in the SWB was high and prevented the sewer line from flowing properly. The amount of wastewater released is unknown. The oily wastewater released potentially contained petroleum hydrocarbon constituents included in the Skinner List. The Skinner List includes constituents which the USEPA identified as potentially present in petroleum refinery wastes. The sumps were installed in 1983 as an interim action for collecting oil. Sampling began in 1981 to identify the source of the oil but a source was not determined. Additionally, in 1984, eleven locations were excavated along the Big Inch in the area of the seepages to investigate the sewer line, but no obvious defects were discovered. Oil absorbent booms were placed in the I&M Canal to contain any seepages that occurred.

According to the Group Phase I/II RFI Work Plan, the information gathered indicated that the source of contamination at the sumps was likely oil from the former API Separator (SWMU 3) in the North Plant. Since the separator was removed in 1984, a continuing source of constituents is no longer present. A release to soil was unlikely because the release was at or below the water table; therefore groundwater was the primary media of concern.

On March 26, 2004, a RCRA Streamlined Category A SWMU Work Plan was submitted to the Illinois EPA. Category A SWMUs were defined as locations where a release from a SWMU may have the potential of reaching the I&M Canal due to its proximity or that do not have existing hydraulic controls, or where there are currently no institutional controls or engineered barriers. SWMUs 2A to 2E were considered to be Category A SWMUs and were addressed in the March 26, 2004, submittal. The RCRA Streamlined Category A SWMU Work Plan proposed that one soil sample be taken adjacent to each sump, for a total of five soil samples. If a soil sample could not be

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Remove page entitled Tables for Corrective Action and replace with attached Tables for Corrective Action.

TABLES FOR CORRECTIVE ACTION

Tables

K-3 Waste Management Units Present at the Refinery

K-4 Construction Details of Site Wide Groundwater Monitoring Program Wells

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Insert the attached Table K-4 after Table K-3.

TABLE K-4. MONITORING WELL AND PIEZOMETER COMPLETION DATA SUMMARY
LEMONT REFINERY, LEMONT, ILLINOIS (MAY 2010)

Well/ Piezometer	Date Drilled	Grade Elevation (ft-msl)	Stick Up Height (ft)	Measuring Point Elevation (ft-msl)	Total Depth (ft-bgs)	Screened Interval (ft-bgs)	Diameter (inches)
SWMU 3							
GQ-MW-3A	5/18/2006	589.04	2.87	591.91	18.50	8.0 - 18.0	4
GQ-MW-3B	5/22/2006	589.27	2.82	592.09	32.50	21.50 - 31.50	4
SWMU 19B							
GQ-MW-4	5/22/2006	590.25	2.49	592.74	18.00	7.50 - 17.50	4
SWMU 31A							
GQ-MW-5	5/31/2006	595.76	Flush Mounted	595.76	21.00	10.5 - 20.5	4
SWMU 31B-E							
GQ-MW-6	5/19/2006	594.56	2.60	597.16	18.00	7.5 - 17.5	4
GQ-MW-7	5/18/2006	593.44	3.17	596.61	18.00	7.5 - 17.5	4
GQ-MW-10	12/17/2007	592.08	2.14	594.22	21.00	10.0 - 20.0	4
SWMU 43J							
GQ-MW-8	5/24/2006	594.16	2.68	596.84	18.50	7.5 - 17.5	4
GQ-MW-9	5/16/2006	594.86	3.00	597.86	18.00	7.5 - 17.5	4
SWMU 30							
GQ-MW-11	12/17/2007	593.71	2.35	596.06	21.00	9.7 - 19.7	4
GQ-MW-12	12/17/2007	593.94	2.34	596.28	21.00	10.2 - 20.2	4
SITE-WIDE WELLS							
MW-101	5/21/2001	726.10	2.90	729.00	158.00	151 - 156	2
MW-102	5/24/2001	690.70	2.85	693.55	122.00	115 - 120	2
MW-103	5/31/2001	644.80	3.56	648.36	74.00	69.0 - 74.0	2
MW-104	6/4/2001	597.00	2.27	599.27	27.00	22.0 - 27.0	2
MW-105A (N)	6/5/2001	587.90	3.29	591.19	19.00	13 - 18	2
MW-105A (S)	6/5/2001	587.90	3.12	591.02	33.00	28.0 - 33.0	2
MW-106A	6/6/2001	587.20	2.60	589.80	18.00	12.0 - 17.0	2
MW-106B	6/6/2001	587.20	2.71	589.91	33.00	27.0 - 32.0	2
MW-107	6/6/2001	588.10	2.95	591.05	19.00	13.0 - 18.0	2
MW-108A	6/7/2001	589.00	2.69	591.69	20.00	14.0 - 19.0	2
MW-108B	6/7/2001	589.00	2.58	591.58	35.00	29.0 - 34.0	2
MW-109A	6/7/2001	587.90	2.93	590.83	19.00	13.0 - 18.0	2
MW-109B	6/7/2001	587.90	2.94	590.84	33.00	28.0 - 33.0	2
MW-110	6/11/2001	592.60	2.66	595.26	24.00	18.0 - 23.0	2
MW-111	9/22/2004	NA	NA	594.08	15.00	10 - 15	2
MW-112	9/8/2004	NA	NA	590.24	18.50	7.5 - 17.5	2
MW-113	10/5/2004	NA	NA	589.15	16.00	6 - 11	2
MW-114	9/8/2004	NA	NA	600.68	15.00	10 - 15	2
MW-115R	5/3/2006	592.30	2.29	594.59	19.40	7.5 - 17.5	4
MW-116	10/5/2004	NA	NA	607.33	16.00	10 - 15	2
MW-117	9/21/2004	NA	NA	598.44	14.50	9 - 14	2
MW-118	9/30/2004	NA	NA	737.03	151.00	140 - 145	2
MW-119	12/17/2007	613.72	1.86	615.58	21.00	10.0 - 20.0	4
MW-120	12/17/2007	676.26	2.49	678.75	68.00	57.0 - 67.0	4
MW-121	12/17/2007	724.87	2.29	727.16	111.00	100.0 - 110.0	4
MW-122	12/17/2007	595.64	2.14	597.78	21.00	10.0 - 20.0	4
SITE WIDE PIEZOMETERS							
PZ-1A	5/20/1993	593.87	Flush Mounted	293.52	20.00	18.0 - 20.0	2
PZ-2A	5/21/1993	593.17	Flush Mounted	592.81	20.00	18.0 - 20.0	2
PZ-3	5/26/1993	595.33	Flush Mounted	594.81	20.00	18.0 - 20.0	2
PZ-3A	5/21/1993	593.62	Flush Mounted	593.29	21.00	19.0 - 21.0	2
PZ-10	5/23/2006	585.19	2.91	588.10	16.00	5.5 - 15.5	2
PZ-11	5/24/2006	589.49	Flush Mounted	589.49	24.00	13.5 - 23.5	2
PZ-13	5/30/2006	592.62	Flush Mounted	592.62	21.00	10.5 - 20.5	2
PZ-15	5/25/2006	591.23	Flush Mounted	591.23	18.00	7.5 - 17.5	2
PZ-16	5/23/2006	588.69	2.72	591.41	22.50	11.5 - 21.5	2
PZ-17	12/17/2007	592.47	2.40	594.87	21.00	10.0 - 20.0	2
GROUNDWATER RECOVERY WELLS							
GRW-1	5/10/2006	588.07	2.64	590.71	24.40	13.9 - 23.9	5
GRW-2	5/22/2006	589.52	3.11	592.63	18.00	7.5 - 17.5	5
GQ-MW-2A**	5/22/2006	589.10	2.64	591.74	18.00	7.5 - 17.5	4

ft-msl Feet above mean sea level
ft-bgs Feet below ground surface
* No well construction log available
** Well GQ-MW-2A is functioning as a monitoring well and is also subject to a groundwater recovery system pilot study

TABLE K-4. MONITORING WELL AND PIEZOMETER COMPLETION DATA SUMMARY
LEMONT REFINERY, LEMONT, ILLINOIS (MAY 2010)

Well/ Piezometer	Date Drilled	Grade Elevation (ft-msl)	Stick Up Height (ft)	Measuring Point Elevation (ft-msl)	Total Depth (ft-bgs)	Screened Interval (ft-bgs)	Diameter (inches)
LAND TREATMENT FACILITY (LTF):							
PIEZOMETERS							
B-01	10/31/1987	NA	2.50	695.20	108.30	102 - 107	2
B-02	10/28/1987	NA	2.50	697.06	110.00	101 - 106	2
B-03	10/23/1987	NA	2.50	712.07	121.20	116 - 121	2
B-04	11/4/1987	NA	2.50	683.34	97.50	90 - 95	2
B-05	12/21/1987	NA	2.40	688.49	101.00	95 - 100	2
B-06	12/1/1987	NA	2.50	700.46	110.00	104 - 109	2
B-07	12/5/1987	NA	2.50	705.12	114.00	108 - 113	2
B-08	12/12/1987	NA	2.40	707.45	114.00	108 - 113	2
B-09	12/17/1987	NA	2.50	693.17	107.00	99 - 104	2
B-10	1/12/1988	NA	2.40	713.46	123.50	117 - 122	2
B-11	11/23/1987	NA	2.50	721.09	128.00	122 - 127	2
B-12	10/27/1987	NA	2.50	723.29	132.50	126 - 131	2
B-13	11/16/1987	NA	2.50	718.26	125.50	119 - 124	2
B-14	10/14/1987	NA	2.50	686.08	96.50	91 - 96	2
B-15	10/22/1987	NA	2.50	721.13	132.60	127 - 132	2
B-16	11/2/1987	NA	2.50	719.63	122.30	116 - 121	2
B-17	10/16/1987	NA	2.50	727.02	130.00	123 - 128	2
B-18R	12/17/2007	707.23	2.57	709.80	121.00	110.0 - 120.0	2
MONITORING WELLS							
UA-1	11/22/1988	715.30	2.50	718.80	104.40	92.1 - 102.1	2
UA-2	1/6/1989	689.70	2.50	692.24	82.00	70.0 - 80.0	2
UA-3	12/23/1988	694.90	2.80	697.73	86.60	74.7 - 84.7	2
UA-4	12/19/1988	693.10	2.90	695.98	84.00	72.1 - 82.1	2
UA-5	12/5/1988	691.90	2.90	694.84	95.50	72.1 - 87.1	2
UA-6	12/14/1988	698.30	3.50	701.76	91.00	79.0 - 89.0	2
GROUNDWATER MANAGEMENT ZONE (GMZ) AND STORM WATER BASIN (SWB):							
MONITORING WELLS							
GMZ-1	7/27/1994	589.79	3.40	593.25	21.10	6 - 16	2
GMZ-2	7/25/1994	595.29	2.80	598.16	18.33	4.5 - 14.5	2
GMZ-3	7/28/1994	594.10	2.70	596.81	17.31	7.0 - 17.0	2
GMZ-4	7/29/1994	593.98	2.10	596.08	18.90	5.5 - 15.5	2
GMZ-5	7/26/1994	591.16	2.00	593.19	14.50	4.0 - 14.0	2
GMZ-6*	7/26/1994	590.72	1.95	592.67	14.70	4.0 - 14.0	2
SWB-1	12/4/1990	590.42	2.01	592.43	24.20	14 - 24	2
SWB-2	12/5/1990	586.87	2.03	588.90	28.00	15 - 25	2
SWB-3	12/7/1990	586.55	1.98	588.53	19.60	8.5 - 18.5	2
SWB-4	12/6/1990	587.86	1.87	589.73	49.70	44.5 - 49.5	2
SWB-5	12/6/1990	587.83	2.14	589.97	18.00	8 - 18	2
SWB-6*	9/8/1992	NA	NA	589.28	NA	16 - 26	2
SWB-7*	9/1/1992	NA	NA	589.14	NA	17 - 27	2
SWB-8*	1/29/1993	NA	NA	588.95	NA	10 - 20	2
PIEZOMETERS							
P-01*	5/7/1991	NA	NA	598.35	NA	30 - 40	1
P-02*	5/15/1991	NA	NA	593.36	NA	13 - 23	1
P-03*	5/21/1991	NA	NA	593.23	NA	14 - 24	1
P-04*	5/23/1991	NA	NA	592.96	NA	14 - 24	1
P-05*	5/22/1991	NA	NA	593.10	NA	47 - 54	1
P-06*	5/24/1991	NA	NA	594.18	NA	10 - 20	1
P-07A*	8/26/1992	NA	NA	592.68	NA	12 - 22	1
P-08*	5/9/1991	NA	NA	592.68	NA	15 - 25	1
P-09*	5/13/1991	NA	NA	589.95	NA	11 - 21	1
P-10*	5/14/1991	NA	NA	588.98	NA	14 - 24	1
P-11*	5/13/1991	NA	NA	592.72	NA	15 - 25	1
P-12*	5/9/1991	NA	NA	591.01	NA	20 - 30	1
P-13*	5/8/1991	NA	NA	590.82	NA	45 - 50	1
P-14*	7/28/1991	590.88	2.33	593.21	NA	12.0 - 22.0	1
P-15*	7/27/1994	587.43	2.00	589.43	NA	10.0 - 20.0	1
CORRECTIVE ACTION PROGRAM WELLS:							
SWMU 2A-E							
GQ-MW-1A	5/12/2006	589.33	2.94	592.27	18.00	7.5 - 17.5	4
GQ-MW-1B	5/17/2006	589.38	2.83	592.21	32.00	21.5 - 31.5	4
GQ-MW-2A**	5/22/2006	589.10	2.64	591.74	18.00	7.5 - 17.5	4
GQ-MW-2B	5/22/2006	588.99	2.66	591.65	32.00	21.0 - 31.0	4

RENEWAL PART B PERMIT APPLICATION
VOLUME 3, SECTION K, FIGURES

Remove page entitled Figures for Corrective Action and replace with attached Figures for Corrective Action.

FIGURES FOR CORRECTIVE ACTION

Figure

K-1 Solid Waste Management Unit Location Map
K-2 Locations of Items Associated with Corrective Action

RENEWAL PART B PERMIT APPLICATION
VOLUME 3, SECTION K, FIGURES

Add attached Figure K-2 after Figure K-1.

LEGEND:

- GAUGING STATIONS
- MONITORING WELL LOCATIONS
- GROUNDWATER RECOVERY WELLS
- SKIMMER PUMP WELLS
- SUMP LOCATIONS
- PIEZOMETER LOCATIONS
- GMZ BOUNDARY
- FRENCH DRAIN SYSTEM (SWMUs 7 AND 34)
- SWMU BOUNDARY

0 800 1600

APPROXIMATE SCALE IN FEET

NOTE:

THE CAD MAP IS NOT GEORECTIFIED AND THEREFORE THERE MAY BE SLIGHT DISCREPANCES BETWEEN THE FEATURES AND THE AERIAL BACKGROUND.

CAD DRAWING FROM URS 2004.

AERIAL BACKGROUND FROM IDNR, LEMONT, IL 2006

Stantec
446 EISENHOWER LANE NORTH
LOMBARD, ILLINOIS 60148
PHONE: (630)792-1680 FAX: (630)792-1691

FOR:			FIGURE:
LEMONT REFINERY LEMONT, ILLINOIS		**Locations of Items Associated with Corrective Action**	**K-2**
JOB NUMBER: 182601130	DRAWN BY: JC	CHECKED BY: AS / APPROVED BY: KTW	DATE: 5/25/10

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JUN 14 2010
IEPA-BOL
PERMIT SECTION

B-162

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Z 453 215 180

cc: Maywood
USEPA

OE 121-97

JHK
WBW

US. EPA ID#: ILD 041 550 567

CITGO Petroleum Corporation

135th Street & New Avenue
Lemont, IL 60439-3659

September 12, 1997

Mr. Ed Bakowski
Manager, Permit Section
Illinois Environmental Protection Agency
Division Of Land Pollution Control #24
1021 N. Grand Avenue East
P. O. Box 19276
Springfield, IL 62794-9276

RECEIVED
SEP 16 1997
PERMIT SECTION

Reference: Letter, Hamper to Bakowski, Dated December 31, 1996.
Resource Conservation and Recovery Act (RCRA) Permit Application Issue

Mr. Bakowski:

Pursuant to a telephone conservation between Jerry Kuhn and Rob Watson of the Illinois EPA, and Kevin Moss of my staff, it was decided that the trend analysis data provided in the referenced letter (comment E-6c, page 5) will not be incorporated into the RCRA Part B permit application. As discussed with your staff, the reasons for this decision are: 1) The trend analysis was performed by a consultant for a previous facility owner (Unocal), neither of which are currently involved at the facility or with the permit; and 2) The final RCRA permit will require a complete reevaluation of the interim status statistics.

If there are questions or concerns, please contract Kevin Moss at (630) 257-4452 or me at (630) 257-4450.

Sincerely,

C W Harmon

C.W. Harmon
Manager, Environmental

KJM:PLM

B-162

cc: Maynard
U.S. EPA

JHK
WKW

Unocal Corporation
Diversified Businesses
2300 Barrington Road, Suite 500
Hoffman Estates, Illinois 60195
Telephone (847) 310-6806
Facsimile (847) 310-6890

UNOCAL 76

February 13, 1997

Thomas I. Hall
Senior Geologist
Environmental Remediation Services

Mr. Rob Watson
Illinois Environmental Protection Agency
Permit Section
Bureau of Land
2200 Churchill Road, P.O. Box 19276
Springfield, IL 62794-9276

Certified Mail
Return Receipt Requested

Re: 1978030004 -- WILL COUNTY
UNO-VEN REFINERY
ILD041550567
RCRA Permit Log No. C-417-M-4
RCRA CLOSURE FILE

Dear Mr. Watson:

Pursuant to our telephone conversation of February 4, 1997, I writing you to concerning the December 31, 1996 submittal of technical information to your office. The communication and accompanying data was sent on Unocal's behalf by our consultant, Geraghty & Miller. To clarify, this information should be considered comments to the draft RCRA Part B permit. If you should have any questions, please call me at (847) 310-6806 if you should have any questions.

Sincerely yours,

Thomas I. Hall
Senior Geologist

ilfy3a06doc

cc: J. H. Garretson
file

FEB 24 1997
PERMIT SECTION

B-162

Todd G.

GERAGHTY
& MILLER, INC.
Environmental Services

August 30, 1996

Edwin C. Bakowski, P.E.
Manager, Permit Section
Illinois Environmental Protection Agency
Bureau of Land ---- #33
Permit Section
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

1978030004 -- Will County
The UNO-VEN Company
Chicago Refinery
RCRA Permit Log No 162
ILD041550567

RECEIVED
AUG 30 1996
IEPA
PERMIT SECTION

Dear Mr. Bakowski:

Enclosed please find four copies of responses to the first technical review comments issued by the Illinois Environmental Protection Agency (IEPA) on August 2, 1996 to The UNO-VEN Company (UNO-VEN). Geraghty & Miller, Inc. (Geraghty & Miller) is submitting these responses on behalf of the Unocal Corporation (Unocal) and UNO-VEN. As requested, this letter cross-references each technical review comment, indicating the location of the response to each comment. Each page that has changed is marked with a revision number and date for tracking purposes. Please note that a replacement table which indicates the pages to be removed from the previously submitted permit application and replaced by the enclosed pages will be submitted under separate cover by September 4, 1996.

SECTION C: Waste Characteristics

C-2 Waste analysis Plan

1. The application currently does not include an unsaturated zone monitoring plan. Therefore, the WAP requirements as they apply to soil sampling have not been adequately addressed.

35 East Wacker Drive, Suite 1000 • Chicago, Illinois 60601 • (312) 263-6703 • FAX (312) 263-7897

Response
An unsaturated zone monitoring plan has been prepared for inclusion in the permit application as Appendix B of the Post-Closure Plan (Appendix I-2).

SECTION D: Process Information

D-7 Land Treatment

D-7b: Land Treatment Program

1. The application needs to provide a more detailed description of the program that was used at the land treatment area. The following must be included in this section of the application:

   a) Provide a list of hazardous constituents (identified in 35 IAC 721, Appendix H) for all of the wastes that were managed in the land treatment area.

   b) Describe the operating procedures used to assure uniform and complete degradation, transformation and immobilization.

   c) Submit information establishing the constituents in the wastes which limited the amount of waste applied at one time, the rate at which reapplication was conducted, and the total capacity of each unit. Identify the rate and frequency of waste application and the concentration of the limiting constituents in the waste.

   d) Describe the methods utilized to apply and incorporate wastes to the treatment zone.

   e) Identify acceptable limits of soil pH and describe the rationale for those limits. Describe how soil pH was measured and adjusted.

   f) Describe the measures used to enhance treatment, including the method and frequency of such measures (e.g., fertilization, microbial inoculations, soil aeration).

   g) Identify the limits on soil moisture content. Describe how soil moisture was monitored and adjusted, if necessary.

[Note: Some of the wording from Section D-7e may serve as a partial response to some of these requirements. However, the wording in Section D-7e, as it currently exists, is not adequate to meet the above requirements]

Response
Section D-7b of the permit application has been revised to provide additional information.

D-7c: Unsaturated Zone Monitoring Program

1. The application does not include a soil core monitoring program for the land treatment area. The application must include the following information:

   a) A description of the program for monitoring soil cores to detect the migration of hazardous constituents below the treatment zone.

   b) Identify sampling locations, if known, and provide the rationale used to select locations. Demonstrate that the sampling locations provide the capability to detect migration of hazardous constituents out of the treatment zone. Indicate that soil cores will be collected from immediately below the treatment zone.

   c) Provide a schedule for sampling soils. Demonstrate that the proposed frequency is adequate, considering potential migration rates of hazardous constituents out of the treatment zone.

   d) Identify and describe equipment used to sample soil cores.

   e) Describe soil core sampling procedures including methods for sample preparation, preservation and transport. The Agency's procedures for collecting VOC samples must be used as part of these procedures.

   f) Identify the analytical methods used to determine the concentration of hazardous constituents in soil core samples.

   g) Provide a description of methods to be utilized to assure sample integrity throughout sampling, transportation, analysis and reporting.

   h) Describe the sampling and analytical program used to establish background soil core concentrations of hazardous constituents. Identify sampling locations and depths, verifying that the area used is representative of the active site soil conditions. Specify the frequency of background sampling. Indicate that background values will be expressed in a form that will permit their comparison with on-site values. Provide background data, if available.

I) Describe the statistical methods and sample calculations that will be used to determine if significant differences exist between background and treatment zone concentrations of hazardous constituents in soil core samples.

j) Provide a suggested list of 35 IAC Part 721 Appendix H hazardous constituents for which the soil core samples will be monitored. Demonstrate the that selected principal hazardous constituents are more difficult to treat than all other Appendix H constituents present in the waste.

Response
An unsaturated zone monitoring plan has been prepared for inclusion as Appendix B of the Post-Closure Plan (Appendix I-2 of the permit application).

D-7d: Treatment Zone Description

1. The application needs to provide a more detailed description of the treatment zone. The following information must also be provided in the description of the treatment zone:

   a) Indicate if the maximum depth of the treatment zone is more than 1 meter (3 feet) above seasonal high water table of the perched aquifer.

   b) Provide (or reference) a map or plot plan delineating the horizontal and vertical boundaries of the treatment zone. Identify all soil series occurring within the treatment zone on the map or plot plan.

   c) Submit a description of each soil series identified within the treatment zone, including:

      - Profile description with horizonation;
      - Depth;
      - Color;
      - USDA Textural Classification;
      - Structure;
      - Thickness;
      - Slope;
      - Mineralogy;
      - Use and vegetation;
      - Atterberg limits;
      - Water capacity;
      - Shrink-swell potential;
      - Erosion factors; and

- Salinity.

d) Provide the results of soil analyses for each treatment zone soil series.

e) Identify the depth to the seasonal high water table in the perched aquifer and the source of that data.

Response
Section D-7d has been revised to provide additional information.

2. It is not acceptable to just reference the author and year of a study (e.g. Geraghty & Miller, 1995). The referenced information must be part of the application.

Response
The reference cited is Appendix B of the Closure Plan (Appendix I-1 of the permit application).

D-7e: Unit Design, Construction, Operation, Maintenance

1) The closure requirements for landfarms reference the design and operating requirements. Therefore, this Section should address the requirements in this part of the Decision Guide & Checklist. The following information must also be provided in this Section of the application:

a) Submit a scale drawing of the unit showing any run-on controls utilized. Demonstrate the those controls will prevent flow onto the treatment zone from at least a 24 hour, 25-year storm.

b) Describe the run-off collection and control system and demonstrate that it is capable of managing the peak flow resulting from a 24-hour, 25-year storm.

c) Identify specific measures that will minimize the concentration of hazardous constituents in run-off from the unit.

d) Demonstrate that collection and holding facilities associated with run-on and run-off control systems will be managed after storms to maintain the minimum required design capacity of the system. Describe the fate of collected surface water and provide the sampling and analysis protocols for determining contaminant levels.

e) Describe the methods employed to control wind dispersal of particulate matter from the treatment zone.

Response
Much of the information requested is provided in Section 3 of the Closure Plan. However, the information is now repeated in Section D-7e.

SECTION F: Procedures to Prevent Hazards

F-2 Inspection Schedule

1. Construction of the soil cover is not scheduled to begin until 60 days after the effective date of the permit. The inspection schedule must be revised to address the inspection requirements for the landfarm starting from the effective date of this permit until the cover is constructed. The items to be inspected and the frequency of the inspection will necessarily change during that time.

   a) Until the cover is constructed, it is important that the wastes on the landfarm stay on the landfarm. During this phase, the area must be inspected to insure that the wastes are not subject to wind dispersal and erosion. Run-off must be prevented from reaching the intermittent stream.

   b) During construction of the cover, the area will be subject to a greater risk of erosion. During this second phase, additional erosion controls will need to be used. Run-off must be prevented from reaching the intermittent stream.

   c) Once the cover is in place, it will be important to insure that the vegetation is properly established. During this last phase, inspection of erosion control devices is still very important as is the development of the vegetation.

Response
A closure period inspection form is presented in Appendix I-2 which is designed for use during the pre-construction, construction, and post-construction phases of the closure period. The inspection form contains items pertinent to each phase of the closure period as conditions on the LTF will necessarily change during the closure period.

2. The cover should be inspected for signs of burrowing animals.

Response
Text has been added to both the closure and post-closure inspection forms (Appendix I-2) to inspect for the presence of burrowing animals.

3. The inspection plan must indicate how the inspection will be performed. It is not acceptable to perform the inspection from the inside of a vehicle. At a minimum, the inspector must walk the perimeter of each area and the length of the intermittent stream.

Response
Instructions have been added to accompany the inspection forms which details the inspection techniques that the inspector is to employ. See Appendix I-2.

F-2a(2): Frequency of Inspection

1. Until the cover is in place and the vegetation firmly established, the wastes on the landfarm are more susceptible to erosion by wind and water. Therefore, frequency of inspection during this period must be weekly and during or immediately after every precipitation event that yields 1 or more inches in a 24-hour period.

Response
The inspection frequency has been increased during the construction and post-construction phases of the closure period and modified text is presented in Appendix I-2, Post-Closure Plan. However, UNO-VEN disagrees with the notion of inspecting after certain rainfall events because it is excessive and impractical. It is excessive because there will be UNO-VEN representatives on site daily during construction of the cover system. Once the cover system is in place, even if unvegetated, the waste will be adequately protected by the soil cover such that the normal inspection interval will provide ample time to address any erosion problems. Inspecting after a given rainfall event is also impractical. Who will collect the precipitation data and at what location? How will the data be transferred in a timely manner to UNO-VEN?

2. A quarterly inspection of the cover system is not adequate to detect erosional problems before they become serious. In addition, the cover system must be inspected after significant precipitation events because they can damage the integrity of the cap in a short period of time. During closure and post-closure, the cover system must be inspected monthly and during or immediately after every precipitation event that yield 4 or more inches in a 24 hour period (e.g. a 24 hour, 10 year storm).

Response
UNO-VEN does not agree that more frequent inspections are necessary during the post-closure period or with the notion of inspecting after a given rainfall event. A quarterly inspection frequency during the post-closure period is adequate given the nature of the waste (waste constituents in relatively low concentrations and with relatively low toxicity for any realistic exposure scenario ie. industrial land use or construction worker) and the

presence of the protective cover system with established vegetation. Performing inspections after a given rainfall event is not practical as discussed in the response to F-2a(2).

F-2b(8): Land Treatment Facility Inspection

1. Page F-6 states that Section F-2a presents the inspection program to be conducted after completion of final closure of the LTF. The program is not adequate because all of the closure and post-closure requirements are not included. 35 IAC 724.380 requires the owner/operator to maintain a run-on control system, a run-off control system, and continue unsaturated zone monitoring. Therefore, the inspection plan must be revised to include the run-on and run-off control systems and any items associated with unsaturated zone monitoring (e.g. benchmarks, sample points, etc.). Both the narrative and inspection form should also be revised to reflect these changes.

Response
The inspection form and narrative in the Post-Closure Plan have been revised to include these additional items.

SECTION G: Contingency Plan

1. Section G-1b should be revised to reflect that sludge was only placed on Area I. UNO-VEN should check the rest of the application to insure that other portions are also current.

Response

The referenced text has been revised to reflect the actual amount and location of Storm-water Basin sediment in temporary storage.

2. Section G-1c: Page G-4 draws the conclusion that even if the LTF cover systems fails, it is unlikely that hazardous constituents would migrate into subsurface soils and groundwater. This statement should be omitted or revised since hazardous constituents have already migrated into the soils under the treatment zone as well as the soils around the perimeter of several of the areas.

Response

The text has been modified slightly for clarification. However, the essence of the original statement is reasonable given that there has been no active landfarming since 1989, a

reduction of infiltration is anticipated after construction of the protective cover system, and the impermeable nature of the underlying glacial till.

3. Section G-2: Page G-5 should indicate that during business hours, the FIC, the lead UNO-VEN Refinery Emergency Response representative at an emergency scene (e.g. the Emergency Coordinator), is the Fire Chief (page G-27).

Response
The referenced text has been revised.

4. Section G-3: This section should read that the Contingency Plan will be implemented if there is a failure of the cover system, or an actual or imminent release of hazardous waste or hazardous constituents from the land treatment facility.

Response
The referenced text has been revised.

5. Section G-4: All of the emergency response procedures provided are very general in nature. These sections of the application must also identify procedures that are specific to the land treatment facility.

   a. G-4b, Identification of Hazardous Waste: Is this information already known? What criteria will be considered?

   b) G-4c, Assessment: If wastes or contaminated soils enter the intermittent stream, off-site locations would be affected because the stream runs off-site. The plan should also identify the RQs for the compounds and wastes in the land treatment facility.

   c) G-4d, Control Procedures: The term "appropriate actions" is not an adequate term for describing control procedures. This section should include specific procedures that will be followed and identify when are these steps taken (during the storm, or after it). If the cap fails but wastes have not reached the intermittent stream the application must describe how will the released wastes will be contained. If wastes have already entered the stream, the application must describe not only how the wastes will be contained, but also how the contaminated surface waters and sediments will be addressed.

d) G-4f, Storage and Treatment of Released Materials: Hazardous waste collected after a release that is not immediately placed back into the landfarm should be placed in a tank or container. Hazardous waste placed on the ground will be subject to the RCRA regulations for waste piles.

Response

a) Additional text has been added to the referenced section (G-4b) to describe procedures to identify the source, amount and areal extent of any material released in the emergency.

b) The RCRA Part B Decision Guide does require the requested information be provided in the permit application.

c) Section G-4d text has been revised to include the specific control procedures requested.

d) Minor changes to the text in Section G-4f were made to clarify proper storage of released material that has been recovered.

6. G-5, Emergency Equipment: This section identifies the equipment available for an oil spill not a release from the landfarm. The application needs to identify the emergency equipment (and its location) that is used to perform the duties identified in Section G-4d. At a minimum it must include:

   a) devices to control erosion such as straw bales, silt fences, rip rap, etc.,

   b) materials used to repair the cover, such as extra cover material,

   c) heavy equipment used for earth work (Can it perform as intended on the side slopes of the landfarm during a significant storm event?),

   d) devices used in the stream to address contaminated water and sediments.

Response

UNO-VEN intends to use contractors for emergency response equipment and outside suppliers for the type of material discussed above. Current Pages G-54 through G-60 of the permit application already identify the sources of the materials, supplies and services to address items a) through d) above.

7. Will the response to an incident at the landfarm be pre-empted by a simultaneous incident at the refinery that requires use of same equipment?

Response
This will not be a problem since UNO-VEN intends to use contractors and outside suppliers for emergency response resources.

SECTION H: Personnel Training

1. H-1a, Job Title/Description: Mr. Harmon indicated that UNO-VEN was going to hire a person to handle Corrective Action issues at the facility. This job description should be added to Appendix H-1.

Response
The requested job description has been added to Appendix H-1.

2. H-1c, Training Director: The application does not demonstrate that the program is directed by a person trained in hazardous waste management.

Response
Additional details concerning the Training Director's qualifications have been added to the text of Section H-1c.

3. Relevance of Training to Job Positions: The application does not demonstrate that facility personnel are instructed in hazardous waste management procedures relevant to their positions.

Response
Hasardous waste management has been added as a topic of Additional Training in Section H-1b(2).

4. H-1e, Training for Emergency Response: The application does not demonstrate that facility personnel are able to respond to emergencies and are familiar with emergency procedures. Specifically, it does not indicate that they are trained to respond to an incident involving failure of the cover system and a release of hazardous waste or hazardous constituents to the soil or the intermittent stream.

Response
Text in Section H-1e has been modified to indicate that facility personnel assigned to the LTF will be trained in emergency response involving failure of the cover system and release of hazardous waste or hazardous constituents.

SECTION I: Closure

1. Section 2.1.3, Treatment Zone Description: The description of the treatment zone must include the elevation of the seasonal high water elevation in the perched aquifer under the land treatment facility. It must identify the distance between the lowest portion of the treatment zone and the seasonal high water elevation in the perched aquifer.

Response
This information is presented in the revised Section D of the permit application included with this submittal.

2. Section 2.2, Maximum Inventory: The narrative and tables must describe how the summaries of data were compiled. Are these average concentrations, maximum concentrations, results from composite samples, etc.? The annual volume of wastes applied must also be identified in the tables.

Response
The tables contain notes indicating the sources of the information presented. It is also apparent from the information presented in the Tables 2-3 through 2-5 that the chemical results are of single samples collected on the specific dates noted on the tables. There is no information available as to the type of sample, grab or composite. Copies of the laboratory reports for the data presented in Tables 2-3 through 2-5 are presented in Appendix C-1 of the permit application. The annual weight of waste applied is listed by waste type in Table 2-1.

3. Section 2.2, Maximum Inventory: The application should be revised to identify the actual amount (weight and volume) of sludge placed on the landfarm, and that it was only placed on Area I.

Response
Text in Section 2.2 has been revised to reflect the actual amount of sludge in temporary storage.

4. Section 2.3.7, page 2-14: All areas around the perimeters of the land treatment areas that have been impacted by hazardous constituents must be covered by the proposed LTF cover system.

Response
Revised text in Section 3.1.3 of the Closure Plan indicates that the cover system will extend over the perimeter soil sample locations with elevated metals concentrations. Drawings 8 and 9 also reflect this change.

5. Section 2.4, Rational for Selection of Closure Alternative: This section must indicate how all of the objectives and factors at 35 IAC 725.380(a) & (b) are addressed in selecting the alternative.

Response
The regulation cited does not apply to this closure plan for a permitted facility. The closure plan already provides sufficient rationale and justification for the method of closure.

6. Section 2.8, Expected Year of Closure: This sections states that UNO-VEN plans to initiate closure in the Spring of 1996. This wording should be updated.

Response
Text in the referenced section has been revised to indicate that UNO-VEN plans to initiate closure in the Spring of 1997.

7. Section 2.9, Schedule for Closure: This section, and Figure 4-1 need to include greater detail regarding the activities that will be involved in the preparation and closure of the site.

Response
A revised Figure 4-1 is included with this submittal.

8. The closure plan (and the schedule) need to indicate that a round of unsaturated zone soil samples will be collected prior to placement of the cover system.

Response
The unsaturated zone monitoring plan is included as Appendix B of the Post-Closure Plan, Appendix I-2 of the permit application. The unsaturated zone monitoring plan specifies that at least one monitoring event will be performed before the cover system is constructed. This is also reflected in the revised Closure Plan Figure 4-1.

9. The closure plan (and the schedule) need to indicate that the four treatment areas will be surveyed both before and after the cover system is installed.

Response
The CQA Plan (Appendix D of the Closure Plan) specifies that surveying will be performed at various stages of construction. The before and after surveys have been included on the schedule.

10. Section 2.10, Hazardous Waste/Constituents: This section must be revised to include VOCs and SVOCs. These compounds also exist in the landfarm and will be encountered during closure.

Response
Text in Section 2.10 has been revised as requested.

11. Section 3.1.2, Stormwater Basin Material: The closure plan and drawings must be revised to account for the amount of this material that was actually placed on the landfarm. The application must also give the volume of this material on the landfarm.

Response
The text in Section 3.1.2 correctly states that approximately 8,570 dry tons of storm-water basin sediments will be placed in Areas I and II before construction of the cover system. The material is already being temporarily stored in Area I and approximately 3,400 cubic yards of it will be transferred to Area II during closure for use as subbase fill.

12. The closure plan does not meet the requirements of 35 IAC 725.380 because it does not include an unsaturated zone monitoring program.

Response
An unsaturated zone monitoring plan has been prepared for inclusion as Appendix B of the Post-Closure Plan.

Final Closure Design

13. Section 3.1.3 Cover System Design: This section should state that the cover system will cover all areas, including those outside the perimeters of the land treatment areas, that have been impacted by hazardous constituents.

Response
The requested statement regarding the incorporation of impacted areas beneath the cover system has been included in revised text.

14. Section 3.1.3.1, Cover System Configuration: The description is not adequate because it does not include the following **in-place specifications** for the protective cover layer:

    - maximum permeability,
    - minimum density
    - minimum moisture content (percentage above optimum),
    - maximum thickness of each lift, and
    - maximum clod size. {Soil with only 12% passing the #200 sieve may not be able to achieve the desired permeability. The specification should call for 35% or more passing #200 sieve.}

Response
The specifications have been clarified in the text; those requested but not previously provided have been incorporated. The text has been revised accordingly.

15. Section 3.1.3.3, Cover System Integrity: This section states that the "vegetation will be limited to shallow-rooted grasses with root systems significantly less than 30 inches deep". However, the previous section indicates that the vegetation mix includes several native prairie grasses. The roots of some tall grasses can extend downward 12 to 20 feet.

Response
Clay subsoils will limit root penetration depth for prairie grasses to approximetly 30 inches into the native soil pursuant to discussions with the Will County Soil Conservation Service and soil survey information presented in the revised Section D. The specified seed mix will be satisfactory.

16. Section 3.1.3.3, page 3-5 discusses settlement of the wastes. If settlement is a concern, the subbase should be compacted prior to placement of the protective cover layer.

Response
Settlement is not a significant concern; the discussion has been clarified to more accurately reflect the settlement issue and affects on the cover system. The text has been revised accordingly.

17. Details B and D on Drawing 11 appear to indicate that the (rerouted) intermittent stream flows over landfarm areas. The details should be revised to indicate the

boundaries of the landfarm areas. It is not acceptable to direct the intermittent stream (including diversion channels and lined waterways) over the landfarm areas.

Response
Details B and D on Drawing No. 11 have been revised to indicate the relative location of the landfarm plots with respect to the intermittent stream. In no case does the intermittent stream encroach upon the landfarm plots. The text has been revised accordingly.

18. Section 3.1.5, Stormwater Management: The diversion channels and rerouted sections of the intermittent stream should be designed to have at least 1.0 feet of freeboard during a peak flow event.

Response
The stormwater calculations were revised to include one-foot of freeboard (see Appendix C). The text has been revised accordingly.

19. Section 3.1.5.2, Run-On Control: The drainage area (LTA + 3.5 acres) is not shown on the topographic maps. The application references Figure B-2 for this information, but it is not shown on B-2. The copies of maps in Attachment C are not legible. The drainage area should be shown on a map like Drawing #1.

Response
The drainage areas have been outlined on a new drawing, Drawing No. 1A. Clearer copies of the drainage areas have also been included with the calculations in Appendix C.

20. Section 3.1.5.3, Run-Off Control: The following aspects of the run-off calculations need to be addressed:

    a) The pages in Appendix C regarding the calculation of the Run Off Curve Number indicate the facility is in Pike County instead of Will County. Does this change any of the assumptions or inputs to the model?

    b) Page I-43 states that the channel was assumed to have a grass and weedy base. The calculations in Appendix C (page I-1043) assumed a roughness factor for a weedy stream in good condition to be 0.06. Table 21-11 in Merritt's Standard Handbook for Civil Engineers (3rd Edition), gives a minimum value of 0.05 and an average value of 0.08 for unlined channels with dense weeds, high as the flow depth. The average value for a channel with short grass, few weeds is 0.027. The portion of the stream that we viewed during our April 23, 1996 site visit (near piezometer B-7) appeared

to have little vegetation growing in it. Thus it appears that the assumed roughness factor may be too large.

c) Page I-43 indicates that field verification of these assumptions will be conducted prior to design documentation and cover construction. This is too late. The assumptions used to calculate run-off should be verified now. The actual field conditions should be included in the response to this list of technical comments.

d) A peak flow rate of 286 cfs and a maximum cross sectional area of 45 sq. ft. yields a peak flow velocity of 6.4 fps. If the stream is nonvegetated, this velocity may be considered too fast. Table 5.6 of Lindeburg's Civil Engineering Reference Manual indicates that the suggested maximum flow for nonvegetated loams is 3.5 fps and 5.0 fps for stiff clay.

e) The application should indicate what the condition(s) of the stream will be when it has been reconstructed and rerouted. That is, it should define the "design stream bed", the type of lining it will have (grass, weeds, an erosion mat, rip-rap, nonvegetated, etc.), roughness factor "n", cross sectional area, and slope. Run-off calculations using the design stream bed should then be calculated.

f) The entire run-off control system is not included in the application. The design parameters of the culvert under the road and the 18" CMP need to be identified. Calculations of the peak flow rates, depth of flow, etc., need to be provided in Appendix C.

g) The rainfall catchment extends 5,000 feet east of the landfarm and is 173 acres. This area should be shown on a scale drawing. The application should describe the difference between the catchment area and the 3.5 acres responsible for run-on onto the landfarm.

Response

a. Since the Counties are located adjacent to one another, there is no difference in the rainfall data which would change the calculation output data. Nevertheless, Will County data was utilized in the revised calculations.

b. The roughness factor was revised in the calculations in Appendix C to reflect the actual stream condition based upon the site inspection conducted on July 31, 1996.

c. The actual field conditions from the site inspection on July 31, 1996 were included in the run-off calculations. Page 3-10 was revised to reflect the actual field conditions.

d. Nine cross-sections of the intermittent stream were evaluated to determine the revised peak flow rate of 225 cubic feet per second (cfs) and, as a result, erosion mat has been incorporated along stream areas which exhibit velocities greater than 3.5 feet per second (fps). Page 3-10 of the report has been revised to reflect this modification.

e. Run-off calculations were prepared which included the intermittent stream. As a result of the velocities and potential flood elevations encroaching upon newly graded transition areas, erosion mat will be placed in the affected areas to minimize erosion and the transport of sediment. Pages 3-10 and 3-11 were revised to reflect these modifications.

f. The capacities of the culverts were evaluated as indicated in Appendix C. The existing 36-inch diameter culvert under the road will be replaced with two 48-inch diameter culverts (see Page 3-9). Illinois Department of Transportation standard culvert designs have been specified for all culvert modifications or replacements.

g. The catchment area includes all drainage areas (Areas 1 through 9 on Drawing No. 10a). The 3.5-acre run-on area corresponds to Drainage Area Nos. 2 and 3 on Drawing No. 1A. The text on Page 3-10 has been revised to correlate the catchment area to the numbered drainage areas.

21. Section 3.1.5.3 specifically states that the intermittent stream will flood during peak flow. This design feature of the system is not adequately described for the following reasons:

a) The smaller copies of Drawing #8 (pages I-411k, I-411l) that are supposed to show the elevations of the flood are illegible. The elevations of the flood waters (e.g., the pool that will form when it floods) must be clearly shown on the topomaps. Cross sections that show the elevations of flood waters relative to the LTA limits and the proposed cap must be provided.

b) The locations and the elevations of all monitoring wells and piezometers (specifically SW-6) must also be shown on the topomaps. Monitoring wells must not be flooded.

c) Statistically significant concentration of hazardous constituents already exist in the treatment zone, below the treatment zone and in perimeter soil samples outside the LTA near the stream (LAII-5PS, LAII-4PS, LAIII-3PS, & LAII-17PS). The application should describe how flooding will effect the migration of hazardous constituents in and around the LTA.

d) The run-off control system for the LTA should be designed not to flood. The application should identify the part of the system (or structural component) that is responsible for the flood condition and why it cannot be modified or removed.

Response

a. The projected flood elevations for a 25-year, 24-hour storm event are displayed on Drawing No. 10. Cross-sections which were utilized to determine the flood elevations are presented in Appendix C.

b. A schedule of monitoring well and piezometer coordinates and elevations is displayed on Drawing No. 1A. As shown on Drawing No. 10, none of the monitoring wells will be flooded by the design storm event.

c. Erosion mat will be placed in select areas along the stream and embankment to minimize erosion and prevent the migration of sediments.

d. Flood conditions are predominantly caused by the large drainage areas upstream and the lack of upstream controls; therefore, extensive design and construction efforts would be required to re-route the stormwater run-on control system. Since there is ample buffer between the limits of flooding and the perimeter of the landfarm plots, the flooding would not have detrimental effects on the cover system. The text has been revised accordingly.

22. Section 3.2, Construction Information: Construction specifications must be included as part of the closure plan, not developed after it is approved.

Response
The design of the cover system is provided within the Closure Plan, including materials specifications, general construction procedures, and performance criteria. Subsequent to approval of the Closure Plan by the IEPA, contract documents will be prepared for the procurement of a construction contractor to implement the closure. The contract documents will not incorporate any modifications to the specifications presented in the Closure Plan. The text has been revised accordingly.

23. Section 3.2.3: The CQA Plan is Appendix D, the HSP is Appendix E.

Response
The text has been revised accordingly.

24. Section 3.2.3, Construction QA/QC: This section needs to include provisions for surveying the land treatment facility both before and after the protective cover system is installed to insure that all portions of the cover are the minimum thickness.

Response
Text has been added to Section 3.2.3.3 to specify surveying of the land treatment facility both before and after the protective cover system is installed to insure that all portions of the cover are the minimum thickness

25. Section 3.2.2, Construction QA/QC: The application needs to identify the test methods (ASTM) that will be followed in analyzing the soil samples.

Response
Soil testing protocols are incorporated in a new table (Table 3-1) which specifies ASTM test methods. The text has been revised accordingly.

26. Section 3.2.3.2, QA/QC of Construction Materials: The borrow soils should be tested for the parameters at the frequencies indicated in the application and anytime there is a change in the material being excavated.

Response
The text has been revised accordingly.

27. Section 3.2.3.2, QA/QC of Construction Materials: A moisture-density curve should be developed for the borrow soils every 5,000 cubic yards and anytime there is a change in the material being excavated.

Response
A moisture-density relationship will be performed at a frequency of one test per 5,000 cubic yards required by the comment. Changes in borrow soil source, stratigraphy of characteristics would require supplemental testing. The text has been revised accordingly.

28. Section 3.2.3.2, QA/QC of Construction Materials: The borrow soils should be compacted to 90% of the modified proctor density.

Response
The purpose of compaction of the protective cover layer is to provide adequate support for any utilization of the completed closure system; i.e., maintenance traffic, vegetation support and wildlife, and to assist in achieving the performance criteria, particularly permeability. However, since permeability is specified as a performance criterion, its

achievement is necessary regardless of the compacted density achieved; therefore, a degree of compaction of 85% is an adequate minimum since the performance criteria must also be met. Further, additional compaction would detract from the ability of vegetation to be sustained on the surface and would not necessarily yield infiltration retardation properties which exceed those specified in the performance criteria. The text has been revised accordingly.

29. Section 3.2.3.3, QA/QC of Construction Procedures: The protective cover must be tested for the following parameters at the specified frequencies during construction:

Parameter	Frequency
Density (nuclear or sand cone	5 tests/acre/lift (250 yd^3)
Moisture content	5 tests/acre/lift (250 yd^3)
Undisturbed permeability	1 tests/acre/lift (1,500 yd^3)
Dry density (undisturbed sample)	1 tests/acre/lift (1,500 yd^3)
Moisture content (undisturbed sample)	1 tests/acre/lift (1,500 yd^3
Atterberg limits	1 tests/acre/lift (1,500 yd^3)
Grain size (to the 2-micron particle size)	1 tests/acre/lift (1,500 yd^3)
Moisture-density curve	5,000 yd^3 and all changes in mat'l.

Response
The text has been revised accordingly

30. The CQA Plan should be revised to include the above testing requirements for the borrow soils and the protective cover.

Response
The text has been revised accordingly.

31. Section 5.0, Post Closure Plan: This section should also reference the post-closure requirements of 724.380 including unsaturated zone monitoring.

Response
The text has been revised accordingly.

Closure & Post-Closure Cost Estimates

1. The cost estimates must be updated to 1996 dollars.

Response
Tables 7-1 and 9-1 have been updated to 1996 dollars.

2. The post-closure cost estimate does not include the costs associated with unsaturated zone monitoring.

Response
A line item for unsaturated zone monitoring has been added to Table 9-1.

I-2 Post-Closure Plan

1. The Post-Closure Plan must include unsaturated zone monitoring. This will impact many parts of this Appendix.

Response
An unsaturated zone monitoring plan has been prepared as Appendix B of the Post-Clsoure Plan.

2. Section 2.1.1, Inspection Frequency: Until the vegetation firmly established, the soil cover on the landfarm is more susceptible to erosion by wind and water. Therefore, the frequency of inspection during this time period must be weekly and during or immediately after every precipitation event that yields 1 or more inches in a 24 hour period.

Response
See response to F-2a(2), Item 1.

3. Section 2.1.1, Inspection Frequency: A quarterly inspection of the cover system is not adequate to detect erosional problems before they become serious. In addition, the cover system must be inspected after significant precipitation events because they can damage the integrity of the cap in a short period of time. During post-closure, the cover system must be inspected monthly and during or immediately after every precipitation event that yields 4 or more inches in a 24 hour period (e.g. a 24 hour, 10 year storm). The other sections of Appendix I-2 that reference inspection frequency must also be revised.

Response
See response to F-2a(2), Item 2.

4. Section 2.1.1, Inspection Frequency: The application must identify what UNO-VEN considers an "extended dry period".

Response
The revised inspection schedule eliminates the need for this element of the inspection program and the referenced text has been deleted.

5. Section 2.1.2, Inspection Instruction: The inspection plan must be consistent with the inspection form. The form must include all of the bullet items in Section 2, and Section 2 must include the items in the form.

Response
All bulleted items in Section 2 have been incorporated into the inspection forms.

6. Section 2.1.2.3, Run-on/Run-off Control Structures: The description and inspection of this system must include the entire length of the intermittent stream; from the point it enters the land treatment facility until it enters Mobil Oil's property. Inspection procedures specific to the intermittent stream must be included in this section.

Response
It is not necessary to inspect the entire length of the intermittent stream within the LTF. Portions of the intermittent stream which overlap with the cover system transitions will be inspected as the inspector walks the perimeter of each land treatment area. Culverts and rip rap in the intermittent stream channel within the LTF will also be inspected individually.

7. Section 2.1.2.4, Monitoring Wells: The surface seals should be checked for cracks or gaps.

Response
Section 2.1.2.4 text and the inspection form have been revised to account for gaps of cracks in the surface seal and/or pads.

8. Inspection Form, Appendix A: The form must be revised to address the following issues:

- It must be consistent with the inspection plan,
- It should be specified to each treatment area,
- If the answer is yes (there is a problem), there should be room for the inspector to indicate the location of the problem.

Response
The inspection forms are consistent with the inspection plan text. The forms have been revised to include the four treatment areas and additional room has been added for inspector comments.

9. Section 2.2, Monitoring: This section must include unsaturated zone monitoring.

Response
Unsaturated zone monitoring has been added as Section 2.3.

10. Section 3.2, Cover Maintenance Plan: The first sentence in the second paragraph should be revised to read " ten percent of the cover in any of the four areas is devoid of vegetation..."

Response
The sentence has been revised and now reads:

> Corrective action to the final cover will be initiated if more than ten (10) percent of the cover in any of the four areas is devoid of vegetation or if any erosion gullies or surface cracks are observed.

11. Section 3.2, Cover Maintenance Plan: Whenever soil is added to correct a problem area, it must be compacted to meet the density, moisture and permeability specifications of the protective cover system. The appropriate tests on the soil must be performed to insure that the specifications are met.

Response
Text in Section 3.2 of the Post-Closure Plan has been revised to indicate that when soil is added to repair erosion gullies or surface cracks in the cover system, it will be compacted to meet the density, moisture and permeability specifications of the protective cover system. Density and moisture content tests will be performed at the originally specified frequency (see Closure-Plan Section 3.2.3.2) to confirm that the specifications have been met.

12. Section 3.2, Cover Maintenance Plan: Whenever soil is added, or an area is regraded, the area must be surveyed to insure that the repaired areas meet the minimum thickness requirements.

Response
Section 3.2 has been revised to indicate that before and after surveys will be conducted to confirm that replacement soil meets the minimum cover thickness requirements for individual repair areas greater than 1,000 square feet. For minor repairs (under 1,000 square feet in size), replacement soil will be brought up to surrounding grade. Section 3.2 text has been revised to reflect the above.

13. Section 3.2, Cover Maintenance Plan: After an area is repaired, it must be inspected weekly until the vegetation is firmly established.

Response
Monthly inspections of repaired areas will be sufficient to monitor the condition of the repaired area. Text has been added to Section 3.2 reflecting the additional inpsection.

14. Section 3.2, Cover Maintenance Plan: This section should be revised to include all of the items in Section 2.1.2.1. All of Section 3 should be reviewed and revised as necessary to insure that it is consistent with Section 2.

Response
These sections have been reviewed and revised as necessary.

15. Section 3.2, Cover Maintenance Plan: The plan should include specific procedures that will be followed in the following two situations:

- the cover is eroded and waste materials are washed out of the area, and
- the cover is eroded and waste materials are washed out of the area and into the intermittent stream.

Response
These situations are addressed in Section G of the permit application.

16. Section 3.3, Run-on/Run-off Control Structures: The description and maintenance of this system must include the entire length of the intermittent stream; from the point it enters the land treatment facility until it enters Mobil Oil's property. Maintenance and corrective action procedures specific to the intermittent stream must be included in this section.

Response
Maintenance and corrective action procedures for the portions of the intermittent stream which overlap with the cover system transition are included in the text. In addition, maintenance and corrective action procedures for culverts and rip rap in the intermittent stream channel within the LTF are also discussed.

17. Section 3.4, Monitoring Wells: Corrective action on monitoring wells must be taken if an annular seal is compromised, regardless if it has resulted in erroneous readings.

Response
A minor change in the text has been made to address this comment.

18. Section 3.4, Monitoring Wells: Corrective action on monitoring wells must be taken if the surface seal is cracked or damaged.

Response
A minor change in the text has been made to address this comment.

19. Section 3.4, Monitoring Wells: It is not acceptable to miss or delay sampling events due to repairs or corrective actions.

Response
The document does not state that it is acceptable to miss or delay sampling events due to repairs or corrective action.

I-3 Financial Assurance

1. The documents must be updated to include the costs of unsaturated zone monitoring and reflect 1996 dollars.

Response
UNO-VEN has chosen to demonstrate financial assurance in Appendix I-3 to an amount more than twice as much as the combined closure and post-closure cost estimates even considering the updated costs provided in Tables 7-1 and 9-1 of the Closure Plan.

SECTION K: Part B Certification

1. The P.E. certification must use the wording at 35 IAC 702.126. The P.E. certification must cover all technical information in the application.

Response
The wording has been revised accordingly.

SECTION C: WASTE CHARACTERISTICS

C-2 WASTE ANALYSIS PLAN

C-2A: Parameters and Rationale

1. These requirements were not adequately addressed. See comments with E-6b below.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

C-2d: Frequency of Analyses

1. These requirements were not adequately addressed. See comments with E-6b below.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

SECTION E: GROUNDWATER MONITORING

E-2 Interim Status Groundwater Monitoring Data

E-2a: Description of Wells

1. Page E-3 of the permit application stated that the MW series of wells (MW-1 through MW-9) were sealed and abandoned after the installation of the UA series wells. The application does not adequately address sealing and abandonment of these wells. The following information must be included in this section:

- Procedures used for sealing and abandonment of MW series wells; and
- A statement as to if the procedures used were Agency approved.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

2. The copies of well completion logs for wells MW-1, MW-2, MW-3, MW-5, MW-6, appear to be missing the lower right hand corner of information. Complete copies of the logs in question must be submitted to the Agency.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-2c: Monitoring Data

1. The application does not include tabulation of all groundwater analysis results and elevation data for each well from the first year (1981) and each subsequent sampling event. The application must be updated to include this information.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-4 TOPOGRAPHIC MAP REQUIREMENTS

1. As required by 35 Ill Adm. Code 703.185(c) the proposed location of groundwater monitoring wells must be included on the topographic map. The monitoring well system for the Storm Water Basin (SWB), (See comments below addressing, E-9: Corrective Action Program, the SWBs) must be included on Figure B-2 or included in Section E-4 by reference to the appropriate Figure they are depicted on. In addition, while Section E-4 states that the locations of the SW-series groundwater monitoring wells are discussed in Section E-6, a specific reference to the figure in which these wells are dipicted must be included in Section E-4.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

2. 35 Ill. Adm. Code 703.185(c) states in part, "On the topographic map required under Section 703.183(s), a delineation of.... and, to the extent possible, the information required in subsection (b):". 35 III. Adm. Code 703.185(b) goes on to state in part that this information includes "Identification of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property, including groundwater flow direction and rate, ...". Section E-4 must include specific reference(s) to the figure(s) in which this information is depicted.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-6 GENERAL MONITORING PROGRAM REQUIREMENTS

E-6a: Description of Wells

1. After review of the boring logs and groundwater monitoring well completion reports it has been determined that the SW-series wells have not been installed in accordance with Agency guidelines. Monitoring wells SW-1, SW-4, SW-5, SW-7, SW-8, and SW-9 were installed with twenty (20) foot screens and native clay blackfill. As a condition of the Permit these wells will be required to be plugged and abandoned using the attached Agency guidelines. The subsequent replacement wells must be installed using the attached Agency guidelines. An Agency Boring Log, Monitoring Well Completion Report, Monitoring Well Diagram and Monitoring Well Design Criteria are attached. The Agency boring log, Monitoring Well Completion and Monitoring Well Diagram will also be included as attachments to the Permit. Borings associated with well installations must be continuously sampled and described using the Unified Soil Classification System.

Response
UNO-VEN will plug and abandoned these wells for the reasons stated above and because they will not be needed following implementation of unsaturated zone monitoring (soil core sampling). The SW-series wells monitor perched water-bearing zones and have served as an early warning system for the potential downward migration of contaminants through the unsaturated zone. UNO-VEN's commitment to conduct soil core sampling during the post-closure period will create a more effective monitoring system capable of

detecting downward migraton of contaminants at very shallow depths in the unsaturated zone and at locations closer to potential sources than most of the SW-series wells.

2. The monitoring well completion reports for US-1, UA-2, UA-3, UA-4, UA-5, UA-6, B-1, B-2, B-3, B-4, B-5, B-6, B-7, B-8, B-9, B-10, B-11, B-12, B-13, B-14, B-15, B-16, B-17, and B-18 were not complete. Information concerning the material used for (1) the filter pack and(2) the grout were not included. This information must be submitted in order to complete the review of the adequacy of these wells.

Response
The key to the graphic symbols used on the boring logs and well construction diagrams is located on page E-79 of the permit application.

3. For future reference, it appears that all of the above wells except for B-3, B-8, B-14, and B-15 have filter packs in excess of 6 inches below the bottom of the screen. This is in violation of Illinois Department of Public Health's (IDPH) Water Well Construction Code. 77 Ill. Adm. Code 920.170(c)(2) status in part, "The filter pack shall extend a maximum of 6 inches below the bottom of the screen...". Future well installation procedures will have to be modified in order to address this regulation.

Response
The information is duly noted.

E-6b: Description of Sampling and Analysis Procedures

1. It appears that a re-evaluation of constituents proposed to be monitored by the shallow and deep groundwater monitoring wells is necessary. Constituents have been found in soils in the treatment zone, below the treatment zone, perimeter samples and the stream sediment samples. The re-evaluation must be in accordance the 35 Ill. Adm. Code 703.185(f) and 35 Ill. Adm. Code 724.198(a) and the list of indicator parameters, waste constituents, or reaction products must provide a reliable indication of the presence of hazardous constituents in the groundwater. Applicable sections of the permit of the permit application must reflect these changes.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

2. 35 Ill Adm. Code 724.197(j) states "Groundwater monitoring data collected in accordance with subsection (g), including actual levels of constituents, must be maintained in the facility operating record. The Agency shall specify in the permit when the data must be submitted for review.". After each semiannual monitoring event a report documenting sampling activities and analytical results must be submitted. The reports must include sampling and analysis procedures and any deviations from the approved plan, along with the items proposed in Section 7.3 of the Groundwater Sampling and Analysis Plan located in Appendix E-2 of the application. Applicable sections of the permit application must reflect these changes.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-6c: Procedures for Establishing Background Quality

1. Page E-236 of the Appendix E-2: Sampling and Analysis Plan states in part "...the most recent two year of interim status groundwater from Monitoring Well UA-1 will be used to establish background values for each parameter." The background values calculated for UA-1 must be based on historical data gathered over the entire interim status period using a trend analysis. The Permit will require that the calculations be submitted for Agency review and approval.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-6d: Statistical Procedures

1. Page E-237 of the Appendix E-2: Sampling and Analysis Plan states "In addition to the statistical evaluation of data, the chemical analytical monitoring results will be compared to concentrations limits established in the post-closure care permit." In lieu of this, the chemical analytical monitoring results must be compared to the appropriate 35 Ill. Adm. Code 620.410 groundwater quality standard.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

2. More details addressing the data analysis for shallow wells found on page E-237 is required. The permit application must define what is meant by (1) "sufficient quantity" of water quality data, (2) "obvious trends" or (3) "sudden changes". The permit will include a condition for the shallow monitoring well sampling and analysis that requires identification of the concentration of any constituent detected which exhibit a progressive increase over four (4) consecutive quarters. In addition, if constituents are added to the monitoring list based on the re-evaluation above, the Permit will include a condition to identify any constituent detected which was not detected in the previous sampling event.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-7 DETECTION MONITORING PROGRAM

E-7a: Indicator parameters, Waste Constituents, Reaction Products to be Monitored

1. These requirements were not adequately addressed. See comments with E-6b above.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-7c: Background Groundwater Concentration Values for Proposed Parameters

1. These requirements were not adequately addressed. See comments with E-6c above.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-9 CORRECTIVE ACTION PROGRAM

1. The January 25, 1996 letter from USEPA granted approval for the closure of the SWB. However, this did not change the requirements of the applicable Agency groundwater monitoring programs at or near the SWB. The GMZ will be identified as Solid Waste Management Unit (SWMU) #33 in the Permit. The groundwater monitoring requirements associated with SWMU #33 will be

included in the groundwater monitoring section of the permit, specifically E-9: Corrective Action Program. The permit application must be revised to include this program.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

E-10 DESCRIPTION OF CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

1. As discussed above in E-9: Corrective Action Program, the GMZ will be identified as SWMU #33. The permit application must be revised to include SWMU #33.

Response
Evaluation of this comment is in progress; however, due to the time constraints for this submittal, the response for this item will be provided at a later date.

CLOSING

Geraghty & Miller, on behalf of UNO-VEN, made an all out effort to address each of IEPA's first technical comments. IEPA's August 2, 1996, first technical comment letter allowed only 20 business days for responses and permit application revisions to the 20 pages of comments. We regret that several comments could not be addressed in time for this submittal, and for which UNO-VEN should not be faulted. Please contact UNO-VEN to discuss a mutually agreeable approach and schedule for responding to the comments which could not be addressed in this submittal.

We trust that this information is responsive to your needs at the present time. If you have any questions about this response, please contact Claude Harmon at (708) 257-4450.

Sincerely,
GERAGHTY & MILLER, INC.

Gary Cipriano

Gary Cipriano, CPG
Principal Hydrogeologist/Project Manager

cc: Claude Harmon, UNO-VEN
Tom Hall, Unocal

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State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

USEPA

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217-524-3300

March 19, 1996

Mr. Claude Harmon
Manager, Operations Environmental
UNO-VEN Company
UNO-VEN Refinery
135th Street and New Avenue
Lemont, IL 60439-3659

Re: 1978030004 -- Will County
UNO-VEN
Chicago Refinery
ILD041550567
RCRA Permit Log No: 162

Dear Mr. Harmon:

The Illinois Environmental Protection Agency has reviewed UNO-VEN's February 29, 1996 response to the second completeness review Notice of Deficiency (NOD). A list of deficiencies still remaining were identified during this third completeness review and are included in the attachment. The Post-Closure permit application for the four land treatment units is not considered to be complete at this time.

On March 14, 1996 Rob Watson of my staff had a conference call with Tom Hall of UNO-CAL and Gary Cipriano of Geraghty & Miller, Inc. Each item listed in the attachment to this letter was discussed, and it was agreed that a response to these items would be submitted to the Agency by March 29, 1996.

Your response must be submitted in quadruplicate and in a format which allows incorporation of the new information into the appropriate sections of your application. To allow for a proper review of this new information, the location of the response to each deficiency should be identified in a list cross-referencing these items. Each revised page or drawing must have the revision date identified on them for tracking purposes.

A certification identical to that outlined at 35 Ill. Adm. Code 702.126 must accompany your submission. The original and three copies of the new information and certification should be submitted to the following address:

Illinois Environmental Protection Agency
Bureau of Land -- #33
Permit Section
2200 Churchill Road
Post Office Box 19276
Springfield, IL 62794-9276

If you have any questions regarding this letter, please feel free to call Rob Watson, P.E. of my staff at 217/524-3265.

Sincerely,

Edwin C. Bakowski
by JHK

Edwin C. Bakowski, P.E.
Manager, Permit Section
Bureau of Land

ECB:WRW:bjh\962881

Attachment

cc: Hak Cho, USEPA Region V, w/attachment
Kelley Moore, USEPA Region V, w/o attachment
Tom Hall, UNOCAL, w/attachment
Gary Cipriano, Geraghty & Miller, Inc., w/attachment

Third Completeness Review - List of Deficiencies

UNO-VEN, Chicago Refinery
RCRA Permit Log No: B-162

1. **Response to item 10 in the Agency's December 15, 1995 letter.** Pursuant to a February 22, 1996 conference call with Tom Hall, this information was not provided with the February 29, 1996 submittal.

2. **P.E. Certification:** All technical information in the application must be certified by a Professional Engineer that is licensed to practice in Illinois. The statement provided in Section K only states that the final design drawings will be certified. There is much more technical information in the application that must also be certified by a P.E.

3. **Drawing #9:** Several areas on the drawing need to be clarified. Elevations need to be identified on several of the contour lines, and the thick jagged line running from the northwest to southeast needs to be identified.

4. **The overall drainage for the LTA is not clearly described in the application.** The narrative and drawings of the storm water management practices for the LTA need to identify the following:

   a. The areas surrounding the LTA need to be identified on the topographic maps,

   b. The size of drainage area drained by the intermittent stream, including any area outside of the LTA,

   c. The locations, amounts and flow rates of the water that runs onto the LTA during the peak rainfall event (including the variables used to calculate these numbers),

   d. The locations, amounts and flow rates of the water that runs off of the LTA during the peak rainfall event (including the variables used to calculate these numbers),

   e. The direction of flow of the run-off when it leaves the diversion channels,

   f. The direction of flow of the run-off when it leaves the LTA,

   g. The goals and design parameters of the storm water management system need to be provided. For example, the peak flow (cfs) in the diversion channels, stream, and any culvert, the depth of flow, minimum free board in the channels, and maximum amount of soil erosion and sediment production, etc. should all be provided. The calculations in Appendix C (page I-392) should be used to demonstrate how the goals and parameters are met, not in place of them.

   h. The equations and values of the variables used to calculate the above information,

5. **Typical Details on Drawing #11:** The drawing should include at least one detail for Area 1 that includes the storm water basin sludge. In particular, the placement of the sludge should not extend beyond the boundary of the LTA. The details and narrative should also be revised to clarify the differences between the sludge and the subbase layer.

6. **Closure of Culverts:** If culverts are abandoned (closed in place), the application needs to describe the procedures that will be followed.

7. **Run-off from the LTA travels off-site:** The path that the run-off takes when it leaves the LTA (e.g. off-site across Mobil's property and then back on to UNO-VEN's) needs to be clearly stated in the narrative and shown on the drawings. The application needs to indicate if activities off-site could negatively affect the drainage from the LTA.

8. **The pipelines on Drawing B-5:** Only portions of the pipelines are shown on Drawing B-5. If possible, these lines should be color coded to differentiate them from the other lines on the figure. The drawing should indicate that only the points where the pipelines enter and leave the site are shown on this figure.

ECB:WRW:bjh\962881

B-162

GERAGHTY & MILLER, INC.
Environmental Services

cc: Maywood USEPA

JHK WRK

A Heidemij company

February 29, 1996

Edwin C. Bakowski, P.E.
Manager, Permit Section
Illinois Environmental Protection Agency
Bureau of Land ---- #33
Permit Section
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

MAR - 1 1996

1978030004 – Will County
The UNO-VEN Company, Chicago Refinery
RCRA Permit Log No. 162
ILD041550567

Dear Mr. Bakowski:

Enclosed please find four copies of responses to the Notice of Deficiency (NOD) issued by the Illinois Environmental Protection Agency (IEPA) on December 15, 1995 to The UNO-VEN Company (UNO-VEN). Geraghty & Miller, Inc. (Geraghty & Miller) is submitting these responses on behalf of the Unocal Corporation (Unocal) and UNO-VEN. As requested, this letter cross-references each NOD item, indicating the location of the response to each item. We have also included an instruction sheet, which indicates the pages which should be removed from the previously submitted permit application and replaced by the enclosed pages. Each page that has changed is marked with a revision number and date for tracking purposes.

GENERAL

1. The application must follow the format of the decision guide.

Response
Sections C, I and K of the application have been revised to follow the format of the decision guide. The completed RCRA Decision Guide Checklist (Section N) also cross-references the location of required information or indicates the application sections which are not applicable.

35 East Wacker Drive, Suite 1000 • Chicago, Illinois 60601 • (312) 263-6703 • FAX (312) 263-7897

2. *The Part A must indicate if the owner and operator are the same. Only the owner signature and address are provided.*

Response
The Part A Permit Application has been revised to include an operator signature to indicate that UNO-VEN is both the owner and operator.

3. *Drawings identified as "for permit purposes only; not to be used for construction" are not acceptable. All drawings, plans, etc. in the application must be final drawings.*

Response
Modifications to the design drawings in the closure plan are in progress and will be submitted to IEPA under separate cover on March 19, 1996 per discussions with Mr. Robert Watson on February 22, 1996. The revised set of design drawings will be stamped by a professional engineer licensed in the State of Illinois.

4. *The application must address the corrective action management unit (CAMU) regulations at 35 IAC 724 Subpart S and how the placement of the nonhazardous sludge from the storm water basin will comply with these requirements.*

Response
The temporary storage of non-hazardous sludge was conducted pursuant to a modification to the interim status closure plan for the Land Treatment Facility (LTF). The closure plan modification request titled "Work Plan for Temporary Storage of Stormwater Basin Closure Material at the Land Treatment Facility, UNO-VEN Refinery, Lemont, Illinois" prepared by Geraghty & Miller (June 1995) was submitted to the IEPA on June 15, 1995. Approval of the modification was granted by the IEPA in a letter dated July 24, 1995. Designation of the LTF as a CAMU is not applicable because this non-hazardous sludge is not subject to the land ban regulations as explained in Item No. 9.

SECTION B

5. *Legal Description: A statement that the refinery property includes parts of several different Sections in two different townships is not a legal description. For example, the same complete written legal description of the refinery that was filed with the county (and/or city) needs to be included as part of the application.*

Response
The legal description has been included in a new Appendix B-1. The previous Appendix B-1 has been changed to Appendix B-2. Appropriate text introducing the new Appendices B-1 and B-2 has been added to Section B-1.

6. *Injection wells: The revisions to page B-3 do not address the requirement to identify any injection wells within 1500 feet of the property line. The application must identify any injection wells or state that there are none within 1500 feet of the property line.*

Response
Text has been added to Section B-2 to indicate that none of the wells listed in the well inventory are known to be injection wells.

7. *B-2a: Topographic Map: Section B of the application still does not discuss Loading/Unloading Areas, Run-on/Run-off Controls, or Solid Waste Units. In particular, the loading/unloading areas used by tank trucks and barges and the pipelines used to pump oil to and from the site must be discussed in the text and identified on the maps of the site.*

Response
Text has been added to Section B-2 referencing other sections of the permit application that address storm-water management, current surface-water drainage at the LTF, and run-on and run-off controls after closure of the LTF, and solid waste management units. The loading/unloading areas have been added to Figure B-2. The locations where pipelines transporting oil and refined products enter and exit the refinery are shown on new Figure B-5. Text has been added to Section B-2 to indicate that the new information is shown on Figures B-2 and B-5.

The discussion of run-on and run-off controls in the permit application is limited to hazardous waste management units. If pertinent, run-on/run-off information for areas of the refinery other than the LTF should be assembled during the RCRA Facility Assessment or Description of Current Conditions Report.

8. *B-2b: Additional Map Requirements for Land Disposal Facilities: Section B of the application must address the individual requirements of this checklist item. UNO-VEN may reference other parts of the application to meet this requirement. However, references must be to specific sections or drawings. References to page numbers are not acceptable as the page numbers will likely change throughout the course of the review. Finally, Page B-3a that was referenced on UNO-VEN's checklist was not provided.*

Response
Text has been added to Section B-2 referencing other sections of the permit application that address the location of the uppermost aquifer beneath the facility and groundwater flow direction and rate. In addition, text has been added to Section B-2 to indicate that the following requirements do not apply: extent of the plume of groundwater contamination, the location of any active or inactive shaft or tunneled mine, the location of any active faults within 2 miles, and the location of surface water bodies within 1500 feet used a source of

public water supply. Text was also included to state that documentation which shows approval of municipalities is not required by Section 21(l) of the Environmental Protection Act. The remaining map requirements were previously addressed in Section B-2. The RCRA Decision Guide Checklist has also been revised to eliminate the reference to page B-3a.

SECTION C

9. *C-2g: Land Ban: Waste analysis requirements to meet the land disposal restrictions must be discussed in the application. UNO-VEN placed solid waste from one hazardous waste unit (the stormwater basin) on an other hazardous waste unit (the LTA). Therefore, UNO-VEN must address this requirement or justify why it is not applicable.*

Response

The stormwater basin (SWB) became a hazardous waste management unit after the Toxicity Characteristic Leaching Procedure (TCLP) rule became effective on September 25, 1990. After discovering that the water and sediments in the SWB exhibited the characteristic of toxicity for benzene, UNO-VEN conducted an in-situ bioremediation program to improve water and sediment quality within the SWB. An extensive confirmation sampling and analysis program conducted in 1993 by ENSR Consulting and Engineering indicated that the storm water pond sediments no longer exhibited the characteristic of toxicity for benzene. The land disposal restrictions for the benzene characteristic (D018) became effective on December 19, 1994 (Code of Federal Regulation, Title 40, Part 268.38 [40 CFR 268.38]) and thus do not apply since the SWB sediments were no longer characteristically hazardous at this time.

In addition to the confirmation sampling conducted in 1993, UNO-VEN analyzed representative samples from batches of dewatered SWB sediments for total benzene in order to document characterization. During March and April 1995, the total benzene concentrations were well below the "twenty times rule" and therefore the material would not exceed the regulatory limit for benzene in the TCLP extract. Additionally in February 1995, benzene was not present above the detection limit (0.05 milligrams per liter [mg/L]) in the TCLP extract from the dewatered SWB sediments. The laboratory analytical data from characterization of the SWB sediments is included in Appendix A of the Closure Plan (Appendix I-1).

SECTION I

10. *I-1: Closure Plan: The application must include detailed design drawings that show all aspects of the final cover systems. The drawings of the four units in the Land Treatment Area (LTA) are not complete for the following reasons:*

a. *As noted above, all drawings must be final design drawings,*

b. *the drawings must show all of the contours for all of the units. Drawings 5 and 9 do not include all of the contours for the northern units.*

c. *at least one set of plan sheets must show the limits of the existing units, the limits of where the waste will be spread, and the final cover (Drawing 5 seems to show that waste will be spread outside of the existing limits of the northern LTA units.),*

d. *the drawings must be expanded to show the areas surrounding the LTA in order to show how the run-on to and run-off from the LTA will flow.*

e. *cross sections of the waste, the cover systems, and drainage systems. The cross sections should include all critical areas of the LTA. They must show multiple units and the drainage features. Example locations include, but are not limited to, the entire length of the following grid lines 2200W, 2500W, 2600W, 6700N, 6600N, 6350N, 6300N, 6200N, on Drawing 9, and 5000N, 5700N, 2900W, 3200W on Drawing 10.*

f. *details and specifications of the drainage and erosional controls such as the diversion ditch, culverts, rip-rap, etc. must be shown on the drawings.*

g. *detailed drawings that show the transition from waste to the final cover to the diversion channel (or drainage ditches and the intermittent stream).*

h. *monitoring wells, surface water sampling points, and bench marks must be indicated on these drawings.*

Response

The closure design drawings are being modified to reflect the smaller than expected volume of SWB sediments placed on the LTF during 1995 as mentioned in Item No. 4. The revised set of design drawings will be submitted to IEPA on March 19, 1996 per our February 22, 1996 telephone conference with Mr. Robert Watson. Typical cross sections and details to address Item Nos. 10e, f and g are included with this transmittal as agreed to with Mr. Robert Watson on February 22, 1996. The locations of the typical cross sections and details are shown on the enclosed stormwater management plan drawings from the closure design. Unocal and Geraghty & Miller understand that submittal of cross sections to address Item No. 10e, based on the modified closure design, will be a permit condition.

10.(second) *<u>I-1: Closure Plan</u>: The plan must include calculations that show that the proposed drainage system (the ditches and culverts) is properly sized for the peak run-off that will flow into it.*

Response
Peak run-off calculations for all of the diversion channels are included on pages I-392 to I-411 of the application. The final cover system will not include any culverts. The existing culvert shown on Drawing No. 1will be abandoned in place or removed when installing the cover system.

11. I-1: Closure Plan: Section 3 must identify the construction specifications of the storm water basin sludge (eg. minimum density, etc.).

Response
The text in Section 3.1.3.1 of the Closure Plan has been modified to indicate that the SWB sediments will be placed and compacted in accordance with the specifications for common borrow.

12. I-1: Closure Plan: Section 3 must identify the hydraulic conductivity of the compacted cover material.

Response
The text in Section 3 of the Closure Plan has been modified to indicate the common borrow material will possess a minimum hydraulic conductivity of 2×10^{-4} centimeters per second (cm/s) in accordance with ASTM D-5084 test methods. Other minor associated revisions to the specifications for placement and compaction of common borrow have also been made to Sections 3.1.3 and 3.1.4 of the Closure Plan.

SECTION K

13. K-2: Engineering Certification: An Engineering Certification is not provided. UNO-VEN's response to this item states that this requirement is not applicable. This is not correct. Examples of technical information that should be certified by a P.E. include figure B-4, the figures in the closure plan (Appendix I-1), etc.

Response
Section K of the application has been modified to include text stating that closure design drawings are certified by a Professional Engineer registered in the State of Illinois.

14. K-3: Prior Conduct Certification: The Prior Conduct Certification provided with Revision No. 1 is not complete. It does not list a person for the Owner/Operator or a social security number.

Response
The Prior Conduct Certification has been revised to include a person as the Owner/Operator and a social security number.

We trust that this information meets your requirements at the present time. If you have any questions about this response, please contact Claude Harmon at (708) 257-4450.

Sincerely,
GERAGHTY & MILLER, INC.

Gary Cipriano

Gary Cipriano, CPG
Principal Hydrogeologist/Project Manager

cc: Claude Harmon, UNO-VEN
Tom Hall, Unocal

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REPLACEMENT TABLE
Response to December 15, 1995 Completeness NOD
RCRA Part B Post-Closure Permit Application
UNO-VEN Refinery, Lemont, Illinois

SECTION	REMOVE	REPLACE WITH	DESCRIPTION OF CHANGES
Volume I			
Table of Contents			Revised Table of Contents
A	A-8	A-8	Certification Section of the Part A Permit Application revised to include operator signature to indicate UNO-VEN is both the owner and operator.
B	B-1	B-1	Added reference to legal description in Appendix B-1.
B	Appendix B-1	Appendix B-1 (pg. B-10 to B-31)	Added new Appendix B-1 to provide legal description.
B	B-2	B-2	New page B-2 required due to shifting of text after revision to page B-1.
B	B-3	B-3 and B-3a, add new Appendix B-2 (pg. B-32 to B-40), add Figure B-5 (pg. B-9)	Page B-3: Clarification regarding injection wells and public water supply; added reference to Figure B-2 indicating locations of loading/unloading areas; added reference to new Appendix B-2. Page B-3a: Added references to specific sections and figures where the following information is located: stormwater management, surface water drainage, run-on and run-off controls, locations and descriptions SWMUs, information regarding uppermost aquifer; added text addressing remaining additional map requirements; added reference to Figure B-5 indicating locations of pipelines.
B	Figure B-2 (pg. B-7)	Figure B-2 (pg. B-7)	Added loading/unloading areas to Figure B-2.

REPLACEMENT TABLE
Response to December 15, 1995 Completeness NOD
RCRA Part B Post-Closure Permit Application
UNO-VEN Refinery, Lemont, Illinois

SECTION	REMOVE	REPLACE WITH	DESCRIPTION OF CHANGES
Volume I			
C	C-1	C-1	Added headings to follow the format of the RCRA Part B Permit Application Decision Guide.
Volume II			
I	I-2 to I-3	I-2 to I-3	Revised headings to follow the format of the RCRA Part B Permit Application Decision Guide.
	I-36 to I-39	I-36 to I-39	Revisions to Section of 3 of the Closure Plan to address the construction characteristics of the SWB sediments and the hydraulic conductivity of the installed common borrow (protective layer).
Volume IIa			
K	K-1	K-1	Added sections with headings to follow the format of the RCRA Part B Permit Application Decision Guide; referenced new Appendix K-1.
K	K-2	K-2	Added Appendix K-1 which includes Part B Certification Form and revised Prior Conduct Certification form.
K	K-3	K-3	Resigned Part B Certification Form.
K		Add Page K-4	Revised Prior Conduct Certification to include a person as the owner/operator and a social security number.
N			Revised RCRA Decision Guide Checklist.

\uno-ven\CI0487.002\data\replmnt2.xls

V.S.E.P.A.

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

217/782-6762

Refer to: 0310270002 -- Cook County
Union Oil Company
ILT170010704
RCRA Permit

RECEIVED
OCT 16 1989
OFFICE OF RCRA
WASTE MANAGEMENT DIVISION
EPA, REGION V

October 5, 1989

Darrell W. Bruckert
ENSR Consulting and Engineering
740 Pasquinelli Drive
Suite 124
Westmont, Illinois 60559

Dear Mr. Bruckert:

This is in response to your letter of May 30, 1989 regarding the management of unreacted organic vapors from the production of styrene butadiene rubber at a proposed facility to be constructed by Unocal Chemicals. While the location of this facility was not identified in your letter, discussions with representatives of this Agency's Division of Air Pollution Control indicate that the proposed facility is in Kankakee, Illinois. The Agency cannot make a final determination on your request, as you did not provide sufficient information to allow for an adequate review of the issue at hand. Specifically:

1. No information was provided to indicate whether the waste in question is a hazardous waste as defined in 35 IAC 721. Based upon a review of the chemical properties of styrene and butadiene, it would appear as though the liquid portion of the waste injected into the afterburner is an ignitable hazardous waste, due to the fact that the flashpoint of styrene is 88°F.

2. No information was provided regarding the rate at which the vapor and liquid waste streams in question are generated and the time period over which these waste stream are generated. Of special importance is the amount of waste generated on an hourly, daily and monthly basis.

3. No information was provided describing how the condensed water vapor and condensed styrene are separated in the condenser.

4. No information was provided to indicate whether the afterburner is an "incinerator" as defined in 35 IAC 720.110. An incinerator is any enclosed device using controlled flame combustion which is neither a "boiler" nor an "industrial furnace".

Assuming that (1) the waste stream in question is a hazardous waste (which, as indicated in Item 1 above, is a good assumption) and (2) the afterburner does meet the definition of an "incinerator", then a RCRA permit must be obtained from this Division. This decision is based on Section 21, paragraph (f) of the Illinois Environmental Protection Act and 35 IAC 703.

If you have any questions regarding this letter, please contact James K. Moore, P.E. of my staff at 217/782-6762.

Very truly yours,

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:JM:dks/3284k, 100-101

cc: Division File
Northern Region
Kankakee County General File
Division of Air Pollution Control
Dan Punzak
Terry Sweitzer
USEPA, Region V -- George Hamper
Jim Moore

Union 76 Division: Eastern Region

Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 345-85

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P 330 175 801

A. J. Eliskalns
Manager, Chicago Refinery

December 4, 1985

RECEIVED
DEC 10 1985
SOLID WASTE BRANCH
U.S. EPA, REGION V

Mr. Gale Hruska
RCRA Activities
Part B Permit Application
USEPA - Region V
P. O. Box A3587
Chicago, IL 60690-3587

Gentlemen:

Part B Permit Application
ILD 041550567-Technical Review Response

Enclosed is a copy of our response to the technical review as received in your letter of October 3, 1985.

Our response is in two sections: two sets of revised pages, tables and figures from the Part B Permit Application; and, narrative responses to each of the questions raised in your technical review. The Part B Permit Application pages have been organized into Sections as they occur in the Part B Permit Application for ease in replacing such pages. Union Oil requests that, in addition to replacing or inserting these revised pages, that the narrative responses also be added to the Part B Permit Application since they provide clarification to our responses.

If you have any questions, please contact Mr. L. D. Erchull at the above telephone number.

Very truly yours,

D. W. Bruckert, Supervisor
Environmental Services

LDE/rm

Enclosures

COPY

RECEIVED
DEC 10 1985
SOLID WASTE BRANCH
U.S. EPA, REGION V

RESPONSES TO
NOTICE OF DEFICIENCY
PART B - PERMIT APPLICATION
UNION OIL - CHICAGO REFINERY
ILD041550567

COPY

RESPONSES TO

NOTICE OF DEFICIENCY

PART B - PERMIT APPLICATION

UNION OIL - CHICAGO REFINERY

ILD041550567

205-46

FACILITY DESCRIPTION

1) EPA COMMENT

The location of uppermost aquifer and aquifers which are hydraulically interconnected beneath the facility are not indicated on a map of the facility (270.14(c)(2)).

RESPONSE

A new section, B-15 Location of Aquifers, has been added to Page B-21, as follows:

> "B-15 Location of Aquifers
>
> Figures B-8 and B-9 show the relative location of the aquifers beneath the land treatment area. A more complete description of these aquifers can be found in Section E of this document."

Additionally, Section E-2c(1) has been changed to read as follows:

"With the exception of the Maquoketa shale, all glacial and bedrock formations in the vicinity of the Chicago Refinery have the potential of yielding water (Anderson, 1919). There are however, four major aquifer systems (Table E-1). Unconsolidated sand and gravel deposits in alluvium and glacial drift, and/or the fractured Silurian Niagaran Dolomites, comprise two separate but interconnected aquifers. These are the uppermost aquifers and underlie the entire land treatment facility (Figure E-2a). A third aquifer system is the Cambrian-Ordovician Aquifer system. This system, is made up of limestones and sandstones below the Maquoketa shale and the principal water bearing formations are the Glenwood-St. Peter sandstone and the Ironton-Galesville sandstone. The fourth aquifer system, the Mt. Simon sandstone, is separated from the underlying sandstone aquifers by the generally impermeable Eau Claire shales. The third and fourth aquifer systems are commonly referred to jointly as the "deep sandstone aquifers" (Table E-1)."

WASTE CHARACTERISTICS

2 and 3) EPA COMMENTS

2) The analyses of the wastes to be treated do not meet the requirements of 270-14(b)(2) and 264.13 (a)(1) for the following reasons:

a. An analysis of the slop oil emulsions (k049) was not provided.

b. Because of the varied composition of a tank cleaning waste (e.g. it is dependent on the contents of the tanks being cleaned at the time) the 1981 analysis of the tank cleaning waste is not acceptable.

If samples of the slop oil emulsions and tank cleaning waste cannot be obtained and included in the treatment demonstration, they must be the topic of a permit modification pursuant to 270.41 if Union Oil wishes to treat these wastes in the future.

c. The analyses submitted are not adequate to meet 264.271 and 264.272. The analyses must include all parameters in Attachment 1, not just inorganic parameters.

d. All wastes to be treated, both hazardous and nonhazardous, need to be analyzed for all parameters in Attachment 1.

3) The waste analysis plan is not adequate for the following reasons:

a. The parameters (page C-9, 10) are not based on a treatment demonstration, and Tables C-10 and C-11 do not coincide with USEPA's list of Appendix VIII constituents suspected to be present in refinery wastes (264.13(b)(1)). Refer to Attachment 1;

b. The test methods do not coincide with those specified in Attachment 1 (264.13(b)(2));

c. The sampling methods for each waste stream are not specified (264.13(b)(3));

d. The first two situations on page C-15 that would initiate an analysis of a waste do not meet 264.13(b)(4);

   i. If a new waste is generated, a permit modification is required (270.41),

   ii. Documentation that mixtures of the wastes are compatible must be made during the treatment demonstration (264.272(c)(1)(i)). Per 264.282, this documentation must address the requirements of 264.17(b).

RESPONSE

Hazardous wastes have not been generated since 1981, and Union Oil has no estimate as to when such wastes will be generated. Since the treatment demonstration via literature review has been rejected, an adequate response to these comments, and several others, requires the information/data from a two or three year treatment demonstration program. Union Oil is in a "Catch-22" situation in that since the requested information/data is not available, and will not be for some time, no response can be provided. Consequently, it appears that there are only two acceptable options available:

1. Initiate a phased permitting process that would provide adequate time to develop the requested data; or

2. Continued operation of the land treatment system for nonhazardous wastes only, under an approved Closure Plan.

Union Oil requests a meeting to discuss the above options.

PROCESS INFORMATION

4) EPA COMMENT

The treatment demonstration provided in Attachment D-1 is not adequate for the following reasons (264.272, 270,20(a)):

a. It does not demonstrate that hazardous constituents in the wastes will be completely degraded, transformed, or immobilized in the treatment zone. A short-term laboratory toxicity test with a one year field plot or "barrel lysimeter" study, followed by the laboratory toxicity test and a two-year follow-up field study is needed to make this demonstration. (See Section 1.3.2 of EPA/530-SW-84-015, December 1984).

b. It does not demonstrate that volatilization of hazardous constituents will not be significant.

c. Hazardous and nonhazardous wastes are subject to the same analyses and treatment demonstration if they are to be applied to the same treatment area.

d. It does not demonstrate if macropore flow exists. This is necessary in order to determine if pan lysimeters are required to monitor this type of flow direction.

RESPONSE

To adequately respond to the comments and/or questions raised in the above, information from a completed treatment demonstration program is required. As indicated in our response to comments 2 and 3, it appears that there are only two acceptable options available:

1. Initiate a phased permitting process that would provide adequate time to develop the requested data; or

2. Continued operation of the land treatment system for nonhazardous wastes only, under an

approved Closure Plan.

5) EPA COMMENT

A map or plot plan delineating the horizontal boundaries of the treatment areas (or units) and all soil series occurring within the treatment areas is not provided (264.272(c)(1)(iv)). This information should then be used to define "uniform areas" within the land treatment unit.

RESPONSE

The land treatment area has been extensively graded in order to minimize run-off slopes and optimize the overall contouring of the area. As a consequence, the original surficial soils have been extensively mixed, relocated and/or otherwise altered. Therefore, published soil reports are of little value since they were prepared prior to grading, and Union Oil will have to implement a new soil survey of the area to characterize the surficial soils. This survey will be performed as part of the treatment demonstration, if that option is chosen.

6) EPA COMMENT

The land treatment program provided in Section D is not adequate because it is not based on an acceptable treatment demonstration as required by 264.271(a)(1), 264.271(a)(2), 264.273(a) and 270.20(b). Specifically, the following need to be provided:

a. A monthly application schedule based on:

i. The application limiting constituents.
ii. The rate limiting constituent,
iii. The capacity limiting constituent,
iv. The waste generation rate,
v. Seasonal restrictions,
vi. The expected life span of the unit, and
vii. The waste application method.

b. Measures to control soil pH including:

   i. The methods used to measure the soil pH.
   ii. The methods used to determine how much lime or "soil mineral" will be added to correct the pH.
   iii. The definition of "appropriate soil mineral" on Page D-30.

Furthermore, current guidance indicates that the optimal pH range is 6.0 to 8.0, not 8.5 as indicated on page D-29.

c. Section D-4, Soil Management needs to include the following:

   i. The dimensions of the disc and plow listed in Table D-16, and the equipment used to inject the waste. This should include pictures which show the injection system,

   ii. The direction in which the treatment plots are cultivated. Contour tillage across the slope rather than with it is recommended,

   iii. Documentation based on the treatment demonstration which shows that the different incorporation methods for the hazardous and nonhazardous wastes will not adversely affect the treatment of the hazardous constituents in both types of wastes,

   iv. A description of the fertilizer which is proposed.

d. Moisture control at the land treatment area needs to be described in much greater detail. First of all, a water balance must be prepared to determine whether moisture control problems will occur at the site. This is described in Section 8.3 and Appendix E of SW-874, Hazardous Waste Land Treatment. Results obtained from the water balance will then determine site design criteria such as the installation of a subsurface drainage system or a controlled surface run-off network.

RESPONSE

To adequately respond to the comments and/or questions raised above, information from a completed treatment demonstration program is required, if that option is chosen.

7) EPA COMMENT

The soil sampling data provided in Tables D-5 to D-13 is not adequate for the following reasons (264.272(c)(1)(iv));

a. Tables D-5, D-7, D-9 and D-13 state that the samples were analyzed by agricultural analytical procedures. If these procedures are not the same as those specified in SW-846, they must be described in detail and documented that they are equivalent to SW-846.

b. Analyses for the surface, 12 inch depth, and 24 inch depth of Area IV are not provided. Also, the analyses for the 3 foot depth of Area IV are 2 years older than the analyses (for the 3 foot depth) of the other areas.

c. The parameters analyzed vary with depth:

   i. The surface, 12 inch depth, and 24 inch depth are not analyzed for oil and grease,

   ii. The 3 foot depth is not analyzed for cation exchange capacity.

d. None of the soil samples, including background samples, are analyzed for the Appendix VIII constituents suspected to be in refinery wastes. This information is necessary in order to determine baseline concentrations of these constituents for use in the treatment demonstration.

e. The December 15, 1982 composite soil EP toxicity analyses do not include Area IV. Also, samples should only be composited within uniform areas of the treatment unit.

f. The background soil analyses do not include all the parameters or sample depths as the other soil analyses. Specifically, the background analyses do not include oil and grease, and do not include the 3 foot depth level.

RESPONSE

To adequately respond to the comments and/or questions raised above, information from a completed treatment demonstration program is required. These data will be provided if the treatment demonstration option is chosen.

8) EPA COMMENT

The run-on and run-off controls discussed in Sections D-4a(1) and D-5a are not adequate to meet the requirements of 264.273(c) and (d) because it has not been demonstrated that the berms, swales and ditches are designed to handle the peak discharge from at least a 25-year storm. Methods for estimating the volume of run-on and run-off are given in Section 8 of SW-874.

The berms, swales and ditches may then be designed to meet the requirements of 264.273(c) and (d) based on these volume estimates. Design drawings of these berms, swales, and ditches must then be included as part of the application. Methods used to minimize erosion of these areas during the time a vegetative cover is being established also need to be described.

RESPONSE

Union Oil believes that the conceptual approach outlined in the original Part B Permit Application provides for not only containment of the run-off from a 24 hour-25 year storm, but includes the subsequent treatment of that run-off through the refinery's wastewater treatment system. A new Page D-28 (Section D-4a(2) Runoff Control) is attached

which clarifies the run-off control from the land treatment plots.

Run-on control is discussed on Page D-27 (Section D-4a(1) Run-on Control). Existing diversion ditches and swales are more than adequate to divert all run-on to the land treatment plots as can be seen by the contours shown on revised Figure D-2. In general, the bottom of these diversion ditches are five (5) to ten (10) feet lower than the land treatment plots. Further, the diversion ditch is the natural intermittent stream bed which drains a much larger area than just the land treatment area, without overflowing its banks. Our response to comment 9 proposes the establishment of a stream monitoring program which will include flow. Data collected will document actual flow rate and capacity, which will be shown to be greater than the 24 hour-25 year storm flow rate. A revised Page D-27a is attached to clarify this point.

9) EPA COMMENT

Section D and Figure D-2a indicate that an intermittent stream course is used to transport run-on and run-off to the facility's waste water treatment pond. This is not adequate for the following reasons:

a. The stream bed is unlined. Therefore, any release of hazardous constituents from the treatment areas which enters this stream may contribute to groundwater contamination beyond the point of compliance.

b. The stream runs off of Union Oil's property for about 1,600 feet before it returns to Union Oil's property. Thus, a release of hazardous constituents to the stream may contaminate soils and water not located on Union Oil's property.

RESPONSE

Existing grading and swales around each land treatment plot prevents run-on. Rainwater and other surface flows (as snow melt) from areas other

than the land treatment plots are diverted around each plot to the intermittent stream course.

At present, no hazardous wastes are being applied to the land treatment plots.

Since only nonhazardous wastes will continue to be land treated, and until a final Part B Permit is received, Union Oil will initiate a monitoring program for the intermittent stream. This monitoring will include flow, pH, specific conductance, TOC and TOX, and will begin after the 1985-1986 winter period. Please refer to our response provided in your comment 8.

10) EPA COMMENT

Page D-27a indicates that the crown of the concrete pipe running under Area II is only 3 inches below the treatment zone (treatment zone is 36 inches deep and the crown of the pipe is 39 inches deep). Therefore, run-on which passes through this pipe must also be tested for hazardous constituents because there is a high probability that untreated hazardous constituents may be wasted into this pipe.

RESPONSE

Page D-27a and Figure D-2 have been revised to show that the South Treatment Plot - Area II will not include the area above the concrete drainage pipe. Only Figure D-2 has been modified for this response. Other figures included throughout the Part B Permit Application show the general arrangement of the land treatment plots; a slight modification to the South Treatment Plot - Area II will not significantly alter the general shape of this area. Consequently, the general arrangement figures have not been revised.

"The drainage ditch is shown on Figure D-1 and D-2A. Figure D-2A is an enlarged USGS topographic map of the land treatment area, and shows the location of the treatment plots and the drainage ditch from the land treatment area. The portion of the drainage ditch shown on Figure 2A is an

existing intermittent stream bed (highlighted in yellow). Nothing has been done to change the natural stream course or channel.

Figure D-1 shows the drainage ditch as it returns onto Chicago Refinery property. The drainage ditch throughout the refinery is contained in either a limestone or concrete lined channel, which includes concrete culverts under refinery roadways. Figure D-1 shows the drainage ditch within the Chicago Refinery property. Figure D-1 also shows the sections in concrete and limestone, with approximate dimensions, as well as the location of the storm water retention basins. All run-off collected in this drainage ditch enters the storm water retention basins."

11) EPA COMMENT

The source used to determine the depth to the seasonal high water table (Table E-2) is not adequate to meet the requirements of 264.271(c)-(2). Because of the heterogeneous nature of glacial till deposits, this information must be obtained from water levels taken from the shallow monitoring wells (SW-4, 5, 7, 8). The water levels should be taken in the spring at a frequency of at least twice a month or within 24 hours of a significant rainfall event.

RESPONSE

Frequent water level monitoring of monitoring wells SW-4, 5, 7, 8 will not result in the determination of the seasonal high water table, but rather the seasonally high perched water level. Therefore, in accordance with 264.271(c)(2), Union Oil will implement water level measurements on a twice monthly schedule during the months of April, May and June for the deep wells in the land treatment area to determine the seasonal high water table. Additionally, if the EPA requires a determination of the seasonal high perched water level(s), Union Oil will perform water level measurements on the same schedule in the shallow perched water monitoring wells. Please advise.

GROUNDWATER MONITORING

General

12) EPA COMMENT

Page E-5 states that the bedrock dips to the east, whereas Page E-13 states that it slopes to the northwest.

RESPONSE

Page E-5 refers to the dip of sedimentary beds, and pages E-12 and 13 refer to the slope of the eroded bedrock surface. For clarity, Section E-2b has been changed to read as follows:

"Underlying the glacial materials is the bedrock limestone aquifer (actually Niagaran Dolomite of Silurian Age) whose eroded surface is nearly level or slightly sloping toward the Des Plains River (northwest)".

13) EPA COMMENT

Page E-12 states that the clayey, silty, fine to coarse sand (the second most predominent soil type) is known to be absent under certain portions of the land treatment area. However, the cross sections (Figures E-3 to E-6) indicate that it is present under these areas.

RESPONSE

Section E-2b has been revised to read as follows:

"Although its horizontal continuity may exceed 2,000 feet, it is known to be absent under certain portions of land surrounding the land treatment area."

14) EPA COMMENT

The estimated permeability coefficients on page E-18 and Attachment E-3 are not adequate to characterize the soils at the site. In-situ permeability tests of all soil types and water bearing strata is necessary to determine the permeability and hydraulic properties of these soils. One in-situ test in MW-1 is not sufficient to meet this requirement. Furthermore, the assumed porosity of 0.30 indicated on page E-19 is only acceptable for mixed-grained sand that is densely compacted.

RESPONSE

Union Oil has questions pertaining to the degree of data development necessary to provide Part-B compliance. We believe this is an area where a meeting and further discussions are appropriate.

15) EPA COMMENT

Page E-20 indicates that under unity gradient the rate of vertical migration is estimated to be approximately equivalent to that for horizontal flow. This would only apply for a homogeneous material, not one which exhibits layered heterogeneity as many glacial till deposits do.

RESPONSE

We believe there may be some misunderstanding as to what is meant on pages E-19 and 20. These pages state:

"Using the hydraulic gradient and permeability referenced above (i.e., referencing the silty sand)(0.007 and 3.56×10^{-5}, respectively) and assuming a porosity of 30%, the rate of groundwater flow near the soil/bedrock interface (i.e., top of the water table) is approximately 8×10^{-7} cm/sec or 2.3×10^{-3} ft/day in a northwesterly direction. It should be noted that the permeability of the clayey silts and silty clays are likely to be 2-3

orders of magnitude less than that of the clayey silty sand. However, because vertical migration would function under unity gradient, the rate of vertical migration during times of recharge is estimated to be approximately equivalent to that for horizontal flow (e.g. 2.3×10^{-2} to 2.3×10^{-4} ft/day)."

The above is simply comparing the horizontal flow rate in the silty sand layer to an estimated saturated vertical flow rate in the overlying clayey silts and silty clays. However, much of the vertical migration would take place in unsaturated flow conditions, at slower rates. For example, if these soil units have the following properties:

<u>silty sand</u>

permeability	3.56×10^{-5}
gradient	0.007
porosity	30%

<u>silty clay or clayey silt</u>

permeability	10^{-7}
gradient	1
porosity	15%

The vertical flow of the silty clay or clayey silts above the water table under unity gradient would be approximately 1.3×10^{-2} ft/day. This value is approximately equivalent to the range of horizontal flow rates for the silty sand (i.e., 2.3×10^{-2} to 2.3×10^{-4} ft/day). The intent of the statement is simply to illustrate that the difference in the permeabilities is approximately offset by the difference in the gradients.

Unsaturated Zone

16) EPA COMMENT

Because the perched water table (Section E-4b) is hydraulically interconnected with the shallow dolomite aquifer, Section E-4b will be reviewed as part of saturated zone monitoring (Section E-3). Therefore, please address perched water table monitoring as part of Section E-3 in all future submittals.

RESPONSE

Union Oil disagrees with the basic premise of the question as stated. However, Union Oil has the following questions pertaining to incorporation of the perched water into the saturated zone monitoring:

a) What is the objective of the proposed change?

b) If the perched water is considered as part of the saturated zone monitoring, will it also have to meet all the requirements of the saturated zone monitoring? If so, some fundamental problems will develop. For example:

   1) How do you provide meaningful groundwater contours for the various perched water zones.

   2) The use of the student t-test would be required during interim status, and this would be a totally inappropriate statistical evaluation method for perched water zones.

Union Oil believes this is an area where further discussion and a meeting is warranted.

17) EPA COMMENT

The description of the depth of the treatment zone (i.e., 3 feet) is not adequate (264.271 (c)(1)). It is very important to assure that samples from the active areas of the land treatment unit and background samples are monitoring similar horizons or layers of parent material. Because soils seldom consist of smooth, horizontal layers, the guidance manuals available state that it is not recommended to specify a single depth below the land surface as the bottom of the treatment zone. Rather, the bottom of the treatment zone should be defined as the bottom of a chosen diagnostic soil horizon. The sources used to identify the soil types in Section D-36 could be used to identify an applicable soil horizon once the specific soil(s) in the land treatment areas have been identified.

RESPONSE

As previously mentioned, the land treatment area has been extensively graded in order to minimize run-off slopes and optimize the overall contouring of the area. As a consequence, the original surficial soils have been extensively mixed, relocated and/or otherwise altered. Therefore, published soil reports are of little value since they were prepared prior to grading, and Union Oil will have to implement a new soil survey of the area to characterize the surficial soils. This survey will be performed as part of the treatment demonstration, if this alternative is selected.

18) EPA COMMENT

The locations of the lysimeters and soil cores are not adequate for the following reasons (264.278(b) and (d), 270-20(b)(3)(ii)):

a. The method used to determine the random sample locations is not provided. The recommended method is described in Section 9.4.2.1 of SW-874 as well as Sections 3.3, 3.4, 4.4, 4.5 of EPA/530-SW-84-016;

b. Documentation that at least six lysimeters are installed and six soil cores are taken at randomly selected locations per uniform area is not provided. If, however, a uniform area is greater than 12 acres, then at least two randomly selected soil cores should be taken per every 4 acres and composited in pairs and 2 lysimeters per every 4 acres should be installed;

c. Because the bottom of the treatment zone has not been adequately described, it cannot be demonstrated that the depth of the lysimeters (pages E-50, 51) or soil cores (page E-60) are adequate;

d. The locations of the above ground portions of the lysimeters are not provided. In order to prevent operational inconvenience and sample bias, the above ground portions of these devices must be located at least 30 feet from the sample location.

RESPONSE

As previously discussed, Union Oil intends to alter its administrative approach. In conjunction with this approach, Union Oil will submit to the agency for review and approval a detailed program plan.

19) EPA COMMENT

The sampling frequency of the lysimeters proposed in Section E-4c(3) is not adequate to meet 264.278 (e). The available guidance manuals indicate that samples should be collected and analyzed at least quarterly unless the wastes are applied very infrequently. If liquid is not present at a regularly scheduled sampling event, the monitoring device should be evacuated prior to and checked within 24 hours following each significant waste application or rainfall event, and a sample drawn when sufficient liquid is present. Also, the sample preservation and shipment procedures E-4c(5) and E-4d(5) (E-3b(3)) are not adequate. See Appendix B, page B-6 of EPA/530-SW-84-016.

RESPONSE

As previously discussed, Union Oil intends to alter its administrative approach. In conjunction with this approach, Union Oil will submit to the agency for review and approval a detailed program plan.

20) EPA COMMENT

A description of the materials used to construct the lysimeters is not provided. Because these devices will be used to collect samples for organic analyses, inert materials such as glass, teflon, and stainless steel must be used for all parts of the sampling device which come in contact with the sample.

RESPONSE

As previously discussed, Union Oil intends to alter its administrative approach. In conjunction with this approach, Union Oil will submit to the agency for review and approval a detailed program plan.

21) EPA COMMENT

The installation of the lysimeters is not adequate to meet 264.278(e) for the following reasons:

a. Page E-49 states that they are installed at a depth of 4-6 feet, page E-50 states that they are installed at a depth of 2-5 feet and pages E-50 and 51 state that they are installed at 28 and 40 inches;

b. Page E-48 references Figure E-11a as a typical vacuum lysimeter installation. This figure shows that the lysimeter is not completely covered by soil, this is not consistent with the description in Section E-4c(1);

c. Page E-48 states that placement of bentonite

pellets in the bottom of the hole is optional. This is not an acceptable installation method. Bentonite pellets must be placed below the lysimeter;

d. Section E-4(c)(1) does not indicate if the lysimeters were tested before they were installed;

e. Section E-4(c)(1) does not indicate how the existing lysimeters were installed.

RESPONSE

As previously discussed, Union Oil intends to alter its administrative approach. In conjunction with this approach, Union Oil will submit to the agency for review and approval a detailed program plan.

22) EPA COMMENT

The analytical methods (i.e., parameters being monitored) described in Section E-4c(6) and E-4d(6) are not adequate to meet the requirements of 264.278(e)(3) because they are not based on an acceptable treatment demonstration and monitoring for only these parameters would not be sufficient to determine if there is a statistically significant change over background values for any of the hazardous constituents to be monitored under 264.278(a). Also, the analytical methods must be referenced to specific methods in SW-846.

RESPONSE

Analytical methods to be used will employ specific methods referenced in SW-846 if the phased approach is the selected alternative. Section E of the Part B permit application has been changed accordingly.

23) EPA COMMENT

The chain of custody procedures indicated in Section E-4c(7) and E-4d(7) (E-3b(5)) are not

adequate to meet the requirements of 264.278(e)(4) because they do not include the following:

a. Sample labels;
b. Sample seals;
c. A field log book;
d. A chain of custody record which accompanies every sample;
e. A sample analysis request sheet;
f. The sample delivery to the laboratory;
g. The shipping of samples;
h. The receipt and logging of samples at the laboratory.

All of the above items are discussed in Appendix B of EPA/530-SW-84-016.

RESPONSE

Sections E-3b(5), E-4c(7) and E-4d(7) have been revised to read as follows:

E-3b(5) Chain of Custody
E-3b(5)(a) Sample Identification

All samples obtained pursuant to this program will be identified by labels or tags affixed to the sample container. Information provided on the label by sampling personnel will prevent misidentification of samples or contents. At a minimum sample identification, labels will provide the following information:

- Sample ID number
- Time and date of sample collection
- Sample matrix
- Preservatives used
- Name of collector and company identification
- Sample location/facility code.

Labels will be affixed to sample containers prior to or at the time of sampling. Sampling information will be completed at the time of sampling. Sample seals to preserve the integrity of the samples prior to analysis will be utilized. Seals used will consist either of gummed paper or tape over or around the container and cap. In lieu of preprinted seals, the collectors initials, date and sample ID number validate the seal during transit

to the laboratory.

E-3b(5)(b) Chain of Custody

The Chain of Custody Record will be initiated in the field by sampling personnel. At the time of sampling, physical measurements and observations will be recorded in a field book. The field book will include but is not limited to the following information:

- Date
- Personnel responsible for sampling
- Assistants and/or visitors
- Plan/plot sketch of monitoring stations
- Monitoring station ID number
  - location
  - physical measurements
- Sample method, preservation, log number
- Field observations
- Results of field analyses, if conducted
  - pH
  - specific conductance.

The Chain of Custody Record Form (Figure E-10) will accompany all samples during transit to the laboratory. This procedure will establish the necessary documentation to trace sample possession from the time of collection to arrival at the laboratory. Information provided on the Chain of Custody Record will act as a manifest during transit to prevent loss of sample containers and provide required information for processing and handling.

At a minimum, the Chain of Custody Record will incorporate the following information for each sample.

- Sample or station ID number
- Name and signature of samplers
- Time and date of collection
- Facility location identification
- Sample matrix
- Number of containers
- Sample analysis request
- Signature of persons involved in the chain of possession

- Inclusive dates of possession.

Samples will be transported to the contract laboratory using shipping methods to insure prompt delivery (48 hours or less) and demonstrated custody security. Signatures are required at change of possession, and at a minimum that person accepting custody shall maintain the samples in a secure area which is restricted to authorized personnel. Upon arrival at the contract laboratory, samples and Custody Record will be inspected. Receipt at the lab will be documented by their signature on the official Chain of Custody Record. Samples will then be logged into the laboratories own sampling handling program according to SOW No. 784 Contract Laboratory Program protocols or equivalent methods.

24) EPA COMMENT

Section E-4c(8), background values for parameters, is not adequate to meet the requirements of 264.278(c) for the following reasons:

a. The parameters monitored are not adequate for the same reasons identified in Item 22 and 3a (264.278(c));

b. It has not been demonstrated that the soils in the background plot have similar characteristics to those in the treatment zone (264.278-(c)(1) and (2)). If the response to item 5 determines that more than 1 uniform area exists, more than one background plot may be necessary due to the different soil types within the treatment unit;

c. Background soil-pore liquid values must be based on at least quarterly sampling for one year (264.278(c)(2));

d. At least 8 randomly selected soil cores must be taken within the 6 inch depth below the treatment zone. These may be composited into 4 composites.

e. The form that the background values are expressed in was not provided for the lysimeters and was not adequate for the soil cores (264.278(c)(3)). According to 264.278(d), the results of unsaturated zone monitoring must be in a form sufficient for determining statistically significant increases under 264.278(f). An example format is provided in Appendix C of EPA/530-SW-84-016, December 1984.

f. The locations and depths of the background samples are not adequate (264.278(c)(4) and 264.278(b)(1)) because the classification of the soil(s) (and therefore uniform areas) within the treatment areas is not adequate, and the depth of the treatment zone is not adequately defined.

RESPONSE

Section E-4c(8) has been revised to read as follows:

E-4c(8) Background Values for Parameters

Union Oil is currently in the process of establishing a control area to provide information on the background concentrations of waste constituents. The control area (Figure E-1) will be located in similar but untreated soils nearby. As currently planned, the control area will be located adjacent to and north of the existing land treatment area. Upon establishment of the control area, and soil uniformity, background monitoring consisting of one year quarterly sampling (see E-3d(3) sampling schedule groundwater monitoring) will be conducted and analyzed. Procedures for analysis will follow those utilized for monitoring the zone of aeration within the land treatment.

Upon selection of the preferred alternative approach, questions regarding specific parameters, random sampling location, background concentrations and soils uniformity will be resolved. if necessary.

25) EPA COMMENT

Sections E-4c(9) and E-4d(9), evaluation of data, are not adequate to meet the requirements of 264.278(f) because they do not indicate how a statistically significant change over background values for any hazardous constituent to be monitored under 264.278(a) will be determined.

RESPONSE

Sections E-4c(9) and E-4d(9) have been revised to read as follows:

In view of the very limited amount of data presently available to characterize both the lysimeter pore water or the soils in the immediate area, Union Oil suggests that a one year bi-monthly sampling effort be undertaken. This effort will generate 6 sets of data which will more accurately describe the pore water and the soils.

At the conclusion of the sampling period, Union Oil will use statistical and graphical procedures to define a statistically significant change over the background conditions. For example, statistical procedures could be of the type Union Oil expects to use in the groundwater assessment program (i.e., non-parametric methods). Alternatively, a graphical procedure to determine a change from baseline conditions may involve comparison of two consecutive samples. Using this approach, a change from baseline conditions may be suggested if two consecutive measurements from lysimeters or soil samples fall outside the range of observations described during the previous baseline sampling period (i.e., two consecutive measurements below lowest previous measurements or higher than the highest previous measurements). We suggest that a meeting be held to discuss these items.

26) EPA COMMENT

The term "anomalous increase" in Sections E-4c(10)

and E-4s(10) needs to be defined. The appropriate actions as set forth in 40 CFR 264.278(g) and/or (h) also need to be defined.

RESPONSE

Sections E-4c(10) and E-4d(10) will be changed to read as follows:

In the event it is determined that there is an anomalous increase for the parameters listed in Section E-4c(2) at any of the pore water lysimeter installations/soil core monitoring locations, the Chicago Refinery will implement the appropriate sections as set forth in 40 CFR Part 264.278(g) and/or Part 264.278(h).

The term "anomalous increase" means:

A change in measured parameter that cannot be explained by the normal environmental variation measured during the baseline sampling period. Should an "anomalous increase" be discovered during the operational monitoring period, additional sampling and analysis will be initiated to define potential causes of the observed increase.

Exceedence of the action level or trigger mechanism will be reported to the agency within seven days following its verification. At that time, the facility will determine whether a permit modification 264.278(g) or document an alternate source pursuant to 264.278(h) will be sought. In either case, the facility will submit its report/application within 90 days following notification.

27) EPA COMMENT

Justifications of principle hazardous constituents to be monitored in the unsaturated zone monitoring program in Sections E-4c(2) and E-4d(2) are not adequate because they are not based on an acceptable treatment demonstration (264.278(a)(2)).

RESPONSE

Sections E-4c(2) and E-4d(2) has been revised as follows:

E-4c(2) Selection of Monitoring Parameters

Consistent with an approved treatment demonstration, hazardous constituents will be identified and evaluated for incorporation into the monitoring program when results are available.

Parameters to be monitored will include the following categories:

1. Constituents which caused the wastes to be listed as hazardous under 40 CFR Part 261.

   - chromium
   - lead

2. Parameter used to monitor waste degradation rates:

   - oil and grease

3. Selected organic and/or inorganic parameters:

   - Based on the waste characterization plan described in Section C and results of treatment demonstration, selected organic and/or inorganic parameters will be incorporated into the pore water monitoring program. The selection of supplemental parameters will be based on the results of the waste characterization, the mobility, stability and persistence of parameters identified, concentration of parameters contained in the waste and treatment demonstration degradation products.

     It should be noted that the volume of pore water collected in the lysimeters may vary greatly. Therefore, it is likely that sufficient samples will not always be available to analyze all

parameters listed above.

E-4d(2) Selection of Monitoring Parameters

Parameters to be monitored include the following categories:

1. Constituents which caused the wastes to be listed as hazardous under 40 CFR Part 261:

   - chromium
   - lead

2. Parameters used to monitor waste degradation rates:

   - oil and grease

3. Selected organic and/or inorganic parameters.

   - Based on the waste characterization plan described in Section C and results of the treatment demonstration selected, organic and/or inorganic parameters will be incorporated into the soil monitoring program. The selection of supplemental parameters will be based on the results of the waste characterization, the mobility, stability and persistence of parameters identified and the concentration of parameters contained in the waste and treatment demonstration degradation products:

4. Parameters used to adjust and optimize degradation rate in the land treatment area:

   - pH
   - cation exchange capacity
   - macro-nutrients (N, P_2O_5 and K_2O).

28 and 29) EPA COMMENTS

28) A description of the type of sampling equipment used for soil cores and the reason it was chosen is not provided (264.278(e)).

29) The soil core sampling procedure described in Section E-4d(4) (Page E-60) is not adequate to meet the requirements of 264.278(e) for the following reasons:

a. Step by step procedures as described in Section 3.5 of EPA/530-SW-84-016 are not provided. These must include:

   i. Preliminary preparation of the site,
   ii. Vertical alignment of the tool in the hole,
   iii. Discarding soil from non sampling horizons,
   iv. Measuring the depth of the hole.
   v. Collecting soil samples from the tool, and
   vi. Backfilling the hole with soil to prevent vertical leakage of pollutants from the treatment zone;

b. It does not indicate how a sample will be obtained from within 6 inches from the bottom of the treatment zone;

c. It does not address the compositing of samples as described in Section 3.4.1 of EPA/530-SW-84-016.

d. It does not address decontamination of the sampling equipment as described in Section 3.6 of EPA/530-SW-84-016.

e. The methods used to prevent contamination of soil core samples are not provided. These methods should address cross contamination from other soil cores as well as contamination of the individual soil zone being sampled due to soil falling into the cavity from the land surface or from the walls of the borehole.

RESPONSE

Section E-4d(4) will be revised as follows:

E-4d(4) Sampling Procedures

The purpose of the soil sampling programs is to determine if waste constituents are present or have migrated below the treatment zone. To effectively assess this condition, the following procedures are followed.

- Survey: Conduct a preliminary survey of the site identifying such items as soils types within treatment areas, plot layout, reference datums for each plot, etc. As part of the survey random monitoring stations are established and located. Low areas, swales and other such "hot spots" should also be identified and located for soil cores. A minimum series of six soil cores are to be taken per each uniform treatment area and in no case will the sample density be less than 1 soil core per 2 acres.

- Sample Equipment: Tube, barrel or split spoon type samplers will be used to obtain cores. Samplers can be either hydraulic or hand driven. Samplers are to be detergent washed between uniform plots and steel brushed between samples to avoid contamination.

- Soil Core Sampling: Soil core samples will be collected at each monitoring location identified in the preliminary survey. All soil cores are to be conducted in a vertical profile as can be visually determined (slight misalignment does not significantly affect the measured depth of soil cores). Soil cores will be advanced from a depth of 3 feet to a final depth of 6 feet below grade. The depth of each core will vary depending on the type of sampler used. Following driving or pressing the sampler, the tip depth will be determined and recorded in a field log book. Unwanted soil cores will be discarded on the surface for subsequent incorporation into the treatment zone. Soil cores taken from depths of 3-3.5 feet (91-106 cm); 3.5-4.5 feet (106-137 cm); 4.5-6.0 feet (106-150 cm) will

be composited. Soil core recoveries are to be measured and recorded in the field log. Recoveries of at least 75% should be maintained by adjusting length of core run. The first 0.5 feet below the treatment zone (3 feet) will be split into four replicate samples and submitted with other composites for analysis.

Soil cores will be composited in separate containers and stored in glass sample bottles to prevent contamination of the cores or adjacent soil samples. At completion of coring at each monitoring location, powdered bentonite is used to backfill the core void. This low permeability material will prevent possible migration down the core holes.

Saturated Zone

30) EPA COMMENT

The interim period groundwater monitoring data required by 270.14(c)(1) are not adequate because of the following:

a. The most recent analytical and potentiometric data are not provided. This should include quarterly groundwater quality data since March 1983 and potentiometric contour maps of the data collected since the application was originally submitted;

b. Specific descriptions of the collection, preservation, shipping, and analytical procedures used to obtain the background samples along with copies of the chain of custody forms are not provided in 265.92(a);

c. Copies of past statistical analyses, a description of the problems associated with the student t-test (pH) and a copy of Union Oil's notification of a statistically significant increase are not provided.

RESPONSE

Union Oil is currently in the process of developing a packet of the requested data for resubmission. It should be noted that the requested data have previously been submitted to the agency. However, it appears that the internal distribution of submissions within the agency may not be comprehensive enough to provide copies to appropriate recipients. To avoid these difficulties in the future, Union Oil is requesting an Agency distribution list, and in the future Union Oil will provide copies of all submissions to parties identified on the distribution list.

31) EPA COMMENT

The identification of the uppermost aquifer and the data used to document this information (270.14(c)-(2)) are not adequate for the following reasons:

a. The cross sections provided (Figure E-2) do not include all land treatment areas. Specifically:

   i. Area II,
   ii. The intermittent stream and any stream deposits associated with it;

b. The results of in-situ tests to determine the hydraulic conductivities of all shallow and deep wells need to be provided;

c. The results of in-situ and laboratory tests of the hydraulic conductivity of the silty clay/clayey silt zones need to be provided;

d. The physical properties of the dolomite (both weathered and unweathered) need to be described in much greater detail. Specifically, the following need to be determined:

   i. Hydraulic conductivity,
   ii. Porosity,
   iii. Potentiometric data (hydraulic gradient) and contour maps,
   iv. The degree of interconnection with the unconsolidated deposits,

v. Flow rate and direction of groundwater in the dolomite (not the soil/bed rock interface, page E-26),
vi. Any fractures/fracture planes,
vii. Weathering of the dolomite;
viii. The effect of any pumping wells;

e. Structural contour maps of the weathered and unweathered dolomite need to be provided;

f. The presence of what appears to be a continuous sand layer at elevation 630' needs to be discussed in greater detail and Figures E-3, 4, 5, 6 revised to indicate its location;

g. The effect of the Chicago Sanitary and Ship Canal and the I & M Canal on the groundwater needs to be determined;

h. Why were the shallow sand and gravel deposits at elevation 660' in MW-3 and MW-5 drawn as stringers and not as a locally continuous sand seam in Figure E-3?

i. SW-7 detected sand and rock fragments at a depth of 39 feet (elev. 660) and MW-7 indicates a bolder at 35' and 44' yet Figure E-4 shows silty clay/clayey silt at this depth and location;

j. MW-5 and MW-8 indicate sand and gravel deposits at elevations 635' and 655' yet Figure E-6 does not show these as continuous seams.

k. The effect of local pumping on the groundwater flow rate and direction needs to be determined.

l. The cross-sections and boring logs should be used to construct a fence diagram in order to clearly define the interconnected aquifers beneath the facility.

m. All new cross sections must indicate the screened intervals of the monitoring wells (both SW and MW series).

n. The vertical limits of the soil types indicated in the SW series and MW-7, 8, and 9 boring logs need to be identified.

RESPONSE

Union Oil has questions pertaining to the degree of data development necessary to provide Part-B compliance. We believe this is an area where a meeting and further discussions are appropriate.

Detection Monitoring Program

32) EPA COMMENT

The "selected organic/inorganic parameters" must be proposed for the detection monitoring program. Although the list of parameters will be dependent on the outcome of the treatment demonstration, an initial list based on laboratory analyses of both the hazardous and nonhazardous wastes for the parameters indicated in Attachment 1 to this letter needs to be provided with the next submission. Simply providing procedures for selecting parameters is not acceptable to meet the requirements of 264.98(a) for the following reasons:

a. The types, quantities, and concentrations of hazardous constituents in the wastes have not been identified (264.98(a)(1));

b. A description of the expected mobility, stability, and persistence of waste constituents, or their reaction products, in the unsaturated zone beneath the treatment zone is not provided (264.98(a)(2));

c. The detectability of the indicator parameters,

waste constituents, or their reaction products in the groundwater is not specified (264.98-(a)(3)).

d. Reasons for selecting the groundwater quality and indicator parameters (page E-36) need to be provided. Will statistical analyses be run on all of these parameters as well as the organic/inorganic parameters?

RESPONSE

As previously discussed, Union Oil intends to alter its administrative approach. In conjunction with this approach, Union Oil will submit to the agency for review and approval a detailed plan. During the interim period and consistent with Union Oil's groundwater assessment program, the following activities will be performed:

Union Oil will perform chemical analysis on monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9 for those wastes constituents identified below.

Union Oil proposes to perform the following analysis using the analytical method noted.

PARAMETERS	EPA METHOD
Arsenic	6010, 7060 or 7061
Barium	6010, 7080 or 7081
Cadmium	6010, 7090 or 7091
Chromium	6010, 7190 or 7191
Lead	6010, 7420 or 7421
Mercury	7420
Selenium	6010, 7740 or 7741
Silver	6010, 7760 or 7761
Volatile Priority Pollutant Compounds	8240
Semi-volatile Organics (acid, base/neutral extractable priority pollutant compounds)	8250

Sampling and analytical methods are presented herein as Attachment A and Attachment B, respectively.

The analytical data will be analyzed in the following manner:

1) Metals: analytical data will be compared with baseline quarterly results and anomalies identified, if they exist. Additionally, the analytical results will be compared to primary drinking water standards to determine if groundwater quality exceeds the standards.

2) Organics: analytical data will be evaluated in a binary "yes-no" manner such that if no organic contaminants are identified, no further evaluation will be performed. Conversely, if organics are identified, further evaluations as to the nature, magnitude and possible source of organics will be performed.

Groundwater Monitoring Program

33) EPA COMMENT

The design of the wells (MW series) is not adequate to monitor the groundwater in the uppermost aquifer (264.97(a)(b), and (c)) for the following reasons:

a. In order to obtain a representative sample from the strata being monitored, the screened interval must be less than or equal to 10 feet;

b. The sand pack should extend a maximum of 1 foot above or below the screened interval;

c. The annular space must be filled with expanding cement grout;

d. The slotted screen must be manufactured (not hand cut with a hacksaw). The size of the slots must be based on the grain size of the sand pack around the screen as well as the

grain size of the strata being monitored;

e. The section of the well which is placed in the saturated zone must be constructed of stainless steel (SS-316) or teflon because organic parameters are being monitored at this facility.

Based on the above design deficiencies, new monitoring wells must be installed at the facility.

RESPONSE

Union Oil has questions pertaining to the degree of data development necessary to provide Part-B compliance. We believe this is an area where a meeting and further discussions are appropriate.

Additionally, many of the existing wells were installed following discussions, review, and approval by the IEPA. If the well installations which were once approved are now unacceptable, what assurances can the agencies provide to Union Oil that a newly installed and approved monitoring network will not also be found to be deficient in the future?

34) EPA COMMENT

The spacing of the wells must be 150 feet or less unless a demonstration (i.e., computer model) justifying a greater spacing is provided (264.97 (a)).

RESPONSE

General requirements of 264.97(a) state that:

> "The ground-water monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that:
>
> Represent the quality of groundwater passing the point of compliance."

The specific spacing of 150 feet is based upon draft guidance and is not a part of the regulation. The spacing of wells and as such the number of wells is to provide representative groundwater quality determinations. This is a probabiliatic determination governed by the natural variations of the water quality. The required number of monitoring points as such may be greater or less than the number established by a crude 150 foot spacing. The number of wells only establishes the degrees of freedom and the confidence level of how representative any given sample is.

The monitoring system at the Union Oil Chicago Refinery may require supplemental wells to establish an acceptable level of monitoring. A system upgrading is being evaluated using modeling techniques and will be provided when available. It is doubtfull whether a 150 foot spacing is however warranted or necessary to meet 264.97(a) requirements.

35) EPA COMMENT

The screened intervals for wells MW-4, MW-6, MW-7, and MW-9 and possibly MW-3 and MW-5 are unacceptable (264.97(a)). It appears that in order to adequately monitor the uppermost aquifer, wells should be placed in the 630' sand zone (where saturated) and the weathered dolomite. If a large portion of the dolomite (i.e., greater than 20 feet) is capable of producing water, additional wells at deeper elevations will be required. Therefore, nested wells are necessary to adequately monitor the uppermost aquifer.

RESPONSE

Union Oil has questions pertaining to the degree of data development necessary to provide Part-B compliance. We believe this is an area where a meeting and further discussions are appropriate.

Additionally, it should be noted that the sand zone at elevation 630 is not the upper most aquifer. It is in fact one of the lower of many perched water

zones that occur throughout the site and overlie the water table.

36) EPA COMMENT

The monitoring wells are not adequate to produce representative samples because the well placement is not adequate (264.97(a)(1) and (2)). They must be nested in the 630' sand and the dolomite.

RESPONSE

Union Oil has questions pertaining to the degree of data development necessary to provide Part-B compliance. We believe this is an area where a meeting and further discussions are appropriate.

37) EPA COMMENT

Background values for each proposed monitoring parameter or constituent are not provided (264.98 (c), 270.14(c)(6)(iii)). When a new monitoring system is installed, new background data must be collected in accordance with 264.97(g). The background values must be expressed in a form necessary for the determination of statistically significant increases under 264.97(h).

RESPONSE

Union Oil is currently in the process of developing a packet of the requested data for resubmission. It should be noted that the requested data have previously been submitted to the agency. However, it appears that the internal distribution of submissions within the agency may not be comprehensive enough to provide copies to appropriate recipients. To avoid these difficulties in the future, Union Oil is requesting an Agency distribution list, and in the future Union Oil will provide copies of all submissions to parties identified on the distribution list.

38) EPA COMMENT

The procedures for sample collection are not adequate to meet the requirements of 264.97(d)(1) for the following reasons:

a. The type of bailer is not specified. The bailer must be constructed of stainless steel (SS-316) or teflon and have a bottom valve. The cord used with the bailer must be constructed of a material which does not conflict with the constituents being sampled;

b. It is not clear why pages E-30 and E-31 describe the decontamination of bailers when Page E-32 states that each well has its own dedicated bailer. In any case, each well must have a dedicated bailer which meets the criteria described in a. above;

c. Should decontamination be required, methanol should not be used. The available guidance manuals indicate that acetone or hexane should be used to decontaminate samplers used to collect samples for organic analysis;

d. The total depth of the wells must be measured and recorded each time the wells are sampled;

e. Procedures to ensure that parameters which are pH and/or volatile sensitive are sampled first are not specified;

f. The well evacuation procedures need to be modified to indicate that on the day of sampling, the wells are evacuated to dryness or have 3 well volumes removed. Under no circumstances should more than 3 hours pass between well evacuation and sampling.

g. Procedures to dispose of the evacuated well water need to be specified;

h. Procedures to sample "floaters" (if present) prior to well evacuation need to be provided;

i. Procedures to record any observations during sampling and well evacuation in a field notebook need to be provided;

j. Any special sampling procedures for organic compounds need to be specified.

RESPONSE

a) PVC has not been shown to cause significant errors in groundwater quality analyses due to sorption/desorption processess during bailing or sampling. Generally, the surface to volume ratio is such that any miniscule sorption is undetectable. In wells which have dedicated bailers equilibrium of sorbed species is rapidly reached and subsequent surface chemistry changes are small with respect to overall well quality. As such, the advantages of low cost, structural integrity availability, override concerns of contamination. Union Oil utilizes poly rope and has found no difficulty with contamination since the rope does not come in contact with the well water.

b) Item 10 of Section E-3b(2) has been changed to reflect the fact that all wells have dedicated bailers.

c) Since all wells now have dedicated bailers, methanol is no longer utilized.

d) Agreed. Section E-3b(1) has been revised to reflect this change.

e) pH is to be determined in the field and is determined from a freshly bailed sample. Other sensitive parameters will be given a sampling priority when identified. Volatile organic analyses are currently not conducted.

f) In many till and perched groundwater conditions, there is insufficient recharge within three hours to obtain sufficient volumes for analysis. By standardizing sampling at 24 hours following purging, sufficient water volumes exist and temporal errors can be minimized. This is conducted to provide consistent procedures between wells and seasonal water availability fluctuations. It is generally felt that such an approach eliminates one source of possible error, as

such a 24 hour recharge period prior to sampling is specified.

g) The volume of purged water will be discharged on the ground in the area of the monitoring well. In most instances, the low or no contaminant level of the groundwater will not adversely affect the area. For highly contaminated wells, purge waters will be directed back to the land treatment areas and managed as run-on/run-off waters.

h) At present, organics having a specific gravity of less than 1 have not been identified. As such, special requirements to sample these compounds are not required.

i) Provided, see E-4c(7).

j) None required at present.

E-3b Sampling and Analytical Methods

E-3b(1) Ground Water Surface, Elevation and Direction of Flow

Chicago Refinery personnel measure the depth to the water table in each well at least semi-annually. The water level measurements are converted to elevations and a ground water contour map is drawn to provide insight into the direction of ground water flow beneath the treatment area. The procedure followed is shown below:

1. Measure the water level using the water level indicator. Measurements are from top of casing to water level, and are recorded to nearest 1/10 of an inch. Only one measurement per sampling period is required.

2. Convert this water level reading to a water table elevation, and prepare ground water contour map.

3. Measure the total depth of well by lowering the water level indicator until the probe touches the well bottom. Record the total depth measured from the top of casing to the nearest 1/10 of an inch.

E-3b(2) Ground Water Sampling Procedure - See Attachment E-8

E-3b(3) Sample Preservation and Shipment - see Attachment E-8.

E-3b(4) Analytical Methods

Ground water quality samples are presently analyzed by Environmental Testing and Certification Labs, who employ U.S.E.P.A. analytical methods. For additional information and documentation, refer to revised Attachment E-9.

39) EPA COMMENT

The procedures for sample preservation and shipment are not adequate to meet the requirements of 264.97(d)(2) for the following reasons:

a. It is not adequate to state that "the methods are in accordance with EPA...or approved alternative methods". The specific methods need to be stated in the application and referenced to SW-846;

b. The parameters which each aliquot will be sampled for (Attachment E-8) need to be specified.

RESPONSE

Please reference revised Attachments E-8 and E-9.

40) EPA COMMENT

The analytical procedures indicated in Section E-3b(4) are not adequate to meet the requirements of 264.97(d)(3) for the following reasons:

a. Specific analytical methods for each parameter being monitored need to be identified in the application. These methods must all be referenced to SW-846;

b. If pH and specific conductance are to be used as indicator parameters, their values must be determined in the field at the time of sampling. Procedures for the field measurement of these parameters are not provided;

c. The use of blanks, spikes or duplicates needs to be discussed.

RESPONSE

Please reference revised Attachment E-8 and E-9. Additionally, for parameters not identified in Attachments E-8 and E-9, SW-846 will be used to identify specific analytical methods.

41) EPA COMMENT

The sampling and analysis period for organic and inorganic parameters must be semi-annually (264.98 (d)).

RESPONSE

Sampling and analysis will be performed on a semi-annual basis.

42) EPA COMMENT

The procedures for determining the flow rate of groundwater in the uppermost aquifer is not provided (264.98(e)).

RESPONSE

Consistent with Union Oil's Groundwater Assessment Program, Union Oil intends to determine the rate and direction of groundwater movement in the

following manner:

"If on the basis of the proposed Phase II program, the analytical results demonstrate contamination exists, a reasonable and conservative approximation of the rate and direction of contaminant flow can be equated to groundwater flow using Darcy's Law. This would obviously be a worst case approximation, since it excludes consideration of contaminant attenuation and is, in effect, a "pipe model".

43 and 44) EPA COMMENT

43) The procedures to be used to determine whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point are not provided (264.98(g)).

44) The statistical comparison procedures which will be used to evaluate whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point are not provided (264.98 (g)(1), 264.97(h)).

RESPONSE

It is proposed that non-parametric statistical analyses be utilized. In brief, Union Oil proposes to assign ranks to all historical data, from least to greatest, corresponding to their absolute magnitude. All future monitoring data be verified and then assigned a rank based on previously collected data at either the downgradient well (if baseline data from the downgradient well is available) or at the upgradient well. These ranks will provide an indication of potential effects, and statistically significant differences would be calculated using the Kruskal-Wallis non-parametric procedure.

Use of the above statistical analysis relies on the following assumptions:

1. Data from the upgradient monitoring well, or

alternatively the baseline data from downgradient monitoring wells, adequately and representatively reflect existing groundwater quality and associated variability in groundwater quality in the area.

2. The downgradient monitoring wells will show effects of change if, and only if, the intervening area produces some change in groundwater quality.

3. There is no cyclical pattern to the groundwater system or, if there is such a pattern, that the groundwater data collected to date are sufficient to explain expected variation within the area.

45) EPA COMMENT

An estimate of the time period, subsequent to sampling completion, within which the results of the statistical analysis will be available is not provided (264.98(g)(2)).

RESPONSE

Based on current analytical turn-around time, it is estimated that statistical results will be available approximately 3-4 months after sampling.

Perched Water Table Monitoring

46) EPA COMMENT

The well spacing for the SW series wells needs to be justified. This may require some computer modelling. Also, the design of the present wells is not adequate because of the large screened interval and sand pack, materials of construction and backfilling of the annulus with native clay.

RESPONSE

The shallow wells were installed in a manner and at locations agreed to by the IEPA. It is Union Oil's understanding that at the time, the IEPA believed that the monitoring of the first perched water zone would provide an early warning system to detect potential contaminant migration.

Union Oil has considered modelling of the perched water zones. However, we have been unable to identify any verified computer codes applicable to modelling flow in heterogeneous anisotropic perched water zones. On the basis that the EPA recommended modelling, Union Oil requests a literature reference or source of the specific code(s) that the EPA had in mind.

47) EPA COMMENT

The background data indicated in Section E-4b(8) should be provided.

RESPONSE

Union Oil is currently in the process of developing a packet of the requested data for resubmission. It should be noted that the requested data have previously been submitted to the agency. However, it appears that the internal distribution of submissions within the agency may not be comprehensive enough to provide copies to appropriate recipients. To avoid these difficulties in the future, Union Oil is requesting an Agency distribution list, and in the future Union Oil will provide copies of all submissions to parties identified on the distribution list.

48) EPA COMMENT

The sampling and analysis problems for these wells are the same as those for the MW series wells.

RESPONSE

Union Oil intends to utilize the same methods to rectify analytical problems as those previously outlined for the MW series wells.

49) EPA COMMENT

Some form of statistical and/or graphical analyses need to be specified for the data collected from these wells.

RESPONSE

Union Oil will use statistical and graphical procedures to define a statistically significant change over the background conditions. For example, statistical procedures could be of the type Union Oil expects to use in the groundwater assessment program (i.e., non-parametric methods). Alternatively, a graphical procedure to determine a change from baseline conditions may involve comparison of two consecutive samples. Using this approach, a departure from baseline conditions may be suggested if two consecutive measurements of water quality parameters fall outside the range of observations described during the previous baseline sampling period (i.e., two consecutive measurements below lowest previous measurements or higher than the highest previous measurements).

50) EPA COMMENT

The post 1984/1985 sampling schedule needs to be provided.

RESPONSE

Subsequent to 1984/1985, the perched water monitoring wells will be analyzed on a semi-annual basis.

PROCEDURES TO PREVENT HAZARDS

51) EPA COMMENT

Page D-40 states that wind dispersal control techniques are in place, but Section F does not include the inspection of these items (264.273(g)(2)).

RESPONSE

Page D-40 and Tables F-1 and F-2, copies attached, have been to show that wind dispersal control systems will be inspected.

"D-6 Control of Wind Dispersal

All hazardous wastes will be subsurface injected to minimize volatile emissions of organic constituents. Additionally, the buffer zones around each land treatment plot is covered with natural vegetation, which minimizes the impact of high winds entraining soil particles. Several areas within the land treatment site, as well as around the site perimeter, are wooded, which also significantly minimizes potential wind dispersal of soil. Therefore, the Chicago Refinery believes that sufficient wind dispersal control techniques are in place. Vegetation cover on the buffer zones will be included as part of the inspection program discussed in Section F."

52) EPA COMMENT

As discussed in Item 9 above, run-off control as required by 270.14(b)(8)(iii) is not adequate because the run-off flows across Mobil Oil property in an unlined stream.

RESPONSE

Since only nonhazardous waste will continue to be

land treated, and until a final Part B Permit is received, Union Oil will initiate a monitoring program for the intermittent stream. This monitoring will include flow, pH, specific conductance, TOC and TOX, and will begin after the 1985-1986 winter period.

53) EPA COMMENT

The precautions taken to prevent accidental ignition of the D001 waste are not adequate. The requirements of 264.281 need to be addressed. Also, the use of spark arresting mufflers and spark proof tools on and around the incorporation equipment (when D001 waste is present) needs to be discussed.

RESPONSE

Tank cleaning wastes are the only wastes which may have a flash point under 140°F, and therefore would be classified as ignitible, or D001. Union Oil will analyze all tank cleaning wastes and if such wastes are found with a flash point under 140° F, such wastes will not be land treated. Therefore, special precautions for handling ignitible wastes will not be required. Revisions to appropriate pages in the Part B Permit Application are attached.

CONTINGENCY PLAN

54) EPA COMMENT

The plan does not discuss the "immediate" implementation of the plan (264.51(b)).

RESPONSE

Page G-i has been revised to include the immediate implementation of the Contingency Plan. A revised

page G-i is attached.

55) EPA COMMENT

The various emergency plans indicated in Section H of Attachment G-1 need to be provided (264.56).

RESPONSE

The emergency plans referred to in Section H of Attachment G-1 refer only to the refinery operation and have no direct application to the land treatment area. The "Land Farm Emergency Plan" shown as item number 4 on the above referenced Section H of Attachment G-1 is Section G of the Part B Permit Application. To clarify this point, Section H of Attachment G-1 should be removed from the Part B Permit Application.

56) EPA COMMENT

Documentation that copies of the contingency plan have been sent to the facilities listed in Table G-5 is not provided (264.53).

RESPONSE

Attached are copies of the signed, returned certified mail receipts which were used to transmit copies of Section G - Hazardous Waste Contingency Plan and Emergency Procedures. This material should be added to the Part B Permit Application immediately after Figure G-4 in Section G.

57) EPA COMMENT

Did the recent explosion in naptha line spill require any modifications of the contingency plan?

RESPONSE

No. The 1984 explosion and the naptha line spill had nothing whatsoever to do with hazardous waste storage, handling and/or treatment, or with the land treatment operation.

PERSONNEL TRAINING

58) EPA COMMENT

Attending one conference in 1980 and one in 1981 (Table H-2) is not adequate documentation that the operations engineer has been trained in hazardous waste management (264.16(a)(2)). This documentation should include items such as a resume, list of recent conferences/seminars attended, and a description of all experience involving the management of hazardous waste both at Union Oil and any other facilities.

RESPONSE

Union Oil believes that the collective experience and education reflected in the listing of training courses and conferences shown on Table H-2 is more than adequate for operation of the land treatment system. Individuals listed on Table H-2 work and consult with each other on a day-to-day basis. Other training courses and conferences, as attended, will be added to Table H-2 to show continued educational experiences of the Union Oil staff.

59) EPA COMMENT

Pages H-12, 13 and 15 state that each area shift supervisor is an emergency coordinator. This does not appear to be consistent with Page G-13 or Table G-2.

RESPONSE

Pages H-12, 13 and 15 have been changed. Attached are revised copies for insert into the Part B Permit Application.

CLOSURE PLAN

60) EPA COMMENT

Section I-1a does not describe how closure of the facility controls, minimizes, or eliminates threats to human health and the environment (264.111).

RESPONSE

Development of the appropriate data to respond to the above comment will be dependent on which option is ultimately chosen:

1. Under a treatment demonstration program, information on degradation products and data showing destruction, transformation or immobilization of hazardous constituents will be collected.

2. Under an approved Closure Plan, additional information will be collected to document that existing conditions, and continued operation for only nonhazardous wastes, pose no threat to human health or the environment.

61) EPA COMMENT

Partial closure is defined as closure of a discrete part or unit of the facility. In this case, a discrete unit would be a uniform area or one of Areas I, II, III, IV. Union Oil, however, indicates that after any of the three situations

described on pages I-3 and I-4, the land treatment area will resume operations. Therefore, it appears that the procedures outlined in Section I-1b, Partial Closure, should be included in the contingency plan. Also, the procedures in paragraph F of Section I-1b regarding the clean-up of incompatible wastes, need to be specified.

RESPONSE

Union Oil does not anticipate any reason for partial closure of any of the land treatment plots (Areas I, II, III or IV), or portion thereof, as defined by the EPA in the above comment. For clarification, the sections described on Pages I-3 and I-4 have been moved to Section G-Contingency Plan.

Since no incompatible wastes are generated, clean-up activities are not required. Clarification has been provided on Page I-7 in this regards.

Revised Pages for Sections I and G are attached.

62) EPA COMMENT

The procedures for final closure of the land treatment area are not adequate for the following reasons (264.112(a)(1)):

a. The soil sampling procedures must be consistent with Section E;

b. The accumulation of Appendix VIII constituents other than metals (lead and chromium) is not addressed;

c. In order to minimize infiltration, and therefore migration of hazardous constituents from the treatment zone, it appears that a clay cap should be placed on the treatment area. 264.118(a)(2)(i) requires that this cap be maintained during post closure;

d. Will the application of nonhazardous wastes continue during the 3 year closure period?

RESPONSE

As previously discussed, since the literature review has been rejected as an adequate treatment demonstration program, Union Oil has only two acceptable options, both of which would require considerable time and studies to respond to the above comments. Under the treatment demonstration program option, data would be collected that would specifically address comments 62(b) and (d). Procedures utilized would address comment 62(a). Continued operation under an approved Closure Plan will also include studies to respond to comments 62(b) and (d). Again, procedures utilized would address comment 62(a).

Union Oil does not agree that a clay cap would be required, nor warranted. Under either option, sufficient data would be collected to document what control and/or procedures would be necessary for final closure.

63) EPA COMMENT

The maximum inventory of wastes needs to be expressed in gallons as well as dry tons.

RESPONSE

Page I-16 has been revised; attached is a copy for insert into the Part B Permit Application.

64) EPA COMMENT

The description of the vegetative cover as required by 270.20(f) and 264.280(a)(8) needs to include the following:

a. Data showing that the cover can thrive in the soils and climate in which it will be planted;

b. The minimum percentage of soil cover to be maintained on the closed land treatment area;

c. The method to be used to establish and maintain the cover.

RESPONSE

In developing the procedures outlined in the Part B Permit Application, Union Oil discussed local climate conditions and pasture grasses utilized, with a local farmer. The mixture of timothy, clover, alsike and rye (at 50%, 35%, 5% and 10%, on a volume basis) is routine used for pasture purposes since:

1. The grasses are perennial, that is they have a life cycle longer than two years and are self-seeding. Therefore, unless physically removed or destroyed, an established pasture grass should last indefinitely.

2. Grasses are relatively tolerant of contaminants and provide excellent protection against erosion.

3. All four grasses are listed in Table 8.11, Regional Adaption of Selected Plant Materials, "Hazardous Waste Land Treatment" SW-874, Pages 476-493, which shows which grasses and other cover materials are suitable for seeding and development on land treatment units.

Appropriate revisions to Pages I-11 and new Pages I-11a and I-11b are attached to clarify this point.

65) EPA COMMENT

How will it be demonstrated that all organics have been degraded within the 3 year closure period (264.280(a)(1))?

RESPONSE

As previously discussed, additional studies would be initiated as part of either option previously identified by Union Oil. This would include either the treatment demonstration program or continued operation under an approved Closure Plan.

66) EPA COMMENT

The frequency of the post closure monitoring is not adequate. As required by 264.98(d) sampling must be at least semi-annually. The closure cost estimate should be revised to reflect this change.

RESPONSE

Page I-22 has been changed to indicate semi-annually monitoring; Table I-5 has been also changed to reflect increased closure costs. Attached are copies of Page I-22 and Table I-5 for insert into the Part B Permit Application.

Union 76 Division: East Region
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 223-85

RECEIVED
AUG 20 1985
SWD - AIS
U.S. EPA, REGION V

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P08 8720462

A. J. Eliskalns
Manager, Chicago Refinery

August 7, 1985

U.S. EPA, REGION V

Mr. Gale Hruska
RCRA Activities
U.S. Environmental Protection
Agency
Region V
P.O. Box A3587
Chicago, Illinois 60690

Dear Sir:

Hazardous and Solid Waste
Amendments of 1984 (HSWA)
Response

Enclosed is a copy of our response to your letter of May 9, 1985, for Union Oil, Chicago Refinery (ILD041550567), which requires that any revisions to the Part B Permit application due to the 1984 RCRA Amendments be submitted no later than August 8, 1985.

Other than this submittal, and our previous submittal of May 16 on past releases, our review of your May 9 request and the material attached thereto shows no revisions to our Part B Permit application are required.

Should you have any questions, please contact L. D. Erchull at the above telephone number.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw
cc: L. W. Eastep, IEPA
attachment 1 - HSWA Response
2 - ERM Visual Inspection Report
3 - USEPA Matrix
4 - May 16, 1985 Corrective Action Letter Response

COPY 2

205-41

Attachment 1

RESPONSE TO THE ADDITIONAL NEW REQUIREMENTS, HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984 (HSWA)

Union Oil Company of California
Chicago Refinery
ILD 041550567

1. Interim Status: HSWA Section 213, RCRA Section 3005(e)

   The Chicago Refinery submitted a Part B Permit application on July 13, 1984, which Permit application is currently undergoing a technical review.

   Certification for 40 CFR Part 265 Subpart F, ground water monitoring standards and 40 CFR Part 265 Subpart H, financial standards, will be submitted no later than November 8, 1985.

2. Minimum Technology Requirements: HSWA Section 202, RCRA Section 3004(o)

   Requirements for landfill and incinerator permits are not applicable.

   The surface impoundment, located within the landfarm area, is currently undergoing closure. Bottom soil samples have been collected and laboratory analysis is underway. Location of soil samples, number of samples and analytical program have been reviewed with the IEPA. At IEPA direction, we have proceeded with gathering specific soils data for both the surface impoundment bottom as well as background soils data in and around the Chicago Refinery property. The intent is to have this data become part of the revised Closure Plan so that if soils are left in place as proposed, such action can be justified by supporting analytical data. A revised Closure Plan, with all laboratory results, will be submitted to the IEPA as soon as such analytical results are received.

3. Surface Impoundments: HSWA Section 215, RCRA Section 3005(j)

   Since the existing surface impoundment is undergoing closure, this requirement does not apply.

4. Continuing Releases at Permitted Facilities: HSWA Section 206, RCRA Section 3004(u)

   The Chicago Refinery submitted a response titled Corrective Action Letter Response, dated May 16, 1985, which provides certification on potential releases from soild waste management units.

   Additionally, on July 30, 1985, the Chicago Refinery had an independent environmental consultant conduct a visual inspection of the Refinery complex to identify any areas where releases are currently occurring, or that potentially could be released in the future. A copy of the consultant's letter documenting that inspection is attached.

5. Corrective Action Beyond Facility Boundary: HSWA Section 207, RCRA Section 3004(v)

   Since no known releases of hazardous wastes or hazardous constituents have occurred, this requirement is not applicable.

6. Financial Responsibility for Corrective Action: HSWA Section 208, RCRA Section 3004(a)

   Since no known releases of hazardous wastes or hazardous constituents have occurred, this requirement is not applicable.

7. Regulated Unit: HSWA Section 243(c), RCRA Section 3005(i)

   This requirement is not applicable.

8. Ground Water Monitoring: HSWA Section 203, RCRA Section 3004(p)

   Since variances have not been requested, this requirement is not applicable.

9. Permit Life: HSWA Section 212, RCRA Section 3005(c)(3)

   This requirement is not applicable.

10. Waste Minimization: HSWA Section 224(b), RCRA Section 3005(h)

Chicago Refinery's Waste Minimization Plan involves the following steps:

1. Waste characterization to identify quantities, sources, and key physical, chemical or toxicological properties of waste.

2. Current management practice review to identify how waste streams are currently managed.

3. Evaluation of possible ways to segregate waste streams or reduce the quantity or toxicity of the waste at the source.

4. Evaluation of ways to reduce the quantity or toxicity of the waste after generation.

5. Evaluation of alternative methods for managing wastes, e.g., recycle, treatment or incineration as landfill alternatives.

6. For wastes that are sent off site for treatment, storage or disposal, evaluation of commercial TSD facilities to identify which sites can handle particular waste streams, the method of management used at those facilities, and any potential environmental problems at those sites.

Various groups of the Unocal Corporation are presently working on facets of the waste minimization program. This work is being done by Unocal corporate groups, 76 Division Refining of which Chicago Refinery is a part and industry efforts by the American Petroleum Institute (API) and the Western Oil and Gas Association (WOGA).

Specific examples of Chicago Refinery efforts in this area are as follows:

1. We have successfully segregated a listed hazardous waste stream, Heat Exchanger Bundle Cleaning Sludge (K050) out of a mixture of refinery corrosion products which is not a hazardous waste.

2. We have investigated disposal alternatives for another listed hazardous waste stream, Slop Oil Emulsion Solids (K049) into a RCRA incinerator or use as a feed stream to a sulfuric acid plant.

3. We are currently investigating dewatering alternatives for other refinery waste streams.

Another 76 Division refinery is currently investigating various dewatering techniques for many of their waste streams.

The Science and Technology Division is currently investigating procedures for stablization/solidification of wastes and procedures for deactivating/passivating catalysts.

The Corporate Environmental Sciences Group has a program in place to evaluate commercial TSD facilities.

Unocal is participating in the following industry waste studies by API and WOGA.

1. Evaluation of alternative technology to landfilling.
2. Evaluation of different types of incinerator processes.
3. Land treatment technology studies.

11. Exposure Information: HSWA Section 247, RCRA Section 3019(a)

This requirement is not applicable.

LDE:dlw

Attachment 2

ERM-North Central, Inc.
835 Sterling Avenue
Palatine, Illinois 60067
(312) 934-4646

Aug. 6, 1985

Mr. L. D. Erchull
Environmental Science Analyst
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Project No. 4036J4

Dear Mr. Erchull:

On Tuesday, July 30, 1985, I conducted a visual inspection of the land treatment area, the tank storage area, and the refinery complex for the purpose of identifying any areas where past or current releases of hazardous materials or constituents would be suspected due to visual indicators of such releases.

This visual inspection concentrated on areas of obvious staining or discoloration of drainage routes from storage tanks and process equipment, and areas of dead or stressed vegetation. Stormwater runoff, drainage ditches, storage ponds and discharge points were also inspected. A Union Oil employee accompanied me during this inspection to answer questions and to discuss past waste management practices at the Chicago Refinery.

Additionally, the May 16, 1985, Chicago Refinery response to the USEPA-Region V, on past and potential releases from solid waste management units was reviewed. The areas identified on the map attached to that submittal were visually observed during the inspection.

It was understood that if this visual inspection resulted in an identification of any suspect areas or situations, such area or situation would be investigated by Union Oil and, if appropriate, the May 16, 1985, certification to the USEPA-Region V would be revised.

Based on the information provided by the Chicago Refinery, the discussions with the Union Oil employee during and after the visual inspection, and the results of the visual inspection conducted by the undersigned, no areas were identified for further investigation. It is concluded that

the May 16 certification by the Chicago Refinery is accurate in that there are no known past or current releases, or potential releases, from solid waste management units.

Very truly yours,

ERM-NORTH CENTRAL, INC.

James W. Polich, P.E.
Principal

hw

IMPACTS OF SIGNIFICANT HSWA† PROVISIONS ON HAZARDOUS WASTE FACILITIES

▒ = This provision is not applicable to these types of facilities.

TYPES OF UNITS	Two liners + leachate collection and GWM or demonstration of equivalent protection (§202)	Waiver of two liners + leachate collection requirement (§202)	Retrofit with two liners and leachate collection and GWM within 4 years or waiver demonstration (§215)	Corrective action + financial assurance for prior releases (§206)	Submission of Part B within set time or loss of interim status (§213)	Elimination of ground water monitoring waiver for double-lined units and inspectable waste piles (§203)	Application of current 264 standards for new wastepiles (§243)	Exposure information and health assessments (§247)	Waste minimization certification (for on-site facilities only) (§224(b))	Part 264 Subpart F requirements (§243(c))	Mandatory review of permit after 5 years (§212)	Ban on disposal of bulk liquids (§201)
LANDFILLS:												
New units		▒	▒				▒					
Existing IS units	▒	▒	▒				▒					
Lateral expansions of existing units		▒	▒				▒					
Replacements of existing units		▒	▒				▒					
Monofill with metal casting molding sand	▒		▒				▒					
Monofill with foundry furnace dust	▒		▒				▒					
Units receiving waste 7/26/82-1/26/83	▒	▒	▒				▒		▒			
SURFACE IMPOUNDMENTS*:												
New units		▒	▒				▒					▒
Existing IS units	▒	▒					▒					▒
Lateral expansions of existing units		▒	▒				▒					▒
Replacements of existing units		▒	▒				▒					▒
Units receiving waste 7/26/82-1/26/83	▒	▒	▒				▒		▒			▒
LAND TREATMENT FACILITIES	▒	▒	▒				▒	▒				▒
WASTE PILE FACILITIES	▒	▒	▒					▒				▒
INCINERATORS	▒	▒	▒			▒	▒	▒		▒	▒	▒
STORAGE OR TREATMENT FACILITIES	▒	▒	▒			▒	▒	▒		▒	▒	▒

† Hazardous and Solid Waste Amendments of 1984 (section numbers for significant provisions are provided in the headings)

* Includes storage surface impoundments

Attachment 3

Attachment 4

Union 76 Division: Eastern Region
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 157-85

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P08 8720440

A. J. Eliskains
Manager, Chicago Refinery

May 16, 1985

Mr. Gale Hruska
RCRA Activities
U.S. Environmental Protection
Agency - Region V
P.O. Box A3587
Chicago, Illinois 60690

Dear Sir:

Corrective Action Letter Response

Enclosed is a copy of our response to your letter of April 26, 1985, for Union Oil, Chicago Refinery, titled Corrective Action Requirements.

Should you have any questions, please contact L. D. Erchull at the above telephone number.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw

Attachment

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL W.O. Number: 4036 J4

Well Number: UO-1 Total Depth: 3.0 ft Diameter: 6"

Surface Elevation: — Water Level: Initial: NFW 24-hrs: —

Screen: Dia. — Length — Slot Size —

Casing: Dia. — Length — Type —

Drilling Company: CANONIC Drilling Method: AUGER (6")

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes: BEGIN 1350
END BORING 1400

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE FILLED W/ CUTTINGS & SOIL	UO-1A	0-0.5 CLAYEY SILT, MOD YELLOWISH BROWN, ( ), 5-10% GRAVEL, DRY, POORLY COHESIVE.
1.0			UO-1B	
1.5			UO-1C	0.5-1.0 SAME AS ABOVE, SLIGHTLY MOISTER, ORANGEIL COLOR
2.0			UO-1A	1.0-2.0 CLAYEY SILT & SILTY CLAY, MOD YELLOWISH BROWN, ≈ 5% GRAVEL, LOW TO MOD MOISTURE, LOW TO MOD COHESIVENESS
2.5				
3.0				2.0-3.0 SAME AS ABOVE 3.0 END OF BORING

NO FREE WATER IN HOLE ON COMPLETION

- FILLED AUGER HOLE W/ CUTTINGS & SOIL
- CLEANED AUGER W/ WIRE BRUSH & ACETONE

LEFT IMPOUNDMENT SITE 1415

LEFT UNION OIL 1510

Environmental Resources Management **Drilling Log**

CLOSURE OF SURFACE

Project: IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL. W.O. Number: 403634

Well Number: UO-2 Total Depth: 3 FT Diameter: 6"

Surface Elevation: — Water Level: Initial: NFW 24-hrs.: —

Screen: Dia.: — Length: — Slot Size: —

Casing: Dia.: — Length: — Type: —

Drilling Company: CANONIE Drilling Method: AUGER (6")

Driller: BOYD Log By: S. HOLLY Date Drilled: 7-30-85

Sketch Map

Notes: BEGIN 1205; END BORING 1215

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE - BACKFILLED w/ CUTTINGS & SOIL	UO-2A	0 - 0.5 CLAYEY SILT, GRAYISH ORANGE (10YR 7/4) ≈ 5% GRAVEL, DRY, POORLY COHESIVE, CRUMBLY,
1.0			UO-2B	
1.5			UO-2C	0.5-1.0 SAME AS ABOVE. MOISTURE INCREASING w/ DEPTH
2.0				1.0-2.0 CLAYEY SILT TO SILTY CLAY, MOD. YELLOWISH BROWN (10YR 5/4), ≈ 5% GRAVEL, MOD MOISTURE CONTENT, MOD. COHESIVE
2.5			UO-2D	
3.0				2.0-3.0 SAME AS ABOVE, SLIGHTLY DARKER.
				3.0 END OF BORING
				NO FREE WATER IN BORING ON COMPLETION
				- BORING FILLED w/ CUTTINGS & SOIL
				- AUGER CLEANED w/ WIRE BRUSH & ACETONE

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL. W.O. Number: 4036 J4

Well Number: UO-3 Total Depth: 3 ft Diameter: 6"

Surface Elevation: — Water Level: Initial: ____ 24-hrs.: ____

Screen: Dia.: — Length: — Slot Size: —

Casing: Dia.: — Length: — Type: —

Drilling Company: CANONIE Drilling Method: AUGER (6")

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes: BEGIN 1240
END BORING 1252

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE FILLED W/ CUTTINGS & SOIL	UO-3A	0-0.5 CLAYEY SILT, MOD YELLOWISH BROWN (10 YR 5/4), ≈ 5% GRAVEL, V. SLIGHTLY MOIST, POORLY COHESIVE,
1.0			UO-3B	
1.5			UO-3C	0.5-1.0 CLAYEY SILT, DARK YELLOWISH ORANGE (10 YR 6/6), ≈ 1-5% GRAVEL, SLIGHTLY MOIST, POORLY COHESIVE.
2.0				
2.5			UO-3D	1.0-2.0 SAME AS ABOVE, SLIGHTLY MORE CLAY, MORE COHESIVE.
3.0				2.0-3.0 CLAYEY SILT & SILTY CLAY, MOD YELLOWISH BROWN (10 YR 5/4), ≈ 1-5% GRAVEL, SLIGHTLY MOIST, SLIGHTLY COHESIVE.
				3.0 END OF BORING

NO FREE WATER IN BORING ON COMPLETION

- FILLED AUGER HOLE W/ CUTTINGS AND SOIL
- CLEANED AUGER W/ WIRE BRUSH & ACETONE

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL. W.O. Number: 4036 J 4

Well Number: UO-4 Total Depth: ____ Diameter: ____

Surface Elevation: ____ Water Level: Initial ____ 24-hrs ____

Screen: Dia. — Length — Slot Size —

Casing: Dia. — Length — Type —

Drilling Company: CANONIC Drilling Method: AUGER (6")

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes: BEGIN 1300
END BORING 1315

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE - FILLED W/ CUTTINGS & SOIL	UO-4A	0-0.5 CLAYEY SILT, MOD. YELLOWISH BROWN (10YR 5/4), ≈ 5% GRAVEL, V. SLIGHTLY MOIST, POORLY COHESIVE.
1.0			UO-4B	
1.5			UO-4C	0.5-1.0 CLAYEY SILT, DARK YELLOWISH ORANGE (10YR 6/6), 1-5% GRAVEL, V. SLIGHTLY MOIST, POORLY COHESIVE. BECOMING DARKER AT BOTTOM OF SAMPLE.
2.0			UO-4D	
2.5				1.0-2.0 SILTY CLAY, MOD. YELLOWISH BROWN (10YR 5/4), 1% GRAVEL, MOD-SLIGHTLY MOIST, POORLY TO MOD COHESIVE.
3.0				2.0-3.0 CLAYEY SILT & SILTY CLAY, MOD YELLOWISH BROWN (10YR 5/4), 5-10% GRAVEL, MOD-SLIGHTLY MOIST, POORLY TO MOD COHESIVE.
				3.0 END OF BORING
				NO FREE WATER IN BORING ON COMPLETION
				— FILLED AUGER HOLE W/ CUTTINGS AND SOIL
				— CLEANED AUGER W/ WIRE BRUSH & ACETONE

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL W.O. Number: 4036 J 4

Well Number: UO-5 Total Depth: 3.0 FT Diameter: 6"

Surface Elevation: ____ Water Level: Initial: NFW 24-hrs.: —

Screen: Dia.: — Length: — Slot Size: —

Casing: Dia.: — Length: — Type: —

Drilling Company: CANONIE Drilling Method: AUGER 6"

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes: BEGIN 1330
END BORING 1345

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE — FILLED W/ CUTTINGS & SOIL	UO-SA	0 – 0.5 CLAYEY SILT, MOD. YELLOWISH BROWN (10 YR 5/4), ≈5% GRAVEL, DRY, NON COHESIVE. WHITE SLUDGE (?) BETWEEN CRACKS.
1.0			UO-SB	
1.5			UO-SC	0.5 – 1.0 SAME AS ABOVE
2.0			UO-SD	1.0 – 2.0 SAME TO ≈ 1.5 FT BECOMING SLIGHTLY MOIST, MOD. COHESIVE.
2.5				
3.0				2.0 – 3.0 CLAYEY SILT & SILTY CLAY, MOD YELLOWISH BROWN (10 YR 5/4), 1% GRAVEL, SLIGHTLY MOIST, SLIGHTLY TO MOD COHESIVE. STIFF.
				3.0 END OF BORING

NO FREE WATER IN BORING ON COMPLETION

— FILLED AUGER HOLE W/ CUTTINGS & SOIL
— CLEANED AUGER W/ WIRE BRUSH & ALCONOX

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT — Owner: UNION OIL

Location: LEMONT, ILL. — W.O. Number: 403634

Well Number: UO-6 — Total Depth: 3 FT. — Diameter: 6 IN.

Surface Elevation: — Water Level: Initial: NFW — 24-hrs: —

Screen: Dia.: — Length: — Slot Size: —

Casing: Dia.: — Length: — Type: —

Drilling Company: CANONIE — Drilling Method: AUGER (6")

Driller: BOLD — Log By: J. HOLLY — Date Drilled: 7-30-85

Sketch Map:

Notes: BEGIN 1145; END BORING 1157

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE - BACKFILLED W/ CUTTINGS	UO-6A	0-0.5 CLAYEY SILT, MOD YELLOWISH BROWN (10YR 5/4) ≥ 5% GRAVEL, V. SLIGHTLY MOIST, POORLY COHESIVE
1.0			UO-6B	
1.5			UO-6C	0.5-1.0 SAME AS ABOVE
2.0			UO-6A	1.0-2.0 SILTY CLAY, MOD YELLOWISH BROWN (10 YR 5/4) 5-10 % GRAVEL, SLIGHTLY MOIST, MOD. COHESIVE, TIGHT AT AUGER BIT.
2.5				
3.0				2.0-3.0 SAME AS ABOVE 3.0 END OF BORING

NO FREE WATER IN BORING ON COMPLETION

- BORING FILLED W/ CUTTINGS & SOIL
- AUGERS CLEANED W/ WIRE BRUSH & ACETONE

Environmental Resources Management CME-45 **Drilling Log**

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL. W.O. Number: 4036 J4

Well Number: UO-7 Total Depth: 3.0 ft Diameter: 6"

Surface Elevation: Water Level: Initial: NT-W 24-hrs: —

Screen: Dia.: — Length: — Slot Size: —

Casing: Dia.: — Length: — Type: —

Drilling Company: CANONIE Drilling Method: AUGER (6")

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes
START 0900
FINISH HOLE 0945

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE - FILLED W/ CUTTINGS & SOIL	UO-7A	0 - 0.5 FT CLAYEY SILT, MOD. YELLOWISH BROWN (10 YR 5/4) WITH ≈ 5% GRAVEL. SLIGHTLY MOIST, POORLY COHESIVE, CRUMBLY,
1			UO-7B	
1.5			UO-7C	0.5 - 1.0 CLAYEY SILT, MOD YELLOWISH BROWN (10 YR 5/4 to 10 YR 4/4) SLIGHTLY DARKER THAN ABOVE, LESS GRAVEL (≈ 1%), SLIGHTLY MOIST, POORLY COHESIVE,
2.0				
2.5			UO-7D	1.0 - 2.0 CLAYEY SILT GRADING TO SILTY CLAY, MOD. YELLOWISH BROWN (10 YR 5/4 to 10 YR 4/4) & TRACE OF GRAVEL, MORE MOISTURE THAN ABOVE, MODERATELY COHESIVE
3.0				
				2.0 - 3.0 SAME AS ABOVE
				3.0 END OF BORING
				NO FREE WATER ENCOUNTERED ON COMPLETION
				— BACKFILLED AUGER HOLE WITH CUTTINGS AND NATIVE SOIL
				— CLEANED AUGER W/ WIRE BRUSH & ACETONE

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL. W.O. Number: 403634

Well Number: UO-8 Total Depth: 3.0' Diameter: 6"

Surface Elevation: - Water Level: Initial: NFW 24-hrs: -

Screen: Dia. - Length - Slot Size -

Casing: Dia. - Length - Type -

Drilling Company: CANONIE Drilling Method: AUGER (6")

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes
BEGIN 1120
END BORING 1129

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE - FILLED W/ CUTTINGS & SOIL	UO-8A	0-0.5 CLAYEY SILT, PALE YELLOWISH BROWN TO DARK YELLOWISH BROWN (10YR6/2 TO 10YR 4/2), ≈ 10% GRAVEL FRAG., MOTTLED APPEARANCE, OCC IRON STAIN, LOW MOISTURE, POORLY COHESIVE. WHITE STREAKS = SLUDGE(?)
1.0			UO-8B	
1.5			UO-8C	0.5-1.0 SAME AS ABOVE, GREATER CLAY CONTENT GRADING TO SILTY CLAY.
2.0				
2.5			UO-8D	1.0-2.0 SILTY CLAY, MOD. YELLOWISH BROWN TO DARK YELLOWISH BROWN (10YR 5/4 TO 10YR 4/2) ≈ 5% GRAVEL, MOD MOISTURE, MOD. COHESIVE.
3.0				2.0-3.0 SAME AS ABOVE
				3.0 END OF BORING
				NO FREE WATER IN BORING AT COMPLETION
				- FILLED AUGER HOLE W/ CUTTINGS & SOIL
				- CLEANED AUGER W/ WIRE BRUSH & ACETONE

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL. W.O. Number: 4036 J 4

Well Number: UO-9 Total Depth: 3.0 ft Diameter: 6"

Surface Elevation: ____ Water Level: Initial: NFW 24-hrs.: —

Screen: Dia.: — Length: — Slot Size: —

Casing: Dia.: — Length: — Type: —

Drilling Company: CANONIE Drilling Method: AUGER (6")

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes: START 0955
FINISH HOLE 1010

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
.5		6" AUGER HOLE — FILLED W/ CUTTINGS & SOIL	UO-9A	0-0.5 CLAYEY SILT, MOD. YELLOWISH BROWN, (10 YR 5/4), LESS THAN 3% GRAVEL FRAGS, V. SLIGHTLY MOIST, POORLY COHESIVE.
1			UO-9B	
1.5			UO-9C	0.5 - 1.0 SAME AS ABOVE, GREATER CONTENT OF SMALL GRAVEL., SLIGHTLY MOISTER.
2				
2.5			UO-9A	1.0 - 2.0 SAME AS ABOVE SLIGHTLY DARKER (10 YR 4/4) ≈ 1% gravel frags., SLIGHTLY MORE COHESIVE. LARGE ROCK ENCOUNTERED AT 1.5 FT
3				2.0 - 3.0 SAME AS ABOVE
				3.0 END OF BORING

NO FREE WATER ENCOUNTERED IN HOLE ON COMPLETION

— FILLED AUGER HOLE W/ CUTTINGS & SOIL
— CLEANED AUGER W/ WIRE BRUSH & ACETONE

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL. W.O. Number: 4036J4

Well Number: UO-10 Total Depth: 3.0' Diameter: 6"

Surface Elevation: ____ Water Level: Initial: NFW 24-hrs: —

Screen: Dia.: — Length: — Slot Size: —

Casing: Dia.: — Length: — Type: —

Drilling Company: CANDNIE Drilling Method: AUGER 6"

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes
BEGIN 1100
FINISH HOLE 1110

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE — FILLED W/ CUTTINGS & SOIL	UO-10A	0-0.5 CLAYEY SILT, MOD YELLOWISH BROWN (10YR 5/4), ≈ 5% GRAVEL FRAG, SL. MOISTURE CONTENT, POORLY COHESIVE.
1.0			UO-10B	
1.5			UO-10C	0.5-1.0 SAME AS ABOVE, SLIGHT INCREASE IN CLAY CONTENT
2.0			UO-10D	
2.5				1.0-2.0 CLAYEY SILT TO SILTY CLAY, MOD YELLOWISH BROWN (10YR 3/4 - 10YR 4/4), ≈ 5% GRAVEL FRAG., MOD. MOISTURE CONTENT, POOR TO MOD. COHESIVE.
3.0				2.0-3.0 SILTY CLAY, ~~SAME AS ABOVE~~. MOD COHESIVE, MOD MOISTURE CONTENT.
				3.0 END OF BORING

NO FREE WATER IN BORING ON COMPLETION

— FILL AUGER HOLE W/ CUTTINGS & SOIL
— CLEAN AUGER W/ WIRE BRUSH & ACETONE

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT
Owner: UNION OIL
Location: LEMONT, ILL.
W.O. Number: 4036 J4
Well Number: VO-11
Total Depth: 3.0'
Diameter: 6"
Surface Elevation:
Water Level: Initial: NFW
24-hrs: —
Screen: Dia.: —
Length: —
Slot Size: —
Casing: Dia.: —
Length: —
Type: —
Drilling Company: CANONIE
Drilling Method: AUGER (6")
Driller: BOYD
Log By: J HOLLY
Date Drilled: 7-30-85

Sketch Map

Notes: BEGIN 1015
FINISH BORING AT 1030

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6 INCH AUGER HOLE — FILLED W/ CUTTINGS & SOIL	VO-11A	0 - 0.5 CLAYEY SILT, MOD. YELLOWISH BROWN (10 YR 5/4), 1 5% GRAVEL, SLIGHTLY MOIST, POORLY COHESIVE.
1			VO-11B	
1.5			VO-11C	0.5 - 1.0 SAME AS ABOVE, SLIGHT INCREASE IN MOISTURE, LESS GRAVEL.
2.0				1.0 - 2.0 CLAYEY SILT GRADING TO SILTY CLAY, MOD. YELLOWISH BROWN (10 YR 5/4 — 10 YR 4/4), 1 - 5 % GRAVEL FRAG., MOD. MOIST., MOD. COHESIVE.
2.5			VO-11D	
3.0				2.0 - 3.0 SAME AS ABOVE
				3.0 END OF BORING
				NO FREE WATER IN BORING AT COMPLETION
				— FILL AUGER HOLE W/ CUTTINGS & SOIL
				— CLEAN AUGER W/ WIRE BRUSH & ACETONE

Environmental Resources Management

Drilling Log

Project: CLOSURE OF SURFACE IMPOUNDMENT Owner: UNION OIL

Location: LEMONT, ILL. W.O. Number: 4036J4

Well Number: UO-12 Total Depth: 3.0' Diameter: 6"

Surface Elevation: Water Level: Initial: NFW 24-hrs: –

Screen: Dia.: – Length: – Slot Size: –

Casing: Dia.: – Length: – Type: –

Drilling Company: CANONIC Drilling Method: AUGER (6")

Driller: BOYD Log By: J HOLLY Date Drilled: 7-30-85

Sketch Map

Notes: BEGIN 1040
END OF BORING 1045

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0.5		6" AUGER HOLE – FILLED W/ CUTTINGS & SOIL	UO-12A	0-0.5 CLAYEY SILT, MOD. YELLOWISH BROWN (10 YR 5/4), ≈ 5% GRAVEL FRAG., ~~DRY~~ SLIGHTLY MOIST, POORLY COHESIVE OCCASIONAL STREAK (≈ 0.2") OF GREY DECOMPOSED ROCK (?)
1.0			UO-12B	0.5-1.0 SAME AS ABOVE,
1.5			UO-12C	1.0-2.0 CLAYEY SILT TO SILTY CLAY, MOD. YELLOWISH BROWN (10 YR 5/4) TO 10YR 4/4), ≈ 5% GRAVEL. MODERATE MOISTURE CONTENT, MOD. COHESIVE, STREAKS OF GREY AS DESCRIBED ABOVE.
2.0			UO-12D	2.0-3.0 SAME AS ABOVE. SLIGHT INCREASE IN CLAY CONTENT
2.5				
3.0				3.0 END OF BORING

NO FREE WATER IN BORING ON COMPLETION

– FILLED AUGER HOLE W/ CUTTINGS & SOIL
– CLEANED AUGER W/ WIRE BRUSH & ACETONE

Fluorescence Screening Procedure

Background

This procedure was developed by Dr. Roy O. Ball, P.E., of ERM-North Central, Inc. in consultation with Dr. Roger A. Minear, now Director of the Institute for Environmental Studies at the University of Illinois at Urbana, Champaign. This procedure is intended for use a screening tool for soil samples known or suspected to be contaminated with fluoresceable chemicals, such as polynuclear aromatics.

This procedure was used at a Superfund site in Minnesota where the principle contaminant was residues from wood preserving, notably pentachlorophenol and creosote. The procedure was to be used in the event visual examination of soil samples could not determine the presence or absence of contaminants.

The procedure requires definition of the known or suspected contamination so that the excitation and emission frequency of the chemicals can be tabulated from standard chemical references and used to design the necessary filters for the fluorometer.

Materials and Equipment

- Erlenmayer Flasks - 125 or 250 milliliter
- Reagent grade iso-octane or hexane
- One micron filter paper or laboratory centrifuge

- Pipettes

- Dilution vials or flasks

- Fluorometer with appropriate filters for producing a suitable range of excitation frequencies and for detecting a suitable range of emission frequencies (Turner fluorometer).

Method Review

In general, the procedure consists of extracting chemicals from the soil into iso-octane or some other suitable solvent based on the solubility and polarity of the chemicals. This can be done by agitation in an Erlenmayer Flask but can also be performed using the Soxhelt apparatus. The extract is then diluted by serial addition into vials containing solvent. The fluorescence of the dilution series is then determined using the fluorometer, in accordance with the manufacturers instruction.

Procedure

1. A representative sample of soil known or suspected to be contaminated with fluoresceable chemicals is obtained.

2. Approximately 40 to 50 grams of the sample is placed in a 125 milliliter Erlenmayer Flask.

3. An equal volume of extracting solvent is placed in the flask and the flask is agitated for a period

of 15 minutes or longer. The flask contents are then filtered to produce a solid-free extract. Alternatively, the flask contents are then centrifuged with the same objective.

4. The solids free extract is used to prepare a serial dilution set using the extracting solvent as diluent.

5. The fluorescence of each dilution vial is determined in accordance with the manufacturers recommended procedure.

6. Steps 1 - 5 are repeated using a background soil sample to determine the native fluorescence of the soil matrix. In most cases either the first extract or one serial dilution will be sufficient to obtain a fluorescence reading.

7. Based on duplicate analyses of samples, it is felt (but not demonstrated) that the precision of this method is one order of magnitude, i.e., the fluorescence could be properly reported as 10^0, 10^1, 10^2, etc., based on the number of serial dilutions required to obtain a reading on the fluorometer.

8. If desired, known amounts of reagent contaminants could be added to the native soil matrix and a response curve developed. Because the interactions of aged industrial chemicals and soil may well differ from the interactions of reagent grade chemicals and soil, caution should be used in interpretation of these results.

SAMPLE DESCRIPTION INFORMATION

for

ERM North Central

RMA Sample No.	Sample Description	Sample Type	Date Sampled	Date Received
51547-01	UO-6-A	Soil	7/30/85	7/31/85

SUMMARY OF ANALYTICAL RESULTS AND METHODOLOGY

for

ERM - North Central

On July 31, 1985, Rocky Mountain Analytical Laboratory (RMAL) received 53 soil samples as shown in the enclosed Sample Description Information sheet. The analytical results for these samples are presented in the enclosed tables, organized as follows:

- Inorganic Parameters - pH, Oil and Grease, Cation Exchange Capacity;
- Total Metals;
- EP Toxicity Metals; and
- PAH Screen.

With one exception, analyses were performed according to methods in SW-846, incorporating changes developed and implemented by RMAL.

The samples were analyzed for PAH's using a modification of the fluorescence screening procedure developed by Dr. Roy O. Ball of ERM - North Central, Inc. A 40-gram sample of soil and 40 ml of isooctane were agitated in an ultrasonic bath for 20 minutes. The mixture was centrifuged, and the isooctane layer was separated for analysis for PAH content. A 5 microliter aliquot of the isooctane extract was injected into a columnless HPLC system equipped with a fluorescence detector. The excitation and emission wavelengths were 245 mm and 400 mm, respectively. The flow rate of the mobile phase, isooctane, was 1 ml/min. The fluorescence response of the sample was compared with the response of standard solution of benzo(a)pyrene. Since the samples contain a mixture of PAH's, the results reported are only semi-quantitative estimates at best. Thus, higher results would be obtained if dibenzo(a,h)anthracene (response of 0.06 relative to benzo(a)pyrene) was used as the standard, and lower results if anthracene (relative response of 6) was used as the standard. The results are reported in units of mg/g of solid, based on the weight of the undried sample.

Recoveries of 82% and 88% were obtained for the duplicate analysis of soil samples spiked with benzo(a)pyrene at a concentration of 0.5 ug/g.

SAMPLE DESCRIPTION INFORMATION

for

ERM - North Central

(Continued)

RMAL Sample No.	Sample Description	Sample Type	Date Sampled	Date Received
51221-41	UO-11-A	Soil	7/30/85	7/31/85
51221-42	UO-11-B	Soil	7/30/85	7/31/85
51221-43	UO-11-C	Soil	7/30/85	7/31/85
51221-44	UO-11-D	Soil	7/30/85	7/31/85
51221-45	UO-12-A	Soil	7/30/85	7/31/85
51221-46	UO-12-B	Soil	7/30/85	7/31/85
51221-47	UO-12-C	Soil	7/30/85	7/31/85
51221-48	UO-12-D	Soil	7/30/85	7/31/85
51221-49	UO-B-1 (X101)	Soil	7/30/85	7/31/85
51221-50	UO-B-2 (X102)	Soil	7/30/85	7/31/85
51221-51	UO-B-3 (X103)	Soil	7/30/85	7/31/85
51221-52	UO-B-4 (X104)	Soil	7/30/85	7/31/85
51221-53	UO-B-5 (X105)	Soil	7/30/85	7/31/85

September 30, 1985

ANALYTICAL RESULTS

for

ERM - North Central

INORGANIC PARAMETERS

Parameter	Units	51221-01		51221-02		51221-03		51221-04	
pH	units	7.93	(0.01)	8.21	(0.01)	8.29	(0.01)	8.36	(0.01)
Oil and Grease	mg/kg	ND	(100)	ND	(100)	ND	(100)	ND	(100)
Cation Exchange Capacity	meq/100g	6.8	(0.5)	5.6	(0.5)	6.5	(0.5)	6.4	(0.5)

Parameter	Units	51221-05		51221-06		51221-07		51221-08	
pH	units	8.45	(0.01)	8.34	(0.01)	8.36	(0.01)	8.29	(0.01)
Oil and Grease	mg/kg	ND	(100)	100	(100)	ND	(100)	ND	(100)
Cation Exchange Capacity	meq/100g	5.0	(0.5)	7.3	(0.5)	4.5	(0.5)	5.0	(0.5)

Parameter	Units	51221-09		51221-10		51221-11		51221-12	
pH	units	8.21	(0.01)	8.44	(0.01)	8.54	(0.01)	8.55	(0.01)
Oil and Grease	mg/kg	ND	(100)	ND	(100)	ND	(100)	ND	(100)
Cation Exchange Capacity	meq/100g	5.8	(0.5)	2.9	(0.5)	2.6	(0.5)	3.5	(0.5)

Parameter	Units	51221-13		51221-14		51221-15		51221-16	
pH	units	8.31	(0.01)	8.39	(0.01)	8.42	(0.01)	8.40	(0.01)
Oil and Grease	mg/kg	ND	(100)	ND	(100)	ND	(100)	ND	(100)
Cation Exchange Capacity	meq/100g	8.0	(0.5)	14	(0.5)	6.2	(0.5)	9.7	(0.5)

Parameter	Units	51221-17		51221-18		51221-19		51221-20	
pH	units	8.00	(0.01)	7.84	(0.01)	7.91	(0.01)	8.19	(0.01)
Oil and Grease	mg/kg	100	(100)	200	(100)	200	(100)	100	(100)
Cation Exchange Capacity	meq/100g	15	(0.5)	15	(0.5)	11	(0.5)	11	(0.5)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

INORGANIC PARAMETERS (Cont.)

Parameter	Units	51221-21		51221-22		51221-23		51221-24	
pH	units	8.39	(0.01)	8.47	(0.01)	8.31	(0.01)	8.35	(0.01)
Oil and Grease	mg/kg	ND	(100)	ND	(100)	ND	(100)	200	(100)
Cation Exchange Capacity	meq/100g	0.7	(0.5)	6.0	(0.5)	7.6	(0.5)	6.8	(0.5)

Parameter	Units	51221-25		51221-26		51221-27		51221-28	
pH	units	8.12	(0.01)	8.01	(0.01)	8.04	(0.01)	8.07	(0.01)
Oil and Grease	mg/kg	170	(100)	ND	(100)	100	(100)	100	(100)
Cation Exchange Capacity	meq/100g	11	(0.5)	11	(0.5)	12	(0.5)	9.7	(0.5)

Parameter	Units	51221-29		51221-30		51221-31		51221-32	
pH	units	8.24	(0.01)	7.90	(0.01)	8.07	(0.01)	8.10	(0.01)
Oil and Grease	mg/kg	ND	(100)	ND	(100)	ND	(100)	160	(100)
Cation Exchange Capacity	meq/100g	23	(0.5)	19	(0.5)	22	(0.5)	18	(0.5)

Parameter	Units	51221-33		51221-34		51221-35		51221-36	
pH	units	8.28	(0.01)	8.34	(0.01)	8.31	(0.01)	8.31	(0.01)
Oil and Grease	mg/kg	200	(100)	300	(100)	200	(100)	400	(100)
Cation Exchange Capacity	meq/100g	19	(0.5)	21	(0.5)	15	(0.5)	22	(0.5)

Parameter	Units	51221-37		51221-38		51221-39		51221-40	
pH	units	8.50	(0.01)	8.34	(0.01)	8.39	(0.01)	8.31	(0.01)
Oil and Grease	mg/kg	200	(100)	200	(100)	ND	(100)	ND	(100)
Cation Exchange Capacity	meq/100g	17	(0.5)	24	(0.5)	17	(0.5)	13	(0.5)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

INORGANIC PARAMETERS (Cont.)

Parameter	Units	51221-41		51221-42		51221-43		51221-44	
pH	units	8.31	(0.01)	8.22	(0.01)	8.21	(0.01)	8.17	(0.01)
Oil and Grease	mg/kg	ND	(100)	ND	(100)	ND	(100)	ND	(100)
Cation Exchange Capacity	meq/100g	22	(0.5)	25	(0.5)	12	(0.5)	15	(0.5)

Parameter	Units	51221-45		51221-46		51221-47		51221-48	
pH	units	8.35	(0.01)	8.27	(0.01)	8.35	(0.01)	8.32	(0.01)
Oil and Grease	mg/kg	ND	(100)	ND	(100)	ND	(100)	ND	(100)
Cation Exchange Capacity	meq/100g	20	(0.5)	12	(0.5)	11	(0.5)	12	(0.5)

Parameter	Units	51221-49		51221-50		51221-51		51221-52	
pH	units	5.83	(0.01)	4.61	(0.01)	6.81	(0.01)	7.01	(0.01)
Oil and Grease	mg/kg	ND	(100)	ND	(100)	ND	(100)	ND	(100)
Cation Exchange Capacity	meq/100g	25	(0.5)	18	(0.5)	19	(0.5)	20	(0.5)

Parameter	Units	51221-53	
pH	units	7.35	(0.01)
Oil and Grease	mg/kg	ND	(100)
Cation Exchange Capacity	meq/100g	19	(0.5)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

TOTAL RCRA METALS

Parameter	Units	51221-01		51221-02		51221-03		51221-04	
Arsenic	mg/kg	10	(2)	11	(2)	10	(2)	10	(2)
Barium	mg/kg	22	(1)	27	(1)	31	(1)	33	(1)
Cadmium	mg/kg	ND	(0.8)	1.1	(0.8)	1.1	(0.8)	1.1	(0.8)
Chromium	mg/kg	14	(1)	14	(1)	15	(1)	16	(1)
Lead	mg/kg	14	(5)	17	(5)	16	(5)	18	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	ND	(0.6)	0.9	(0.6)	0.7	(0.6)	1.0	(0.6)

Parameter	Units	51221-05		51221-06		51221-07		51221-08	
Arsenic	mg/kg	14	(2)	8	(2)	7	(2)	9	(2)
Barium	mg/kg	32	(1)	32	(1)	28	(1)	25	(1)
Cadmium	mg/kg	ND	(0.8)	0.9	(0.8)	1.1	(0.8)	0.9	(0.8)
Chromium	mg/kg	39	(1)	25	(1)	14	(1)	12	(1)
Lead	mg/kg	19	(5)	19	(5)	17	(5)	16	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	1.1	(0.6)	0.8	(0.6)	ND	(0.6)	0.9	(0.6)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

TOTAL RCRA METALS (Cont.)

Parameter	Units	51221-09		51221-10		51221-11		51221-12	
Arsenic	mg/kg	8	(2)	10	(4)	9	(2)	6	(2)
Barium	mg/kg	30	(1)	22	(1)	16	(1)	17	(1)
Cadmium	mg/kg	ND	(0.8)	1.1	(0.8)	1.5	(0.8)	ND	(0.8)
Chromium	mg/kg	18	(1)	11	(1)	9.4	(1)	9	(1)
Lead	mg/kg	19	(5)	17	(5)	16	(5)	16	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	0.6	(0.6)	0.7	(0.6)	0.7	(0.6)	ND	(0.6)

Parameter	Units	51221-13		51221-14		51221-15		51221-16	
Arsenic	mg/kg	10	(2)	11	(2)	11	(2)	12	(2)
Barium	mg/kg	28	(1)	21	(1)	27	(1)	27	(1)
Cadmium	mg/kg	1.3	(0.8)	ND	(0.8)	0.8	(0.8)	1.0	(0.8)
Chromium	mg/kg	13	(1)	12	(1)	13	(1)	13	(1)
Lead	mg/kg	17	(5)	17	(5)	19	(5)	16	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	0.25	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	0.8	(0.6)	0.7	(0.6)	0.8	(0.6)	0.7	(0.6)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

TOTAL RCRA METALS (Cont.)

Parameter	Units	51221-17		51221-18		51221-19		51221-20	
Arsenic	mg/kg	18	(2)	20	(2)	16	(2)	14	(2)
Barium	mg/kg	171	(1)	76	(1)	62	(1)	40	(1)
Cadmium	mg/kg	3.4	(0.8)	1.8	(0.8)	1.3	(0.8)	1.0	(0.8)
Chromium	mg/kg	105	(1)	123	(1)	54	(1)	48	(1)
Lead	mg/kg	31	(5)	31	(5)	27	(5)	19	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	0.6	(0.6)	1.1	(0.6)	0.7	(0.6)	0.6	(0.6)

Parameter	Units	51221-21		51221-22		51221-23		51221-24	
Arsenic	mg/kg	14	(2)	14	(2)	13	(2)	8	(4)
Barium	mg/kg	33	(1)	27	(1)	25	(1)	32	(1)
Cadmium	mg/kg	1.3	(0.8)	ND	(0.8)	1.3	(0.8)	1.1	(0.8)
Chromium	mg/kg	126	(1)	31	(1)	29	(1)	76	(1)
Lead	mg/kg	22	(5)	17	(5)	16	(5)	17	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	ND	(0.6)	0.6	(0.6)	0.8	(0.6)	0.8	(0.6)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

TOTAL RCRA METALS (Cont.)

Parameter	Units	51221-25		51221-26		51221-27		51221-28	
Arsenic	mg/kg	16	(2)	20	(2)	17	(2)	16	(2)
Barium	mg/kg	128	(1)	67	(1)	58	(1)	41	(1)
Cadmium	mg/kg	2.1	(0.8)	1.6	(0.8)	1.2	(0.8)	1.2	(0.8)
Chromium	mg/kg	68	(1)	54	(1)	14	(1)	13	(1)
Lead	mg/kg	31	(5)	28	(5)	25	(5)	21	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	1.3	(0.6)	0.8	(0.6)	0.9	(0.6)	0.6	(0.6)

Parameter	Units	51221-29		51221-30		51221-31		51221-32	
Arsenic	mg/kg	16	(4)	19	(2)	15	(2)	15	(2)
Barium	mg/kg	67	(1)	72	(1)	54	(1)	45	(1)
Cadmium	mg/kg	0.8	(0.8)	1.6	(0.8)	1.3	(0.8)	0.9	(0.8)
Chromium	mg/kg	24	(1)	18	(1)	16	(1)	15	(1)
Lead	mg/kg	21	(5)	21	(5)	20	(5)	18	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	ND	(0.6)	ND	(0.6)	ND	(0.6)	ND	(0.6)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

TOTAL RCRA METALS (Cont.)

Parameter	Units	51221-33		51221-34		51221-35		51221-36	
Arsenic	mg/kg	16	(2)	14	(2)	12	(2)	14	(2)
Barium	mg/kg	36	(1)	32	(1)	29	(1)	28	(1)
Cadmium	mg/kg	0.8	(0.8)	0.8	(0.8)	ND	(0.8)	ND	(0.8)
Chromium	mg/kg	12	(1)	13	(1)	12	(1)	14	(1)
Lead	mg/kg	15	(5)	17	(5)	15	(5)	16	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(3)
Silver	mg/kg	ND	(0.6)	ND	(0.6)	ND	(0.6)	ND	(0.6)

Parameter	Units	51221-37		51221-38		51221-39		51221-40	
Arsenic	mg/kg	13	(2)	8	(4)	8	(2)	14	(2)
Barium	mg/kg	29	(1)	31	(1)	29	(1)	24	(1)
Cadmium	mg/kg	ND	(0.8)	0.9	(0.8)	1.0	(0.8)	ND	(0.8)
Chromium	mg/kg	15	(1)	14	(1)	14	(1)	11	(1)
Lead	mg/kg	16	(5)	16	(5)	17	(5)	18	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	0.05	(0.05)
Selenium	mg/kg	ND	(3)	ND	(3)	ND	(3)	ND	(3)
Silver	mg/kg	ND	(0.6)	ND	(0.6)	0.6	(0.6)	ND	(0.6)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

TOTAL RCRA METALS (Cont.)

Parameter	Units	51221-41		51221-42		51221-43		51221-44	
Arsenic	mg/kg	16	(2)	17	(2)	13	(2)	15	(2)
Barium	mg/kg	44	(1)	41	(1)	35	(1)	36	(1)
Cadmium	mg/kg	1.4	(0.8)	1.4	(0.8)	1.5	(0.8)	1.5	(0.8)
Chromium	mg/kg	17	(1)	16	(1)	14	(1)	15	(1)
Lead	mg/kg	24	(5)	19	(5)	19	(5)	30	(5)
Mercury	mg/kg	0.05	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(6)
Silver	mg/kg	ND	(0.6)	ND	(0.6)	ND	(0.6)	ND	(0.6)

Parameter	Units	51221-45		51221-46		51221-47		51221-48	
Arsenic	mg/kg	12	(2)	11	(2)	11	(2)	12	(2)
Barium	mg/kg	37	(1)	29	(1)	28	(1)	21	(1)
Cadmium	mg/kg	0.9	(0.8)	ND	(0.8)	0.9	(0.8)	ND	(0.8)
Chromium	mg/kg	16	(1)	12	(1)	12	(1)	10	(1)
Lead	mg/kg	19	(5)	16	(5)	17	(5)	14	(5)
Mercury	mg/kg	ND	(0.05)	ND	(0.05)	ND	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(6)	ND	(6)	ND	(3)
Silver	mg/kg	ND	(0.6)	ND	(0.6)	ND	(0.6)	ND	(0.6)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

TOTAL RCRA METALS (Cont.)

Parameter	Units	51221-49		51221-50		51221-51		51221-52	
Arsenic	mg/kg	15	(2)	15	(2)	17	(2)	14	(2)
Barium	mg/kg	49	(1)	88	(1)	56	(1)	77	(1)
Cadmium	mg/kg	1.7	(0.8)	1.3	(0.8)	1.5	(0.8)	1.0	(0.8)
Chromium	mg/kg	16	(1)	13	(1)	17	(1)	14	(1)
Lead	mg/kg	30	(5)	33	(5)	39	(5)	24	(5)
Mercury	mg/kg	0.07	(0.05)	0.06	(0.05)	0.06	(0.05)	ND	(0.05)
Selenium	mg/kg	ND	(6)	ND	(3)	ND	(3)	ND	(3)
Silver	mg/kg	ND	(0.6)	ND	(0.6)	ND	(0.6)	ND	(0.6)

Parameter	Units	51221-53	
Arsenic	mg/kg	14	(2)
Barium	mg/kg	88	(1)
Cadmium	mg/kg	1.1	(0.8)
Chromium	mg/kg	13	(1)
Lead	mg/kg	28	(5)
Mercury	mg/kg	ND	(0.05)
Selenium	mg/kg	ND	(3)
Silver	mg/kg	ND	(0.6)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

EP TOXICITY RCRA METALS

Parameter	Units	51221-01		51221-02		51221-03		51221-04	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.28	(0.015)	0.25	(0.015)	0.25	(0.015)	0.22	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

Parameter	Units	51221-05		51221-06		51221-07		51221-08	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.37	(0.015)	0.33	(0.015)	0.23	(0.015)	0.19	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	0.036	(0.012)	ND	(0.012)
Chromium	mg/kg	0.037	(0.015)	0.022	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

EP TOXICITY RCRA METALS (Cont.)

Parameter	Units	51221-09		51221-10		51221-11		51221-12	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.24	(0.015)	0.19	(0.015)	0.14	(0.015)	0.14	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	0.009	(0.009)	ND	(0.009)	0.019	(0.009)	0.010	(0.009)

Parameter	Units	51221-13		51221-14		51221-15		51221-16	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.19	(0.015)	0.18	(0.015)	0.17	(0.015)	0.16	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

EP TOXICITY RCRA METALS (Cont.)

Parameter	Units	51221-17		51221-18		51221-19		51221-20	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.51	(0.015)	0.55	(0.015)	0.43	(0.015)	0.43	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	0.039	(0.015)	0.016	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

Parameter	Units	51221-21		51221-22		51221-23		51221-24	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.30	(0.015)	0.30	(0.015)	0.22	(0.015)	0.23	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	0.021	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	0.012	(0.009)	0.012	(0.009)	ND	(0.009)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

EP TOXICITY RCRA METALS (Cont.)

Parameter	Units	51221-25		51221-26		51221-27		51221-28	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.70	(0.015)	0.72	(0.015)	0.45	(0.015)	0.29	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

Parameter	Units	51221-29		51221-30		51221-31		51221-32	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.50	(0.015)	0.42	(0.015)	0.43	(0.015)	0.33	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

EP TOXICITY RCRA METALS (Cont.)

Parameter	Units	51221-33		51221-34		51221-35		51221-36	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.35	(0.015)	0.30	(0.015)	0.27	(0.015)	0.26	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	0.011	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

Parameter	Units	51221-37		51221-38		51221-39		51221-40	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.28	(0.015)	0.25	(0.015)	0.24	(0.015)	0.21	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

EP TOXICITY RCRA METALS (Cont.)

Parameter	Units	51221-41		51221-42		51221-43		51221-44	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.36	(0.015)	0.33	(0.015)	0.25	(0.015)	0.27	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

Parameter	Units	51221-45		51221-46		51221-47		51221-48	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	0.26	(0.015)	0.28	(0.015)	0.27	(0.015)	0.23	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

EP TOXICITY RCRA METALS (Cont.)

Parameter	Units	51221-49		51221-50		51221-51		51221-52	
Arsenic	mg/kg	ND	(0.2)	ND	(0.2)	ND	(0.2)	ND	(0.2)
Barium	mg/kg	ND	(0.015)	ND	(0.015)	0.034	(0.015)	0.030	(0.015)
Cadmium	mg/kg	ND	(0.012)	ND	(0.012)	ND	(0.012)	ND	(0.012)
Chromium	mg/kg	ND	(0.015)	ND	(0.015)	ND	(0.015)	ND	(0.015)
Lead	mg/kg	ND	(0.075)	ND	(0.075)	ND	(0.075)	ND	(0.075)
Mercury	mg/kg	ND	(0.002)	ND	(0.002)	ND	(0.002)	ND	(0.002)
Selenium	mg/kg	ND	(0.02)	ND	(0.02)	ND	(0.02)	ND	(0.02)
Silver	mg/kg	ND	(0.009)	ND	(0.009)	ND	(0.009)	ND	(0.009)

Parameter	Units	51221-53	
Arsenic	mg/kg	ND	(0.2)
Barium	mg/kg	0.29	(0.015)
Cadmium	mg/kg	ND	(0.012)
Chromium	mg/kg	ND	(0.015)
Lead	mg/kg	ND	(0.075)
Mercury	mg/kg	ND	(0.002)
Selenium	mg/kg	ND	(0.02)
Silver	mg/kg	ND	(0.009)

ND = Not detected. Detection limits in parentheses.

ANALYTICAL RESULTS

for

ERM - North Central

PAH SCREEN

Sample Number	ug/g (ppm)*	Sample Number	ug/g (ppm)
51221-01	4.5	51221-28	ND
51221-02	0.36	51221-29	1.6
51221-03	0.07	51221-30	0.04
51221-04	0.05	51221-31	ND
51221-05	2.7	51221-32	ND
51221-06	1.8	51221-33	0.17
51221-07	0.08	51221-34	ND
51221-08	0.10	51221-35	ND
51221-09	1.6	51221-36	ND
51221-10	0.28	51221-37	0.14
51221-11	0.03	51221-38	ND
51221-12	0.03	51221-39	ND
51221-13	ND**	51221-40	ND
51221-14	ND	51221-41	ND
51221-15	0.05	51221-42	ND
51221-16	0.03	51221-43	ND
51221-17	12	51221-44	ND
51221-18	19	51221-45	ND
51221-19	2.0	51221-46	ND
51221-20	3.1	51221-47	ND
51221-21	45	51221-48	ND
51221-22	16	51221-49	0.30
51221-23	0.05	51221-50	0.13
51221-24	0.22	51221-51	0.57
51221-25	0.36	51221-52	0.17
51221-26	0.11	51221-53	0.27
51221-27	ND		

*Based on response factor of benzo(a)pyrene.
**Not detected, detection limit 0.03 ug/g.

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 5/221

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-1-A	16oz widemouth glass jar - soil sample	~~TOTAL METALS~~ See Below	ONE
UO-1-B	"	"	"
UO-1-C	"	"	"
UO-1-D	"	"	"
UO-2-A	"	"	"
UO-2-B	"	"	"
UO-2-C	"	"	"
UO-2-D	"	"	"
UO-3-A	"	"	"

Samoled by: Jim Holly / Jim Poriet - ERM-N.C. Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

PARAMETER: TOTAL RCRA METALS
EPTOXICITY METALS
~~[illegible]~~
~~[illegible]~~
Soil pH
Cation Exchange Capacity

Sheet 1 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 5/221

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-3-B	16oz wide mouth glass jar - soil sample	See Page 1	One
UO-3-C			"
UO-3-D			"
UO-4-A			"
UO-4-B			"
UO-4-C			"
UO-4-D			"
UO-5-A			"
UO-5-B			"

Sampled by: Jim Holly / Jim Pokel - ELM-KC Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Betty Kelley Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Sheet 2 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 5/221

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-5-C	16 oz. wide mouth glass jar - soil sample	See Page 1	One
UO-5-D			
UO-6-A			
UO-6-B			
UO-6-C			
UO-6-D			
UO-7-A			
UO-7-B			
UO-7-C			

Sampled by: Jim Holly/Jim Pohl - ERM-NC Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Sheet 3 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 5/221

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-7-D	16oz wide mouth glass jar soil sample	See Page 1	One
UO-8-A			
UO-8-B			
UO-8-C			
UO-8-D			
UO-9-A			
UO-9-B			
UO-9-C			
UO-9-D			

Sampled by: Jim Holly/Jim Pohl - ERM - NC Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Sheet 4 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 51221

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-10-A	16 oz wide mouth glass jar - soil sample	See Page 1	One
UO-10-B			
UO-10-C			
UO-10-D			
UO-11-A			
UO-11-B			
UO-11-C			
UO-11-D			
UO-12-A			

Sampled by: Jim Holly / Jim Pshel - ERM-NC Date: July 30, 1995

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/95

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Sheet 5 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure-Surface Impoundment RMA - 5122

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Contain Rec'd. per Sa
UO-12-B	16oz wide mouth glass jar - soil sample	See Page 1	One
UO-12-C	↓	↓	↑
UO-12-D	↓	↓	↑
X	X	X	↑
UO-1-A	7oz glass jar - soil sample	See Below	↑
UO-1-B	↓	↓	↑
UO-1-C	↓	↓	↑
UO-1-D	↓	↓	↑
UO-2-A	↓	↓	↑

Sampled by: Date:

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment:

Samples relinquished by: Date:

Samples relinquished to: Date:

Parameter:
Oil & Grease
Polynuclear Aromatic Screen

Sheet 6 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 51221

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-2-B	7 oz glass jar - soil sample	See Page 6	One
UO-2-C			
UO-2-D			
UO-3-A			
UO-3-B			
UO-3-C			
UO-3-D			
UO-4-A			
UO-4-B			

Sampled by: Jim Holly/Jim Pshel - EAM-DC Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment:

Samples relinquished by: Date:

Samples relinquished to: Date:

Sheet 7 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 5/22

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Contain Rec'd. per S
UO-4-C	4 oz glass jar - soil sample	See Page 6	One
UO-4-D			
UO-5-A			
UO-5-B			
UO-5-C			
UO-5-D			
UO-6-A			
UO-6-B			
UO-6-C			

Samoled by: Jim Holly / Jim Schel - ELM-NC Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Shot 3 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 51221

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-6-D	7 oz glass jar - soil sample	See Page 6	One
UO-7-A			
UO-7-B			
UO-7-C			
UO-7-D			
UO-8-A			
UO-8-B			
UO-8-C			
UO-8-D			

Sampled by: Jim Holly/Jim Schuch - ERM-NC Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Sheet 9 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 51321

Client Dwim Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Contain Rec'd. per S.
UO-9-A	4 oz glass jar - soil sample	See Page 6	One
UO-9-B			
UO-9-C			
UO-9-D			
UO-10-A			
UO-10-B			
UO-10-C			
UO-10-D			
UO-11-A			

Sampled by: Jim Holly / Jim Bohl - EEM - NC Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Sheet 10 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment

RMA - 5721

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-11-B	4 oz glass jar - soil sample	See Page 6	One
UO-11-C	↓	↓	↓
UO-11-D	↓	↓	↓
UO-12-A	↓	↓	↓
UO-12-B	↓	↓	↓
UO-12-C	↓	↓	↓
UO-12-D	↓	↓	↓

Sampled by: Jim Holly / Jim Bolch - ERM-WC Date: July 30, 1985

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelley Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Sheet 11 of 12

SAMPLE RECEIPT/CUSTODY RECORD

Project Name Closure - Surface Impoundment RMA - 5221

Client Union Oil

Method of Shipment Federal Express

Sample Number	Sample Description	Parameter -	No. Containe Rec'd. per Sa
UO-B-1	X101	See Below	one
UO-B-2	X102		"
UO-B-3	X103		"
UO-B-4	X104		"
UO-B-5	X105		"

Sampled by: State of Illinois Date:

Delivered to Laboratory by: Date:

Received in Laboratory by: Beth Kelly Date: 7/31/85

Method of shipment: Federal Express

Samples relinquished by: Date:

Samples relinquished to: Date:

Parameters: Total RCRA Metals
EP Toxicity Metals
Oil & Grease
Polynuclear Aromatic Screen
Soil pH & Cation Exchange Capacity

Sheet 12 of 12

Illinois Environmental Protection Agency · 2200 Churchill Road, Springfield, IL 62706

217/782-6762

Refer to: 1978030004 -- Will County
Lemont/Union Oil
ILD041550567

September 3, 1985

RECEIVED
SEP 10 1985
SOLID WASTE BRANCH
U.S. EPA, REGION V

RECEIVED
SEP 10 1985
SWB - AIS
U.S. EPA, REGION V

Edith Ardiente
USEPA -- Region V
230 South Dearborn
Chicago, Illinois 60604

Dear Ms. Ardiente:

Enclosed is a list of deficiencies found during the technical review of the Part B permit application for the hazardous waste management facility operated by Union Oil.

If you have any questions, please contact Rob Watson at 217/785-8410.

Very truly yours,

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:WRW:rd1929E/10

Enclosure

cc: Maywood Region
Division File
Bill Radlinski
Jodi Traub -- USEPA

GOF-12

205-39

Union Oil, Chicago Refinery
ILD041550567

FACILITY DESCRIPTION

1. The location of uppermost aquifer and aquifers which are hydraulically interconnected beneath the facility are not indicated on a map of the facility (270.14(c)(2)).

WASTE CHARACTERISTICS

2. The analyses of the wastes to be treated do not meet the requirements of 270.14(b)(2) and 264.13(a)(1) for the following reasons:

   a. An analysis of the slop oil emulsions (k049) was not provided.

   b. Because of the varied composition of a tank cleaning waste (e.g. it is dependent on the contents of the tanks being cleaned at the time) the 1981 analysis of the tank cleaning waste is not acceptable.

   If samples of the slop oil emulsions and tank cleaning waste cannot be obtained and included in the treatment demonstration, they must be the topic of a permit modification pursuant to 270.41 if union oil wishes to treat these wastes in the future.

   c. The analyses submitted are not adequate to meet 264.271 and 264.272. The analyses must include all parameters in Attachment 1, not just inorganic parameters.

   d. All wastes to be treated, both hazardous and nonhazardous, need to be analyzed for all parameters in Attachment 1.

3. The waste analysis plan is not adequate for the following reasons:

   a. The parameters (page C-9, 10) are not based on a treatment demonstration, and tables C-10 and C-11 do not coincide with USEPA's list of Appendix VIII constituents suspected to be present in refinery wastes (264.13(b)(1)). Refer to Attachment 1;

   b. The test methods do not coincide with those specified in Attachment 1 (264.13(b)(2));

   c. The sampling methods for each waste stream are not specified (264.13(b)(3));

   d. The first two situations on page C-15 that would initiate an analysis of a waste do not meet 264.13(b)(4);

      i. If a new waste is generated, a permit modification is required (270.41),
      ii. Documentation that mixtures of the wastes are compatible must be made during the treatment demonstration (264.272(c)(1)(i)). Per 264.282 this documentation must address the requirements of 264.17(b).

PROCESS INFORMATION

4. The treatment demonstration provided in Attachment D-1 is not adequate for the following reasons (264.272, 270.20(a)):

   a. It does not demonstrate that hazardous constituents in the wastes will be completely degraded, transformed, or immobilized in the treatment zone. A short-term laboratory toxicity test with a one year field plot or "barrel lysimeter" study, followed by the laboratory toxicity test and a two-year follow-up field study is needed to make this demonstration. (See Section 1.3.2 of EPA/530-SW-84-015, December 1984)

   b. It does not demonstrate that volatilzation of hazardous constituents will not be significant.

   c. Hazardous and nonhazardous wastes are subject to the same analyses and treatment demonstration if they are to be applied to the same treatment area.

   d. It does not demonstrate if macropore flow exists. This is necessary in order to determine if pan lysimeters are required to monitor this type of flow condition.

5. A map or plot plan delineating the horizontal boundaries of the treatment areas (or units) and all soil series occurring within the treatment areas is not provided (264.272(c)(1)(iv)). This information should then be used to define "uniform areas" within the land treatment unit.

6. The land treatment program provided in Section D is not adequate because it is not based on an acceptable treatment demonstration as required by 264.271(a)(1), 264.271(a)(2), 264.273(a) and 270.20(b). Specifically, the following need to be provided:

   a. A monthly application schedule based on:
      i. The application limiting constituent,
      ii. The rate limiting constituent,
      iii. The capacity limiting constituent,
      iv. The waste generation rate,
      v. Seasonal restrictions,
      vi. The expected life span of the unit, and
      vii. The waste application method.

   b. Measures to control soil pH including:
      i. The methods used to measure the soil pH,
      ii. The methods used to determine how much lime or "soil mineral" will be added to correct the pH,
      iii. The definition of "appropriate soil mineral" on Page D-30,

Furthermore, current guidance indicates that the optimal pH range is 6.0 to 8.0, not 8.5 as indicated on page D-29.

c. Section D-4, Soil Management needs to include the following:
   i. The dimensions of the disc and plow listed in Table D-16, and the equipment used to inject the waste. This should include pictures which show the injection system,
   ii. The direction in which the treatment plots are cultivated. Contour tillage across the slope rather than with it is recommended,
   iii. Documentation based on the treatment demonstration which shows that the different incorporation methods for the hazardous and nonhazardous wastes will not adversely affect the treatment of the hazardous constituents in both types of wastes,
   iv. A description of the fertilizer which is proposed.

d. Moisture control at the land treatment area needs to be described in much greater detail. First of all, a water balance must be prepared to determine whether moisture control problems will occur at the site. This is described in Section 8.3 and Appendix E of SW-874, Hazardous Waste Land Treatment. Results obtained from the water balance will then determine site design criteria such as the installation of a subsurface drainage system or a controlled surface run-off network.

7. The soil sampling data provided in Tables D-5 to D-13 is not adequate for the following reasons (264.272(c)(1)(iv));

a. Tables D-5, D-7, D-9 and D-13 state that the samples were analyzed by agricultural analytical procedures. If these procedures are not the same as those specified in SW-846, they must be described in detail and documented that they are equivalent to SW-846.

b. Analyses for the surface, 12 inch depth, and 24 inch depth of Area IV are not provided. Also, the analyses for the 3 foot depth of Area IV are 2 years older than the analyses (for the 3 foot depth) of the other areas.

c. The parameters analyzed vary with depth:
   i. The surface, 12 inch depth, and 24 inch depth are not analyzed for oil & grease,
   ii. The 3 foot depth is not analyzed for cation exchange capacity.

d. None of the soil samples, including background samples, are analyzed for the Appendix VIII constituents suspected to be in refinery wastes. This information is necessary in order to determine baseline concentrations of these constituents for use in the treatment demonstration.

e. The December 15, 1982 composite soil EP toxicity analyses do not include Area IV. Also, samples should only be composited within uniform areas of the treatment unit.

f. The background soil analyses do not include all the parameters or sample depths as the other soil analyses. Specifically, the background analyses do not include oil and grease, and do not include the 3 foot depth level.

8. The Run-on and Run-off controls discussed in Sections D-4a(1) and D-5a are not adequate to meet the requirements of 264.273(c) and (d) because it has not been demonstrated that the berms, swales and dtiches are designed to handle the peak discharge from at least a 25-year storm. Methods for estimating the volume of run-on and run-off are given in Section 8 of SW-874.

   The berms, swales and ditches may then be designed to meet the requirements of 264.273(c) and (d) based on these volume estimates. Design drawings of these berms, swales, and ditches must then be included as part of the application. Methods used to minimize erosion of these areas during the time a vegetative cover is being established also need to be described.

9. Section D and Figure D-2a indicate that an intermittent stream course is used to transport run-on and run-off to the facility's waste water treatment pond. This is not adequate for the following reasons:

   a. The stream bed is unlined. Therefore any release of hazardous constituents from the treatment areas which enters this stream may contribute to groundwater contamination beyond the point of compliance.

   b. The stream runs off of Union Oil's property for about 1600 feet before it returns to Union Oil's property. Thus, a release of hazardous constituents to the stream may contaminate soils and water not located on Union Oil's property.

10. Page D-27a indicates that the crown of the concrete pipe running under Area II is only 3 inches below the treatment zone (treatment zone is 36 inches deep and the crown of the pipe is 39 inches deep). Therefore run-on which passes through this pipe must also be tested for hazardous constituents because there is a high probability that untreated hazardous constituents may be washed into this pipe.

11. The source used to determine the depth to the seasonal high water table (Table E-2) is not adequate to meet the requirements of 264.271(c)(2). Because of the heterogeneous nature of glacial till deposits, this information must be obtained from water levels taken from the shallow monitoring wells (SW-4, 5, 7, 8). The water levels should be taken in the spring at a frequency of at least twice a month or within 24 hours of a significant rainfall event.

GROUNDWATER MONITORING

General

12. Page E-5 states that the bedrock dips to the east, whereas Page E-13 states that it slopes to the northwest.

13. Page E-12 states that the clayey, silty, fine to coarse sand (the second most predominent soil type) is known to be absent under certain portions of the land treatment area. However, the cross sections (figures E-3 to E-6) indicate that it is present under these areas.

14. The estimated permeability coefficients on page E-18 and Attachment E-3 are not adequate to characterize the soils at the site. In-situ permeability tests of all soil types and water bearing strata is necessary to determine the permeability and hydraulic properties of these soils. One in-situ test in MW-1 is not sufficient to meet this requirement. Furthermore, the assumed porosity of 0.30 indicated on page E-19 is only acceptable for mixed-grained sand that is densely compacted.

15. Page E-20 indicates that under unity gradient the rate of vertical migration is estimated to be approximately equivalent to that for horizontal flow. This would only apply for a homogeneous material, not one which exhibits layered heterogeneity as many glacial till deposits do.

Unsaturated Zone

16. Because the perched water table (Section E-4b) is hydraulically interconnected with the shallow dolomite aquifer, Section E-4b will be reviewed as part of saturated zone monitoring (Section E-3). Therefore, please address perched water table monitoring as part of Section E-3 in all future submittals.

17. The description of the depth of the treatment zone (i.e. 3 feet) is not adequate (264.271(c)(1)). It is very important to assure that samples from the active areas of the land treatment unit and background samples are monitoring similar horizions or layers of parent material. Because soils seldom consist of smooth, horizontal layers, the guidance manuals available state that it is not recommended to specify a single depth below the land surface as the bottom of the treatment zone. Rather, the bottom of the treatment zone should be defined as the bottom of a chosen diagnostic soil horizon. The sources used to identify the soil types in Section D-36 could be used to identify an applicable soil horizon once the specific soil(s) in the land treatment areas have been identified.

18. The locations of the lysimeters and soil cores are not adequate for the following reasons (264.278(b) and (d), 270.20(b)(3)(ii)):

    a. The method used to determine the random sample locations is not provided. The recommended method is described in Section 9.4.2.1 of SW-874 as well as Sections 3.3, 3.4, 4.4, 4.5 of EPA/530-SW-84-016;

    b. Documentation that at least six lysimeters are installed and six soil cores are taken at randomly selected locations per uniform area is not provided. If, however, a uniform area is greater than 12 acres, then at least two randomly selected soil cores should be taken per every 4 acres and composited in pairs and 2 lysimeters per every 4 acres should be installed;

    c. Because the bottom of the treatment zone has not been adequately described, it cannot be demonstrated that the depth of the lysimeters (pages E-50, 51) or soil cores (page E-60) are adequate;

    d. The locations of the above ground portions of the lysimeters are not provided. In order to prevent operational inconvenience and sample bias, the above ground portions of these devices must be located at least 30 feet from the sample location.

19. The sampling frequency of the lysimeters proposed in Section E-4c(3) is not adequate to meet 264.278(e). The available guidance manuals indicate that samples should be collected and analyzed at least quarterly unless the wastes are applied very infrequently. If liquid is not present at a regularly scheduled sampling event, the monitoring device should be evacuated prior to and checked within 24 hours following each significant waste application or rainfall event, and a sample drawn when sufficient liquid is present. Also, the sample preservation and shipment procedures E-4c(5) and E-4d(5) (E-3b(3)) are not adequate. See Appendix B, page B-6 of EPA/530-SW-84-016.

20. A description of the materials used to construct the lysimeters is not provided. Because these devices will be used to collect samples for organic analyses, inert materials such as glass, teflon, and stainless steel must be used for all parts of the sampling device which come in contact with the sample.

21. The installation of the lysimeters is not adequate to meet 264.278(e) for the following reasons:

    a. Page E-49 states that they are installed at a depth of 4-6 feet, page E-50 states that they are installed at a depth of 2-5 feet and pages E-50 & 51 state that they are installed at 28 and 40 inches;

    b. Page E-48 references Figure E-11a as a typical vacuum lysimeter installation. This figure shows that the lysimeter is not completely covered by soil, this is not consistent with the description in Section E-4c(1);

c. Page E-48 states that placement of bentonite pellets in the bottom of the hole is optional. This is not an acceptable installation method. Bentonite pellets must be placed below the lysimeter;

d. Section E-4(c)(1) does not indicate if the lysimeters were tested before they were installed;

e. Section E-4(c)(1) does not indicate how the existing lysimeters were installed.

22. The analytical methods (i.e. parameters being monitored) described in Section E-4c(6) and E-4d(6) are not adequate to meet the requirements of 264.278(e)(3) because they are not based on an acceptable treatment demonstration and monitoring for only these parameters would not be sufficient to determine if there is a statistically significant change over background values for any of the hazardous constituents to be monitored under 264.278(a). Also the analytical methods must be referenced to specific methods in SW-846.

23. The chain of custody procedures indicated in Section E-4c(7) and E-4d(7) (E-3b(5)) are not adequate to meet the requirements of 264.278(e)(4) because they do not include the following:

a. Sample labels;
b. Sample seals;
c. A field log book;
d. A chain of custody record which accompanies every sample;
e. A sample analysis request sheet;
f. The sample delivery to the laboratory;
g. The shipping of samples;
h. The receipt and logging of saples at the laboratory.

All of the above items are discussed in Appendix B of EPA/530-SW-84-016.

24. Section E-4c(8), background values for parameters, is not adequate to meet the requirements of 264.278(c) for the following reasons:

a. The parameters monitored are not adequate for the same reasons identified in Item 22 and 3a (264.278(c));

b. It has not been demonstrated that the soils in the background plot have similar characteristics to those in the treatment zone (264.278(c)(1) and (2)). If the response to item 5 determines that more than 1 uniform area exists, more than one background plot may be necessary due to the different soil types within the treatment unit;

c. Background soil-pore liquid values must be based on at least quarterly sampling for one year (264.278(c)(2));

d. At least 8 randomly selected soil cores must be taken within the 6 inch depth below the treatment zone. These may be composited into 4 composites.

e. The form that the background values are expressed in was not provided for the lysimeters and was not adequate for the soil cores (264.278(c)(3)). According to 264.278(d), the results of unsaturated zone monitoring must be in a form sufficient for determining statistically significant increases under 264.278(f). An example format is provided in Appendix C of EPA/530-SW-84-016, December 1984.

f. The locations and depths of the background samples are not adequate (264.278(c)(4) and 264.278(b)(1)) because the classification of the soil(s) (and therefore uniform areas) within the treatment areas is not adequate, and the depth of the treatment zone is not adequately defined.

25. Sections E-4c(9) and E-4d(9), evaluation of data, are not adequate to meet the requirements of 264.278(f) because they do not indicate how a statistically significant change over background values for any hazardous constituent to be monitored under 264.278(a) will be determined.

26. The term "anomalous increase" in Sections E-4c(10) and E-4d(10) needs to be defined. The appropriate actions as set forth in 40 CFR 264.278(g) and/or (h) also need to be defined.

27. Justifications of principle hazardous constituents to be monitored in the unsaturated zone monitoring program in Sections E-4c(2) and E-4d(2) are not adequate because they are not based on an acceptable treatment demonstration (264.278(a)(2)).

28. A description of the type of sampling equipment used for soil cores and the reason it was chosen is not provided (264.278(e)).

29. The soil core sampling procedure described in Section E-4d(4) (Page E-60) is not adequate to meet the requirements of 264.278(e) for the following reasons:

    a. Step by step procedures as described in Section 3.5 of EPA/530-SW-84-016 are not provided. These must include:
        i. Preliminary preparation of the site,
        ii. Vertical alignment of the tool in the hole,
        iii. Discarding soil from non sampling horizons,
        iv. Measuring the depth of the hole,
        v. Collecting soil samples from the tool, and
        vi. Backfilling the hole with soil to prevent vertical leakage of pollutants from the treatment zone;

b. It does not indicate how a sample will be obtained from within 6 inches from the bottom of the treatment zone;

c. It does not address the compositing of samples as described in Section 3.4.1 of EPA/530-SW-84-016;

d. It does not address decontamination of the sampling equipment as described in Section 3.6 of EPA/530-SW-84-016.

e. The methods used to prevent contamination of soil core samples are not provided. These methods should address cross contamination from other soil cores as well as contamination of the individual soil zone being sampled due to soil falling into the cavity from the land surface or from the walls of the borehole.

Saturated Zone

30. The interim period groundwater monitoring data required by 270.14(c)(1) are not adequate because of the following:

a. The most recent analytical and potentiometric data are not provided. This should include quarterly groundwater quality data since March 1984 and potentiometric contour maps of the data collected since the application was originally submitted;

b. Specific descriptions of the collection, preservation, shipping, and analytical procedures used to obtain the background samples along with copies of the chain of custody forms are not provided 265.92(a);

c. Copies of past statistical analyses, a description of the problems associated with the student t-test (pH) and a copy of Union Oil's notification of a statistically significant increase are not provided.

31. The identification of the uppermost aquifer and the data used to document this information (270.14(c)(2)) are not adequate for the following reasons:

a. The cross sections provided (Figure E-2) do not include all land treatment areas. Specifically:

i. Area II,
ii. The intermittent stream and any stream deposits associated with it;

b. The results of in-situ tests to determine the hydraulic conductivities of all shallow and deep wells need to be provided;

c. The results of in-situ and laboratory tests of the hydraulic conductivity of the silty clay/clayey silt zones need to be provided;

d. The physical properties of the dolomite (both weathered and unweathered) need to be described in much greater detail. Specifically, the following need to be determined:

   i. Hydraulic conductivity,
   ii. Porosity,
   iii. Potentiometric data (hydraulic gradient) and contour maps,
   iv. The degree of interconnection with the unconsolidated deposits,
   v. Flow rate and direction of groundwater in the dolomite (not the soil/bed rock interface, page E-26),
   vi. Any fractures/fracture planes,
   vii. Weathering of the dolomite,
   viii. The effect of any pumping wells;

e. Structural contour maps of the weathered and unweathered dolomite need to be provided;

f. The presence of what appears to be a continuous sand layer at elevation 630' needs to be discussed in greater detail and Figures E-3, 4, 5, 6 revised to indicate its location;

g. The effect of the Chicago Sanitary and Ship Canal and the I&M Canal on the groundwater needs to be determined;

h. Why were the shallow sand and gravel deposits at elevation 660' in MW-3 and MW-5 drawn as stringers and not as a locally continuous sand seam in Figure E-3?

i. SW-7 detected sand and rock fragments at a depth of 39 feet (elev. 660) and MW-7 indicates a bolder at 35' and 44' yet figure E-4 shows silty clay/clayey silt at this depth and location;

j. MW-5 and MW-8 indicate sand and gravel deposits at elevations 635' and 655' yet Figure E-6 does not show these as continuous seams.

k. The effect of local pumping on the groundwater flow rate and direction needs to be determined.

l. The cross-sections and boring logs should be used to construct a fence diagram in order to clearly define the interconnected aquifers beneath the facility.

m. All new cross sections must indicate the screened intervals of the monitoring wells (both SW and MW series).

n. The vertical limits of the soil types indicated in the SW series and MW-7, 8, and 9 boring logs need to be identified.

Detection Monitoring Program

32. The "selected organic/inorganic parameters" must be proposed for the detection monitoring program. Although the list of parameters will be dependent on the outcome of the treatment demonstration, an initial list based on laboratory analyses of both the hazardous and nonhazardous wastes for the parameters indicated in Attachment 1 to this letter needs to be provided with the next submission. Simply providing procedures for selecting parameters is not acceptable to meet the requirements of 264.98(a) for the following reasons:

    a. The types, quantities, and concentrations of hazardous constituents in the wastes have not been identified (264.98(a)(1));

    b. A description of the expected mobility, stability, and persistence of waste constituents, or their reaction products, in the unsaturated zone beneath the treatment zone is not provided (264.98(a)(2));

    c. The detectability of the indicator parameters, waste constituents, or their reaction products in the groundwater is not specified (264.98(a)(3)).

    d. Reasons for selecting the groundwater quality and indicator parameters (Page E-36) need to be provided. Will statistical analyses be run on all of these parameters as well the organic/inorganic parameters?

Groundwater Monitoring Program

33. The design of the wells (MW series) is not adequate to monitor the groundwater in the uppermost aquifer (264.97(a)(b), and (c)) for the following reasons:

    a. In order to obtain a representative sample from the strata being monitored, the screened interval must be less than or equal to 10 feet;

    b. The sand pack should extend a maximum of 1 foot above or below the screened interval;

    c. The annular space must be filled with expanding cement grout;

    d. The slotted screen must be manufactured (not hand cut with a hacksaw). The size of the slots must be based on the grain size of the sand pack around the screen as well as the grain size of the strata being monitored;

e. The section of the well which is placed in the saturated zone must be constructed of stainless steel (SS-316) or teflon because organic parameters are being monitored at this facility.

Based on the above design deficiencies, new monitoring wells must be installed at the facility.

34. The spacing of the wells must be 150 feet or less unless a demonstration (i.e. computer model) justifying a greater spacing is provided (264.97(a)).

35. The screened intervals for wells MW-4, MW-6, MW-7, and MW-9 and possibly MW-3 and MW-5 are unacceptable (264.97(a)). It appears that in order to adequately monitor the uppermost aquifer, wells should be placed in the 630' sand zone (where saturated) and the weathered dolomite. If a large portion of the dolomite (i.e. greater than 20 feet) is capable of producing water, additional wells at deeper elevations will be required. Therefore, nested wells are necessary to adequately monitor the uppermost aquifer.

36. The monitoring wells are not adequate to produce representative samples because the well placement is not adequate (264.97(a)(1) and (2)). They must be nested in the 630' sand and the dolomite.

37. Background values for each proposed monitoring parameter or constituent are not provided (264.98(c), 270.14(c)(6)(iii)). When a new monitoring system is installed, new background data must be collected in accordance with 264.97(g). The background values must be expressed in a form necessary for the determination of statistically significant increases under 264.97(h).

38. The procedures for sample collection are not adequate to meet the requirements of 264.97(d)(1) for the following reasons:

    a. The type of bailer is not specified. The bailer must be constructed of stainless steel (SS-316) or teflon and have a bottom valve. The cord used with the bailer must be constructed of a material which does not conflict with the constituents being sampled;

    b. It is not clear why pages E-30 and E-31 describe the decontamination of bailers when Page E-32 states that each well has its own dedicated bailer. In any case, each well must have a dedicated bailer which meets the criteria described in a. above;

    c. Should decontamination be required, methanol should not be used. The available guidance manuals indicate that acetone or hexane should be used to decontaminate samplers used to collect samples for organic analysis;

d. The total depth of the wells must be measured and recorded each time the wells are sampled;

e. Procedures to ensure that parameters which are pH and/or volatile sensitive are sampled first are not specified;

f. The well evacuation procedures need to be modified to indicate that on the day of sampling, the wells are evacuated to dryness or have 3 well volumes removed. Under no circumstances should more than 3 hours pass between well evacuation and sampling;

g. Procedures to dispose of the evacuated well water need to be specified;

h. Procedures to sample "floaters" (if present) prior to well evacuation need to be provided;

i. Procedures to record any observations during sampling and well evacuation in a field notebook need to be provided;

j. Any special sampling procedures for organic compounds need to be specified.

39. The procedures for sample preservation and shipment are not adequate to meet the requirements of 264.97(d)(2) for the following reasons:

a. It is not adequate to state that "the methods are in accordance with EPA ... or approved alternative methods". The specific methods need to be stated in the application and referenced to SW-846;

b. The parameters which each aliquot will be sampled for (Attachment E-8) need to be specified.

40. The analytical procedures indicated in Section E-3b(4) are not adequate to meet the requirements of 264.97(d)(3) for the following reasons:

a. Specific analytical methods for each parameter being monitored need to be identified in the application. These methods must all be referenced to SW-846;

b. If pH and specific conductance are to be used as indicator parameters, their values must be determined in the field at the time of sampling. Procedures for the field measurement of these parameters are not provided;

c. The use of blanks, spikes or duplicates needs to be discussed.

41. The sampling and analysis period for organic and inorganic parameters must be semiannually (264.98(d)).

42. The procedures for determining the flow rate of groundwater in the uppermost aquifer is not provided (264.98(e)).

43. The procedures to be used to determine whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point are not provided (264.98(g)).

44. The statistical comparison procedures which will be used to evaluate whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point are not provided (264.98(g)(1), 264.97(h)).

45. An estimate of the time period, subsequent to sampling completion, within which the results of the statistical analysis will be available is not provided (264.98(g)(2)).

Perched Water Table Monitoring

46. The well spacing for the SW series wells needs to be justified. This may require some computer modelling. Also, the design of the present wells is not adequate because of the large screened interval and sand pack, materials of construction and backfilling of the annulus with native clay.

47. The background data indicated in Section E-4b(8) should be provided.

48. The sampling and analysis problems for these wells are the same as those for the MW series wells.

49. Some form of statistical and/or graphical analyses need to be specified for the data collected from these wells.

50. The post 1984/1985 sampling schedule needs to be provided.

PROCEDURES TO PREVENT HAZARDS

51. Page D-40 states that wind dispersal control techniques are in place, but Section F does not include the inspection of these items (264.273(g)(2)).

52. As discussed in Item 9 above, run-off control as required by 270.14(b)(8)(iii) is not adequate because the run-off flows across Mobil Oil property in an unlined stream.

53. The precautions taken to prevent accidental ignition of the D001 waste are not adequate. The requirements of 264.281 need to be addressed. Also, the use of spark arresting mufflers and spark proof tools on and around the incorporation equipment (when D001 waste is present) needs to be discussed.

CONTINGENCY PLAN

54. The plan does not discuss the "immediate" implementation of the plan (264.51(b)).

55. The various emergency plans indicated in Section H of attachment G-1 need to be provided (264.56).

56. Documentation that copies of the contingency plan have been sent to the facilities listed in Table G-5 is not provided (264.53).

57. Did the recent explosion and napthaline spill require any modifications of the contingency plan?

PERSONNEL TRAINING

58. Attending one conference in 1980 and one in 1981 (Table H-2) is not adequate documentation that the operations engineer has been trained in hazardous waste management (264.16(a)(2)). This documentation should include items such as a resume, list of recent conferences/seminars attended, and a description of all experience involving the management of hazarous waste both at Union Oil and any other facilities.

59. Pages H-12, 13 and 15 state that each area shift supervisor is an emergency coordinator. This does not appear to be consistent with Page G-13 or Table G-2.

CLOSURE PLAN

60. Section I-1a does not describe how closure of the facility controls, minimizes, or eliminates threats to human health and the environment (264.111).

61. Partial closure is defined as closure of a discrete part or unit of the facility. In this case, a discrete unit would be a uniform area or one of Areas I, II, III, IV. Union Oil, however, indicates that after any of the three situations described on pages I-3 and I-4, the land treatment area will resume operations. Therefore, it appears that the procedures outlined in Section I-1b, Partial Closure, should be included in the contingency plan. Also, the procedures in paragraph F of Section I-1b regarding the clean up of incompatible wastes, need to be specified.

62. The procedures for final closure of the land treatment area are not adequate for the following reasons (264.112(a)(1)):

    a. The soil sampling procedures must be consistent with Section E;

    b. The accumulation of Appendix VIII constitutents other than metals (lead and chromium) is not addressed;

    c. In order to minimize infiltration, and therefore migration of hazaroud constituents from the treatment zone, it appears that a clay cap should be placed on the treatment area. 264.118(a)(2)(i) requires that this cap be maintained during post closure;

    d. Will the application of nonhazardous wastes continue during the 3 year closure period?

63. The maximum inventory of wastes needs to be expressed in gallons as well as dry tons.

64. The description of the vegetative cover as required by 270.20(f) and 264.280(a)(8) needs to include the following:

    a. Data showing that the cover can thrive in the soils and climate in which it will be planted;

    b. The minimum percentage of soil cover to be maintained on the closed land treatment area;

    c. The methods to be used to establish and maintain the cover.

65. How will it be demonstrated that all organics have been degraded within the 3 year closure period (264.280(a)(1))?

66. The frequency of the post closure monitoring is not adequate. As required by 264.98(d) sampling must be at least semi-annually. The closure cost estimate should be revised to reflect this change.

RW:sf/sp/2024e,1-14

ATTACHMENT 1

Appendix VIII Hazardous Constituents Suspected to be Present in Refinery Wastes

**Acetonitrile (Ethanenitrile)
**Acrolein (2-Propenal)
**Acrylonitrile (2-Propenenitrile)
Aniline (Benzenamine)
Antimony
Arsenic
Barium
Benz (c) acridine (3,4-Benzacridine)
Benz (a) anthracene (1,2-Benzanthracene)
**Benzene (Cyclohexatriene)
Benzenethiol (Thiophenol)
Benzidine (1,1-Biphenyl-4,4'diamine)
Benzo(b)fluoranthene (2,3-Benzofluoranthene)
Benzo(j)fluoranthene (7,8-Benzofluoranthene)
Benzo(a)pyrene (3,4-Benzopyrene)
**Benzyl chloride (Benzene, (chloromethyl)-)
Beryllium
Bis (2-chloroethyl) ether (Ethane, 1,1'-oxybis (2-chloro-))
Bis (2-chloroisopropyl) ether (Propane, 2,2'-oxybis (2-chloro-))
**Bis (chloromethyl) ether (Methane, oxybis (chloro))
Bis (2-ethylhexyl) phthalate (1,2-Benzenedicarboxylic acid, bis (2-ethylhexyl) ester)
Butyl benzyl phthalate (1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester)
Cadmium
Carbon disulfide (Carbon bisulfide)
p-Chloro-m-cresol
**Chlorobenzene (Benzene, chloro-)
**Chloroform (Methane, trichloro-)
**Chloromethane (Methyl chloride)
2- Chloronapthalene (Naphthalene, beta-chloro-)
2-Chlorophenol (Phenol, o-chloro-)
Chromium
Chrysene (1,2-Benzphenanthrene)
Cresols (Cresylic acid) (Phenol, methyl-)
**Crotonaldehyde (2-Butenal)
Cyanide
Dibenz(a,h)acridine (1,2,5,6-Dibenzacridine)
Dibenz(a,j)acridine (1,2,7,8-Dibenzacridine)
Dibenz(a,h)anthracene (1,2,5,6-Dibenzanthracene)
7H-Dibenzo(c,g)carbazole (3,4,5,6-Dibenzcarbazole)
Dibenzo(a,e)pyrene (1,2,4,5-Dibenzpyrene)
Dibenzo(a,h)pyrene (1,2,5,6-Dibenzpyrene)
Dibenzo(a,i)pyrene (1,2,7,8-Dibenzpyrene)
**1,2-Dibromoethane (Ethylene dibromide)
Di-n-butyl phthalate (1,2-Benzenedicarboxylic acid, dibutyl ester)
*Dichlorobenzenes
**1,2-Dichloroethane (Ethylene dichloride)
**trans-1,2-Dichloroethene (1,2-Dichlorethylene)
**1,1-Dichloroethylene (Ethene, 1,1-dichloro-)
**Dichloromethane (Methylene chloride)

**Dichloropropane
Dichloropropanol
Diethytl phthalate (1,2-Benzenedicarboxylic acid, diethyl ester)
7,12-Dimethyl-benz(a)anthracene
2,4-Dimethylphenol (Phenol, 2,4-dimethyl-)
Dimethyl phthalate (1,2-Benzenedicarboxylic acid, dimethyl ester)
4,6-Dinitro-o-cresol
2,4-Dinitrophenol (phenol, 2,4-nitro-)
2,4-Dinitrotoluene (Benzene, 1-methyl-2,4-dinitro-)
Di-n-octyl phthalate (1,2-Benzenedicarboxylic acid, dioctyl ester)
**1,4-Dioxane (1,4-Diethylene oxide)
1,2-Diphenylhydrazine (Hydrazine, 1,2-diphenyl-)
**Ethyleneimine (Azridine)
**Ethylene oxide (Oxirane)
Fluoranthene (Benzo (j,k) fluorene)
**Formaldehyde
Hydrogen sulfide (Sulfur hydride)
Indeno (1,2,3-cd)pyrene (1 10(1,2-phenylene)pyrene)
Lead
Mercury
Methanethiol (Thiomethanol)
3-Methylchlolanthrene (Benz(j)aceanthrylene, 1,2-dihydro-3-methyl-)
**Methyl ethyl ketone (MEK) (2-Butanone)
Naphthalene
Nickel
p-Nitroaniline (Benzenamine, 4-nitro-)
Nitrobenzene (Benzene, nitro-)
4-Nitrophenol (Phenol,pentachloro-)
Pentachlorophenol (Phenol, pentachloro-)
Phenol (Benzene, hydroxy-)
Pyridine
Selenium
*,**Tetrachloroethanes
**Tetrachloroethylene (Ethene, 1,1,2,2-tetra chloro-)
**Toluene (Benzene, methyl-)
*Trichlorobenzenes
*,**Trichloroethanes
**Trichloroethene (Trichloroethylene)
*Trichlorophenols
Vanadium

---

* If any of these groups of compounds are found, the specific isomers listed in Appendix VIII should be identified.

** Use Test Method 8240 for these volatile compounds.

*** Use Test Method 3050 in SW-846 for all metals; see Attachment 2 for semivolatile organic compounds.

Non-Appendix VIII Constituents of Concern (may be added to App. VIII)

Cobalt
1-Methylnapthalene
Styrene
Hydroquinone
Anthracene
Indene
5-Nitro acenaphthene
Quinoline
Phenanthrene
Pyrene

5HS-12

CERTIFIED MAIL #P246 373 457
RETURN RECEIPT REQUESTED

D.W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Re: Waste Reduction Process
ILD 041550567

Dear Mr. Bruckert:

We have reviewed the Tracker Oil Recovery Process described in your letter of May 13, 1985, with respect to its regulatory status under the provisions of the Resource Conservation and Recovery Act (RCRA). Our analysis is as follows.

The waste described as "residual from a slop oil tank" appears to meet the definition of slop oil emulsion solids from the petroleum refining industry (K049). Therefore, storage of the material prior to recycling is regulated -40 CFR §261.6(b). The actual reclaimation, in the Tracker system, is excluded from regulation.

Three materials are generated as a result of the Tracker process: filter cake, water, and oil. The filter cake remains a listed hazardous waste (K049) and must be managed in accordance with the regulations given in 40 CFR Part 264. The water generated in the process remains a hazardous waste under 40 CFR §261.3(c), and any storage prior to treatment in a NPDES permitted unit is regulated. The waste oil recovered from the Tracker process is presently exempt from regulation. However, on January 11, 1985, U.S. EPA proposed new regulations regarding the use of waste and off-specification oil. In addition, on May 13, 1985, the Agency requested public comment on the need for regulation of "oils that are recovered from hazardous wastes that are generated at a petroleum refinery and which recovered oils are fed back to the petroleum refinery for processing". (Copies of the Federal Registers are enclosed). Therefore, though the use of the oil is presently exempt from regulation, it may come under regulation in the near future, and your decision on whether to utilize the Tracker process should take this possibility into account.

Original in Docket

If you have further questions regarding this issue, please contact Gale Hruska at (312) 886-0989.

Sincerely yours,

Edith M. Ardiente, P.E.
Chief, Technical Programs Section

cc: Larry Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.Hruska:fr:5/22/85

CERTIFIED MAIL P#557 098 050
RETURN RECEIPT REQUESTED

Gale

5HS-12

Mr. D.W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Re: Notice of Deficiency
Part B Permit Application
Union Oil-Chicago Refinery
ILD041550567

Dear Mr. Bruckert:

U.S. Environmental Protection Agency (U.S. EPA) and Illinois Environmental Protection Agency (IEPA) have completed the first technical review of your Part B hazardous waste permit application. Enclosed is a list of deficiencies which must be addressed. Because of the magnitude of additional information required, we are extending our normal 30 days submission due date; your response is due December 1, 1985.

Please submit the original and one copy of your response to this Notice of Deficiency to U.S. EPA and two copies to IEPA. Your response should be in a format which allows incorporation of the new information directly into the appropriate sections of the existing Part B application. A certification statement identical to that given in 40 CFR §270.11(d) must accompany the submission. Please send your response to the following addresses:

RCRA ACTIVITIES Part B Permit Application U.S. EPA, Region V P.O. Box A3587 Chicago, Illinois 60690	Lawrence Eastep, Manager Permit Section, DLPC Illinois EPA 2200 Churchill Road Springfield, Illinos 62706

If you have questions regarding the Notice of Deficiency please contact either Gale Hruska (U.S. EPA), at 312/886-0989, or Rob Watson (IEPA), at 217/785-8410.

Sincerely yours,

Edith M. Ardiente, P.E.
Chief, Technical Programs Section

Enclosure

cc: Lawrence Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.Hruska:fr:9/25/85

RECEIVED
MAY 16 1985
SOLID WASTE BRANCH
U.S. EPA, REGION V

Union 76 Division: East Region
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 148-85

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P08 8720435

A. J. Eliskalns
Manager, Chicago Refinery

RECEIVED 5/16/85

May 13, 1985

Mr. Basil G. Constantelas
Director, Waste Management Division
U. S. Environmental Protection Agency
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Constantelas:

Waste Reduction Process

This letter is confirming a telephone conversation I had with Mr. Gale Hruska, USEPA, on May 8, 1985. Chicago Refinery is considering the use a process to physically separate a refinery residual into oil, water, and a listed hazardous waste. From my discussion with Mr. Hruska it is my understanding that a permit is not needed to use this process. It is requested that you review the information below and confirm this understanding in writing.

This process is called the Tracker Oil Recover Process. It is a pressure filtration system which breaks oil/water emulsions and separates oil and water from the waste solids by forcing the liquids through a pore size of 1 to 5 microns. The system is mobile and has complete on-site production capabilities. Attached are photographs of the system.

Union Oil is considering the use of the system to process a residual from a slop oil tank at Chicago Refinery. With the Tracker Process on-site near the tank, the residual would be pumped from the tank to the Tracker Process. Oil from the process will return to the Refinery and water will be treated in the Refinery's NPDES facilities. The solid filter cake (Slop Oil Emulsion Solids, K049) generated by the process is a listed hazardous waste. It will be disposed of off-site at an approved landfill.

We believe the Tracker Process is an environmentally sound process, since (1) It reduces the volume of a waste, (2)

205-31

It produces a solid filter cake, and (3) Recovers oil which can be used for a beneficial purpose.

I, therefore, request that USEPA review this information as expeditiously as possible and confirm in writing, to my attention, that a permit is not required to use the Tracker Process.

Very truly yours,

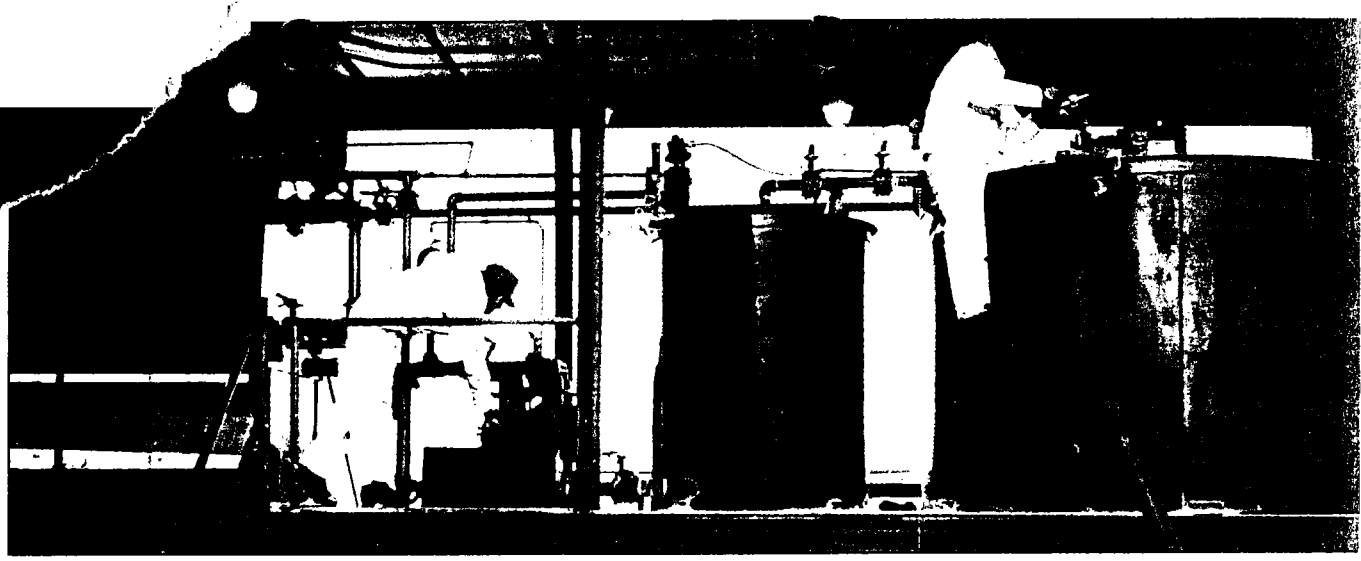
D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

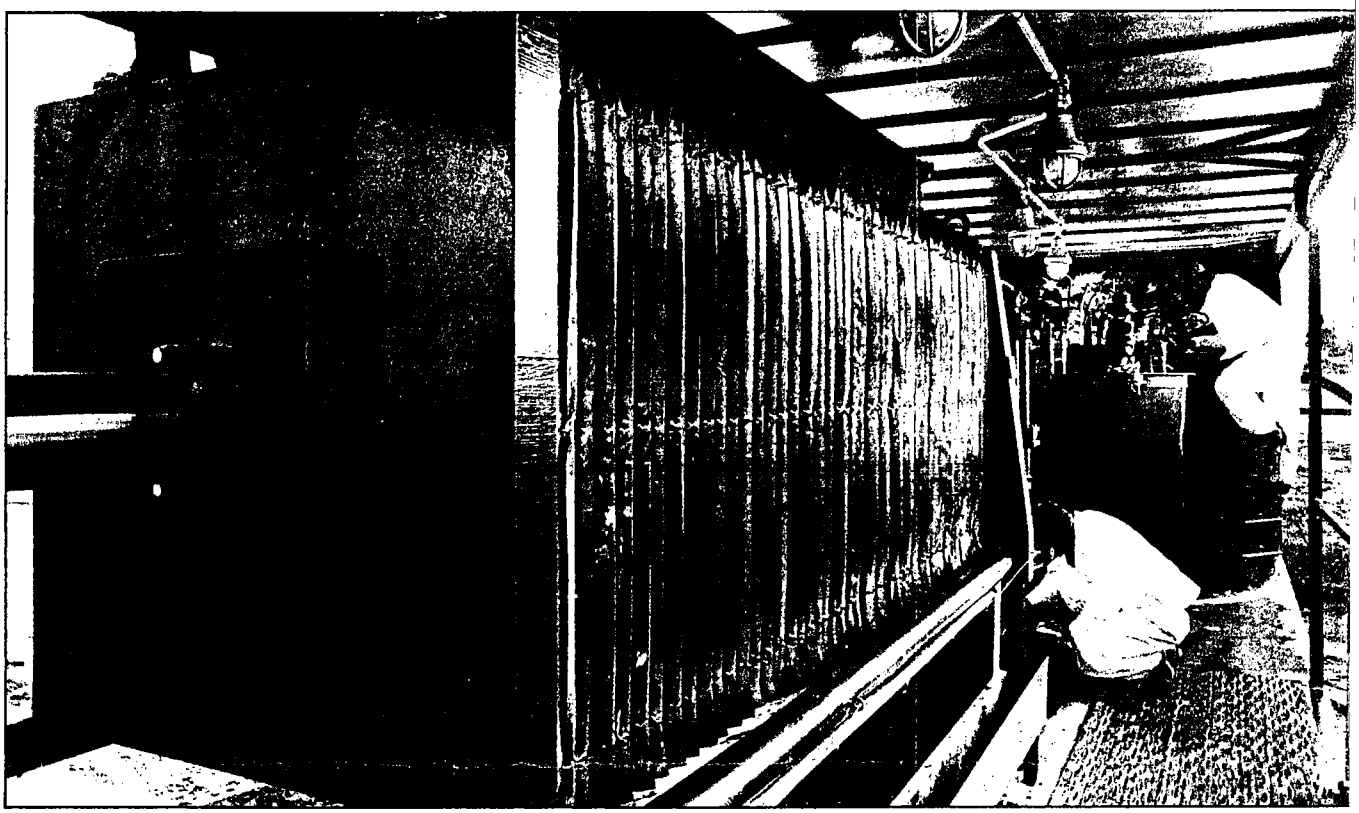
DWB/ms

cc: Eugene Theios - IEPA

Attachment

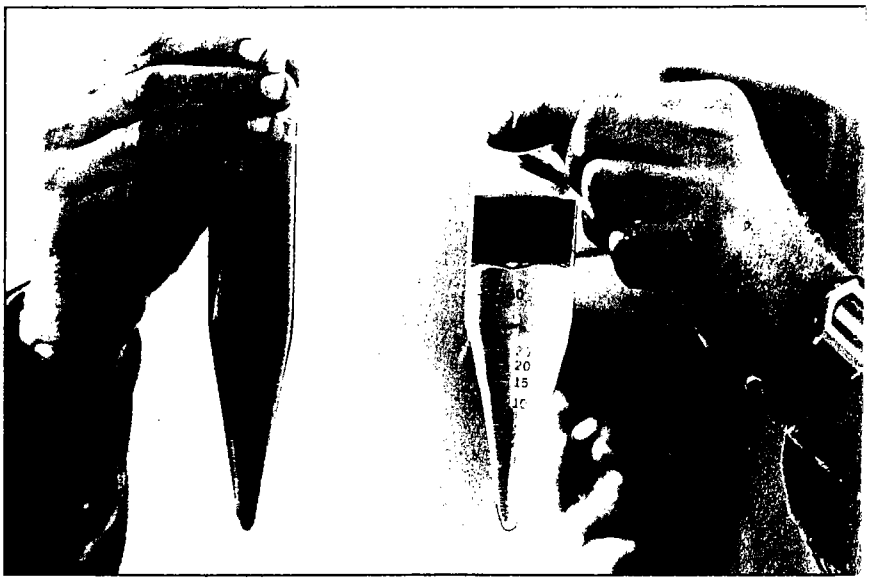


Mobile system provides complete on-site, explosion proof, self-powered production capabilities.



Patent pending process combines conventional equipment technology with a proprietary chemical conditioning of the process stream.

Non-leaching and non-igniting consolidated residue.



Removal of solids to pipeline quality.

MAY 9 1985

5HS-13

CERTIFIED MAIL
RETURN RECEIPT REQUESTED #P 246 272 052

H. D. Haas, Supervisor of Env. SEr.
Union Oil Co. of California-Chgo Ref.
135th Street and New Avenue
Lemont, Illinois 60439

Re: Additional New Requirements
Hazardous and Solid Waste
Amendments of 1984 (HSWA)

Union Oil Co. of California-Chgo Ref.
ILD 041550567

Dear Mr. Haas:

On November 8, 1984, the Hazardous and Solid Waste Amendments of 1984 (HSWA) were signed into law. These Amendments add a number of requirements for your facility which must be addressed before we can issue a permit. A formal request for the submittal of Part B of the Resource Conservation and Recovery Act (RCRA) permit application for treatment, storage, or disposal of hazardous waste had already been made for the above-referenced facility.

The purpose of this letter is to notify you that your RCRA Part B Permit Application must be revised to incorporate the requirements of the Hazardous and Solid Waste Amendments of 1984. The revisions to your Part B application should be submitted no later than August 8, 1985.

This request for a revision to your RCRA Part B permit application and the associated due date of August 8, 1985, for submitting your revisions are related only to the new requirements brought about by the 1984 Amendments. In the meantime, the review and processing of the Part B application you have already submitted will continue and you may be required to make corrections and revisions to your original Part B application that will need to be submitted prior to August 8, 1985.

205-36

Enclosed, for your information, is a fact sheet, a brief guidance document, and a copy of selected statute sections on the new requirements. I urge you to examine the enclosures as soon as possible, because target dates under HSWA begin as early as May 8, 1985. For two of the new requirements, exposure assessments and the double liner requirements, additional guidance being developed by EPA Headquarters will be provided to land disposal permit applicants as soon as they become available.

Please contact the previously identified permit writer with our Agency for additional information.

Sincerely yours,

David A. Stringham, Acting Chief
Solid Waste Branch

Enclosures

	TYPIST	AUTHOR	STU #1 CHIEF	STU #2 CHIEF	STU #3 CHIEF	TPS CHIEF	WMB CHIEF	WMD DIRECTOR
INITIALS	FR							
DATE	5-9-85		MAY 9 1985			5/10/85		

P 246 372 052

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to H.D. Haas, Sup. of Env. Ser. Union Oil Co. of Calif.-Chgo.RF	
Street and No. 135th Street and New AVe.	
P.O., State and ZIP Code Lemont, Il. 60439	
Postage	$.~~90~~ 107
Certified Fee	.75
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	.70
Return receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$ 252
Postmark or Date	

PS Form 3800, Feb. 1982

★ U.S.G.P.O. 1984-446-014

H. Witschonke: 5HS-12: STU#1: ILD 041550567

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
H.D. Haas, Supervisor of Env. Ser.
Union Oil Co. of Calif.-Chgo.Ref.
135th Street and New Avenue
Lemont, IL. 60439

LEMONT, IL 60439 MAY 13 1985 USPS

4. Type of Service:
☐ Registered ☐ Insured
☐ Certified ☐ COD
☐ Express Mail

Article Number P 246 372 052

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X Larry Rosa

6. Signature — Agent
X

7. Date of Delivery
5-13-85

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

H. Witschonke: 5HS-12: STU#1: ILD 041550567

5HS-12

[redacted] #P 602 533 496
RETURN RECEIPT REQUESTED

D. W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil - Chicago Refinery
ILD 041550567

Dear Mr. Bruckert:

This letter is to notify you that we have determined that your Resource Conservation and Recovery Act hazardous waste permit application for the Chicago Refinery is complete. Please note that this determination means only that all of the applicable items required by 40 CFR §270.13-270.21 have been addressed; the adequacy of the submission will be considered during our subsequent technical review of the application. In addition, this completeness review does not include additional requirements that may result from the Hazardous and Solid Waste Amendments of 1984. You will be notified at a later date about any additional information that is required.

U.S. Environmental Protection Agency and Illinois Environmental Protection Agency are now beginning a cooperative joint technical review of the permit application. Either of the Agencies may request additional information when necessary to clarify, modify, or supplement material in the submission. Our purpose is to obtain a complete and adequate permit application. Timely responses to any information request will be appreciated and will result in the expeditious processing of your application.

If you have any questions concerning this matter, please contact Gale Hruska, at (312) 886-0989.

Sincerely yours,

Edith M. Ardiente, P.E.
Chief, Technical Programs Section

cc: Larry Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.Hruska:fr:4/29/85

205-30

5HS-12

CERTIFIED MAIL #P 602 533 496
RETURN RECEIPT REQUESTED

D. W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil - Chicago Refinery
ILD 041550567

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Sincerely yours,

Edith M. Ardiente, P.E.
Chief, Technical Programs Section

cc: Larry Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.Hruska:fr:4/29/85

5HS-12

CERTIFIED MAIL #P 602 533 496
RETURN RECEIPT REQUESTED

D. W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago, Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil - Chicago Refinery
ILD 041550567

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If you have any questions concerning this matter, please contact Gale Hruska, at (312) 886-0989.

Sincerely yours,

Edith M. Ardiente, P.E.
Chief, Technical Programs Section

cc: Larry Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.Hruska:Tr:4/29/85

	TYPIST	AUTHOR	STU #1 CHIEF	STU #2 CHIEF	STU #3 CHIEF	TPS CHIEF	W. CHIEF
INITIALS	FL	GH	MGW				
DATE	4/29/85	4/30/85	4/30/85			5/3/85	

cm 4-30-85

5/2/85 MK

P 602 533 496

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to D. W. Bruckert, Supervisor Environmental Services	
Street and No. Union Oil Company of Cal. Chicago, Refinery	
P.O., State and ZIP Code Lemont, Illinois 60439	
Postage	$ .22
Certified Fee	.75
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	.90
Return receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	1.67
Postmark or Date	

CHICAGO, ILLINOIS MAY 7 1985 USPO

PS Form 3800, Feb. 1982

★ U.S.G.P.O. 1983-403-517

ILD 041550567:STU#1: 5HS-12: G. Hruska

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
D. W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago, Refinery
Lemont, Illinois 60439

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P602533496

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X Jon Urban

6. Signature – Agent
X

7. Date of Delivery
5/8/85

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

G. Hruska: 5HS-12: STU#1: ILD 041550567

MAY 0 2 1985

5HS-12

CERTIFIED MAIL #P 557 098 136
RETURN RECEIPT REQUESTED

Lawrence W. Eastep, Manager
Permit Section, DLPC
Illinois EPA
2200 Churchill Road
Springfield, Illinois 62706

Re: Part B Permit Application
Union Oil Company - Chicago Refinery
ILD 041550567

Dear Mr. Eastep:

We are in concurrence with your determination that the Part B application for the Union Oil Company-Chicago Refinery is complete. Therefore, we are requesting that you begin the technical review. In accordance with our cooperative agreement, your submission is due 120 days from your receipt of this request.

Please contact Gale Hruska, at (312) 886-0989 if you have any questions regarding this matter.

Sincerely yours,

Edith M. Ardiente, P.E.
Chief, Technical Programs Section

cc: Rob Watson, IEPA
W. Radlinski, IEPA

bcc: Jodi Traub, SPS

5HS-12:G.HRUSKA:fr:4/29/85

INITIALS	TYPIST	AUTHOR	ILLINOIS CHIEF	STU #2 CHIEF	STU #3 CHIEF	TPS CHIEF
DATE	FR 4/29/85	GRH 4/30/85	4/30/85			5/2/85

206-29

Union Oil

P 557 098 136

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Lawrence W. Eastep, Manager Permit Section, DLPC	
Street and No. Illinois EPA 2200 Churchill Road	
P.O., State and ZIP Code Springfield, IL. 62706	
Postage	$ .22
Certified Fee	.75
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	.70
Return receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$1.67
Postmark or Date	

MAY 06 1985 POSTMARK

PS Form 3800, Feb. 1982 ★ U.S.G.P.O. 1983-403-517

ILD 041550567: G. Hruska: STU#1: 5HS-12

PS Form 3811, July 1983 DOMESTIC RETURN RECEIPT

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Lawrence W. Eastep, Manager
Permit Section, DLPC
Illinois EPA
2200 Churchill Road
Springfield, IL. 62706

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number: P557098136

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
MAY - 6 1985

8. Addressee's Address *(ONLY if requested and fee paid)*

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

ILD 041550567: STU#1: 5HS-12: G. Hruska

APR 26 1985

5HS-13

CERTIFIED MAIL #P 557 098 112
RETURN RECEIPT REQUESTED

H. D. Haas, Supervisor of Env. Ser.
Union Oil Co. of California - Chgo. Ref.
135th Street and New Avenue
Lemont, Illinois 60439

RE: Corrective Action Requirements,
Hazardous and Solid Waste
Amendments of 1984
Lemont, Illinois
ILD 041550567

Dear Mr. Haas:

As you know, we are currently reviewing Part B of the Resource Conservation and Recovery Act (RCRA) permit application for the above-referenced facility.

On November 8, 1984, the Hazardous and Solid Waste Amendments of 1984 (the Amendments) were enacted to modify RCRA. Under Section 206 (copy enclosed) of the Amendments, all RCRA permits issued after the date of enactment must provide for corrective action for all releases of hazardous waste or constituents from any solid waste management unit, regardless of the time at which waste was placed in the unit. Please note that both hazardous and non-hazardous waste can meet the definition of solid waste under 40 CFR 261.2.

Consequently, we must determine whether such releases have ever occurred at the facility site. If they have, we must ensure that corrective actions either have been taken or will be taken, pursuant to a RCRA permit. An important part of our determination includes your willingess (or unwillingness) to sign the enclosed certification statement. Please read it carefully and either sign it and return it, or return it to us unsigned with a cover letter of explanation, within three weeks of the date of this letter. Any information regarding releases of hazardous waste or hazardous constituents to the environment will be evaluated during the permit review process. Any tentative decision we make concerning your permit application will be public noticed in a newspaper of general circulation in the area of the facility.

Please contact the previously identified permit writer with our Agency for additional information.

Sincerely yours,

Karl J. Klepitsch, Jr.
Chief, Solid Waste Branch

Enclosures

	TYPIST	AUTHOR	STU #1 CHIEF	STU #2 CHIEF	STU #3 CHIEF	TPS CHIEF	WMB CHIEF	WMD DIRECTOR
INITIALS	CM							
DATE	4-25-85		APR 25 1985			4-25-85		

CM 4-25-85

Illinois Environmental Protection Agency · 2200 Churchill Road, Springfield, IL 62706

217/782-6762

Refer to: 1978030004 -- Will County
Lemont/Union Oil
ILD041550567
Log Number: 45

RECEIVED
APR 09 1985
WMD-RAIU
EPA, REGION V

April 3, 1985

Ms. Edith M. Ardiente, P.E.
Chief Technical Programs Section
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Ms. Ardiente:

This Agency has concluded the completeness review for the above referenced facility and has determined that the application is now complete.

Please note that Union Oil has been triggered into a groundwater assessment program (see Attachment E-10 in the Part B Application). IEPA's Compliance Monitoring Section is reviewing the plan and is presently waiting for test results from Union Oil. The results of IEPA's review are needed for the technical review of the Part B because the groundwater assessment plan will affect the statistical methods used to evaluate data from the groundwater monitoring wells (Section E-3c), the shallow wells (Section E-4b(9)), the lysimeters (Section E-4c(9)), and the soil cores (Section E-4d(9)).

If you have any questions concerning this matter, please contact Rob Watson at 217/785-8410.

Very truly yours,

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:WRW:sd/624e/18

cc: Division File
Northern Region
Bill Radlinski
Jodi Traub -- USEPA

Union 76 Division: Eastern Region

Union Oil Company of California
Chicago Refinery, Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 70-85

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P08 8720404

RECEIVED
MAR 07 1985
WMD-RAIU
EPA, REGION V

A.J. Eliskalns
Manager, Chicago Refinery

March 4, 1985

Mr. Gale Hruska
RCRA Activities
Part B Permit Application
USEPA - Region V
P.O. Box A3587
Chicago, Illinois 60690-3587

Gentlemen:

Part B Permit Application
ILD 041550567 - Completeness
Review Response

Enclosed is a copy of our response to the completeness review as received in your letters of January 20 and 31, 1985. Union Oil requests that in addition to inserting the revised pages, tables and figures included as part of our response, that the response be added to the Part B permit application since it provides clarification to the completeness comments.

If you have any questions, please contact Mr. L. D. Erchull at the above telephone number.

Very truly yours,

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw

Attachments

COPY

COMMENTS/RESPONSES TO USEPA-REGION V
UNION OIL PART B PERMIT APPLICATION
COMPLETENESS REVIEW
March 1, 1985

RECEIVED
MAR 07 1985
WMD-RAIU
EPA, REGION V

Treatment Demonstration. Questions 1 through 4

During the meeting of Friday, February 15, 1985, between Illinois EPA and Union Oil, it was concluded that responses to questions 1 through 4 are better addressed during the technical review of the Part B Permit Application rather than the completeness review. Consequently, it was agreed that no additional response was required at this time.

Facility Description

Question 5. **The Drainage pipe which goes under Area II (Figure D-2) needs to be described in greater detail. Specifically:**
a. How deep is the pipe buried.
b. How long is the pipe?
c. What is its diameter?

Response: Additional information has been provided on page D-27a, to be inserted between pages D-27 and D-28.

Question 6. **The entire drainage system, beginning at the treatment plots and ending at the storm water retention ponds, needs to be shown on a map of the facility. A narrative describing dimensions and materials of construction of the drainage system also needs to be provided.**

Response: Additional information has been provided on page D-27a and Figure D-1. An additional drawing, Figure D-2a has been provided.

COPY

Groundwater Monitoring

Question 7. **The location(s) of the control area(s), used to represent the background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment areas, need to be provided (264.278(b)(1)).**

Response: A revised Figure E-1 is provided, as is a revised section E-4c(8), page E-55 and E-56.

Question 8. **The locations of the lysimeters, soil cores, and monitoring wells need to be provided on a map of the treatment plots (1 inch = 200 feet) (264.278(b)).**

Response: A revised Figure E-1, at a scale of 1 inch equals 200 feet is provided.

Question 9. **Sections E - 4c(1)(b) and E - 4d(1) indicate that the number of lysimeters and soil cores will equal approximately one per acre for the active land treatment plots. Figure E - 1 shows that there are only 7 lysimeters and 3 soil cores for the 13.3 acres. All additional lysimeters and soil cores should be indicated on the map requested in No. 8 above (264.278(b)).**

Response: A revised section E-4c(1)(b), page E-50 and E-51 is provided, as is section E-4d(1) page E-57 and E-58.

Question 10. **The specific depth (Page E - 48 states 3-6 feet) of the existing and any future lysimeters needs to be provided (264.278(b)).**

Response: Tabulation of existing lysimeter depths is provided on page E-50 and E-51.

Question 11. **The land treatment plots need to be indicated on Figures E-3, E-4, E-5, and E-6.**

Response: Revised Figures E-3, E-4, E-5, and E-6 are provided.

SECTION K

CERTIFICATION

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Date 3-4-85 Signature: LDE 3-1-85

Name and Title: A. J. Eliskalns

Manager, Chicago Refinery

LDE:dlw
12/14/84

DW BRUCKERT

JAN 2 0 1986

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

5HS-JCK-13

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

U.S. EPA ID #: ILD041550567

UNION OIL CO OF CALIF CHGO REFINERY
135TH STREET & NEW AVE
LEMONT IL 60439

RE: Hazardous Waste Permit Application

Dear Permit Applicant:

As you know, you have previously submitted Part A of the Resource Conservation and Recovery Act (RCRA) permit application for the above-referenced facility. Timely submission of "the Part A" has allowed most hazardous waste management facilities to continue to operate under RCRA "interim status"(or the State program equivalent), while complying with applicable technical and record-keeping standards.

On November 8, 1984, the Hazardous and Solid Waste Amendments of 1984 (the 1984 Amendments) were enacted to modify RCRA. Under the 1984 Amendments, all RCRA permits issued after the date of enactment must provide for corrective action for all releases of hazardous waste or hazardous waste constituents from any solid waste management unit, regardless of the time at which waste was placed in the unit. In addition, all interim status facilities are subject to corrective action requirements, regardless of whether they have 1) submitted a Part B application, 2) submitted a closure plan, 3) reverted to generator status only, 4) actually closed, or 5) none of these. Unless our Agency has formally terminated the facility's interim status, the corrective action requirements apply. Please note that both hazardous and non-hazardous waste can meet the definition of solid waste under 40 CFR 261.2 (or the State regulation equivalent).

We must determine whether releases of hazardous waste or hazardous waste constituents have ever occurred at the facility site. If they have, we must ensure that corrective actions either have been taken or will be taken to eliminate threats to public health or the environment. An important element in our decision process is the information that you provide on the enclosed certification statement. Please read it carefully and either sign it and return it, or return it unsigned with a cover letter of explanation, within 45 days of the date of this letter. At some point in time, public input will be sought to either confirm or deny information you provide, or information we gather on our own, concerning releases and corrective actions.

Please mail your response to the following:

RCRA Activities
Region V
P. O. Box A3587
Attention: ATKJG
Chicago, Illinois 60690

Sincerely yours,

David A. Stringham
Chief, Solid Waste Branch

Enclosure

listed as Union Oil

Union 76 Division: Eastern Region

Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 16-86

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P 330 175 823

A. J. Eliskalns
Manager, Chicago Refinery

RECEIVED
JAN 27 1986
SWB - AIS
U.S. EPA, REGION V

January 20, 1985

U.S. Environmental Protection
Agency
RCRA Activities
Region V
P.O. Box A3587
Attention: ATKJG
Chicago, Illinois 60690

Dear Sir:

Letter Response

In reply to your attached undated letter, we provide the following information. The requested information has previously been sent to you on two occasions. Please refer to letter ENV 157-85, received by you on May 23, 1985, and Attachment 4 of letter ENV 223-85, received by you on August 14, 1985.

Should you have any further questions, please contact L. D. Erchull at the above telephone number.

Very truly yours,

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw

Attachment

JAN 31 1985

CERTIFIED MAIL #P602 533 506
RETURN RECEIPT REQUESTED

5HS-12

Mr. A. J. Eliskalns, Manager
Union Oil of California
Chicago, Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil - Chicago Refinery
ILD 041550567

Dear Mr. Eliskalns:

U.S. Environmental Protection Agency and Illinois Environmental Protection Agency have again reviewed your Part B Hazardous Waste Permit Application for the Chicago Refinery with respect to the completeness of the application. While your response to our Notice of Deficiency of November 14, 1984, has answered some questions, the application remains incomplete. Enclosed is a list of deficiencies which must be addressed. Your response must be submitted in quadruplicate and postmarked no later than March 1, 1985. The original and one copy of the application must be sent to the U.S. Environmental Protection Agency (U.S. EPA) and the other two copies to the Illinois Environmental Protection Agency (IEPA). Your response should be in a format which allows incorporation of the new information into the appropriate sections of the existing Part B Application. A certification statement identical to the one stated in 40 CFR §270.11(d) must accompany the application and all additional submittals. Send your application to the following addresses:

RCRA ACTIVITIES Part B Permit Application U.S. EPA, Region V P.O. Box A3587 Chicago, Illinois 60690	Larry Eastep, Manager Permit Section, DLPC Illinois EPA 2200 Churchill Road Springfield, Illinois 62706

Please contact Gale Hruska, at (312) 886-0989, if you have questions regarding this matter.

Sincerely,

Edith M. Ardiente, P.E., Chief
Technical Programs Section

Enclosures

cc: Larry Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.HRUSKA:fr:1/28/85

205-24

CERTIFIED MAIL #P602 533 506 5HS-12
RETURN RECEIPT REQUESTED

Mr. A. J. Eliskalns, Manager
Union Oil of California
Chicago, Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil - Chicago Refinery
ILD 041550567

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RCRA ACTIVITIES Part B Permit Application U.S. EPA, Region V P.O. Box A3587 Chicago, Illinois 60690	Larry Eastep, Manager Permit Section, DLPC Illinois EPA 2200 Churchill Road Springfield, Illinois 62706

Please contact Gale Hruska, at (312) 886-0989, if you have questions regarding this matter.

Sincerely,

Edith M. Ardiente, P.E., Chief
Technical Programs Section

Enclosures

cc: Larry Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.HRUSKA:f:1/28/85

INITIALS	TYPIST	AUTHOR	STU #1 CHIEF	STU #2 CHIEF	STU #3 CHIEF	TPS CHIEF	WMB CHIEF
	F.R.	GRH				CM 1-29-85	
DATE	1/28/85	1/28/85	1/29/85			1/30/85	

JAN 28 1985

5HS-12

CERTIFIED MAIL #P602-533-504
RETURN RECEIPT REQUESTED

D.W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Re: Part B Permit Application Issues
Union Oil - Chicago Refinery
ILD 041550567

Dear Mr. Bruckert:

This letter is written in reply to your two letters of December 10, 1984, and a third letter of December 14, 1984. Our response to the individual concerns are as follows:

Time Extension to Submit Information Request

A request was made for an extension of time to obtain copies of referenced reports used in the literature review portion of the land treatment demonstration. You specified no date for submission of the complete information. We believe that the processing of your permit application can continue (for a while) without being adversely affected by the lack of this information. We also realize that it takes time to obtain permission to utilize copyrighted material. Therefore, we are extending the time allowed to submit this information by three months. The submission will be due on March 14, 1985.

Request for Waiver

You requested a waiver of the requirement of 40 CFR §264.52(d), which states that the facility's contingency plan "must list names, addresses, and phone numbers (office and home) of all persons qualified to act as emergency coordinator." The justification for the request is based on the fact that "Union Oil provides 24-hour, 7 days per week, on-site emergency coordinator coverage."

U.S. EPA is denying this request for two reasons. First the regulation specifically states that the information "must" be provided; there is no provision for a waiver. Second, should a major accident occur, which results in the on-duty emergency coordinator being unable to discharge his duties, it would be necessary to immediately contact someone else who is qualified to

205-23

act as emergency coordinator, and who could implement the contingency plan. Not having this information in the contingency plan could lead to unacceptable delays until the person could be found.

Surface Impoundment Closure

We have reviewed your request for an "approval in principle" for the closure of the surface impoundment at your facility. While we cannot provide an official approval of your proposed closure scenario, we can offer guidance in this matter.

You propose to close the surface impoundment under interim status, prior to the issuance of a final permit decision by U.S. Environmental Protection Agency, by removing all wastes. Approval of your plan and determination that the impoundment has been closed in conformance with applicable regulations is done through the Illinois Environmental Protection Agency. The State of Illinois has Interim Authorization and their regulations apply in lieu of the Federal Regulations.

If all hazardous wastes and residues are successfully removed from the impoundment, post-closure care and monitoring are not required. However, if any hazardous wastes or residues remain, post-closure requirements equivalent to those for landfills apply. Additionally, since your impoundment does not meet the liner requirements of 40 CFR §264.221(a), both your closure and post-closure plans and cost estimates given in your Part B application must address the contingency that all of the contaminated subsoils cannot be removed at closure. Detailed information on these requirements may be found in 40 CFR §264.228.

Please contact Mr. Gale R. Hruska, at (312) 886-0989, if you have further questions regarding this matter.

Sincerely,

Edith M. Ardiente, P.E.
Chief, Technical Programs Section

cc: Lawrence Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.HRUSKA:fr:1/15/85

	TYPIST	AUTHOR	STU #1 CHIEF	STU #2 CHIEF	STU #3 CHIEF	TPS CHIEF	WMB CHIEF	W
INITIALS	F.R.	GRH	[illegible]			[illegible]		
DATE	1/15/85	1/15/85	1/15/85			1-24-85		

P 602 533 504

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Ltr Part B Permit STU#1 5HS-12 G. Hruska ILD 041550567
Application

Sent to D.W. Bruckert, Supervisor Environmental Services	
Street and No. Union Oil Company of Calif. Chicago Refinery	
P.O., State and ZIP Code Lemont, Illinois 60439	
Postage	$ .20
Certified Fee	.75
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	.60
Return receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$1.55
Postmark or Date	

CHICAGO ILL JAN 30 1985 USPO

PS Form 3800, Feb. 1982 ★ U.S.G.P.O. 1983-403-517

PS Form 3811, July 1983 DOMESTIC RETURN RECEIPT

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
D.W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number: P 602 533 504

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X John Becker

7. Date of Delivery

8. Addressee's Address *(ONLY if requested and fee paid)*

LEMONT ILL FEB 4 1985 USPO

ILD 041550567

UNION OIL

JAN 24 1985

5HS-12

MAIL #602 533 501
CEIPT REQUESTED

Eastep, Manager
ction - DLPC
EPA
chill Road
ld, Illinois 62706

Re: Part B Permit Application
Union Oil Co., Lemont, Illinois
ILD 041550567

Eastep:

u should have received a copy of a submission by Union Oil Company
se to our Completeness Review Notice of Deficiency of November 14,
ease review this submission and either advise us that the application
te or provide a list of any remaining deficiencies. Your response
days from receipt of this letter.

ntact Mr. Gale Hruska, at (312) 886-0989, if you have any further
regarding this matter.

,

Ardiente, P.E.
chnical Programs Section

adlinski, IEPA

ie Traub, GMCU

HRUSKA:fr:1/10/85

205-21

5HS-12

MAIL #602 533 501
CEIPT REQUESTED

Eastep, Manager
ction - DLPC
EPA
chill Road
d, Illinois 62706

Re: Part B Permit Application
Union Oil Co., Lemont, Illinois
ILD 041550567

Eastep:

u should have received a copy of a submission by Union Oil Company
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ease review this submission and either advise us that the application
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days from receipt of this letter.

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regarding this matter.

rdiente, P.E.
chnical Programs Section

dlinski, IEPA

e Traub, GHCU

HUSKA:fn:1/10/85

TYPIST	AUTHOR	STU 1 CHIEF	STU 2 CHIEF	STU 3 CHIEF	T CHIEF
FR	GRH	CW			
1/10/85	1/10/85	1/14/85			1-23-85

Union Oil

P 602 533 581

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to: Lawrence Eastep, Manager
Permit Section - DLPC
Street and No.: Illinois EPA
2200 Churchill Road
P.O., State and ZIP Code: Springfield, Illinois 62706

Postage	$ .30
Certified Fee	.75
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	.60
Return receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$ 1.55
Postmark or Date	

CLERK'S OFFICE LOOP STA. JAN 28 1985 USPO

PS Form 3800, Feb. 1982 ★ U.S.G.P.O. 1983-403-517

Ltr. Part B Permit Application G. Hruska:STU#1:5HS-12
ILD 041550567

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Lawrence Eastep, Manager
Permit Section - DLPC
Illinois EPA
2200 Churchill Road
Springfield, Illinois 62706

4. Type of Service: ☐ Registered ☐ Insured ☐ Certified ☐ COD ☐ Express

Article Number P 602 533 581

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery

8. Addressee's Address (ONLY if requested and fee paid)

JAN 30 1985 USPO

DOMESTIC RETURN

Illinois Environmental Protection Agency · 2200 Churchill Road, Springfield, IL 62706

217/782-6762

Refer to: 1978030004 -- Will County
Lemont/Union Oil
ILD 041550567
Log Number: 45

RECEIVED
JAN 16 1985
WMD-RAIU
EPA, REGION V

January 11, 1985

William H. Miner
Technical, Permit & Compliance Section
U.S. Environmental Protection Agency
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Miner:

Enclosed is a list of informational deficiencies discovered during the second completeness review of Union Oil's RCRA permit application.

Although the deficiencies listed under treatment demonstration could be considered technical review items, they are included in this review because the treatment demonstration is a critical part of the application and in its present form is inadequate.

If you have any questions, please contact Rob Watson at 217/782-9883.

Very truly yours,

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:WRW:jd/0086E/1

Enclosures

cc: Division File
Bill Radlinski
Jodi Traub, Region 5

COPY 2

RECEIVED
JAN 17 1985
WASTE MANAGEMENT
BRANCH

205-22

Treatment Demonstration

1. From the information available, it is evident that actual field and laboratory tests are needed to demonstrate that the hazardous constituents in the wastes applied to the treatment plots can be completely degraded, transformed, or immobilized in the treatment zone as required by 264.272. The treatment demonstration must include all information required by 270.20 as well as 264.272.

2. The treatment demonstration must include all wastes which will be applied to the land treatment plots. Since the slop oil emulsions and tank cleaning waste have not been generated to date and samples of these wastes have not been obtained, these wastes cannot be included in the treatment demonstration, and should be the topic of a permit modification pursuant to 270.41, should Union Oil wish to apply these wastes in the future.

3. As the addition of nonhazardous refinery wastes to the land treatment plots will affect the ability of the soil to treat the hazardous constituents in the API separator sludge, and because the Literature Review (Appendix A) indicates that petroleum refinery wastes, other than the API separator sludge, contain organic Appendix VIII constituents, all wastes both hazardous and nonhazardous must be addressed in the same manner with respect to the treatment demonstration and waste analysis. Enclosed with this letter is a copy of "Guidance on Petroleum Refinery Waste Analyses for Land Treatment Permit Applications" which should be used to revise the existing waste analysis plan.

4. Any hazardous constituents which may be derived from the treatment of wastes in the land treatment area are not discussed or documented (264.271(b)).

Facility Description

5. The drainage pipe which goes under Area II (Figure D-2) needs to be described in greater detail. Specifically:
   a. How deep is the pipe buried?
   b. How long is the pipe?
   c. What is its diameter?

6. The entire drainage system, beginning at the treatment plots and ending at the storm water retention ponds, needs to be shown on a map of the facility. A narrative describing dimensions and materials of construction of the drainage system also needs to be provided.

Groundwater Monitoring

7. The location(s) of the control area(s), used to represent the background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment areas, need to be provided (264.278(b)(1)).

8. The locations of the lysimeters, soil cores, and monitoring wells need to be provided on a map of the treatment plots (1 inch = 200 feet) (264.278(b)).

9. Sections E - 4c(1)(b) and E - 4d(1) indicate that the number of lysimeters and soil cores will equal approximately one per acre for the active land treatment plots. Figure E - 1 shows that there are only 7 lysimeters and 3 soil cores for the 13.3 acres. All additional lysimeters and soil cores should be indicated on the map requested in No. 8 above (264.278(b)).

10. The specific depth (Page E - 48 states 3-6 feet) of the existing and any future lysimeters needs to be provided (264.278(b)).

11. The land treatment plots need to be indicated on Figures E-3, E-4, E-5, and E-6.

12. How will the proposed statistical methods described in Attachment E-10 meet the requirements of 264.278(f)(3)?

13. For each method described in Attachment E-10, what constitutes a statistically significant change over background values (264.278(f)).

14. The detection monitoring program is incomplete for the following reasons:

    A. The groundwater quality must be analyzed at least semi-annually at each monitoring well at the compliance point; (264.98(d)).

    B. The groundwater flow rate and direction in the uppermost aquifer must be determined at least annually; (264.98(e)).

    C. The requirements of 264.97(h)(1) as required by 264.98(d) are not addressed.

    D. The "Appropriate Actions" the refinery will implement if a statistically significant increase is found needs to be expanded to include specifics.

Closure

15. A demonstration that two years is necessary to close the facility needs to be provided (264.113(b)). This demonstration should also address 264.280.

LWE:WRW:jd/0086E/1-3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 3 1984

SUBJECT: Guidance on Petroleum Refinery Waste Analyses for Land Treatment Permit Applications

FROM: John Skinner, Director
Office of Solid Waste

TO: Hazardous Waste Permit Branch Chiefs, Regions I-X

Mark

RECEIVED
AUG 24 1984
IEPA-DLPC

Introduction

The purpose of this memo is to provide permit writers guidance on evaluating petroleum refinery waste analyses submitted in land treatment permit applications. A list of Appendix VIII hazardous constituents suspected to be present in petroleum refinery wastes and a special analytical method for refinery wastes are provided.

Background

The general Part B information requirements specified under §270.14(b) require the submittal of (1) chemical and physical analysis data on the hazardous wastes to be handled at the facility including all data that must be known to treat, store, or dispose of wastes properly in accordance with Part 264, and (2) a copy of the waste analysis plan. In addition, the specific information requirements under §270.20 require an owner/operator of any facility that includes a land treatment unit to submit "a list of hazardous constituents reasonably expected to be in, or derived from, the wastes to be land treated based on waste analyses performed pursuant to §264.13." Also, §270.20(a) stipulates that the description of the treatment demonstration plan must include a list of potential hazardous constituents in the waste.

Because the design and management of a land treatment unit is based on the goal of attaining treatment of hazardous constituents (i.e., constituents listed in Appendix VIII), it is very important that the presence of these constituents in the land treated wastes be accurately identified and quantified. This is best achieved through a comprehensive waste analysis for all Appendix VIII constituents. However, due to the cost and analytical difficulties associated with these analyses, many applicants have submitted requests to conduct analyses for some subset of Appendix VIII, which are "reasonably expected to be in or derived from the wastes to be land treated." To date, the majority of wastes proposed for land treatment have been petroleum refinery wastes, specifically the listed wastes K048-K052.

RECEIVED
APR 09 1984
WASTE MANAGEMENT BRANCH

EPA Form 1320-6 (Rev. 3-76)

The evaluation of these Appendix VIII subsets for each land treatment application has been difficult due to the lack of published information on specific organic compounds in refinery wastes, and also due to the variability of waste characteristics within the refinery industry. However, OSW has gathered sufficient information from EPA research studies, in-house waste studies and analyses, and refinery process evaluations to develop a conservative list of hazardous constituents that are suspected to be present in petroleum refinery wastes. This list is provided in Attachment 1. This list should be used by permit writers as a guide in determining which constituents may and may not be eliminated from consideration when completing waste analyses for a land treatment permit application. Additional explanation of the derivation and use of this list is provided below.

Derivation and Use of List

The list of hazardous constituents suspected to be present in refinery wastes was derived from a review of data on petroleum refinery wastewater and sludge characteristics from the following sources: (1) literature, particularly EPA research reports; (2) in-house waste analyses completed by EPA research laboratories; (3) preliminary data from the OSW refinery waste study; and (4) an evaluation of petroleum refinery processes. Although these four sources were used, the data base on specific hazardous organic constituents in sludges was still limited. Considerable weight was placed on wastewater data as indicators of sludge characteristics (e.g., API separator sludge).

Also, the list in Attachment 1 is a generic list developed by combining waste analysis data on all five listed refinery wastes (K048-K052). Due to the lack of extensive data, no attempt was made to differentiate between the characteristics of these five refinery wastes. Until sufficient information is available to allow development of separate lists for each waste, the attached list should be considered applicable to dissolved air flotation float (K048), slop oil emulsion solids (K049), heat exchanger bundle cleaning sludge (K050), API separator sludge (K051), and leaded tank bottoms (K052).

To compensate for the limited data base and variability among refineries, the attached list is purposely comprehensive. It includes a total of 89 hazardous constituents or groups of constituents (e.g., trichlorobenzenes). All of these constituents have been identified as possibly being present in the above referenced wastes. Many of the compounds on the list may be present at low concentrations and others may not be present at all in certain wastes at some refineries.

The permit writer should use the attached list as a guide to the Appendix VIII constituents that should be addressed in

the up-front waste analyses and waste analysis plans for Part B applications that propose land treatment of petroleum refinery wastes. A permit applicant may further refine this list by providing detailed evidence that certain hazardous constituents cannot be present in the listed wastes at that particular refinery. In most cases, however, waste analysis data on the constituents listed in Attachment 1 will be necessary to make this showing.

Analytical Methods

To assist in the analysis for specific organic constituents in petroleum refinery wastes, OSW has developed a column cleanup procedure which is provided in Attachment 2. This draft method is used specifically to separate semivolatile aliphatic, aromatic, and polar compounds in the waste matrix. The method should be used only by experienced residue analysts. Volatile compounds are determined using method 8240 with PEG (tetraglyme) Extraction. Test method 3050 should be used for all metal analyses. These methods are described in SW-846.

Relationship to Delisting and Listing Efforts

Finally, the attached list is consistent with the waste analysis information that EPA has requested from delisting petitioners. Many petroleum refinery operators who are preparing Part B applications for land treatment facilities also have submitted delisting petitions to the Agency for one or more of their wastes. It is important that the waste analysis data requested by the Agency for permitting and delisting be consistent, although there may be differences in the extent of data necessary in certain cases. Therefore, the list of Appendix VIII constituents provided in Attachment 1 is also being used in refinery delisting actions. Additional information on non-Appendix VIII constituents, however, is being collected as part of OSW's new waste assessment and listing efforts for petroleum refineries. These compounds, which are listed at the end of Attachment 1 for your information, may be added to Appendix VIII in the future. Although it is not required at this time, permit applicants should be encouraged to provide information on these waste constituents.

If you have any questions on the listing of specific hazardous constituents in Attachment 1 or on the recommended test methods, please contact Ben Smith (382-4791) of the Waste Identification Branch. Other questions pertaining to the use of the above guidance in permitting land treatment facilities should be directed to Mike Flynn (382-4489) of the Land Disposal Branch.

Attachments

cc: Jack Lehman
Fred Lindsey
Ken Shuster
Eileen Claussen
Matt Straus
Bruce Weddle
Peter Guerrero

ATTACHMENT 1

Appendix VIII Hazardous Constituents Suspected to be Present in Refinery Wastes

**Acetonitrile (Ethanenitrile)
**Acrolein (2-Propenal)
**Acrylonitrile (2-Propenenitrile)
Aniline (Benzenamine)
Antimony
Arsenic
Barium
Benz (c) acridine (3,4-Benzacridine)
Benz (a) anthracene (1,2-Benzanthracene)
**Benzene (Cyclohexatriene)
Benzenethiol (Thiophenol)
Benzidine (1,1-Biphenyl-4,4'diamine)
Benzo(b)fluoranthene (2,3-Benzofluoranthene)
Benzo(j)fluoranthene (7,8-Benzofluoranthene)
Benzo(a)pyrene (3,4-Benzopyrene)
**Benzyl chloride (Benzene, (chloromethyl)-)
Beryllium
Bis (2-chloroethyl) ether (Ethane, 1,1'-oxybis (2-chloro-))
Bis (2-chloroisopropyl) ether (Propane, 2,2'-oxybis (2-chloro-))
**Bis (chloromethyl) ether (Methane, oxybis (chloro))
Bis (2-ethylhexyl) phthalate (1,2-Benzenedicarboxylic acid, bis (2-ethylhexyl) ester)
Butyl benzyl phthalate (1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester)
Cadmium
Carbon disulfide (Carbon bisulfide)
p-Chloro-m-cresol
**Chlorobenzene (Benzene, chloro-)
**Chloroform (Methane, trichloro-)
**Chloromethane (Methyl chloride)
2- Chloronapthalene (Naphthalene, beta-chloro-)
2-Chlorophenol (Phenol, o-chloro-)
Chromium
Chrysene (1,2-Benzphenanthrene)
Cresols (Cresylic acid) (Phenol, methyl-)
**Crotonaldehyde (2-Butenal)
Cyanide
Dibenz(a,h)acridine (1,2,5,6-Dibenzacridine)
Dibenz(a,j)acridine (1,2,7,8-Dibenzacridine)
Dibenz(a,h)anthracene (1,2,5,6-Dibenzanthracene)
7H-Dibenzo(c,g)carbazole (3,4,5,6-Dibenzcarbazole)
Dibenzo(a,e)pyrene (1,2,4,5-Dibenzpyrene)
Dibenzo(a,h)pyrene (1,2,5,6-Dibenzpyrene)
Dibenzo(a,i)pyrene (1,2,7,8-Dibenzpyrene)
**1,2-Dibromoethane (Ethylene dibromide)
Di-n-butyl phthalate (1,2-Benzenedicarboxylic acid, dibutyl ester)
*Dichlorobenzenes
**1,2-Dichloroethane (Ethylene dichloride)
**trans-1,2-Dichloroethene (1,2-Dichlorethylene)
**1,1-Dichloroethylene (Ethene, 1,1-dichloro-)
**Dichloromethane (Methylene chloride)

**Dichloropropane
Dichloropropanol
Diethytl phthalate (1,2-Benzenedicarboxylic acid, diethyl ester)
7,12-Dimethyl-benz(a)anthracene
2,4-Dimethylphenol (Phenol, 2,4-dimethyl-)
Dimethyl phthalate (1,2-Benzenedicarboxylic acid, dimethyl ester)
4,6-Dinitro-o-cresol
2,4-Dinitrophenol (phenol, 2,4-nitro-)
2,4-Dinitrotoluene (Benzene, 1-methyl-2,4-dinitro-)
Di-n-octyl phthalate (1,2-Benzenedicarboxylic acid, dioctyl ester)
**1,4-Dioxane (1,4-Diethylene oxide)
1,2-Diphenylhydrazine (Hydrazine, 1,2-diphenyl-)
**Ethyleneimine (Azridine)
**Ethylene oxide (Oxirane)
Fluoranthene (Benzo (j,k) fluorene)
**Formaldehyde
Hydrogen sulfide (Sulfur hydride)
Indeno (1,2,3-cd)pyrene (1 10(1,2-phenylene)pyrene)
Lead
Mercury
Methanethiol (Thiomethanol)
3-Methylchlolanthrene (Benz(j)aceanthrylene, 1,2-dihydro-3-methyl-)
**Methyl ethyl ketone (MEK) (2-Butanone)
Naphthalene
Nickel
p-Nitroaniline (Benzenamine, 4-nitro-)
Nitrobenzene (Benzene, nitro-)
4-Nitrophenol (Phenol,pentachloro-)
Pentachlorophenol (Phenol, pentachloro-)
Phenol (Benzene, hydroxy-)
Pyridine
Selenium
*,**Tetrachloroethanes
**Tetrachloroethylene (Ethene, 1,1,2,2-tetra chloro-)
**Toluene (Benzene, methyl-)
*Trichlorobenzenes
*,**Trichloroethanes
**Trichloroethene (Trichloroethylene)
*Trichlorophenols
Vanadium

---

* If any of these groups of compounds are found, the specific isomers listed in Appendix VIII should be identified.

** Use Test Method 8240 for these volatile compounds.

*** Use Test Method 3050 in SW-846 for all metals; see Attachment 2 for semivolatile organic compounds.

Non-Appendix VIII Constituents of Concern (may be added to App. VIII)

Cobalt
1-Methylnapthalene
Styrene
Hydroquinone
Anthracene
Indene
5-Nitro acenaphthene
Quinoline
Phenanthrene
Pyrene

ATTACHMENT 2

Column Cleanup of Petroleum Wastes

Introduction

The following procedure is intended for application to the analysis of semivolatile organic compounds in oily waste samples. Its application is necessary in those cases where the conventional cleanup procedures (Methods 3510, 3520, 3540, 3550) fail to provide suitable detection limits (approximately 10ppm) for the semivolatile compounds specified in Attachment 1. Analysis of the cleaned-up extracts should be performed according to Method 8270, a capillary GC/MS technique.

It should be noted that this procedure is in draft form. It may be modified as more experience is gained.

Cleanup Techniques

It is anticipated that after a sample is subjected to conventional extraction procedures (Methods 3510,3520, 3540, and 3550) or after dilution, a cleanup step may be required to remove matrix interferences and yield acceptable detection limits for compounds of interest. Determination as to whether an extract needs to be cleaned can usually be provided by either examination of the sample itself or by knowledge of the particular waste stream that was sampled. It is also possible to estimate whether or not the extract is suitably clean for GC/MS analysis. An aliquot of the methylene chloride extract can be evaporated to dryness and the total amount of material in the aliquot weighed. In general, if the extract contains less than a few milligrams of material per millilitre of solvent, it is probably clean enough for capillary CG/MS. If it contains more materials, it will likely require additional preparation.

In most instances, some type of cleanup technique will be necessary in order to achieve suitably low detection limits for the target compounds. If much aliphatic material exists in the sample it will mask the compounds of interest. Mere dilution will not remedy the situation as detection limits are raised by the dilution.

If acidic compounds such as phenols are suspected of being present in the sample, a separate fraction containing these acids can be created using the organic extract obtained above. Methods 3530, a base/neutral acid cleanup extraction technique, may be applicable to the cleanup of certain sample types. Modifications to Methods 3530 are as follows:

a) In Section 7.6, the organic and aqueous phases are both treated as containing compounds; and

b) Section 7.15 will not be necessary.

The aqueous phase, when transferred to organic solvent after Section 7.13, will contain acidic compounds. The organic phase contains basic and neutral compounds. In most instances, the acidic fraction will be clean enough for GC/MS analysis. The base/neutral extract, however, may require further cleanup. Thus, a cleanup procedure has been devised for base/neutral extracts that minimizes the interferences caused by high concentrations of aliphatic and polymeric materials.

Although the cleanup procedure is thoroughly described in the next section, one generally proceeds as follows. The sample is subjected to cleanup by placing a representative aliquot of the sample on an alumina column and successively eluting with hexane, methylene chloride, and diethyl ether to yield 3 fractions containing the aliphatic (hexane fraction), aromatic (methylene chloride fraction) and polar compounds (ether fraction). The methylene cloride fraction is then concentrated to about 1 ml. and then is analyzed by GC/MS for the compounds of interest. The hexane concentrate can be screened by GC/MS to determine if compounds were eluted into the hexane fraction. However, this usually will not be required. If polar compounds are of interest, the ether fraction is also analyzed.

Quantitation of the semivolatile constituents in Attachment 1 is to be performed using the reverse search technique. Additionally, tentative identification should be attempted for the ten organic compounds detected at the highest concentrations. Identifications should be made via a forward search of the EPA/NIH mass spectral library. Concentrations should be approximated by comparison of the compound response to that of the closest eluted internal standard. A procedural blank, matrix spike, and duplicate should be analyzed for every batch of samples.

Accuracy and precision control charts should be maintained for indicator constituents. The percent recoveries of spiked surrogate standards for a given sample type should be plotted versus sample identification number. Table 1 contains a list of the surrogate compounds to be employed for the analysis of semivolatile organic compounds, and recovery limits. Recovery limits are based upon obtaining a final extract sufficiently clean, such that the surrogate compounds should be present at 50 ppm or higher in the extract. If dilution of the sample is still required, detection of the surrogates may be difficult and the associated recoveries imprecise or non-existant. Such samples should be spiked with higher surrogate levels and resubjected to the cleanup procedure.

Table 1. Surrogate Standards for Semivolatile Organic Compound Analysis

	Recovery Limits
Acid surrogates	
phenol-d_5	40-115%
2-fluorophenol	
2,4,6-tribromophenol	
Base/neutral surrogates	
nitrobenzene-d_5	
5-fluorobiphenyl	50-120%
terphenyl-d_{14}	
acridine-d_9	
pyrene-d_{10}	

The precision control chart should consist of the percent difference for indicator constituent concentration determined in duplicate samples of a given sample type versus sample identification numbers.

Column Clean Up of Petroleum Wastes

Scope and Application

This method is used to cleanup samples containing high levels of aliphatic hydrocarbons, such as wastes from petroleum refining. It is used specifically to separate aliphatics, aromatics, and polar compounds in the waste matrix. This method is applicable to API separator sludges, rag oils, slop oil emulsion, and other oily wastes derived from petroleum refining. This method is recommended for use only by or under close supervision of experienced analysts.

Summary of Method

Take a 200 mg aliquot of the waste/methylene chloride concentrate from step 7.13 of Method 3530. Dissolve the aliquot in hexane and spike with 10mg each of d_9-acridine, d_5-nitrobenzene, d_5-phenol, 2-fluorobiphenyl, tribromophenol, d_{14}-terphenyl, 2-fluorophenol, and d_{10}-pyrene. Apply the mixture directly to the alumina column.

The column is eluted sequentially with hexane, methylene chloride, and diethyl either and the corresponding three fractions are collected. An aliquot of the CH_2Cl_2 fraction is evaporated under a gentle stream of nitrogen and weighed to determine the appropriate concentration factors prior to

GC/MS. If pyrene or terphenyl is recovered at less than 50%, the procedure should be repeated.

Interferences

Matrix interferences will likely be coextracted from the sample. The extent of these interferences will vary considerably from waste to waste depending on the nature and diversity of the particular waste being analyzed. The use of additional cleanup extractions can be used as necessary for specific compound identification and quantitation.

Apparatus

Glass Column: 30 cm long x 1 cm I.D. with glass frit or glass wool and stop clock.

Aluminum weighing boats: Approximately 2 in. in diameter.

Analytical Balance: Capable of weighing to $\pm$0.5 mg.

Concentrator Tube, KD, 10 ml

Evaporative Flask, KD, 250 ml

Snyder Column, KD, three-ball micro

Snyder Column, KD, two-ball micro

Steam Bath

Boiling Chips: 10-40 mesh carbarundum. Heat to 450°C for 5-10 hours.

Syringe: 1 ml glass

50 ml beaker

250 ml beaker

Reagents

Hexane: Distilled in glass (B&J) or equivalent

Methylene Chloride: Distilled in glass (B&J) or equivalent

Diethyl Ether: Distilled in glass (B&J) or equivalent

Alumina: Dried overnight at 130°C, neutral 80-325 MCB chromatographic grade

Sodium Sulfate: Washed with CH_2Cl_2 and heated to 150°C for 4 hours

Procedure

Weigh out 10.0 gm of alumina and add to the chromatographic column that is filled to about 20 mL with hexane.

Allow the alumina to settle and then add 0.5 gm sodium sulfate.

Let the solvent flow such that the head of liquid in the column is about 1 cm above the sodium sulfate layer. Stop the flow.

Add the aliquot equivalent to 100-200 mg of material.

Start the flow and elute with 13 ml of hexane. Collect the effluent in a 50 beaker. Label this fraction "aliphatics".

Elute the column with 100 ml of methylene chloride and collect the effluent in a 250 ml beaker. Label "aromatics".

Elute the column with 100 ml of diethyl ether and collect the effluent in a 250 ml beaker. Label "polars".

Weigh three sample boats to the nearest 0.5 mg. Reduce the volume of each fraction using the KDs to between 1 and 5 ml. Record the volume of each and place 1/2 of each sample in the respective boat.

Evaporate the liquid in each boat under a gentle stream of nitrogen. Reweigh each boat and record the weight of each fraction.

Calculate the weight of each fraction as a proportion of the total sample. For example, fraction 1 is 56.3 mg, fraction 2 is 25.4 mg, and fraction 3 is 85.0 mg.

Calculate the amount of sample in the fractions and adjust the volumes so injection will permit determination of various components on scale

12.7 mg/2500 ul = 5.1 ug/ul

Dilute each of the three fractions obtained by a ratio so that the sample entering the capillary column does not exceed 2.5 ug. For example, if the calculated weight of the fraction as a proportion of the total sample is 12.7, and the amount of sample in the fractions is 5.1 ug/ul as in the above example, dilute the sample 1:1 with methylene chloride.

Quality Control

Before processing any samples, the analyst should demonstrate through the analysis of a distilled water method blank that all glassware and reagents are interference-free. Each time a set of samples is extracted or there is a change in reagents, a method blank should be processed as a safeguard against

chronic laboratory contamination. The blank sample should be carried through all stages of the sample preparation and measurement. Standard quality assurance practices should be used with this method. Laboratory replicates should be analyzed to validate the precision of the analysis. Fortified samples should be carried through all stages of sample preparation and measurement; they should be anlayzed to validate the sensitivity and accuracy of the analysis.

Union 76 Division: Eastern Region

Union Oil Company of California
Chicago Refinery, Lemont, Illinois 60439
Telephone (312) 257-7761

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A.J. Eliskalns
Manager, Chicago Refinery

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DEC 18 1984
WMD-RAIU
EPA, REGION V

December 14, 1984

Mr. Gale Hruska
RCRA Activities
Part B Permit Application
USEPA - Region V
P.O. Box A3587
Chicago, Illinois 60690

Gentlemen:

Part B Permit Application
ILD 041550567 - Completeness
Review Response

Enclosed is a copy of our response to the completeness review as received in your letter of November 14, 1984. Union Oil requests that in addition to inserting the revised pages, tables and figures included as part of our response, that the response be added to the Part B permit application since it provides clarification to the completeness comments.

Additionally, Union Oil requires additional time to provide copies of all articles/reports requested in comment 10.B.1, since copyright limitations prohibit our copying complete copies. Since four (4) copies of each article/report must be ordered from various universities and publishing houses, the additional time necessary to respond to question 10.B.1 is unknown. Union Oil will proceed to provide these copies as quickly as possible.

If you have any questions, please contact Mr. L. D. Erchull at the above telephone number.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw
Attachments
cc: Mr. Larry W. Eastep - IEPA

COPY

COMMENTS/RESPONSES TO USEPA-REGION V
UNION OIL PART B PERMIT APPLICATION
COMPLETENESS REVIEW

Question 1. **On Figure B-5, is there a gate at N8000-W1800 (270.14(b)(19))?**

Yes. The text in Section B-2d Access Control, accurately states that access is controlled by gates and fences. Figure B-5 and Figure F-1 (copies attached) have been revised to show the existing gate.

Question 2. **Analyses for the slop oil emulsions and the tank cleaning waste which will be applied to the land treatment plots were not provided; (264.13(a)(1)). The tank cleaning waste needs to be analyzed for percent solvents as well as flash point.**

Page C-3 in Section C discusses the generation of both slop oil emulsions and tank cleaning wastes. As stated, tank cleaning wastes were last generated in 1981 and analyses of that specific waste are reported on Table C-4.

Page C-3 also states that, to date, slop oil emulsions have not been generated due to the manufacturing operation used by Union Oil. Slop oil emulsions have been included in the Part B application as a contingency for future land treatment. Slop oil emulsions are expected to be organic materials (oil/water mixture) with inorganic constituents. This waste is expected to be generated in 1985.

Table C-10 shows the parameters to be analyzed for both tank cleaning wastes and slop oil emulsions, when the wastes are generated. Table C-10 has been modified to add percent solvents as an additional requirement.

Question 3. **All waste streams were not analyzed for all the hazardous waste characteristics. Specifically, flash point and pH; (264.13(a)(1)).**

Table C-11 shows that these two parameters, (flash point, or ignitibility, and pH) will be included in all characterization analyses. It is recognized that existing data, as shown on Tables C-3 through C-9 may not have these parameters reported. Under 262.11(c)(2), Union Oil applied its knowledge of the materials and processes used at the Chicago Refinery to accurately reflect the character of the wastes being handled. Although there is no reason to believe that any of the non-hazardous or hazardous wastes to be land treated would be of concern with respect to either flash point or pH, Tables C-10 and C-11 both show that these parameters will be included in future waste analyses.

Question 4. **Table 3-11 as referenced on Page C-8 is not included in Appendix A reference (15); (264.13(b)(1)).**

Table 3-11 is attached and is numbered as page 223a, to be inserted after 223 in Appendix A, Volume II of the Union Oil Part B permit application.

Question 5. **The phrase "significant quantities" on Page C-9 needs to be defined; (264.13(b)(1)).**

Revised page C-9, which defines "significant quantities" is attached. It should replace the existing page C-9 in the Part B permit application.

Question 6. **The sampling methods used to collect a representative sample need to be specified; (264.13(b)(3)).**

Section C-2b Sampling Methods, page C-11 states that only approved procedures, as published by the USEPA will be used.

Page C-13 and C-14 discusses the use of a "landfarm logbook" which will be used to document what sampling protocol is used for each particular waste stream. Union Oil has chosen this approach particularly since the hazardous waste streams (tank cleaning wastes and slop oil emulsions) are generated so infrequently. Actual sampling procedures will have to be determined when, and if, these wastes are generated. Recommended EPA sampling procedures have been provided in Table C-12.

Question 7. **The analytical methods used to test for the various parameters need to be specified; (264.(b)(2)).**

Section C-2c Analytical Methods, page C-11 states that only approved analytical methods or procedures will be used for all chemical analyses.

Union Oil is aware that the analytical procedures referenced in the EPA document, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Second Edition, USEPA Office of Water and Waste Management, SW-846, 1982, are currently being reviewed/revised. Current EPA method number for pertinent analytical methods have been provided in Table C-13.

Since the hazardous wastes are generated so infrequently, if at all, the analytical procedures to be used will reflect the most recent, approved analytical procedure. Page C-14 has been revised to clarify this point.

Question 8. **The inspection report form does not include all areas listed in Table F-2, including the land treatment areas; (264.15).**

Figure F-2 has been modified to more accurately reflect the inspection areas specified on Table F-2. A revised Figure F-2 is attached to replace the existing Figure F-2.

Question 9. **The inspection schedule (inspection report form) does not identify the types of problems to look for during inspections; (264.15(b)(3)).**

Figure F-2 has been modified to more accurately reflect the inspection areas specified on Table F-2. A revised Figure 2 is attached to replace the existing Figure F-2.

Question 10. **Treatment demonstration deficiencies include the following:**

A. **All hazardous constituents of the wastes to be applied to the treatment area are not identified; (264.271(b), 270.20(a)(1).**

1. **The oil slop emulsion (K049) and tank cleaning waste (D001) have not been analyzed.**

2. **The exclusion of appendix VIII constituents needs to be discussed and documented in greater detail; 264.271(b). Table 3-11, as referenced on page C-8, is not provided in Appendix A Ref. (15).**

Under 264.271(b) and 270.20(a)(1), the generator, based on his knowledge of the manufacturing process operations used, can identify those waste constituents reasonably or potentially expected to be in the waste. Existing data, as shown on Tables C-3 through C-9, reflect this approach. Tables C-10 and C-11 shows that future waste analyses will include all hazardous waste characteristics as part of the waste characterization program.

Page C-3 in Section C discusses the generation of both slop oil emulsions and tank cleaning wastes. As stated, the tank cleaning wastes were last generated in 1981 and analyses of that specific waste are reported on Table C-4.

Page C-3 also states that, to date, slop oil emulsions have not been generated due to the manufacturing operations used by Union Oil. Slop oil emulsions have been included in the Part B application as a contingency for future land treatment.

Table C-10 shows the parameters to be analyzed for both tank cleaning wastes and slop oil emulsions; all reasonable expected hazardous constituents (as well as the general hazardous characteristics) will be included in future waste analyses. We anticipate that some of this information should be available in 1985.

Table 3-11, as referenced on page C-8, is attached and is numbered as page 223a, to be inserted after page 223 in Appendix A, Volume II of the Union Oil Part B permit application. Further, the subject reference document, number 15, titled "Environmental Research and Technology, Inc. Land Treatability of Appendix VIII Constituents Present in Petroleum Industry Wastes. ERT Report No. B-974-220,

Prepared for the American Petroleum Institute. February, 1984," more fully explains the rationale on exclusion of most of the Appendix VIII constituents. Four copies of the complete ERT report have been ordered and will be forwarded when received.

Question 10 - Continued

3. **The Appendix VIII constituents in the nonhazardous wastes, to be land applied, need to be identified and a treatment demonstration also made for these constituents because, according to 261.3(b)(2), nonhazardous wastes are considered to be hazardous when mixed with listed hazardous wastes.**

4. **Any hazardous constituents which may be derived from the treatment of wastes in the land treatment area are not discussed or documented; (264.271(b)).**

The above referenced ERT report, when received, will be forwarded in response to question 10.3 above and will more fully document why most of the Appendix VIII constituents can be excluded.

Section D-7b, page D-41, identifies the soil analyses to be used for monitoring the treatment zone soil. Section C-2a Parameters and Rationale addresses the approach to be used in selecting hazardous waste constituents. Page C-9 and C-10 specifically addressed the analytical screening and selection process; when the indicator organics have been identified, these same indicators will be used for the treatment zone soil monitoring of hazardous organic

constituents. A revised page D-42 is provided to clarify this approach.

Question 10 - Continued

B. **The literature review is not adequate to meet the requirements of the treatment demonstration.**

1. **Complete copies, of all referenced reports, need to be provided and all of the conclusions, summarized in Appendix A, need to be referenced to specific parts of these reports.**

2. **The field tests and laboratory analyses referenced in the reports must meet the requirements of 264.272(c). As most of the reports do not meet these requirements, it appears that field tests or laboratory analysis of the specific procedures, wastes, and soils involved may be necessary to adequately meet the requirements of the treatment demonstration; 264.272.**

Union Oil believes that the literature review included in Appendix A of Volume II of the Part B permit application adequately addresses the requirements of 264.272(c). However, since complete copies of all references are requested (10.B.1 above), Union Oil will require additional time to order four (4) copies of the articles and reports, since copyright limitations prohibit the copying of complete articles and reports. The time required for obtaining such copies is unknown; Union Oil will proceed to obtain the four (4) copies of each reference and will forward all the references as soon as all have been received. Further,

additional time will be required to cross-reference the conclusions to specific pages within each reference. At this time, Union Oil envisions a summary table to be provided with each reference that identifies pages/sections and conclusions. A copy of a letter to Mr. W. H. Miner, requesting a time extension, is attached.

Question 11. **Page D-19 states that there is 60 feet between the seasonable high water table and the bottom of the treatment zone, yet table E-2 indicates that the seasonably high water table is 12 - 72 inches from the surface and figures E-3, E-4 and E-5 all show the perched water table to be very close to the surface. Please clarify this apparent inconsistency. (264.271(c)(2)).**

Table E-2 is a summary of the general characteristics of the soil types found in the general area of the Chicago Refinery site but not specific to the Chicago Refinery. Section E discusses the hydrogeology at the land treatment area, and is referenced here for more specific detail. The site has a perched water layer that overlies the zone of saturation or ground water. Data shown on Table E-3 shows elevations for both the ground water monitoring wells (designated as MW-1 to MW-9) and the shallow well or perched water layer monitoring wells (designated as SW-1, SW-4, SW-5, SW-7, SW-8, and SW-9). Figure E-3, E-4 and E-5 clearly shows the elevations for both the perched water layer (ranging from about 5 to 25 feet below the ground surface) to those elevations of the uppermost aquifer (ranging from about 60 to 90 feet below the ground surface).

Question 12. **Measures to control the moisture content of the treatment zone were not addressed; (264.273(a)(4)).**

Page D-27 has been revised to address this point.

Question 13. **Figure D-2 shows what appears to be a drainage swale through Area II. Please describe this in greater detail and how it complies with 264.273(c).**

The "drainage swale" shown on Figure D-2 going through Area II is an underground concrete drainage pipe to prevent run-on to that portion of Area II. Figure D-2 has been revised to clarify the purpose of the drainage pipe.

Question 14. **A demonstration that the run-off management system can collect and control at least the volume of water resulting from a 24-hour, 25-year storm was not provided; (264.273(d)).**

Run-on and run-off control are discussed in Section D-4a(1) Run-On Control and D-4a(2) Runoff Control (pages D-27 and D-28). Section D-5 Surface Water Control Plans (pages D-38 and D-39) also discuss these concerns. Since all run-off from the land treatment plots will flow to the Chicago Refinery's storm water retention basins, and from the basins through the NPDES permitted wastewater treatment plant, Union Oil is providing for control of storm water runoff in excess of the 24-hour, 25-year storm. Consequently, the requirements of 264.273(d) are being met. Page D-39 referenced the wrong section within 264.273 and a revised page D-39 is attached.

Question 15. **A description of any plume of contamination that has entered the groundwater from a regulated unit at the facility, if applicable, was not addressed; (270.14(c)(4)).**

Despite an apparent variance for the Student t-Test there is no evidence or demonstrable indication of a contaminant plume indicated by the available groundwater quality data. The significance of the apparent variance for the Student's t-Test is currently being evaluated through an EPA approved groundwater assessment plan.

Question 16. **Do all wells have their own bailer; 264.97(e)?**

Yes.

Question 17. **The location(s) of the control area(s), used to represent the background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment areas, need to be provided; (264.278(b)(1)).**

Union Oil is currently in the process of establishing a control area to provide information on the background concentrations of the waste constituents. The control area will be located in similar but untreated soils nearby. As currently planned, the control area will be located adjacent to and north of the existing land treatment area. Upon establishment of the control area, background monitoring will be conducted in conjunction with and using the same sampling and analytical procedure utilized for monitoring the zone of aeration within the land treatment area.

Question 18. **The locations of the lysimeters, shallow wells, and soil cores used to indicate the quality of soil-pore liquid and the chemical make-up of the soil below the treatment zone need to be provided on a map (1 inch = 200 feet) of the treatment plots; (264.278(b)(2)). Sections E-4c(1)(b)) and E-4d(1) indicate that the number of lysimeters and soil core**

locations will equal approximately one per acre for the active land treatment plots. All additional lysimeters and soil cores should be included on the map. A boring log and lithologic description of all lysimeters and soil cores also needs to be provided.

The attached Figure E-1 provides the locations of all monitoring points utilized for monitoring the land treatment area.

The lithologic description of the surficial soils is described in E-2b and illustrated in Figures E-3, E-4, E-5 and E-6. Because of the shallow nature (i.e., 2'-5') of the lysimeter installations and soil cores, they will all be placed in the clayey-silt/silty clay (CL/ML) layer. Therefore, unless conditions anomalous to those described in Section E-2b and illustrated in Figures E-3, E-4, E-5 and E-6 are encountered during the installation of lysimeters or collection of soil cores, the preparation of individual logs for each of these sampling locations is considered an unnecessary redundancy to already well documented surficial soil conditions.

Question 19. **Additional information about the proposed statistical methods, used to evaluate the soil and pore water quality in the unsaturated zone and how they will meet the requirements of 264.278(f)(3) along with the statistical procedures used to determine a statistically significant increase; need to be provided; (264.278(f)).**

Reference Sections E-4c(9), E-4c(10), E-4d(9) and E-4d(10).

Question 20. The detection monitoring program is incomplete for the following reasons:

A. The groundwater quality must be analyzed at least semi-annually at each monitoring well at the compliance point; (264.98(d)).

B. The groundwater flow rate and direction in the uppermost aquifer must be determined at least annually; (264.98(e)).

C. The procedures and methods used for sampling and analysis were not indicated: (264.98(f), 270.14(c)(6)(iv).

D. The procedures used to determine whether there is a statistical significant increase over background values for any parameter measured at the point of compliance were not provided; (264.99(9), 264.97(h), 270.14(c)(6)(iv)).

E. The results of actions taken in response to 264.98(g) were not provided; (264.98(h)). Please note, the detection monitoring program is not necessarily dependent on the results of the groundwater assessment program.

A. Reference Section E-3d(3)(a).

B. Reference Section E-3d(3)(a).

C. The procedures and methods used for sampling and analysis are the same as described in Section E-3b.

D. The procedures used to determine whether there is a statistical significant increase over background values are the same as described in Section E-3c.

E. At the Union Oil site, the groundwater monitoring and detection monitoring programs coincide on a "one-to-one" basis. Therefore, the actions taken in response to 264.98(g) and 264.98(h) are dependent upon and must await conclusion of the ongoing groundwater assessment program.

Question 21. **The names, addresses, and phone numbers (home and office) of all persons qualified to act as emergency coordinator were not provided; (264.52(d)).**

Section G-2 Emergency Coordinator specifically states that Union Oil provides continuous 24-hour, 7 day per week on-site emergency coordinators. This assignment is by designated position. Since this approach provides maximum protection, the provision of individual addresses and phone numbers is unnecessary. Union Oil has requested approval by the USEPA-Region V Regional Administrator that the provision of a continuous on-site emergency coordinator precludes the requirements of 264.52(d). A copy of the request is attached.

Question 22. **Where do the pages after section H in attachment G-1 belong?**

The four (4) pages immediately after page H-1 in Attachment G-1 consist of:

1) a summary sheet of fire fighting equipment

2) three (3) procedure memos for use by the security personnel at Union Oil

These pages were included as supplemental information to Section G of Attachment G-1 and should be inserted immediately before page H-1. These sheets then supplement Section G of Attachment G-1.

Question 23. **Have any local authorities refused to enter into a coordinated agreement; (264.37(b))?**

Figure G-4 is a copy of the letter of transmittal to those organizations shown on Table G-5. To date, no organization has refused to enter into a coordinated agreement.

Question 24. **The names and job descriptions of the maintenance personnel who transport and apply the waste are not provided; (264.16(d)(1) and (2)).**

Section H has been modified to include this information.

Question 25. **The names of the other people whose positions at the facility are related to hazardous waste are not provided; (264.16(d)(1)).**

Pages H-2, H-3, H-4, H-6 and H-8 have been revised to show the names of the individuals currently in the five positions identified in Section H.

Question 26. **The training frequency indicated in table H-1 as "as needed" needs to be specified; (264.16(d)(3)).**

Table H-1 has been revised to clarify training frequency.

Question 27. **The training program does not address the emergency response procedures to groundwater contamination incidents; (264.16(a)(3)(v)).**

Section E addressed the issues of the detection monitoring, compliance monitoring and a remedial action program. These monitoring activities will indicate if contamination of the ground water occurs; response will obviously be consistent with the type and extent of contamination found. There are no "emergency" response procedures that are appropriate to ground water contamination due to movement of contaminants into the ground water from long-term land treatment of wastes at the soil surface.

Spills and/or other similar major releases, which potentially could cause an "immediate" threat to ground water contamination are covered as part of the contingency plan (Section G) and personnel training (Section H).

If the above does not address the concern initially expressed by Question 27, Union Oil must have further clarification on what the concern is before any other response can be provided.

Question 28. **Documentation that the training director has been trained in hazardous waste management is not provided; (264.16(a)(2)).**

Enclosed as Table H-2 is a summary of training courses and other relevant conferences attended by the Training Director and staff since 1979. Page H-11 has been revised to reflect this addition.

Question 29. **The discussion of partial closure includes clean up of equipment, but partial closure of the land treatment plots and the requirements of 264.280 is not provided; (264.112(a)(1)).**

The purpose of the land treatment operation at Union Oil is to provide for the biological degradation of the organics contained in the wastes. As described in Section I-1b Partial Closure, Union Oil can control the generation of hazardous wastes, or store nonhazardous wastes in the decant basin within the hazardous waste treatment area.

Consequently, "partial closure" of the land treatment plots involves the suspension of all land application operations, but would require the continued discing of the land treatment plots to insure aeration and degradation of the wastes already applied to the soil. Page I-8 has been revised to provide clarification.

Question 30. **A demonstration that two years is necessary to close the facility needs to be provided; (264.113(b). This demonstration should also address 264.280.**

The two years discussed for final closure of the land treatment plots is required to insure that all organics are degraded. During this period, all nominal site monitoring and operating practices will continue (page I-11). Subsequent to the two-year operation, soil samples will be taken and analyzed (page I-11). Page I-11 has been revised to include consideration of continued operation should these analyses indicate that decomposition of the organics has not been completed.

Question 31. **The closure cost estimate does not include the monitoring and analytical costs for the two seasons during closure; (264.142, 270.14(b)(15)).**

The closure cost estimate of monitoring and analytical costs is two thirds of Item 6 found in Table I-3 ($14,500).

Question 32. **The post-closure plan for the surface impoundment should also be included in the Part B application; (264.117).**

Union Oil is seeking approval of a closure/reuse concept for the surface impoundment from both the Illinois EPA and USEPA-Region V. This post-closure plan will be addressed after clarification from both agencies has been received. Attached to Section I is a copy of the letter sent to regulators seeking "agreement in principal" with the closure/reuse concept for the surface impoundment.

Question 33. **The name and location of the person(s) responsible for the post-closure plan both prior to closure (264.118(a)) and during the post-closure period (264.118(a)(3)), needs to be provided.**

Page I-21 has been revised to provide this information.

Question 34. **A copy of the certification of insurance or other documentation which comprises compliance with 264.147 needs to be provided.**

Exhibit I-1 provides, on Illinois form IL 532-1206, financial assurance that Union Oil is meeting the provisions of 264.147 by self-insurance.

bcc: JKBassett/JEPurtell
M. J. Dougherty
R. N. Fleck
N. Kurai

Union 76 Division: Eastern Region

Union Oil Company of California
Chicago Refinery, Lemont, Illinois 60439
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CERTIFIED MAIL
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#P08 8720359

A.J. Eliskalns
Manager, Chicago Refinery

December 10, 1984

Mr. William H. Miner
U.S. Environmental Protection
Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Sir:

Request for Time Extension

We are presently preparing a response to your letter of November 14, 1984, concerning the completeness review of the Chicago Refinery Part B Hazardous Waste Permit Application.

Question 10B. requests complete copies of all referenced reports used in the literature review treatment demonstration. We will require additional time to order four copies of the articles and reports, since copyright limitations prohibit the copying of complete articles and reports. The time required for obtaining such copies is unknown. We will forward all references as soon as all have been received.

After receiving the references, an additional thirty days will be required to cross-reference the conclusions to specific pages within each reference. At that time we envision a summary table to be provided with each reference that identifies pages/sections and conclusions.

Should you have any questions concerning our request, please contact Mr. L. D. Erchull at the above telephone number for assistance.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

/LDE:dlw

Union 76 Division: Eastern Region

Union Oil Company of California
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CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P08 8720358

A.J. Eliskalns
Manager, Chicago Refinery

December 10, 1984

Mr. Valdas Adamkus
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Sir:

Request for Waiver
of 40CFR264.52(d)

We are presently preparing a response to a November 14, 1984, letter from William H. Miner to Union Oil concerning the completeness review of the Chicago Refinery Part B Hazardous Waste Permit Application.

Question 21 states that the names, addresses, and phone numbers (home and office) of all persons qualified to act as emergency coordinator were not provided (264.52(d)).

Section G-2 Emergency Coordinator of our permit application specifically states that Union Oil provides 24-hour, 7 day per week, on-site emergency coordinator coverage. This assignment is by designated position. Since this approach provides maximum protection, the provision of names, addresses and phone numbers is unnecessary.

We hereby request approval by the USEPA-Region 5 Regional Administrator that the provision of a continuous on-site emergency coordinator precludes the requirements of 40CFR264.52(d) as procedurally outlined in 40CFR270.14.

Should you have any questions conerning our request, please contact Mr. L. D. Erchull at (312)257-7761 for assistance.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

✓LDE:dlw

cc: Mr. William Miner - USEPA

bcc: JKBassett/JEPurtell
M. J. Dougherty
R. N. Fleck
N. Kurai

Union 76 Division: Eastern Region

Union Oil Company of California
Chicago Refinery, Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 457-84

RECEIVED
DEC 14 1984
WMD-RAIU
EPA, REGION V

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P08 8720358

A.J. Eliskalns
Manager, Chicago Refinery

December 10, 1984

RECEIVED
DEC 14 1984
WASTE MANAGEMENT BRANCH

Mr. Valdas Adamkus
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Sir:

Request for Waiver
of 40CFR264.52(d)

We are presently preparing a response to a November 14, 1984, letter from William H. Miner to Union Oil concerning the completeness review of the Chicago Refinery Part B Hazardous Waste Permit Application.

Question 21 states that the names, addresses, and phone numbers (home and office) of all persons qualified to act as emergency coordinator were not provided (264.52(d)).

Section G-2 Emergency Coordinator of our permit application specifically states that Union Oil provides 24-hour, 7 day per week, on-site emergency coordinator coverage. This assignment is by designated position. Since this approach provides maximum protection, the provision of names, addresses and phone numbers is unnecessary.

We hereby request approval by the USEPA-Region 5 Regional Administrator that the provision of a continuous on-site emergency coordinator precludes the requirements of 40CFR264.52(d) as procedurally outlined in 40CFR270.14.

205-196

Union 76 Division: Eastern Region
Union Oil Company of California
Chicago Refinery, Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 458-84

RECEIVED
DEC 14 1984
WASTE MANAGEMENT BRANCH

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P08 8720359

A.J. Eliskalns
Manager, Chicago Refinery

December 10, 1984

Mr. William H. Miner
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Sir:

Request for Time Extension

We are presently preparing a response to your letter of November 14, 1984, concerning the completeness review of the Chicago Refinery Part B Hazardous Waste Permit Application.

Question 10B. requests complete copies of all referenced reports used in the literature review treatment demonstration. We will require additional time to order four copies of the articles and reports, since copyright limitations prohibit the copying of complete articles and reports. The time required for obtaining such copies is unknown. We will forward all references as soon as all have been received.

After receiving the references, an additional thirty days will be required to cross-reference the conclusions to specific pages within each reference. At that time we envision a summary table to be provided with each reference that identifies pages/sections and conclusions.

Should you have any questions concerning our request, please contact Mr. L. D. Erchull at the above telephone number for assistance.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw

205-19a

Should you have any questions conerning our request, please contact Mr. L. D. Erchull at (312)257-7761 for assistance.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw

cc: Mr. William Miner - USEPA

Union 76 Division: Eastern Region
Union Oil Company of California
Chicago Refinery, Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 435-84

union 76

A.J. Eliskalns
Manager, Chicago Refinery

November 21, 1984

Mr. Gale Hruska
U.S. Environmental Protection Agency
Region 5
230 South Dearborn Street
Chicago, IL. 60604

Dear Sir:

ILD 041550567 G,TRS,TSD,PA

Confirmation of Telephone Conversation

This letter is to confirm a November 16, 1984 telephone conversation between yourself and L. D. Erchull of my staff concerning your Part B Permit comment letter.

It is our understanding that our response to your letter can be delayed to December 15, 1984 which is 30 days from receipt of the letter. We will be sending a partial set of comments to you prior to December 15, 1984.

Certain questions need further time and we will send a letter to William H. Miner requesting an extension with the appropriate justification.

Very truly yours,

D. W. Bruckert, Supervisor
Environmental Services

LDE:jlj

RECEIVED
NOV 27 1984
WMD-RAIU
EPA, REGION V

COPY 2

205-25

NOV 1 4 1984

5HW-12

CERTIFIED MAIL # P593667729
RETURN RECEIPT REQUESTED

Mr. A. J. Eliskalns, Manager
Union Oil of California
Chicago Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil - Chicago Refinery
ILD 041550567

Dear Mr. Eliskalns:

U.S. Environmental Protection Agency and Illinois Environmental Protection Agency have jointly reviewed your Part B Hazardous Waste Permit Application for the Chicago Refinery with respect to the completeness of the application. Please note, the completeness review only documents whether or not the information required by 40 CFR §270.14 through §270.21 has been addressed; the technical adequacy of the submission will be evaluated in subsequent reviews.

The application has been determined to be incomplete. Enclosed is a list of deficiencies which must be addressed. The Part B Application must be submitted in quadruplicate and postmarked no later than December 5, 1984. The original and one copy of the application must be sent to the U.S. Environmental Protection Agency (U.S. EPA) and the other two copies to the Illinois Environmental Protection Agency (IEPA). Your response should be in a format which allows incorporation of the new information into the appropriate sections of the existing Part B Application. A certification statement identical to the one stated in 40 CFR §270.11(d) must accompany the application and all additional submittals. Send your application to the following addresses:

RCRA ACTIVITIES
Part B Permit Application
U.S. EPA, Region V
P.O. Box A3587
Chicago, Illinois 60690-3587

Larry Eastep, Manager
Permit Section, DLPC
Illinois EPA
2200 Churchill Road
Springfield, Illinois 62706

	TYPIST	AUTHOR	STU #1 CHIEF	STU #2 CHIEF	STU #3 CHIEF	TPS CHIEF	WMB CHIEF	WMD DIRECTOR
INITIALS	CM	GRN	RPP			Gmr 11-8-84		
DATE	11-2-84	11/2/84	11/2/84			11/5/84		

205-18

Please contact Gale Hruska, at (312) 886-0989, if you have questions regarding this matter.

Sincerely yours,

ORIGINAL SIGNED BY
WILLIAM H. MINER

William H. Miner, Chief
Technical, Permits, and Compliance Section

Enclosure

cc: L. Eastep, IEPA
R. Watson, IEPA

5HW-12:G.Hruska:cm:11/02/84

PS Form 3811, July 1983

DOMESTIC RETURN RECEIPT

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☒ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:

MR. A.J. ELISKALNS, MANAGER
UNION OIL OF CALIFORNIA
CHICAGO REFINERY
LEMONT, ILLINOIS 60439

4. Type of Service:

☐ ☒ ☐ ☐ ☐

Article Number

STICK POSTAGE STAMPS TO ARTICLE TO COVER CERTIFIED MAIL FEE AND CHARGES FOR RESTRICTED DELIVERY

1. If you want this receipt postmarked, stick the gummed stamps on the article, date, detach and leave the receipt attached and present the article. (no extra charge)
2. If you do not want this receipt postmarked, stick the stamps on the article, date, detach and retain the receipt, and mail the article.
3. If you want a return receipt, write the certified mail number and your name and address on the Form 3811, and attach it to the front of the article by securely tying or affixing it to back of article. Endorse front of article RETURN RECEIPT REQUESTED.
4. If you want delivery restricted to the addressee, or to an authorized agent, endorse RESTRICTED DELIVERY on the front of the article.
5. Enter fees for the services requested in the appropriate blocks in item 4 of Form 3811. If requested, check the applicable blocks in item 1 of Form 3811.
6. Save this receipt and present it if you make inquiry.

5HW
PS Form

Illinois Environmental Protection Agency · 2200 Churchill Road, Springfield, IL 62706

217/782-6762

Refer to: 1978030007 -- Will County
Lemont/Union Oil
ILD 041550567
Log Number: 45

WASTE MANAGEMENT BRANCH
RECEIVED
OCT 19 1984
WMD-RAIU
EPA, REGION V

October 12, 1984

William H. Miner
Technical, Permit & Compliance Section
U.S. Environmental Protection Agency
230 South Dearborn
Chicago, Illinois 60604

Dear Mr. Miner:

Enclosed is a list of informational deficiencies discovered during the completeness review of Union Oil's RCRA permit application.

If you have any questions, please contact Rob Watson at 217/782-9883.

Very truly yours,

Lawrence W. Eastep by WRW

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:WRW:mkb:1/67

Enclosures

cc: Division File
Bill Radlinski
JODI TRAUB
Region 5

COPY 2

205-14

October 12, 1984 Lemont/Union Oil

All References are to 40 CFR ILD041590567

General

1. On Figure B-5, is there a gate at N8000 W1800 (270.14(b)(19))?

Waste Characteristics

2. Analyses for the slop oil emulsions and the tank cleaning waste which will be applied to the land treatment plots were not provided (264.13(a)(1)). The tank cleaning waste needs to be analyzed for percent solvents as well as flash point.

3. All waste streams were not analyzed for all the hazardous waste characteristics. Specifically, flash point and pH (264.13(a)(1)).

4. Table 3-11 as referenced on page C-8 is not included in Appendix A reference (15). (264.13(b)(1)).

5. The phase "significant quantities" on Page C-9 needs to be defined (264.13(b)(1)).

6. The sampling methods used to collect a representative sample need to be specified (264.13(b)(3)).

7. The analytical methods used to test for the various parameters needs to be specified (264.13(b)(2)).

Procedures to Prevent Hazards

8. The inspection report form does not include all areas listed in Table F-2, including the land treatment areas (264.15).

9. The inspection schedule (inspection report form) does not identify the types of problems to look for during inspections (264.15(b)(3)).

Land Treatment

10. Treatment demonstration deficiencies include the following:

    A. All hazardous constituents of the wastes to be applied to the treatment area are not identified (264.271(b), 270.20(a)(1)).

        1. The oil slop emulsion (K049) and tank cleaning waste (D001) have not been analyzed.

        2. The exclusion of appendix VIII constitutes needs to be discussed and documented in greater detail 264.271(b). Table 3-11, as referenced on page C-8, is not provided in appendix A Ref. (15).

3. The Appendix VIII constituents in the nonhazardous wastes to be land applied need to be identified and a treatment demonstration also made for these constituents because according to 261.3(b)(2) nonhazardous wastes are considered to be hazardous when mixed with listed hazardous wastes.

4. Any hazardous constituents which may be derived from the treatment of wastes in the land treatment area are not discussed or documented (264.271(b)).

B. The literature review is not adequate to meet the requirements of the treatment demonstration.

1. Complete copies of all referenced reports need to be provided and all of the conclusions summarized in Appendix A need to be referenced to specific parts of these reports.

2. The field tests and laboratory analyses referenced in the reports must meet the requirements of 264.272(c). As most of the reports do not meet these requirements, it appears that field tests or laboratory analysis of the specific precedures, wastes, and soils involved may be necessary to adequately meet the requirements of the treatment demonstration 264.272.

11. Page D-19 states that there is 60 feet between the seasonal high water table and the bottom of the treatment zone, yet table E-2 indicates that the seasonally high water table is 12 - 72 inches from the surface and figures E-3, E-4 and E-5 all show the perched water table to be very close to the surface. Please clarify this apparent inconsistency. (264.271(c)(2)).

12. Measures to control the moisture content of the treatment zone were not addressed (264.273(a)(4)).

13. Figure D-2 shows what appears to be a drainage swale through area II. Please describe this in greater detail and how it complies with 264.273(c).

14. A demonstration that the run-off management system can collect and control at least the volume of water resulting from a 24-hour, 25-year storm was not provided (264.273(d)).

Groundwater Monitoring

15. A description of any plume of contamination that has entered the groundwater from a regulated unit at the facility, if applicable, was not addressed (270.14(c)(4)).

16. Do all wells have their own bailer 264.97(e)?

17. The locations(s) of the control area(s) used to represent the background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment areas need to be provided (264.278(b)(1)).

18. The locations of the lysimeters, shallow wells, and soil cores used to indicate the quality of soil-pore liquid and the chemical make-up of the soil below the treatment zone need to be provided on a map (1 inch = 200 feet) of the treatment plots (264.278(b)(2)). Sections E-4c(1)(b) and E-4d(1) indicate that the number of lysimeters and soil core locations will equal approximately one per acre for the active land treatment plots. All additional lysimeters and soil cores should be included on the map. A boring log and lithologic description of all lysimeters and soil cores also needs to be provided.

19. Additional information about the proposed statitical methods used to evaluate the soil and pore water quality in the unsaturated zone and how they will meet the requirements of 264.278(f)(3) along with the statistical procedures used to determine a statistically significant increase need to be provided (264.278(f)).

20. The detection monitoring program is incomplete for the following reasons:

    A. The groundwater quality must be analyzed at least semi-annually at each monitoring well at the compliance point (264.98(d)).

    B. The groundwater flow rate and direction in the uppermost aquifer must be determined at least annually (264.98(e)).

    C. The procedures and methods used for sampling and analysis were not indicated (264.98(f), 270.14(c)(6)(iv)).

    D. The procedures used to determine whether there is a statistical significant increase over background values for any parameter measured at the point of compliance were not provided (264.99(9), 264.97(h), 270.14(c)(6)(iv)).

    E. The results of actions taken in response to 264.98(g) were not provided (264.98(h)). Please note, the detection monitoring program is not necessarily dependent on the results of the groundwater assessment program.

Contingency Plan

21. The names, addresses, and phone numbers (home and office) of all persons qualified to act as emergency coordinator were not provided (264.52(d)).

22. Where do the pages after section H in attachment G-1 belong?

23. Have any local authorities refused to enter into a coordinated agreement (264.37(b))?

Personnel Training

24. The names and job descriptions of the maintenance personnel who transport and apply the waste are not provided (264.16(d)(1) and (2)).

25. The names of the other people whose positions at the facility are related to hazardous waste are not provided. (264.16(d)(1)).

26. The training frequency indicated in table H-1 as "as needed" needs to be specified (264.16(d)(3)).

27. The training program does not address the emergency response procedures to groundwater contamination incidents (264.16(a)(3)(v)).

28. Documentation that the training director has been trained in hazardous waste management is not provided (264.16(a)(2)).

Closure Plan

29. The discussion of partial closure includes clean up of equipment, but partial closure of the land treatment plots and the requirements of 264.280 is not provied (264.112(a)(1)).

30. A demonstration that 2 years is necessary to close the facility needs to be provided (264.113(b). This demontration should also address 264.280.

31. The Closure cost estimate does not include the monitoring and analytical costs for the two seasons during closure (264.142, 270.14(b)(15)).

Post-Closure Plan

32. The post closure plan for the surface impoundment should also be included in the Part B application (264.117).

33. The name and location of the person(s) responsible for the post closure plan both prior to closure (264.118(a)) and during the post-closure period (264.118(a)(3)) need to be provided.

Liability Requirements

34. A copy of the certification of insurance or other documentation which comprises compliance with 264.147 needs to be provided.

RW:st:2062d/11-14

RECORD OF COMMUNICATION	☒ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE ☐ OTHER (SPECIFY) (Record of item checked above)	
TO: Lee Urchell, Union Oil Co. ILD041550567	FROM: Gale Hruska	DATE 8/28/84 TIME 1.30 pm

SUBJECT

Continuation of Permitting Process

SUMMARY OF COMMUNICATION

I called Lee Erchell to find out if Union Oil wants U.S EPA to continue its review of their Part B in light of the major fire that occured at the facility. Erchell said that the company is going to continue operations, and therefore they still want the permit. I told him that we will continue the review, but that our completeness check would be later than the 60 day normal ~~time~~ response

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES TO:

EPA Form 1320-5 (7-72) REPLACES EPA HQ FORM 5900-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

ERM-North Central, Inc.
835 Sterling Avenue
Palatine, Illinois 60067
(312) 934-4646

RECEIVED
JUL 13 1984
WMD-RAIU
EPA, REGION V

July 13, 1984

Mr. Gale Hruska
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, IL 60604

Project No. 4006JB

RE: RCRA Part B Permit Submittal
Union Oil, Chicago Refinery
I.D. No. ILD041550567

Dear Mr. Hruska:

Attached are four (4) sets of the remaining sections for the Union Oil of California Chicago Refinery, Part B Permit Application for their hazardous waste land treatment operation. This submittal completes the permit application sections that were submitted on May 31, 1984.

Also attached is a final completeness checklist to reference regulatory requirements with specific sections within the permit application.

Very truly yours,

ERM-NORTH CENTRAL, INC.

James W. Polich, P.E.

ljc

Enc.

cc: L.D. Erchull
Union Oil, Chicago Refinery

205-11

Union 76 Division: Eas
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 174-84

union 76

RECEIVED
JUN 6 1984
WMD-RAIU
EPA, REGION V

May 31, 1984

A. J. Eliskalns
Manager, Chicago Refinery

Mr. Gale Hruska
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Mr. Hruska:

RCRA Part B Permit Submittal
Union Oil, Chicago Refinery
I.D. No. ILD041550567

Attached are four (4) copies of the Chicago Refinery's partial Part B Permit Application for the hazardous waste land treatment operation. This submittal consists of: a partial Table of Contents; Section B, General Facility Information; Section F, Procedures to Prevent Hazards; Section G, Contingency Plan; Section H, Personnel Training; and, Section J, Other Federal Laws. The remainder of the Part B Application will be submitted by July 13, 1984, per Mr. William Miner's letter of March 15, 1984, granting a 45 day extension.

To clarify which sections will be submitted by July 13, 1984, the following explanation is provided.

- Table of Contents - A partial Table of Contents is submitted; a complete Table of Contents will be provided with the final submittal to include those Sections still being developed.

- Section A, Revised Part A - A revised Part A form, with required signatures, will be submitted July 13, 1984, to reflect the complete Part B Permit Application.

- Section C, Waste Characteristics - This Section was granted a 45 day extension.

- Section D, Process Information - This Section cannot be completed until Sections C and E on waste analyses and recently completed hydrogeological work have been completed.

COPY 2

205-9

- Section E, Groundwater Monitoring - This Section was granted a 45 day extension.

- Section I, Closure and Post-Closure and Financial - The closure of the hazardous waste facility is directly related to its' operation. An adequate description of the operational parameters cannot be completed until the literature review and the hydrogeological work have been completed.

- Section K, Certification - Certification will be provided when the complete document is submitted.

- Appendix A, Literature Review - This Section was granted a 45 day extension.

- Appendix B, Treatment Demonstration Program - Development of the Treatment Demonstration Program is dependent on the results of the literature review, waste analyses, and hydrogeological work.

As discussed during our meeting of April 30, 1984, with you, we understand that we can insert, or replace pages in the attached submittal, when we provide the final submittal in July. This will allow us to insure continuity in the narrative text with those sections still being developed.

Please call our Mr. Erchull, at (312) 257-7761 if you have any questions or need further information.

Sincerely yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw

Attachment

RECORD OF COMMUNICATION	☐ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☒ CONFERENCE ☐ OTHER (SPECIFY) (Record of item checked above)	
TO: Part B file - Union Oil Lemont - ILD 041550567	FROM: Gale Hruska	DATE 4/30/84 TIME 9:30Am

SUBJECT: Pre-submission meeting - Part B application

SUMMARY OF COMMUNICATION

Glen Bruck and I met with Lee Erchull (Union Oil) and J. Polich and F. Blaha (Environmental Resources Management) regarding the facility's Part B submission.

The company will only be seeking a permit for their land treatment of petroleum wastes (eg slop oil solids tank bottoms). No storage will be requested. We pointed out areas in Part B submissions where many applicants experience difficulty in supplying the information we require.

The ~~company~~ consultants questioned the need for 2 foot contours on the map. G. Bruck thought that they would be needed. The consultant said that they ~~were~~ felt that lab testing and a literature search should be adequate for a treatment demonstration. We did not concur; they would have to make a good case before we would accept this.

5/1/84. I spoke to Richard Karl (USEPA - Soils Scientist). He said that because of the large change in contours, a minimum 5' contour lines should be determined. He also thought that limiting the treatment demonstration to lab testing would not test the existing land's capacity to treat the waste (ie has past use degraded its ability to treat waste).

CONCLUSIONS, ACTION TAKEN OR REQUIRED

ERM-North Central, inc.
Environmental Resources Management
James W. Polich, P.E.
835 Sterling Avenue
Palatine, Illinois 60067
(312) 934-4646

ERM-North Central, inc.
Environmental Resources Management
Frank J. Blaha
835 Sterling Avenue
Palatine, Illinois 60067
(312) 934-4646

MAR 15 1984

5HW-12

A.J. Eliskalns, Manager
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil Company, Chicago Refinery
ILD 041550567

Dear Mr. Eliskalns:

We have reviewed your request on March 7, 1984, for an extension of the due date for the submission of the Part B hazardous waste permit application for the above referenced facility. We will extend the due date to July 15, 1984, for the items which you identified in your letter (waste availability for analysis, hydrogeological work, and land treatment system literature analysis). The remaining material for the Part B permit application must be submitted by the original due date of May 31, 1984.

Please be advised that failure to submit the information as required could result in termination of Interim Status for the facility and/or the issuance of an enforcement action. You may contact Mr. Gale Hruska, at (312) 886-0989, if you have questions concerning this matter.

Sincerely yours,

William A. Miner, Chief
Technical, Permits, and Compliance Section

cc: Lawrence Eastep, IEPA

5HW-12:G.HRUSKA:ns:3/14/84

205-7

Union 76 Division: Eastern Region
Union Oil Company of Califo
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 72-84

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P 334 827 562

. J. Eliskalns
nager, Chicago Refinery

March 7, 1984

Mr. Gale Hruska
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Sir:

ILD041 550567
G,TRS,TSD,PA,9

Request for Extension of Submittal Date - Part B RCRA Permit Application

Environmental Resources Management-North Central, Inc. (ERM) is preparing the Part B Permit Application for Union Oil's Chicago Refinery. The application is for a land treatment facility, and this will be the first our contractor has prepared. We also understand that it is one of the first required in the country. Some major technical difficulties have been encountered during preparation of the permit application. These difficulties are such that an extension in the submittal date would improve our application. Some of the difficulties which have required more time than expected are listed below.

1. Due to the periodic nature of waste production at the facility, some wastes have not been available for waste analyses. These analyses are critical to the design of the treatment demonstration program.

2. Poor weather has delayed hydrogeological work needed to:

   a. specify the operating procedures of the land treatment system,

   b. design the subsurface monitoring systems, and

   c. design the surface topography to minimize runoff and surface water impacts.

3. It has also been necessary to obtain, and critically analyze the literature on land treatment systems. (This is particularly true with respect to literature on the volatilization of some waste fractions.)

Therefore, some additional time is needed to complete these aspects of the Part B Permit Application.

RECEIVED MAR 12 1984 WASTE MANAGEMENT BRANCH

RECEIVED 3/13/84

We therefore respectfully request that the submittal date for the Part B Permit Application (scheduled for May 31, 1984) be extended for 45 days until July 15, 1984. This extension will allow for completing the above activities. We believe that our request for this extension is reasonable given the magnitude of the technical tasks and our good faith in working toward the present submittal date.

We would be willing to provide a partial submittal of the application on May 31, 1984. This partial submittal would contain those sections of the permit application not affected by the technical difficulties described above. Any remaining application sections would be submitted within 45 days.

We appreciate your consideration in this matter. Please call Mr. L. D. Erchull at 312-257-7761 if you have any questions or need any further information.

Very truly yours,

A. J. Eliskalns

LDE:dlw

RECORD OF COMMUNICATION	☒ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE ☐ OTHER (SPECIFY) (Record of item checked above)	
TO: Part B file; Union Oil Lemont, IL ILD041550567	FROM: Gale Hruska	DATE March 15, 1984 TIME

SUBJECT
Questions regarding preparation of Part B permit application

SUMMARY OF COMMUNICATION
On 3/14/84 Frank Blaha (Environmental Research Management (984-4646) called with some questions regarding land Treatment and the Part B preparation. I called Mike Flynn (Hq.) (8-382-4489) He said that he has spoken to a ~~con~~ representative from ERM and answered some of their questions. He told me that some guidance on land treatment demonstrations would be coming soon.

I asked Flynn about time limits for the treatment demonstration. He said that the time should be about 1 year - long enough to do it adequately, yet not drazing it out. They have been telling facilities to start on it under interim status and that it would be incorporated into the Part B.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES TO:

EPA Form 1300-6 (7-72) REPLACES EPA HQ FORM 6300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

SEP - 7 1984

5HW-12

CERTIFIED MAIL NO [illegible] 185
RETURN [illegible]

Mr. Lawrence Eastep, Manager
DLPC - Permit Section
Illinois EPA
2200 Churchill Road
Springfield, Illinois [illegible]

Re: Part B Permit Application
Union Oil Co., Lemont, IL
ILD 041550567

Dear Mr. Eastep:

We have been in contact with Union Oil in order to determine whether or not the company plans to rebuild and continue operations at the refinery, which was heavily damaged in an explosion and fire on July 23, 1984. Lee Erchall, the facility contact, said that the company will rebuild the facility, and they want to continue with the permitting process. We are, therefore, enclosing two copies of their Part B permit application. Please review the application for completeness within the 30-day time period, using the approved checklist, and return a copy of the filled-out checklist together with a list of deficiencies for submission to the applicant.

Please contact Mr. Gale Hruska, at (312) 886-0989, if there are questions regarding this matter.

Sincerely yours,

ORIGINAL SIGNED BY
WILLIAM H. MINER

William H. Miner, Chief
Technical, Permits, and Compliance Section

Enclosures

cc: W. Radlinski, IEPA

bcc: Jodi Traub, GMCU

N.S 9/5/84

5HW-:G.Hruska:fr 8/31/84 205-16

	TYPIST	AUTHOR	STU #1	STU #2	STU #3		WMB
INITIALS		GRH		CHIEF	CHIEF		CHIEF
DATE	8/31/84	9/5/84	9/6/84			9/6/84	

Union 76 Division: Easte Region
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 72-84

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P 334 827 562

A. J. Eliskalns
Manager, Chicago Refinery

March 7, 1984

Mr. Gale Hruska
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Sir:

Request for Extension of Submittal Date - Part B RCRA Permit Application

Environmental Resources Management-North Central, Inc. (ERM) is preparing the Part B Permit Application for Union Oil's Chicago Refinery. The application is for a land treatment facility, and this will be the first our contractor has prepared. We also understand that it is one of the first required in the country. Some major technical difficulties have been encountered during preparation of the permit application. These difficulties are such that an extension in the submittal date would improve our application. Some of the difficulties which have required more time than expected are listed below.

1. Due to the periodic nature of waste production at the facility, some wastes have not been available for waste analyses. These analyses are critical to the design of the treatment demonstration program.

2. Poor weather has delayed hydrogeological work needed to:

   a. specify the operating procedures of the land treatment system,

   b. design the subsurface monitoring systems, and

   c. design the surface topography to minimize runoff and surface water impacts.

3. It has also been necessary to obtain, and critically analyze the literature on land treatment systems. (This is particularly true with respect to literature on the volatilization of some waste fractions.)

Therefore, some additional time is needed to complete these aspects of the Part B Permit Application.

RECEIVED
MAR 12 1984
WASTE MANAGEMENT BRANCH

205-S

We therefore respectfully request that the submittal date for the Part B Permit Application (scheduled for May 31, 1984) be extended for 45 days until July 15, 1984. This extension will allow for completing the above activities. We believe that our request for this extension is reasonable given the magnitude of the technical tasks and our good faith in working toward the present submittal date.

We would be willing to provide a partial submittal of the application on May 31, 1984. This partial submittal would contain those sections of the permit application not affected by the technical difficulties described above. Any remaining application sections would be submitted within 45 days.

We appreciate your consideration in this matter. Please call Mr. L. D. Erchull at 312-257-7761 if you have any questions or need any further information.

Very truly yours,

A. J. Eliskalns

LDE:dlw

RECORD OF COMMUNICATION	☒ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE ☐ OTHER (SPECIFY) (Record of item checked above)	
TO: Part B file - Union Oil of California ILD041550567	FROM: Gale R. Hruska	DATE 1/17/84 TIME 10:00 Am

SUBJECT
Meeting to discuss Part B requirements.

SUMMARY OF COMMUNICATION

Lee Erchull called to set up a meeting to discuss their Part B submission requirements and to obtain ~~[illegible]~~ literature which will help them in preparing their submission.

1/23/84

L. Erchull came in for a meeting. I provided him with: (1) Storage application preparation guide, (2) land disposal application preparation guide, (3) Copy of EPA checksheet. I answered some general questions about the Part B process.

GRH.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

I set the meeting for 1/23/84. I will obtain permit preparation manuals and other information from RAIL.

Union 76 Division: Eastern Region
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

INFORMATION COPIES
TO:

union 76

(Lee) Leo D. Erchull
Environmental Science Analyst

EPA Form 1300-6 (7-72) REPLACES EPA HQ FORM 5300-3 WHICH MAY BE US

RECORD OF COMMUNICATION

☒ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)
(Record of item checked above)

TO: Part B file
Union Oil of Cal - Chicago Refinery
ILD 041550567

FROM: G. Hruska

DATE: 11/23/83

TIME: 10:30 Am

SUBJECT: Request to know why they ~~were~~ had their Part B called in.

SUMMARY OF COMMUNICATION

Lee Erchull (257-7761) called to ask why their Part B was called in at this time. He will be in the office 11/28/83.

11/28/83 Answer: 1) They are a major facility requiring ground water monitoring. Per HQ guidance, they should have priority in being called in.

2) State of Illinois requested they be called in (in response to our request for candidates).

I also told him that closure requirements for land treatment facilities are found in 264.228, general requirements in 264 Subparts G & H.

Furthermore, I told him that should they decide to go for a permit instead of closing, they should contact me in order to get applicant preparation material.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES
TO:

EPA Form 1300-6 (7-72) REPLACES EPA HQ FORM 8300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

15 NOV 1983

5HW-12

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. H.D. Haas, Supervisor Environmental Services
Union Oil Company of California
Chicago Refinery
135th Street & New Avenue
Lemont, Illinois 60439

RE: Union Oil Company of California
Chicago Refinery
135th Street & New Avenue
Lemont, Illinois 60439
ILD 041550567

Dear Mr. Haas:

By now you should have received an acknowledgement of our receipt of the Part A permit application material for the above-referenced hazardous waste facility under the Resource Conservation and Recovery Act (RCRA) permit program.

Accordingly, this letter constitutes the next step in the formal process leading toward issuance or denial of a RCRA permit. Under the authority of 40 CFR 270.10, this is a formal request for submittal of Part B of the permit application for the above-referenced facility.

Enclosed are parts of 40 CFR 270, which list the items required for submitting the Part B permit application for the facility. The Part B application must be submitted in quadruplicate and postmarked no later than May 31, 1984. Please uniquely number each page of the application including all attachments (maps, specifications, etc.). A certification statement identical to the one stated in 40 CFR 270.11(d) must accompany the application and all additional submittals. Send your application to the following address:

RCRA ACTIVITIES
Part B Permit Application
U.S. EPA, Region V
P.O. Box A3587
Chicago, Illinois 60690-3587

We are committed to conducting the RCRA permitting process as efficiently as possible. Consequently, I suggest you contact Mr. Gale Hruska of my staff, at (312) 886-0989, as you begin preparing your application. Mr. Hruska will be available to discuss specific needs of your application or to meet with you in Chicago. These efforts are intended to generate complete applications, without requiring any information beyond that which is necessary to make RCRA permit decisions.

ILD 041550567 Part B

PS Form 3811

SENDER: Complete items 1, 2, and 3.
Add your address in the "RETURN TO" space on reverse.

1. The following service is requested (check one).

- [x] Show to whom and date delivered .... 15¢
- [ ] Show to whom, date, & address of delivery.. 35¢

RESTRICTED DELIVERY

[illegible]

UNABLE TO DELIVER BECAUSE: | INITIALS

GPO: 19[illegible]-O-[illegible]-847

Failure to furnish the complete Part B permit application by the above date, and to provide in full all required information, is grounds for termination of interim status under 40 CFR 270.10.

Information in the Part B permit application can be disclosed to the public, according to the Freedom of Information Act and U.S. Environmental Protection Agency (U.S. EPA) Freedom of Information regulations. If you wish, however, you may assert a claim of business confidentiality by printing the word "Confidential" on each page of the application which you believe contains confidential business information. U.S. EPA will review business confidentiality claims under regulations in 40 CFR Part 2, and may later request substantiation of such claims. Please review these rules carefully before making a claim.

If you claim parts of your application as confidential, please provide us with a public information copy of the application. The public information copy must be identical to the full application with the exclusion of the confidential information.

We have also enclosed parts of 40 CFR Part 264, which include technical standards for the operation of treatment, storage, and land disposal facilities. These standards will become applicable to your facility upon issuance of a RCRA permit by U.S. EPA. A copy of our "Guidance For Permit Application Preparation" is also enclosed, which will help you in preparing a comprehensive and complete permit application.

We will coordinate review of the application with the Illinois Environmental Protection Agency (IEPA), and will strive for the simultaneous issuance of Federal and State hazardous waste facility permits. It is possible that during the processing of the application, the State hazardous waste program may become authorized to issue RCRA permits for your type of facility. In that case, direct Federal processing will cease, and IEPA in lieu of U.S. EPA will make the final determination on your permit application.

We look forward to receiving your Part B permit application.

Sincerely yours,

ORIGINAL SIGNED BY
WILLIAM H. MINER for

Karl J. Klepitsch, Jr., Chief
Waste Management Branch

Enclosures: 40 CFR 270 (applicable parts)
40 CFR 264 (applicable parts)
Guidance For Permit Application Preparation

cc: Robert Kuykendall, IEPA

Union 76 Division: East Region
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 345-85

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P 330 175 801

A. J. Eliskalns
Manager, Chicago Refinery

December 4, 1985

RECEIVED
DEC 10 1985
SOLID WASTE BRANCH
U.S. EPA, REGION V

Mr. Gale Hruska
RCRA Activities
Part B Permit Application
USEPA - Region V
P. O. Box A3587
Chicago, IL 60690-3587

Gentlemen:

Part B Permit Application
ILD 041550567-Technical Review Response

Enclosed is a copy of our response to the technical review as received in your letter of October 3, 1985.

Our response is in two sections: two sets of revised pages, tables and figures from the Part B Permit Application; and, narrative responses to each of the questions raised in your technical review. The Part B Permit Application pages have been organized into Sections as they occur in the Part B Permit Application for ease in replacing such pages. Union Oil requests that, in addition to replacing or inserting these revised pages, that the narrative responses also be added to the Part B Permit Application since they provide clarification to our responses.

If you have any questions, please contact Mr. L. D. Erchull at the above telephone number.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE/rm

Enclosures

COPY 2

205-45

SECTION K

CERTIFICATION

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Date 12-2-85 Signature: 12-2-85

Name and Title: A. J. Eliskains

Manager, Chicago Refinery

NOV 14 1984

5HW-12

CERTIFIED MAIL # P593667729
RETURN RECEIPT REQUESTED

Mr. A. J. Eliskalns, Manager
Union Oil of California
Chicago Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil - Chicago Refinery
ILD 041550567

Dear Mr. Eliskalns:

U.S. Environmental Protection Agency and Illinois Environmental Protection Agency have jointly reviewed your Part B Hazardous Waste Permit Application for the Chicago Refinery with respect to the completeness of the application. Please note, the completeness review only documents whether or not the information required by 40 CFR §270.14 through §270.21 has been addressed; the technical adequacy of the submission will be evaluated in subsequent reviews.

The application has been determined to be incomplete. Enclosed is a list of deficiencies which must be addressed. The Part B Application must be submitted in quadruplicate and postmarked no later than December 5, 1984. The original and one copy of the application must be sent to the U.S. Environmental Protection Agency (U.S. EPA) and the other two copies to the Illinois Environmental Protection Agency (IEPA). Your response should be in a format which allows incorporation of the new information into the appropriate sections of the existing Part B Application. A certification statement identical to the one stated in 40 CFR §270.11(d) must accompany the application and all additional submittals. Send your application to the following addresses:

RCRA ACTIVITIES
Part B Permit Application
U.S. EPA, Region V
P.O. Box A3587
Chicago, Illinois 60690-3587

Larry Eastep, Manager
Permit Section, DLPC
Illinois EPA
2200 Churchill Road
Springfield, Illinois 62706

Please contact Gale Hruska, at (312) 886-0989, if you have questions regarding this matter.

Sincerely yours,

ORIGINAL SIGNED BY
WILLIAM H. MINER

William H. Miner, Chief
Technical, Permits, and Compliance Section

Enclosure

cc: L. Eastep, IEPA
R. Watson, IEPA

5HW-12:G.Hruska:cm:11/02/84

October 12, 1984 Lemont/Union Oil

All References are to 40 CFR 1LD041550567

General

1. On Figure B-5, is there a gate at N8000 W1800 (270.14(b)(19))?

Waste Characteristics

2. Analyses for the slop oil emulsions and the tank cleaning waste which will be applied to the land treatment plots were not provided; (264.13(a)(1)). The tank cleaning waste needs to be analyzed for percent solvents as well as flash point.

3. All waste streams were not analyzed for all the hazardous waste characteristics. Specifically, flash point and pH; (264.13(a)(1)).

4. Table 3-11 as referenced on page C-8 is not included in Appendix A reference (15); (264.13(b)(1)).

5. The phrase "significant quantities" on Page C-9 needs to be defined; (264.13(b)(1)).

6. The sampling methods used to collect a representative sample need to be specified; (264.13(b)(3)).

7. The analytical methods used to test for the various parameters need to be specified; (264.13(b)(2)).

Procedures to Prevent Hazards

8. The inspection report form does not include all areas listed in Table F-2, including the land treatment areas; (264.15).

9. The inspection schedule (inspection report form) does not identify the types of problems to look for during inspections; (264.15(b)(3)).

Land Treatment

10. Treatment demonstration deficiencies include the following:

    A. All hazardous constituents of the wastes to be applied to the treatment area are not identified; (264.271(b), 270.20(a)(1)).

        1. The oil slop emulsion (K049) and tank cleaning waste (D001) have not been analyzed.

        2. The exclusion of appendix VIII constituents needs to be discussed and documented in greater detail; 264.271(b). Table 3-11, as referenced on page C-8, is not provided in Appendix A Ref. (15).

3. The Appendix VIII constituents in the nonhazardous wastes, to be land applied, need to be identified and a treatment demonstration also made for these constituents because, according to 261.3(b)(2), nonhazardous wastes are considered to be hazardous when mixed with listed hazardous wastes.

4. Any hazardous constituents which may be derived from the treatment of wastes in the land treatment area are not discussed or documented; (264.271(b)).

B. The literature review is not adequate to meet the requirements of the treatment demonstration.

1. Complete copies, of all referenced reports, need to be provided and all of the conclusions, summarized in Appendix A, need to be referenced to specific parts of these reports.

2. The field tests and laboratory analyses referenced in the reports must meet the requirements of 264.272(c). As most of the reports do not meet these requirements, it appears that field tests or laboratory analysis of the specific precedures, wastes, and soils involved may be necessary to adequately meet the requirements of the treatment demonstration; 264.272.

11. Page D-19 states that there is 60 feet between the seasonal high water table and the bottom of the treatment zone, yet table E-2 indicates that the seasonally high water table is 12 - 72 inches from the surface and figures E-3, E-4 and E-5 all show the perched water table to be very close to the surface. Please clarify this apparent inconsistency. (264.271(c)(2)).

12. Measures to control the moisture content of the treatment zone were not addressed; (264.273(a)(4)).

13. Figure D-2 shows what appears to be a drainage swale through Area II. Please describe this in greater detail and how it complies with 264.273(c).

14. A demonstration that the run-off management system can collect and control at least the volume of water resulting from a 24-hour, 25-year storm was not provided; (264.273(d)).

Groundwater Monitoring

15. A description of any plume of contamination that has entered the groundwater from a regulated unit at the facility, if applicable, was not addressed; (270.14(c)(4)).

16. Do all wells have their own bailer; 264.97(e)?

17. The location(s) of the control area(s), used to represent the background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment areas, need to be provided; (264.278(b)(1)).

18. The locations of the lysimeters, shallow wells, and soil cores used to indicate the quality of soil-pore liquid and the chemical make-up of the soil below the treatment zone need to be provided on a map (1 inch = 200 feet) of the treatment plots; (264.278(b)(2)). Sections E-4c(1)(b) and E-4d(1) indicate that the number of lysimeters and soil core locations will equal approximately one per acre for the active land treatment plots. All additional lysimeters and soil cores should be included on the map. A boring log and lithologic description of all lysimeters and soil cores also needs to be provided.

19. Additional information about the proposed statitical methods, used to evaluate the soil and pore water quality in the unsaturated zone and how they will meet the requirements of 264.278(f)(3) along with the statistical procedures used to determine a statistically significant increase; need to be provided; (264.278(f)).

20. The detection monitoring program is incomplete for the following reasons:

    A. The groundwater quality must be analyzed at least semi-annually at each monitoring well at the compliance point; (264.98(d)).

    B. The groundwater flow rate and direction in the uppermost aquifer must be determined at least annually; (264.98(e)).

    C. The procedures and methods used for sampling and analysis were not indicated; (264.98(f), 270.14(c)(6)(iv)).

    D. The procedures used to determine whether there is a statistical significant increase over background values for any parameter measured at the point of compliance were not provided; (264.99(9), 264.97(h), 270.14(c)(6)(iv)).

    E. The results of actions taken in response to 264.98(g) were not provided; (264.98(h)). Please note, the detection monitoring program is not necessarily dependent on the results of the groundwater assessment program.

Contingency Plan

21. The names, addresses, and phone numbers (home and office) of all persons qualified to act as emergency coordinator were not provided; (264.52(d)).

22. Where do the pages after section H in attachment G-1 belong?

23. Have any local authorities refused to enter into a coordinated agreement; (264.37(b))?

Personnel Training

24. The names and job descriptions of the maintenance personnel who transport and apply the waste are not provided; (264.16(d)(1) and (2)).

25. The names of the other people whose positions at the facility are related to hazardous waste are not provided; (264.16(d)(1)).

26. The training frequency indicated in table H-1 as "as needed" needs to be specified; (264.16(d)(3)).

27. The training program does not address the emergency response procedures to groundwater contamination incidents; (264.16(a)(3)(v)).

28. Documentation that the training director has been trained in hazardous waste management is not provided; (264.16(a)(2)).

Closure Plan

29. The discussion of partial closure includes clean up of equipment, but partial closure of the land treatment plots and the requirements of 264.280 is not provided; (264.112(a)(1)).

30. A demonstration that two years is necessary to close the facility needs to be provided; (264.113(b). This demonstration should also address 264.280.

31. The Closure cost estimate does not include the monitoring and analytical costs for the two seasons during closure; (264.142, 270.14(b)(15)).

Post-Closure Plan

32. The post-closure plan for the surface impoundment should also be included in the Part B application; (264.117).

33. The name and location of the person(s) responsible for the post-closure plan both prior to closure (264:118(a)) and during the post-closure period (264.118(a)(3)), needs to be provided.

Liability Requirements

34. A copy of the certification of insurance or other documentation which comprises compliance with 264.147 needs to be provided.

SEP - 7 1984

5HW-12

CERTIFIED MAIL #P 558 235 195
RETURN RECEIPT REQUESTED

Mr. Laurence Eastep, Manager
DLPC - Permits Section
Illinois EPA
2200 Churchill Road
Springfield, Illinois 62706

Re: Part B Permit Application
Union Oil Co., Lemont, IL
ILD 041560567

Dear Mr. Eastep:

We have been in contact with Union Oil in order to determine whether or not the company plans to rebuild and continue operations at the refinery, which was heavily damaged in an explosion and fire on July 23, 1984. Lee Erchall, the facility contact, said that the company will rebuild the facility, and they want to continue with the permitting process. We are, therefore, enclosing two copies of their Part B permit application. Please review the application for completeness within the 30-day time period, using the approved checklist, and return a copy of the filled-out checklist together with a list of deficiencies for submission to the applicant.

Please contact Mr. Gale Hruska, at (312) 886-0989, if there are questions regarding this matter.

Sincerely yours,

ORIGINAL SIGNED BY
WILLIAM H. MINER

William H. Miner, Chief
Technical, Permits, and Compliance Section

Enclosures

cc: W. Radlinski, IEPA

bcc: Jodi Traub, GMCU

5HW-:G.Hruska:fr 8/31/84

N.S 9/5/84

205-16

INITIALS	TYPIST	AUTHOR	STU #1	STU #2	STU #3	TPS	WMB
	RR	RRH		CHIEF	CHIEF	Comc 9/6/84	CHIEF
DATE	8/31/84	9/5/84	9/6/84			9/7/84	

Union 76 Division: Eastern Region

Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 174-84

union 76

RECEIVED
JUN 6 1984
WMD-RAIU
EPA, REGION V

A. J. Eliskalns
Manager, Chicago Refinery

May 31, 1984

Mr. Gale Hruska
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Mr. Hruska:

RCRA Part B Permit Submittal
Union Oil, Chicago Refinery
I.D. No. ILD041550567

Attached are four (4) copies of the Chicago Refinery's partial Part B Permit Application for the hazardous waste land treatment operation. This submittal consists of: a partial Table of Contents; Section B, General Facility Information; Section F, Procedures to Prevent Hazards; Section G, Contingency Plan; Section H, Personnel Training; and, Section J, Other Federal Laws. The remainder of the Part B Application will be submitted by July 13, 1984, per Mr. William Miner's letter of March 15, 1984, granting a 45 day extension.

To clarify which sections will be submitted by July 13, 1984, the following explanation is provided.

- Table of Contents - A partial Table of Contents is submitted; a complete Table of Contents will be provided with the final submittal to include those Sections still being developed.

- Section A, Revised Part A - A revised Part A form, with required signatures, will be submitted July 13, 1984, to reflect the complete Part B Permit Application.

- Section C, Waste Characteristics - This Section was granted a 45 day extension.

- Section D, Process Information - This Section cannot be completed until Sections C and E on waste analyses and recently completed hydrogeological work have been completed.

COPY

- Section E, Groundwater Monitoring - This Section was granted a 45 day extension.

- Section I, Closure and Post-Closure and Financial - The closure of the hazardous waste facility is directly related to its' operation. An adequate description of the operational parameters cannot be completed until the literature review and the hydrogeological work have been completed.

- Section K, Certification - Certification will be provided when the complete document is submitted.

- Appendix A, Literature Review - This Section was granted a 45 day extension.

- Appendix B, Treatment Demonstration Program - Development of the Treatment Demonstration Program is dependent on the results of the literature review, waste analyses, and hydrogeological work.

As discussed during our meeting of April 30, 1984, with you, we understand that we can insert, or replace pages in the attached submittal, when we provide the final submittal in July. This will allow us to insure continuity in the narrative text with those sections still being developed.

Please call our Mr. Erchull, at (312) 257-7761 if you have any questions or need further information.

Sincerely yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE:dlw

Attachment

MAR 15 84

5HW-12

R.J. Eliskalns, Manager
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Re: Part B Permit Application
Union Oil Company, Chicago Refinery
ID: IL0001550567

Dear Mr. Eliskalns:

We have reviewed your request on March 7, 1984, for an extension of the due date for the submission of the Part B hazardous waste permit application for the above referenced facility. We will extend the due date to July 15, 1984, for the items which you identified in your letter (waste availability for analysis, hydrogeological work, and land treatment system literature analysis). The remaining material for the Part B permit application must be submitted by the original due date of May 31, 1984.

Please be advised that failure to submit the information as required could result in termination of Interim Status for the facility and/or the issuance of an enforcement action. You may contact Mr. Gale Hruska, at (312) 886-0988, if you have questions concerning this matter.

Sincerely yours,

William D. Miner, Chief
Technical, Permits, and Compliance Section

cc: Lawrence Eastep, IEPA

5HW-12:G.HRUSKA:ns:3/14/84

	TYPIST	AUTHOR	STU #1 CHIEF	STU #2 CHIEF	STU #3 CHIEF	TPS CHIEF	WMB CHIEF	WM DIRECTOR
INITIALS	N.S.	GRH						
DATE	3/15/84	3/15/84	3/15/84			3/15/84		

Union 76 Division: Eastern Region
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 72-84

union 76

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
#P 334 827 562

A. J. Eliskalns
Manager, Chicago Refinery

March 7, 1984

Mr. Gale Hruska
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dear Sir:

ILD041550567
G,TRS,TSD,PA,9

Request for Extension of Submittal Date - Part B RCRA Permit Application

Environmental Resources Management-North Central, Inc. (ERM) is preparing the Part B Permit Application for Union Oil's Chicago Refinery. The application is for a land treatment facility, and this will be the first our contractor has prepared. We also understand that it is one of the first required in the country. Some major technical difficulties have been encountered during preparation of the permit application. These difficulties are such that an extension in the submittal date would improve our application. Some of the difficulties which have required more time than expected are listed below.

1. Due to the periodic nature of waste production at the facility, some wastes have not been available for waste analyses. These analyses are critical to the design of the treatment demonstration program.

2. Poor weather has delayed hydrogeological work needed to:

   a. specify the operating procedures of the land treatment system,

   b. design the subsurface monitoring systems, and

   c. design the surface topography to minimize runoff and surface water impacts.

3. It has also been necessary to obtain, and critically analyze the literature on land treatment systems. (This is particularly true with respect to literature on the volatilization of some waste fractions.)

Therefore, some additional time is needed to complete these aspects of the Part B Permit Application.

RECEIVED MAR 12 1984 WASTE MANAGEMENT BRANCH

RECEIVED 3/13/84

We therefore respectfully request that the submittal date for the Part B Permit Application (scheduled for May 31, 1984) be extended for 45 days until July 15, 1984. This extension will allow for completing the above activities. We believe that our request for this extension is reasonable given the magnitude of the technical tasks and our good faith in working toward the present submittal date.

We would be willing to provide a partial submittal of the application on May 31, 1984. This partial submittal would contain those sections of the permit application not affected by the technical difficulties described above. Any remaining application sections would be submitted within 45 days.

We appreciate your consideration in this matter. Please call Mr. L. D. Erchull at 312-257-7761 if you have any questions or need any further information.

Very truly yours,

A. J. Eliskalns

LDE:dlw

FILE Jim Maybe

Illinois Environmental Protection Agency · 2200 Churchill Road, Springfield, IL 62706

217/782-6762

Refer to: 1978030004 - Will County
Union Oil Co. of California
ILD049500867
Part B Application Notice of Deficiency

September 4, 1986

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SWD - AIS
U.S. EPA, REGION V

Union Oil Co. of California
Attention: L.D. Erchull
158th Street & New Avenue
Lemont, Illinois 60439

Gentlemen

35 I.A.C. 703.183(d) requires owners and operators of hazardous waste surface impoundments, piles, land treatment units, and landfills seeking a Part B permit to describe the presence or absence of any plume of contamination that has entered the groundwater from a regulated unit by identifying the concentrations of each Attachment A constituent. This information has not been provided for your Part B application. Your application cannot be considered adequate for Part B permit issuance unless this information is submitted. In addition, you have not shown that the groundwater monitoring system is capable of detecting a plume should it occur. The groundwater monitoring system needs to be upgraded, in order to meet the requirements of 35 I.A.C. 725 Subpart F so that any plume is detectable. A plan should be submitted to the Agency for approval. All wells should then be sampled and analyzed for the Attachment A constituents.

You must resolve this deficiency by amending your Part B application no later than October 3, 1986, to include a schedule providing for installation of new wells and groundwater sampling and analysis of Attachment A constituent concentrations. The sampling plan should be capable of determining the presence of any plume of contamination. If a plume is identified, the plan should be capable of adequately describing that plume. Sampling and analytical quality assurance plans should accompany the schedule. The scheduled date for submittal of monitoring results for Attachment A constituents should be no later than January 31, 1987, to minimize delays in the Part B review process.

Reference materials may be found in the RCRA Groundwater Monitoring Technical Enforcement Guidance Document (Draft), dated August, 1986. A copy of the checklist from this document for groundwater monitoring systems of facilities seeking a Part B permit is included for your use (Attachment B).

COPY 2

If you have any questions, please contact Linda Kissinger of my staff. Any other concerns the Agency has about your Part B application will be addressed by separate correspondence.

Very truly yours

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:LDK:sgh/1605F/0130

Enclosure

cc: Region
Compliance Monitoring Section
Division File
Linda Kissinger
Region V - Jodi Traub
Region V - Jim Kayka

Union 76 Division: Eas[illegible] Region
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439
Telephone (312) 257-7761

ENV 342-85

union 76

A. J. Eliskalns
Manager, Chicago Refinery

November 25, 1985

Mr. Gale Hruska
U.S. Environmental Protection Agency
Region 5
230 South Dearborn Street
Chicago, Illinois 60604

SOLID WASTE BRANCH
U.S. EPA REGION V

Dear Sir:

Request for Additional Time -
Part B - Technical Review Responses

This letter confirms a telephone conversation between yourself and L. D. Erchull of my staff concerning a request for additional time to respond to the Part B - Technical Review questions. We are utilizing two consultants to prepare responses to your questions. The responses are prepared but the attachments and Part B text changes may not be ready for submission by Wednesday, November 27, 1985. As agreed, the package will be submitted by December 6, 1985.

Should you have any questions, please contact L. D. Erchull at the above telephone number.

Very truly yours,

D. W. Bruckert

D. W. Bruckert, Supervisor
Environmental Services

LDE/rm

cc: R. Watson, IEPA

205-44

COMMENTS/RESPONSES TO USEPA-REGION V
UNION OIL PART B PERMIT APPLICATION
COMPLETENESS REVIEW

Question 1. **On Figure B-5, is there a gate at N8000-W1800 (270.14(b)(19))?**

Yes. The text in Section B-2d Access Control, accurately states that access is controlled by gates and fences. Figure B-5 and Figure F-1 (copies attached) have been revised to show the existing gate.

Question 2. **Analyses for the slop oil emulsions and the tank cleaning waste which will be applied to the land treatment plots were not provided; (264.13(a)(1)). The tank cleaning waste needs to be analyzed for percent solvents as well as flash point.**

Page C-3 in Section C discusses the generation of both slop oil emulsions and tank cleaning wastes. As stated, tank cleaning wastes were last generated in 1981 and analyses of that specific waste are reported on Table C-4.

Page C-3 also states that, to date, slop oil emulsions have not been generated due to the manufacturing operation used by Union Oil. Slop oil emulsions have been included in the Part B application as a contingency for future land treatment. Slop oil emulsions are expected to be organic materials (oil/water mixture) with inorganic constituents. This waste is expected to be generated in 1985.

Table C-10 shows the parameters to be analyzed for both tank cleaning wastes and slop oil emulsions, when the wastes are generated. Table C-10 has been modified to add percent solvents as an additional requirement.

Question 3. **All waste streams were not analyzed for all the hazardous waste characteristics. Specifically, flash point and pH; (264.13(a)(1)).**

Table C-11 shows that these two parameters, (flash point, or ignitibility, and pH) will be included in all characterization analyses. It is recognized that existing data, as shown on Tables C-3 through C-9 may not have these parameters reported. Under 262.11(c)(2), Union Oil applied its knowledge of the materials and processes used at the Chicago Refinery to accurately reflect the character of the wastes being handled. Although there is no reason to believe that any of the non-hazardous or hazardous wastes to be land treated would be of concern with respect to either flash point or pH, Tables C-10 and C-11 both show that these parameters will be included in future waste analyses.

Question 4. **Table 3-11 as referenced on Page C-8 is not included in Appendix A reference (15); (264.13(b)(1)).**

Table 3-11 is attached and is numbered as page 223a, to be inserted after 223 in Appendix A, Volume II of the Union Oil Part B permit application.

Question 5. **The phrase "significant quantities" on Page C-9 needs to be defined; (264.13(b)(1)).**

Revised page C-9, which defines "significant quantities" is attached. It should replace the existing page C-9 in the Part B permit application.

Question 6. **The sampling methods used to collect a representative sample need to be specified; (264.13(b)(3)).**

Section C-2b Sampling Methods, page C-11 states that only approved procedures, as published by the USEPA will be used.

Page C-13 and C-14 discusses the use of a "landfarm logbook" which will be used to document what sampling protocol is used for each particular waste stream. Union Oil has chosen this approach particularly since the hazardous waste streams (tank cleaning wastes and slop oil emulsions) are generated so infrequently. Actual sampling procedures will have to be determined when, and if, these wastes are generated. Recommended EPA sampling procedures have been provided in Table C-12.

Question 7. **The analytical methods used to test for the various parameters need to be specified; (264.(b)(2)).**

Section C-2c Analytical Methods, page C-11 states that only approved analytical methods or procedures will be used for all chemical analyses.

Union Oil is aware that the analytical procedures referenced in the EPA document, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Second Edition, USEPA Office of Water and Waste Management, SW-846, 1982, are currently being reviewed/revised. Current EPA method number for pertinent analytical methods have been provided in Table C-13.

Since the hazardous wastes are generated so infrequently, if at all, the analytical procedures to be used will reflect the most recent, approved analytical procedure. Page C-14 has been revised to clarify this point.

Question 8. **The inspection report form does not include all areas listed in Table F-2, including the land treatment areas; (264.15).**

Figure F-2 has been modified to more accurately reflect the inspection areas specified on Table F-2. A revised Figure F-2 is attached to replace the existing Figure F-2.

Question 9. **The inspection schedule (inspection report form) does not identify the types of problems to look for during inspections; (264.15(b)(3)).**

Figure F-2 has been modified to more accurately reflect the inspection areas specified on Table F-2. A revised Figure 2 is attached to replace the existing Figure F-2.

Question 10. **Treatment demonstration deficiencies include the following:**

A. **All hazardous constituents of the wastes to be applied to the treatment area are not identified; (264.271(b), 270.20(a)(1).**

1. **The oil slop emulsion (K049) and tank cleaning waste (D001) have not been analyzed.**

2. **The exclusion of appendix VIII constituents needs to be discussed and documented in greater detail; 264.271(b). Table 3-11, as referenced on page C-8, is not provided in Appendix A Ref. (15).**

Under 264.271(b) and 270.20(a)(1), the generator, based on his knowledge of the manufacturing process operations used, can identify those waste constituents reasonably or potentially expected to be in the waste. Existing data, as shown on Tables C-3 through C-9, reflect this approach. Tables C-10 and C-11 shows that future waste analyses will include all hazardous waste characteristics as part of the waste characterization program.

Page C-3 in Section C discusses the generation of both slop oil emulsions and tank cleaning wastes. As stated, the tank cleaning wastes were last generated in 1981 and analyses of that specific waste are reported on Table C-4.

Page C-3 also states that, to date, slop oil emulsions have not been generated due to the manufacturing operations used by Union Oil. Slop oil emulsions have been included in the Part B application as a contingency for future land treatment.

Table C-10 shows the parameters to be analyzed for both tank cleaning wastes and slop oil emulsions; all reasonable expected hazardous constituents (as well as the general hazardous characteristics) will be included in future waste analyses. We anticipate that some of this information should be available in 1985.

Table 3-11, as referenced on page C-8, is attached and is numbered as page 223a, to be inserted after page 223 in Appendix A, Volume II of the Union Oil Part B permit application. Further, the subject reference document, number 15, titled "Environmental Research and Technology, Inc. Land Treatability of Appendix VIII Constituents Present in Petroleum Industry Wastes. ERT Report No. B-974-220,

Prepared for the American Petroleum Institute. February, 1984," more fully explains the rationale on exclusion of most of the Appendix VIII constituents. Four copies of the complete ERT report have been ordered and will be forwarded when received.

Question 10 - Continued

3. **The Appendix VIII constituents in the nonhazardous wastes, to be land applied, need to be identified and a treatment demonstration also made for these constituents because, according to 261.3(b)(2), nonhazardous wastes are considered to be hazardous when mixed with listed hazardous wastes.**

4. **Any hazardous constituents which may be derived from the treatment of wastes in the land treatment area are not discussed or documented; (264.271(b)).**

The above referenced ERT report, when received, will be forwarded in response to question 10.3 above and will more fully document why most of the Appendix VIII constituents can be excluded.

Section D-7b, page D-41, identifies the soil analyses to be used for monitoring the treatment zone soil. Section C-2a Parameters and Rationale addresses the approach to be used in selecting hazardous waste constituents. Page C-9 and C-10 specifically addressed the analytical screening and selection process; when the indicator organics have been identified, these same indicators will be used for the treatment zone soil monitoring of hazardous organic

constituents. A revised page D-42 is provided to clarify this approach.

Question 10 - Continued

B. **The literature review is not adequate to meet the requirements of the treatment demonstration.**

1. **Complete copies, of all referenced reports, need to be provided and all of the conclusions, summarized in Appendix A, need to be referenced to specific parts of these reports.**

2. **The field tests and laboratory analyses referenced in the reports must meet the requirements of 264.272(c). As most of the reports do not meet these requirements, it appears that field tests or laboratory analysis of the specific procedures, wastes, and soils involved may be necessary to adequately meet the requirements of the treatment demonstration; 264.272.**

Union Oil believes that the literature review included in Appendix A of Volume II of the Part B permit application adequately addresses the requirements of 264.272(c). However, since complete copies of all references are requested (10.B.1 above), Union Oil will require additional time to order four (4) copies of the articles and reports, since copyright limitations prohibit the copying of complete articles and reports. The time required for obtaining such copies is unknown; Union Oil will proceed to obtain the four (4) copies of each reference and will forward all the references as soon as all have been received. Further,

additional time will be required to cross-reference the conclusions to specific pages within each reference. At this time, Union Oil envisions a summary table to be provided with each reference that identifies pages/sections and conclusions. A copy of a letter to Mr. W. H. Miner, requesting a time extension, is attached.

Question 11. **Page D-19 states that there is 60 feet between the seasonable high water table and the bottom of the treatment zone, yet table E-2 indicates that the seasonably high water table is 12 - 72 inches from the surface and figures E-3, E-4 and E-5 all show the perched water table to be very close to the surface. Please clarify this apparent inconsistency. (264.271(c)(2)).**

Table E-2 is a summary of the general characteristics of the soil types found in the general area of the Chicago Refinery site but not specific to the Chicago Refinery. Section E discusses the hydrogeology at the land treatment area, and is referenced here for more specific detail. The site has a perched water layer that overlies the zone of saturation or ground water. Data shown on Table E-3 shows elevations for both the ground water monitoring wells (designated as MW-1 to MW-9) and the shallow well or perched water layer monitoring wells (designated as SW-1, SW-4, SW-5, SW-7, SW-8, and SW-9). Figure E-3, E-4 and E-5 clearly shows the elevations for both the perched water layer (ranging from about 5 to 25 feet below the ground surface) to those elevations of the uppermost aquifer (ranging from about 60 to 90 feet below the ground surface).

Question 12. **Measures to control the moisture content of the treatment zone were not addressed; (264.273(a)(4)).**

Page D-27 has been revised to address this point.

Question 13. **Figure D-2 shows what appears to be a drainage swale through Area II. Please describe this in greater detail and how it complies with 264.273(c).**

The "drainage swale" shown on Figure D-2 going through Area II is an underground concrete drainage pipe to prevent run-on to that portion of Area II. Figure D-2 has been revised to clarify the purpose of the drainage pipe.

Question 14. **A demonstration that the run-off management system can collect and control at least the volume of water resulting from a 24-hour, 25-year storm was not provided; (264.273(d)).**

Run-on and run-off control are discussed in Section D-4a(1) Run-On Control and D-4a(2) Runoff Control (pages D-27 and D-28). Section D-5 Surface Water Control Plans (pages D-38 and D-39) also discuss these concerns. Since all run-off from the land treatment plots will flow to the Chicago Refinery's storm water retention basins, and from the basins through the NPDES permitted wastewater treatment plant, Union Oil is providing for control of storm water runoff in excess of the 24-hour, 25-year storm. Consequently, the requirements of 264.273(d) are being met. Page D-39 referenced the wrong section within 264.273 and a revised page D-39 is attached.

Question 15. **A description of any plume of contamination that has entered the groundwater from a regulated unit at the facility, if applicable, was not addressed; (270.14(c)(4)).**

Despite an apparent variance for the Student t-Test there is no evidence or demonstrable indication of a contaminant plume indicated by the available groundwater quality data. The significance of the apparent variance for the Student's t-Test is currently being evaluated through an EPA approved groundwater assessment plan.

Question 16. **Do all wells have their own bailer; 264.97(e)?**

Yes.

Question 17. **The location(s) of the control area(s), used to represent the background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment areas, need to be provided; (264.278(b)(1)).**

Union Oil is currently in the process of establishing a control area to provide information on the background concentrations of the waste constituents. The control area will be located in similar but untreated soils nearby. As currently planned, the control area will be located adjacent to and north of the existing land treatment area. Upon establishment of the control area, background monitoring will be conducted in conjunction with and using the same sampling and analytical procedure utilized for monitoring the zone of aeration within the land treatment area.

Question 18. **The locations of the lysimeters, shallow wells, and soil cores used to indicate the quality of soil-pore liquid and the chemical make-up of the soil below the treatment zone need to be provided on a map (1 inch = 200 feet) of the treatment plots; (264.278(b)(2)). Sections E-4c(1)(b)) and E-4d(1) indicate that the number of lysimeters and soil core**

locations will equal approximately one per acre for the active land treatment plots. All additional lysimeters and soil cores should be included on the map. A boring log and lithologic description of all lysimeters and soil cores also needs to be provided.

The attached Figure E-1 provides the locations of all monitoring points utilized for monitoring the land treatment area.

The lithologic description of the surficial soils is described in E-2b and illustrated in Figures E-3, E-4, E-5 and E-6. Because of the shallow nature (i.e., 2'-5') of the lysimeter installations and soil cores, they will all be placed in the clayey-silt/silty clay (CL/ML) layer. Therefore, unless conditions anomalous to those described in Section E-2b and illustrated in Figures E-3, E-4, E-5 and E-6 are encountered during the installation of lysimeters or collection of soil cores, the preparation of individual logs for each of these sampling locations is considered an unnecessary redundancy to already well documented surficial soil conditions.

Question 19. **Additional information about the proposed statistical methods, used to evaluate the soil and pore water quality in the unsaturated zone and how they will meet the requirements of 264.278(f)(3) along with the statistical procedures used to determine a statistically significant increase; need to be provided; (264.278(f)).**

Reference Sections E-4c(9), E-4c(10), E-4d(9) and E-4d(10).

Question 20. The detection monitoring program is incomplete for the following reasons:

A. The groundwater quality must be analyzed at least semi-annually at each monitoring well at the compliance point; (264.98(d)).

B. The groundwater flow rate and direction in the uppermost aquifer must be determined at least annually; (264.98(e)).

C. The procedures and methods used for sampling and analysis were not indicated: (264.98(f), 270.14(c)(6)(iv).

D. The procedures used to determine whether there is a statistical significant increase over background values for any parameter measured at the point of compliance were not provided; (264.99(9), 264.97(h), 270.14(c)(6)(iv)).

E. The results of actions taken in response to 264.98(g) were not provided; (264.98(h)). Please note, the detection monitoring program is not necessarily dependent on the results of the groundwater assessment program.

A. Reference Section E-3d(3)(a).

B. Reference Section E-3d(3)(a).

C. The procedures and methods used for sampling and analysis are the same as described in Section E-3b.

D. The procedures used to determine whether there is a statistical significant increase over background values are the same as described in Section E-3c.

E. At the Union Oil site, the groundwater monitoring and detection monitoring programs coincide on a "one-to-one" basis. Therefore, the actions taken in response to 264.98(g) and 264.98(h) are dependent upon and must await conclusion of the ongoing groundwater assessment program.

Question 21. **The names, addresses, and phone numbers (home and office) of all persons qualified to act as emergency coordinator were not provided; (264.52(d)).**

Section G-2 Emergency Coordinator specifically states that Union Oil provides continuous 24-hour, 7 day per week on-site emergency coordinators. This assignment is by designated position. Since this approach provides maximum protection, the provision of individual addresses and phone numbers is unnecessary. Union Oil has requested approval by the USEPA-Region V Regional Administrator that the provision of a continuous on-site emergency coordinator precludes the requirements of 264.52(d). A copy of the request is attached.

Question 22. **Where do the pages after section H in attachment G-1 belong?**

The four (4) pages immediately after page H-1 in Attachment G-1 consist of:

1) a summary sheet of fire fighting equipment

2) three (3) procedure memos for use by the security personnel at Union Oil

These pages were included as supplemental information to Section G of Attachment G-1 and should be inserted immediately before page H-1. These sheets then supplement Section G of Attachment G-1.

Question 23. **Have any local authorities refused to enter into a coordinated agreement; (264.37(b))?**

Figure G-4 is a copy of the letter of transmittal to those organizations shown on Table G-5. To date, no organization has refused to enter into a coordinated agreement.

Question 24. **The names and job descriptions of the maintenance personnel who transport and apply the waste are not provided; (264.16(d)(1) and (2)).**

Section H has been modified to include this information.

Question 25. **The names of the other people whose positions at the facility are related to hazardous waste are not provided; (264.16(d)(1)).**

Pages H-2, H-3, H-4, H-6 and H-8 have been revised to show the names of the individuals currently in the five positions identified in Section H.

Question 26. **The training frequency indicated in table H-1 as "as needed" needs to be specified; (264.16(d)(3)).**

Table H-1 has been revised to clarify training frequency.

Question 27. **The training program does not address the emergency response procedures to groundwater contamination incidents; (264.16(a)(3)(v)).**

Section E addressed the issues of the detection monitoring, compliance monitoring and a remedial action program. These monitoring activities will indicate if contamination of the ground water occurs; response will obviously be consistent with the type and extent of contamination found. There are no "emergency" response procedures that are appropriate to ground water contamination due to movement of contaminants into the ground water from long-term land treatment of wastes at the soil surface.

Spills and/or other similar major releases, which potentially could cause an "immediate" threat to ground water contamination are covered as part of the contingency plan (Section G) and personnel training (Section H).

If the above does not address the concern initially expressed by Question 27, Union Oil must have further clarification on what the concern is before any other response can be provided.

Question 28. **Documentation that the training director has been trained in hazardous waste management is not provided; (264.16(a)(2)).**

Enclosed as Table H-2 is a summary of training courses and other relevant conferences attended by the Training Director and staff since 1979. Page H-11 has been revised to reflect this addition.

Question 29. **The discussion of partial closure includes clean up of equipment, but partial closure of the land treatment plots and the requirements of 264.280 is not provided; (264.112(a)(1)).**

The purpose of the land treatment operation at Union Oil is to provide for the biological degradation of the organics contained in the wastes. As described in Section I-1b Partial Closure, Union Oil can control the generation of hazardous wastes, or store nonhazardous wastes in the decant basin within the hazardous waste treatment area.

Consequently, "partial closure" of the land treatment plots involves the suspension of all land application operations, but would require the continued discing of the land treatment plots to insure aeration and degradation of the wastes already applied to the soil. Page I-8 has been revised to provide clarification.

Question 30. **A demonstration that two years is necessary to close the facility needs to be provided; (264.113(b). This demonstration should also address 264.280.**

The two years discussed for final closure of the land treatment plots is required to insure that all organics are degraded. During this period, all nominal site monitoring and operating practices will continue (page I-11). Subsequent to the two-year operation, soil samples will be taken and analyzed (page I-11). Page I-11 has been revised to include consideration of continued operation should these analyses indicate that decomposition of the organics has not been completed.

Question 31. **The closure cost estimate does not include the monitoring and analytical costs for the two seasons during closure; (264.142, 270.14(b)(15)).**

The closure cost estimate of monitoring and analytical costs is two thirds of Item 6 found in Table I-3 ($14,500).

Question 32. **The post-closure plan for the surface impoundment should also be included in the Part B application; (264.117).**

Union Oil is seeking approval of a closure/reuse concept for the surface impoundment from both the Illinois EPA and USEPA-Region V. This post-closure plan will be addressed after clarification from both agencies has been received. Attached to Section I is a copy of the letter sent to regulators seeking "agreement in principal" with the closure/reuse concept for the surface impoundment.

Question 33. **The name and location of the person(s) responsible for the post-closure plan both prior to closure (264.118(a)) and during the post-closure period (264.118(a)(3)), needs to be provided.**

Page I-21 has been revised to provide this information.

Question 34. **A copy of the certification of insurance or other documentation which comprises compliance with 264.147 needs to be provided.**

Exhibit 1-1 provides, on Illinois form IL 532-1206, financial assurance that Union Oil is meeting the provisions of 264.147 by self-insurance.

Sent 9/30/85

5HS-12

CERTIFIED MAIL P#557 098 050
RETURN RECEIPT REQUESTED

Mr. D.W. Bruckert, Supervisor
Environmental Services
Union Oil Company of California
Chicago Refinery
Lemont, Illinois 60439

Re: Notice of Deficiency
Part B Permit Application
Union Oil-Chicago Refinery
ILD041550567

Dear Mr. Bruckert:

U.S. Environmental Protection Agency (U.S. EPA) and Illinois Environmental Protection Agency (IEPA) have completed the first technical review of your Part B hazardous waste permit application. Enclosed is a list of deficiencies which must be addressed. Because of the magnitude of additional information required, we are extending our normal 30 days submission due date; your response is due December 1, 1985.

Please submit the original and one copy of your response to this Notice of Deficiency to U.S. EPA and two copies to IEPA. Your response should be in a format which allows incorporation of the new information directly into the appropriate sections of the existing Part B application. A certification statement identical to that given in 40 CFR §270.11(d) must accompany the submission. Please send your response to the following addresses:

RCRA ACTIVITIES Part B Permit Application U.S. EPA, Region V P.O. Box A3587 Chicago, Illinois 60690	Lawrence Eastep, Manager Permit Section, DLPC Illinois EPA 2200 Churchill Road Springfield, Illinos 62706

If you have questions regarding the Notice of Deficiency please contact either Gale Hruska (U.S. EPA), at 312/886-0989, or Rob Watson (IEPA), at 217/785-8410.

Sincerely yours,

Edith M. Ardiente, P.E.
Chief, Technical Programs Section

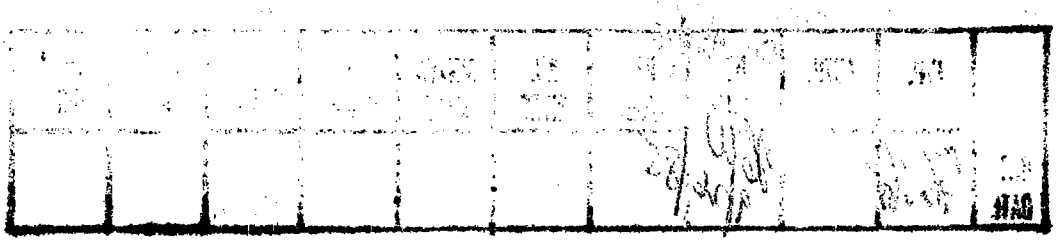
Enclosure

cc: Lawrence Eastep, IEPA
Rob Watson, IEPA

5HS-12:G.Hruska:fr:9/25/85

	DIR.	ADM.	CHIEF	DIV. CHIEF					
DATE	9/25/85		9/26/85				DJB 9/30/85		

205-42



Union Oil, Chicago Refinery
ILD041550567

FACILITY DESCRIPTION

1. The location of uppermost aquifer and aquifers which are hydraulically interconnected beneath the facility are not indicated on a map of the facility (270.14(c)(2)).

WASTE CHARACTERISTICS

2. The analyses of the wastes to be treated do not meet the requirements of 270.14(b)(2) and 264.13(a)(1) for the following reasons:

   a. An analysis of the slop oil emulsions (k049) was not provided.

   b. Because of the varied composition of a tank cleaning waste (e.g. it is dependent on the contents of the tanks being cleaned at the time) the 1981 analysis of the tank cleaning waste is not acceptable.

   If samples of the slop oil emulsions and tank cleaning waste cannot be obtained and included in the treatment demonstration, they must be the topic of a permit modification pursuant to 270.41 if union oil wishes to treat these wastes in the future.

   c. The analyses submitted are not adequate to meet 264.271 and 264.272. The analyses must include all parameters in Attachment 1, not just inorganic parameters.

   d. All wastes to be treated, both hazardous and nonhazardous, need to be analyzed for all parameters in Attachment 1.

3. The waste analysis plan is not adequate for the following reasons:

   a. The parameters (page C-9, 10) are not based on a treatment demonstration, and tables C-10 and C-11 do not coincide with USEPA's list of Appendix VIII constituents suspected to be present in refinery wastes (264.13(b)(1)). Refer to Attachment 1;

   b. The test methods do not coincide with those specified in Attachment 1 (264.13(b)(2));

   c. The sampling methods for each waste stream are not specified (264.13(b)(3));

   d. The first two situations on page C-15 that would initiate an analysis of a waste do not meet 264.13(b)(4);

      i. If a new waste is generated, a permit modification is required (270.41),
      ii. Documentation that mixtures of the wastes are compatible must be made during the treatment demonstration (264.272(c)(1)(i)). Per 264.282 this documentation must address the requirements of 264.17(b).

PROCESS INFORMATION

4. The treatment demonstration provided in Attachment D-1 is not adequate for the following reasons (264.272, 270.20(a)):

   a. It does not demonstrate that hazardous constituents in the wastes will be completely degraded, transformed, or immobilized in the treatment zone. A short-term laboratory toxicity test with a one year field plot or "barrel lysimeter" study, followed by the laboratory toxicity test and a two-year follow-up field study is needed to make this demonstration. (See Section 1.3.2 of EPA/530-SW-84-015, December 1984)

   b. It does not demonstrate that volatilzation of hazardous constituents will not be significant.

   c. Hazardous and nonhazardous wastes are subject to the same analyses and treatment demonstration if they are to be applied to the same treatment area.

   d. It does not demonstrate if macropore flow exists. This is necessary in order to determine if pan lysimeters are required to monitor this type of flow condition.

5. A map or plot plan delineating the horizontal boundaries of the treatment areas (or units) and all soil series occurring within the treatment areas is not provided (264.272(c)(1)(iv)). This information should then be used to define "uniform areas" within the land treatment unit.

6. The land treatment program provided in Section D is not adequate because it is not based on an acceptable treatment demonstration as required by 264.271(a)(1), 264.271(a)(2), 264.273(a) and 270.20(b). Specifically, the following need to be provided:

   a. A monthly application schedule based on:
      i. The application limiting constituent,
      ii. The rate limiting constituent,
      iii. The capacity limiting constituent,
      iv. The waste generation rate,
      v. Seasonal restrictions,
      vi. The expected life span of the unit, and
      vii. The waste application method.

   b. Measures to control soil pH including:
      i. The methods used to measure the soil pH,
      ii. The methods used to determine how much lime or "soil mineral" will be added to correct the pH,
      iii. The definition of "appropriate soil mineral" on Page D-30,

Furthermore, current guidance indicates that the optimal pH range is 6.0 to 8.0, not 8.5 as indicated on page D-29.

c. Section D-4, Soil Management needs to include the following:
   i. The dimensions of the disc and plow listed in Table D-16, and the equipment used to inject the waste. This should include pictures which show the injection system,
   ii. The direction in which the treatment plots are cultivated. Contour tillage across the slope rather than with it is recommended,
   iii. Documentation based on the treatment demonstration which shows that the different incorporation methods for the hazardous and nonhazardous wastes will not adversely affect the treatment of the hazardous constituents in both types of wastes,
   iv. A description of the fertilizer which is proposed.

d. Moisture control at the land treatment area needs to be described in much greater detail. First of all, a water balance must be prepared to determine whether moisture control problems will occur at the site. This is described in Section 8.3 and Appendix E of SW-874, Hazardous Waste Land Treatment. Results obtained from the water balance will then determine site design criteria such as the installation of a subsurface drainage system or a controlled surface run-off network.

7. The soil sampling data provided in Tables D-5 to D-13 is not adequate for the following reasons (264.272(c)(1)(iv));

   a. Tables D-5, D-7, D-9 and D-13 state that the samples were analyzed by agricultural analytical procedures. If these procedures are not the same as those specified in SW-846, they must be described in detail and documented that they are equivalent to SW-846.

   b. Analyses for the surface, 12 inch depth, and 24 inch depth of Area IV are not provided. Also, the analyses for the 3 foot depth of Area IV are 2 years older than the analyses (for the 3 foot depth) of the other areas.

   c. The parameters analyzed vary with depth:
      i. The surface, 12 inch depth, and 24 inch depth are not analyzed for oil & grease,
      ii. The 3 foot depth is not analyzed for cation exchange capacity.

   d. None of the soil samples, including background samples, are analyzed for the Appendix VIII constituents suspected to be in refinery wastes. This information is necessary in order to determine baseline concentrations of these constituents for use in the treatment demonstration.

e. The December 15, 1982 composite soil EP toxicity analyses do not include Area IV. Also, samples should only be composited within uniform areas of the treatment unit.

f. The background soil analyses do not include all the parameters or sample depths as the other soil analyses. Specifically, the background analyses do not include oil and grease, and do not include the 3 foot depth level.

8. The Run-on and Run-off controls discussed in Sections D-4a(1) and D-5a are not adequate to meet the requirements of 264.273(c) and (d) because it has not been demonstrated that the berms, swales and dtiches are designed to handle the peak discharge from at least a 25-year storm. Methods for estimating the volume of run-on and run-off are given in Section 8 of SW-874.

   The berms, swales and ditches may then be designed to meet the requirements of 264.273(c) and (d) based on these volume estimates. Design drawings of these berms, swales, and ditches must then be included as part of the application. Methods used to minimize erosion of these areas during the time a vegetative cover is being established also need to be described.

9. Section D and Figure D-2a indicate that an intermittent stream course is used to transport run-on and run-off to the facility's waste water treatment pond. This is not adequate for the following reasons:

   a. The stream bed is unlined. Therefore any release of hazardous constituents from the treatment areas which enters this stream may contribute to groundwater contamination beyond the point of compliance.

   b. The stream runs off of Union Oil's property for about 1600 feet before it returns to Union Oil's property. Thus, a release of hazardous constituents to the stream may contaminate soils and water not located on Union Oil's property.

10. Page D-27a indicates that the crown of the concrete pipe running under Area II is only 3 inches below the treatment zone (treatment zone is 36 inches deep and the crown of the pipe is 39 inches deep). Therefore run-on which passes through this pipe must also be tested for hazardous constituents because there is a high probability that untreated hazardous constituents may be washed into this pipe.

11. The source used to determine the depth to the seasonal high water table (Table E-2) is not adequate to meet the requirements of 264.271(c)(2). Because of the heterogeneous nature of glacial till deposits, this information must be obtained from water levels taken from the shallow monitoring wells (SW-4, 5, 7, 8). The water levels should be taken in the spring at a frequency of at least twice a month or within 24 hours of a significant rainfall event.

GROUNDWATER MONITORING

General

12. Page E-5 states that the bedrock dips to the east, whereas Page E-13 states that it slopes to the northwest.

13. Page E-12 states that the clayey, silty, fine to coarse sand (the second most predominent soil type) is known to be absent under certain portions of the land treatment area. However, the cross sections (figures E-3 to E-6) indicate that it is present under these areas.

14. The estimated permeability coefficients on page E-18 and Attachment E-3 are not adequate to characterize the soils at the site. In-situ permeability tests of all soil types and water bearing strata is necessary to determine the permeability and hydraulic properties of these soils. One in-situ test in MW-1 is not sufficient to meet this requirement. Furthermore, the assumed porosity of 0.30 indicated on page E-19 is only acceptable for mixed-grained sand that is densely compacted.

15. Page E-20 indicates that under unity gradient the rate of vertical migration is estimated to be approximately equivalent to that for horizontal flow. This would only apply for a homogeneous material, not one which exhibits layered heterogeneity as many glacial till deposits do.

Unsaturated Zone

16. Because the perched water table (Section E-4b) is hydraulically interconnected with the shallow dolomite aquifer, Section E-4b will be reviewed as part of saturated zone monitoring (Section E-3). Therefore, please address perched water table monitoring as part of Section E-3 in all future submittals.

17. The description of the depth of the treatment zone (i.e. 3 feet) is not adequate (264.271(c)(1)). It is very important to assure that samples from the active areas of the land treatment unit and background samples are monitoring similar horizions or layers of parent material. Because soils seldom consist of smooth, horizontal layers, the guidance manuals available state that it is not recommended to specify a single depth below the land surface as the bottom of the treatment zone. Rather, the bottom of the treatment zone should be defined as the bottom of a chosen diagnostic soil horizon. The sources used to identify the soil types in Section D-36 could be used to identify an applicable soil horizon once the specific soil(s) in the land treatment areas have been identified.

18. The locations of the lysimeters and soil cores are not adequate for the following reasons (264.278(b) and (d), 270.20(b)(3)(ii)):

    a. The method used to determine the random sample locations is not provided. The recommended method is described in Section 9.4.2.1 of SW-874 as well as Sections 3.3, 3.4, 4.4, 4.5 of EPA/530-SW-84-016;

    b. Documentation that at least six lysimeters are installed and six soil cores are taken at randomly selected locations per uniform area is not provided. If, however, a uniform area is greater than 12 acres, then at least two randomly selected soil cores should be taken per every 4 acres and composited in pairs and 2 lysimeters per every 4 acres should be installed;

    c. Because the bottom of the treatment zone has not been adequately described, it cannot be demonstrated that the depth of the lysimeters (pages E-50, 51) or soil cores (page E-60) are adequate;

    d. The locations of the above ground portions of the lysimeters are not provided. In order to prevent operational inconvenience and sample bias, the above ground portions of these devices must be located at least 30 feet from the sample location.

19. The sampling frequency of the lysimeters proposed in Section E-4c(3) is not adequate to meet 264.278(e). The available guidance manuals indicate that samples should be collected and analyzed at least quarterly unless the wastes are applied very infrequently. If liquid is not present at a regularly scheduled sampling event, the monitoring device should be evacuated prior to and checked within 24 hours following each significant waste application or rainfall event, and a sample drawn when sufficient liquid is present. Also, the sample preservation and shipment procedures E-4c(5) and E-4d(5) (E-3b(3)) are not adequate. See Appendix B, page B-6 of EPA/530-SW-84-016.

20. A description of the materials used to construct the lysimeters is not provided. Because these devices will be used to collect samples for organic analyses, inert materials such as glass, teflon, and stainless steel must be used for all parts of the sampling device which come in contact with the sample.

21. The installation of the lysimeters is not adequate to meet 264.278(e) for the following reasons:

    a. Page E-49 states that they are installed at a depth of 4-6 feet, page E-50 states that they are installed at a depth of 2-5 feet and pages E-50 & 51 state that they are installed at 28 and 40 inches;

    b. Page E-48 references Figure E-11a as a typical vacuum lysimeter installation. This figure shows that the lysimeter is not completely covered by soil, this is not consistent with the description in Section E-4c(1);

c. Page E-48 states that placement of bentonite pellets in the bottom of the hole is optional. This is not an acceptable installation method. Bentonite pellets must be placed below the lysimeter;

d. Section E-4(c)(1) does not indicate if the lysimeters were tested before they were installed;

e. Section E-4(c)(1) does not indicate how the existing lysimeters were installed.

22. The analytical methods (i.e. parameters being monitored) described in Section E-4c(6) and E-4d(6) are not adequate to meet the requirements of 264.278(e)(3) because they are not based on an acceptable treatment demonstration and monitoring for only these parameters would not be sufficient to determine if there is a statistically significant change over background values for any of the hazardous constituents to be monitored under 264.278(a). Also the analytical methods must be referenced to specific methods in SW-846.

23. The chain of custody procedures indicated in Section E-4c(7) and E-4d(7) (E-3b(5)) are not adequate to meet the requirements of 264.278(e)(4) because they do not include the following:

a. Sample labels;
b. Sample seals;
c. A field log book;
d. A chain of custody record which accompanies every sample;
e. A sample analysis request sheet;
f. The sample delivery to the laboratory;
g. The shipping of samples;
h. The receipt and logging of saples at the laboratory.

All of the above items are discussed in Appendix B of EPA/530-SW-84-016.

24. Section E-4c(8), background values for parameters, is not adequate to meet the requirements of 264.278(c) for the following reasons:

a. The parameters monitored are not adequate for the same reasons identified in Item 22 and 3a (264.278(c));

b. It has not been demonstrated that the soils in the background plot have similar characteristics to those in the treatment zone (264.278(c)(1) and (2)). If the response to item 5 determines that more than 1 uniform area exists, more than one background plot may be necessary due to the different soil types within the treatment unit;

c. Background soil-pore liquid values must be based on at least quarterly sampling for one year (264.278(c)(2));

d. At least 8 randomly selected soil cores must be taken within the 6 inch depth below the treatment zone. These may be composited into 4 composites.

e. The form that the background values are expressed in was not provided for the lysimeters and was not adequate for the soil cores (264.278(c)(3)). According to 264.278(d), the results of unsaturated zone monitoring must be in a form sufficient for determining statistically significant increases under 264.278(f). An example format is provided in Appendix C of EPA/530-SW-84-016, December 1984.

f. The locations and depths of the background samples are not adequate (264.278(c)(4) and 264.278(b)(1)) because the classification of the soil(s) (and therefore uniform areas) within the treatment areas is not adequate, and the depth of the treatment zone is not adequately defined.

25. Sections E-4c(9) and E-4d(9), evaluation of data, are not adequate to meet the requirements of 264.278(f) because they do not indicate how a statistically significant change over background values for any hazardous constituent to be monitored under 264.278(a) will be determined.

26. The term "anomalous increase" in Sections E-4c(10) and E-4d(10) needs to be defined. The appropriate actions as set forth in 40 CFR 264.278(g) and/or (h) also need to be defined.

27. Justifications of principle hazardous constituents to be monitored in the unsaturated zone monitoring program in Sections E-4c(2) and E-4d(2) are not adequate because they are not based on an acceptable treatment demonstration (264.278(a)(2)).

28. A description of the type of sampling equipment used for soil cores and the reason it was chosen is not provided (264.278(e)).

29. The soil core sampling procedure described in Section E-4d(4) (Page E-60) is not adequate to meet the requirements of 264.278(e) for the following reasons:

    a. Step by step procedures as described in Section 3.5 of EPA/530-SW-84-016 are not provided. These must include:
        i. Preliminary preparation of the site,
        ii. Vertical alignment of the tool in the hole,
        iii. Discarding soil from non sampling horizons,
        iv. Measuring the depth of the hole,
        v. Collecting soil samples from the tool, and
        vi. Backfilling the hole with soil to prevent vertical leakage of pollutants from the treatment zone;

b. It does not indicate how a sample will be obtained from within 6 inches from the bottom of the treatment zone;

c. It does not address the compositing of samples as described in Section 3.4.1 of EPA/530-SW-84-016;

d. It does not address decontamination of the sampling equipment as described in Section 3.6 of EPA/530-SW-84-016.

e. The methods used to prevent contamination of soil core samples are not provided. These methods should address cross contamination from other soil cores as well as contamination of the individual soil zone being sampled due to soil falling into the cavity from the land surface or from the walls of the borehole.

Saturated Zone

30. The interim period groundwater monitoring data required by 270.14(c)(1) are not adequate because of the following:

a. The most recent analytical and potentiometric data are not provided. This should include quarterly groundwater quality data since March 1984 and potentiometric contour maps of the data collected since the application was originally submitted;

b. Specific descriptions of the collection, preservation, shipping, and analytical procedures used to obtain the background samples along with copies of the chain of custody forms are not provided 265.92(a);

c. Copies of past statistical analyses, a description of the problems associated with the student t-test (pH) and a copy of Union Oil's notification of a statistically significant increase are not provided.

31. The identification of the uppermost aquifer and the data used to document this information (270.14(c)(2)) are not adequate for the following reasons:

a. The cross sections provided (Figure E-2) do not include all land treatment areas. Specifically:

i. Area II,
ii. The intermittent stream and any stream deposits associated with it;

b. The results of in-situ tests to determine the hydraulic conductivities of all shallow and deep wells need to be provided;

c. The results of in-situ and laboratory tests of the hydraulic conductivity of the silty clay/clayey silt zones need to be provided;

d. The physical properties of the dolomite (both weathered and unweathered) need to be described in much greater detail. Specifically, the following need to be determined:

   i. Hydraulic conductivity,
   ii. Porosity,
   iii. Potentiometric data (hydraulic gradient) and contour maps,
   iv. The degree of interconnection with the unconsolidated deposits,
   v. Flow rate and direction of groundwater in the dolomite (not the soil/bed rock interface, page E-26),
   vi. Any fractures/fracture planes,
   vii. Weathering of the dolomite,
   viii. The effect of any pumping wells;

e. Structural contour maps of the weathered and unweathered dolomite need to be provided;

f. The presence of what appears to be a continuous sand layer at elevation 630' needs to be discussed in greater detail and Figures E-3, 4, 5, 6 revised to indicate its location;

g. The effect of the Chicago Sanitary and Ship Canal and the I&M Canal on the groundwater needs to be determined;

h. Why were the shallow sand and gravel deposits at elevation 660' in MW-3 and MW-5 drawn as stringers and not as a locally continuous sand seam in Figure E-3?

i. SW-7 detected sand and rock fragments at a depth of 39 feet (elev. 660) and MW-7 indicates a bolder at 35' and 44' yet figure E-4 shows silty clay/clayey silt at this depth and location;

j. MW-5 and MW-8 indicate sand and gravel deposits at elevations 635' and 655' yet Figure E-6 does not show these as continuous seams.

k. The effect of local pumping on the groundwater flow rate and direction needs to be determined.

l. The cross-sections and boring logs should be used to construct a fence diagram in order to clearly define the interconnected aquifers beneath the facility.

m. All new cross sections must indicate the screened intervals of the monitoring wells (both SW and MW series).

n. The vertical limits of the soil types indicated in the SW series and MW-7, 8, and 9 boring logs need to be identified.

Detection Monitoring Program

32. The "selected organic/inorganic parameters" must be proposed for the detection monitoring program. Although the list of parameters will be dependent on the outcome of the treatment demonstration, an initial list based on laboratory analyses of both the hazardous and nonhazardous wastes for the parameters indicated in Attachment 1 to this letter needs to be provided with the next submission. Simply providing procedures for selecting parameters is not acceptable to meet the requirements of 264.98(a) for the following reasons:

    a. The types, quantities, and concentrations of hazardous constituents in the wastes have not been identified (264.98(a)(1));

    b. A description of the expected mobility, stability, and persistence of waste constituents, or their reaction products, in the unsaturated zone beneath the treatment zone is not provided (264.98(a)(2));

    c. The detectability of the indicator parameters, waste constituents, or their reaction products in the groundwater is not specified (264.98(a)(3)).

    d. Reasons for selecting the groundwater quality and indicator parameters (Page E-36) need to be provided. Will statistical analyses be run on all of these parameters as well the organic/inorganic parameters?

Groundwater Monitoring Program

33. The design of the wells (MW series) is not adequate to monitor the groundwater in the uppermost aquifer (264.97(a)(b), and (c)) for the following reasons:

    a. In order to obtain a representative sample from the strata being monitored, the screened interval must be less than or equal to 10 feet;

    b. The sand pack should extend a maximum of 1 foot above or below the screened interval;

    c. The annular space must be filled with expanding cement grout;

    d. The slotted screen must be manufactured (not hand cut with a hacksaw). The size of the slots must be based on the grain size of the sand pack around the screen as well as the grain size of the strata being monitored;

e. The section of the well which is placed in the saturated zone must be constructed of stainless steel (SS-316) or teflon because organic parameters are being monitored at this facility.

Based on the above design deficiencies, new monitoring wells must be installed at the facility.

34. The spacing of the wells must be 150 feet or less unless a demonstration (i.e. computer model) justifying a greater spacing is provided (264.97(a)).

35. The screened intervals for wells MW-4, MW-6, MW-7, and MW-9 and possibly MW-3 and MW-5 are unacceptable (264.97(a)). It appears that in order to adequately monitor the uppermost aquifer, wells should be placed in the 630' sand zone (where saturated) and the weathered dolomite. If a large portion of the dolomite (i.e. greater than 20 feet) is capable of producing water, additional wells at deeper elevations will be required. Therefore, nested wells are necessary to adequately monitor the uppermost aquifer.

36. The monitoring wells are not adequate to produce representative samples because the well placement is not adequate (264.97(a)(1) and (2)). They must be nested in the 630' sand and the dolomite.

37. Background values for each proposed monitoring parameter or constituent are not provided (264.98(c), 270.14(c)(6)(iii)). When a new monitoring system is installed, new background data must be collected in accordance with 264.97(g). The background values must be expressed in a form necessary for the determination of statistically significant increases under 264.97(h).

38. The procedures for sample collection are not adequate to meet the requirements of 264.97(d)(1) for the following reasons:

a. The type of bailer is not specified. The bailer must be constructed of stainless steel (SS-316) or teflon and have a bottom valve. The cord used with the bailer must be constructed of a material which does not conflict with the constituents being sampled;

b. It is not clear why pages E-30 and E-31 describe the decontamination of bailers when Page E-32 states that each well has its own dedicated bailer. In any case, each well must have a dedicated bailer which meets the criteria described in a. above;

c. Should decontamination be required, methanol should not be used. The available guidance manuals indicate that acetone or hexane should be used to decontaminate samplers used to collect samples for organic analysis;

d. The total depth of the wells must be measured and recorded each time the wells are sampled;

e. Procedures to ensure that parameters which are pH and/or volatile sensitive are sampled first are not specified;

f. The well evacuation procedures need to be modified to indicate that on the day of sampling, the wells are evacuated to dryness or have 3 well volumes removed. Under no circumstances should more than 3 hours pass between well evacuation and sampling;

g. Procedures to dispose of the evacuated well water need to be specified;

h. Procedures to sample "floaters" (if present) prior to well evacuation need to be provided;

i. Procedures to record any observations during sampling and well evacuation in a field notebook need to be provided;

j. Any special sampling procedures for organic compounds need to be specified.

39. The procedures for sample preservation and shipment are not adequate to meet the requirements of 264.97(d)(2) for the following reasons:

a. It is not adequate to state that "the methods are in accordance with EPA ... or approved alternative methods". The specific methods need to be stated in the application and referenced to SW-846;

b. The parameters which each aliquot will be sampled for (Attachment E-8) need to be specified.

40. The analytical procedures indicated in Section E-3b(4) are not adequate to meet the requirements of 264.97(d)(3) for the following reasons:

a. Specific analytical methods for each parameter being monitored need to be identified in the application. These methods must all be referenced to SW-846;

b. If pH and specific conductance are to be used as indicator parameters, their values must be determined in the field at the time of sampling. Procedures for the field measurement of these parameters are not provided;

c. The use of blanks, spikes or duplicates needs to be discussed.

41. The sampling and analysis period for organic and inorganic parameters must be semiannually (264.98(d)).

42. The procedures for determining the flow rate of groundwater in the uppermost aquifer is not provided (264.98(e)).

43. The procedures to be used to determine whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point are not provided (264.98(g)).

44. The statistical comparison procedures which will be used to evaluate whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point are not provided (264.98(g)(1), 264.97(h)).

45. An estimate of the time period, subsequent to sampling completion, within which the results of the statistical analysis will be available is not provided (264.98(g)(2)).

Perched Water Table Monitoring

46. The well spacing for the SW series wells needs to be justified. This may require some computer modelling. Also, the design of the present wells is not adequate because of the large screened interval and sand pack, materials of construction and backfilling of the annulus with native clay.

47. The background data indicated in Section E-4b(8) should be provided.

48. The sampling and analysis problems for these wells are the same as those for the MW series wells.

49. Some form of statistical and/or graphical analyses need to be specified for the data collected from these wells.

50. The post 1984/1985 sampling schedule needs to be provided.

PROCEDURES TO PREVENT HAZARDS

51. Page D-40 states that wind dispersal control techniques are in place, but Section F does not include the inspection of these items (264.273(g)(2)).

52. As discussed in Item 9 above, run-off control as required by 270.14(b)(8)(iii) is not adequate because the run-off flows across Mobil Oil property in an unlined stream.

53. The precautions taken to prevent accidental ignition of the D001 waste are not adequate. The requirements of 264.281 need to be addressed. Also, the use of spark arresting mufflers and spark proof tools on and around the incorporation equipment (when D001 waste is present) needs to be discussed.

CONTINGENCY PLAN

54. The plan does not discuss the "immediate" implementation of the plan (264.51(b)).

55. The various emergency plans indicated in Section H of attachment G-1 need to be provided (264.56).

56. Documentation that copies of the contingency plan have been sent to the facilities listed in Table G-5 is not provided (264.53).

57. Did the recent explosion and napthaline spill require any modifications of the contingency plan?

PERSONNEL TRAINING

58. Attending one conference in 1980 and one in 1981 (Table H-2) is not adequate documentation that the operations engineer has been trained in hazardous waste management (264.16(a)(2)). This documentation should include items such as a resume, list of recent conferences/seminars attended, and a description of all experience involving the management of hazarous waste both at Union Oil and any other facilities.

59. Pages H-12, 13 and 15 state that each area shift supervisor is an emergency coordinator. This does not appear to be consistent with Page G-13 or Table G-2.

CLOSURE PLAN

60. Section I-1a does not describe how closure of the facility controls, minimizes, or eliminates threats to human health and the environment (264.111).

61. Partial closure is defined as closure of a discrete part or unit of the facility. In this case, a discrete unit would be a uniform area or one of Areas I, II, III, IV. Union Oil, however, indicates that after any of the three situations described on pages I-3 and I-4, the land treatment area will resume operations. Therefore, it appears that the procedures outlined in Section I-1b, Partial Closure, should be included in the contingency plan. Also, the procedures in paragraph F of Section I-1b regarding the clean up of incompatible wastes, need to be specified.

62. The procedures for final closure of the land treatment area are not adequate for the following reasons (264.112(a)(1)):

    a. The soil sampling procedures must be consistent with Section E;

    b. The accumulation of Appendix VIII constitutents other than metals (lead and chromium) is not addressed;

    c. In order to minimize infiltration, and therefore migration of hazaroud constituents from the treatment zone, it appears that a clay cap should be placed on the treatment area. 264.118(a)(2)(i) requires that this cap be maintained during post closure;

    d. Will the application of nonhazardous wastes continue during the 3 year closure period?

63. The maximum inventory of wastes needs to be expressed in gallons as well as dry tons.

64. The description of the vegetative cover as required by 270.20(f) and 264.280(a)(8) needs to include the following:

    a. Data showing that the cover can thrive in the soils and climate in which it will be planted;

    b. The minimum percentage of soil cover to be maintained on the closed land treatment area;

    c. The methods to be used to establish and maintain the cover.

65. How will it be demonstrated that all organics have been degraded within the 3 year closure period (264.280(a)(1))?

66. The frequency of the post closure monitoring is not adequate. As required by 264.98(d) sampling must be at least semi-annually. The closure cost estimate should be revised to reflect this change.

RW:sf/sp/2024e,1-14

ATTACHMENT 1

Appendix VIII Hazardous Constituents Suspected to be Present in Refinery Wastes

**Acetonitrile (Ethanenitrile)
**Acrolein (2-Propenal)
**Acrylonitrile (2-Propenenitrile)
Aniline (Benzenamine)
Antimony
Arsenic
Barium
Benz (c) acridine (3,4-Benzacridine)
Benz (a) anthracene (1,2-Benzanthracene)
**Benzene (Cyclohexatriene)
Benzenethiol (Thiophenol)
Benzidine (1,1-Biphenyl-4,4'diamine)
Benzo(b)fluoranthene (2,3-Benzofluoranthene)
Benzo(j)fluoranthene (7,8-Benzofluoranthene)
Benzo(a)pyrene (3,4-Benzopyrene)
**Benzyl chloride (Benzene, (chloromethyl)-)
Beryllium
Bis (2-chloroethyl) ether (Ethane, 1,1'-oxybis (2-chloro-))
Bis (2-chloroisopropyl) ether (Propane, 2,2'-oxybis (2-chloro-))
**Bis (chloromethyl) ether (Methane, oxybis (chloro))
Bis (2-ethylhexyl) phthalate (1,2-Benzenedicarboxylic acid, bis (2-ethylhexyl) ester)
Butyl benzyl phthalate (1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester)
Cadmium
Carbon disulfide (Carbon bisulfide)
p-Chloro-m-cresol
**Chlorobenzene (Benzene, chloro-)
**Chloroform (Methane, trichloro-)
**Chloromethane (Methyl chloride)
2- Chloronapthalene (Naphthalene, beta-chloro-)
2-Chlorophenol (Phenol, o-chloro-)
Chromium
Chrysene (1,2-Benzphenanthrene)
Cresols (Cresylic acid) (Phenol, methyl-)
**Crotonaldehyde (2-Butenal)
Cyanide
Dibenz(a,h)acridine (1,2,5,6-Dibenzacridine)
Dibenz(a,j)acridine (1,2,7,8-Dibenzacridine)
Dibenz(a,h)anthracene (1,2,5,6-Dibenzanthracene)
7H-Dibenzo(c,g)carbazole (3,4,5,6-Dibenzcarbazole)
Dibenzo(a,e)pyrene (1,2,4,5-Dibenzpyrene)
Dibenzo(a,h)pyrene (1,2,5,6-Dibenzpyrene)
Dibenzo(a,i)pyrene (1,2,7,8-Dibenzpyrene)
**1,2-Dibromoethane (Ethylene dibromide)
Di-n-butyl phthalate (1,2-Benzenedicarboxylic acid, dibutyl ester)
*Dichlorobenzenes
**1,2-Dichloroethane (Ethylene dichloride)
**trans-1,2-Dichloroethene (1,2-Dichlorethylene)
**1,1-Dichloroethylene (Ethene, 1,1-dichloro-)
**Dichloromethane (Methylene chloride)

**Dichloropropane
Dichloropropanol
Diethytl phthalate (1,2-Benzenedicarboxylic acid, diethyl ester)
7,12-Dimethyl-benz(a)anthracene
2,4-Dimethylphenol (Phenol, 2,4-dimethyl-)
Dimethyl phthalate (1,2-Benzenedicarboxylic acid, dimethyl ester)
4,6-Dinitro-o-cresol
2,4-Dinitrophenol (phenol, 2,4-nitro-)
2,4-Dinitrotoluene (Benzene, 1-methyl-2,4-dinitro-)
Di-n-octyl phthalate (1,2-Benzenedicarboxylic acid, dioctyl ester)
**1,4-Dioxane (1,4-Diethylene oxide)
1,2-Diphenylhydrazine (Hydrazine, 1,2-diphenyl-)
**Ethyleneimine (Azridine)
**Ethylene oxide (Oxirane)
Fluoranthene (Benzo (j,k) fluorene)
**Formaldehyde
Hydrogen sulfide (Sulfur hydride)
Indeno (1,2,3-cd)pyrene (1 10(1,2-phenylene)pyrene)
Lead
Mercury
Methanethiol (Thiomethanol)
3-Methylchlolanthrene (Benz(j)aceanthrylene, 1,2-dihydro-3-methyl-)
**Methyl ethyl ketone (MEK) (2-Butanone)
Naphthalene
Nickel
p-Nitroaniline (Benzenamine, 4-nitro-)
Nitrobenzene (Benzene, nitro-)
4-Nitrophenol (Phenol,pentachloro-)
Pentachlorophenol (Phenol, pentachloro-)
Phenol (Benzene, hydroxy-)
Pyridine
Selenium
*,**Tetrachloroethanes
**Tetrachloroethylene (Ethene, 1,1,2,2-tetra chloro-)
**Toluene (Benzene, methyl-)
*Trichlorobenzenes
*,**Trichloroethanes
**Trichloroethene (Trichloroethylene)
*Trichlorophenols
Vanadium

---

* If any of these groups of compounds are found, the specific isomers listed in Appendix VIII should be identified.

** Use Test Method 8240 for these volatile compounds.

*** Use Test Method 3050 in SW-846 for all metals; see Attachment 2 for semivolatile organic compounds.

Non-Appendix VIII Constituents of Concern (may be added to App. VIII)

Cobalt
1-Methylnapthalene
Styrene
Hydroquinone
Anthracene
Indene
5-Nitro acenaphthene
Quinoline
Phenanthrene
Pyrene

Illinois Environmental Protection Agency · 2200 Churchill Road, Springfield, IL 62706

217/782-6762

Refer to: 1978030004 -- Will County
Lemont/Union Oil
ILD041550567

September 3, 1985

RECEIVED
SEP 10 1985
SOLID WASTE BRANCH
U.S. EPA, REGION V

RECEIVED
SEP 10 1985
SWB - AIS
U.S. EPA, REGION V

Edith Ardiente
USEPA -- Region V
230 South Dearborn
Chicago, Illinois 60604

Dear Ms. Ardiente:

Enclosed is a list of deficiencies found during the technical review of the Part B permit application for the hazardous waste management facility operated by Union Oil.

If you have any questions, please contact Rob Watson at 217/785-8410.

Very truly yours,

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:WRW:rd1929E/10

Enclosure

cc: Maywood Region
Division File
Bill Radlinski
Jodi Traub -- USEPA

COPY 2

205-39

Union Oil, Chicago Refinery
ILD041550567

FACILITY DESCRIPTION

1. The location of uppermost aquifer and aquifers which are hydraulically interconnected beneath the facility are not indicated on a map of the facility (270.14(c)(2)).

WASTE CHARACTERISTICS

2. The analyses of the wastes to be treated do not meet the requirements of 270.14(b)(2) and 264.13(a)(1) for the following reasons:

   a. An analysis of the slop oil emulsions (k049) was not provided.

   b. Because of the varied composition of a tank cleaning waste (e.g. it is dependent on the contents of the tanks being cleaned at the time) the 1981 analysis of the tank cleaning waste is not acceptable.

   If samples of the slop oil emulsions and tank cleaning waste cannot be obtained and included in the treatment demonstration, they must be the topic of a permit modification pursuant to 270.41 if union oil wishes to treat these wastes in the future.

   c. The analyses submitted are not adequate to meet 264.271 and 264.272. The analyses must include all parameters in Attachment 1, not just inorganic parameters.

   d. All wastes to be treated, both hazardous and nonhazardous, need to be analyzed for all parameters in Attachment 1.

3. The waste analysis plan is not adequate for the following reasons:

   a. The parameters (page C-9, 10) are not based on a treatment demonstration, and tables C-10 and C-11 do not coincide with USEPA's list of Appendix VIII constituents suspected to be present in refinery wastes (264.13(b)(1)). Refer to Attachment 1;

   b. The test methods do not coincide with those specified in Attachment 1 (264.13(b)(2));

   c. The sampling methods for each waste stream are not specified (264.13(b)(3));

   d. The first two situations on page C-15 that would initiate an analysis of a waste do not meet 264.13(b)(4);

      i. If a new waste is generated, a permit modification is required (270.41),
      ii. Documentation that mixtures of the wastes are compatible must be made during the treatment demonstration (264.272(c)(1)(i)). Per 264.282 this documentation must address the requirements of 264.17(b).

PROCESS INFORMATION

4. The treatment demonstration provided in Attachment D-1 is not adequate for the following reasons (264.272, 270.20(a)):

   a. It does not demonstrate that hazardous constituents in the wastes will be completely degraded, transformed, or immobilized in the treatment zone. A short-term laboratory toxicity test with a one year field plot or "barrel lysimeter" study, followed by the laboratory toxicity test and a two-year follow-up field study is needed to make this demonstration. (See Section 1.3.2 of EPA/530-SW-84-015, December 1984)

   b. It does not demonstrate that volatilzation of hazardous constituents will not be significant.

   c. Hazardous and nonhazardous wastes are subject to the same analyses and treatment demonstration if they are to be applied to the same treatment area.

   d. It does not demonstrate if macropore flow exists. This is necessary in order to determine if pan lysimeters are required to monitor this type of flow condition.

5. A map or plot plan delineating the horizontal boundaries of the treatment areas (or units) and all soil series occurring within the treatment areas is not provided (264.272(c)(1)(iv)). This information should then be used to define "uniform areas" within the land treatment unit.

6. The land treatment program provided in Section D is not adequate because it is not based on an acceptable treatment demonstration as required by 264.271(a)(1), 264.271(a)(2), 264.273(a) and 270.20(b). Specifically, the following need to be provided:

   a. A monthly application schedule based on:
      i. The application limiting constituent,
      ii. The rate limiting constituent,
      iii. The capacity limiting constituent,
      iv. The waste generation rate,
      v. Seasonal restrictions,
      vi. The expected life span of the unit, and
      vii. The waste application method.

   b. Measures to control soil pH including:
      i. The methods used to measure the soil pH,
      ii. The methods used to determine how much lime or "soil mineral" will be added to correct the pH,
      iii. The definition of "appropriate soil mineral" on Page D-30,

Furthermore, current guidance indicates that the optimal pH range is 6.0 to 8.0, not 8.5 as indicated on page D-29.

c. Section D-4, Soil Management needs to include the following:
   i. The dimensions of the disc and plow listed in Table D-16, and the equipment used to inject the waste. This should include pictures which show the injection system,
   ii. The direction in which the treatment plots are cultivated. Contour tillage across the slope rather than with it is recommended,
   iii. Documentation based on the treatment demonstration which shows that the different incorporation methods for the hazardous and nonhazardous wastes will not adversely affect the treatment of the hazardous constituents in both types of wastes,
   iv. A description of the fertilizer which is proposed.

d. Moisture control at the land treatment area needs to be described in much greater detail. First of all, a water balance must be prepared to determine whether moisture control problems will occur at the site. This is described in Section 8.3 and Appendix E of SW-874, Hazardous Waste Land Treatment. Results obtained from the water balance will then determine site design criteria such as the installation of a subsurface drainage system or a controlled surface run-off network.

7. The soil sampling data provided in Tables D-5 to D-13 is not adequate for the following reasons (264.272(c)(1)(iv));

a. Tables D-5, D-7, D-9 and D-13 state that the samples were analyzed by agricultural analytical procedures. If these procedures are not the same as those specified in SW-846, they must be described in detail and documented that they are equivalent to SW-846.

b. Analyses for the surface, 12 inch depth, and 24 inch depth of Area IV are not provided. Also, the analyses for the 3 foot depth of Area IV are 2 years older than the analyses (for the 3 foot depth) of the other areas.

c. The parameters analyzed vary with depth:
   i. The surface, 12 inch depth, and 24 inch depth are not analyzed for oil & grease,
   ii. The 3 foot depth is not analyzed for cation exchange capacity.

d. None of the soil samples, including background samples, are analyzed for the Appendix VIII constituents suspected to be in refinery wastes. This information is necessary in order to determine baseline concentrations of these constituents for use in the treatment demonstration.

e. The December 15, 1982 composite soil EP toxicity analyses do not include Area IV. Also, samples should only be composited within uniform areas of the treatment unit.

f. The background soil analyses do not include all the parameters or sample depths as the other soil analyses. Specifically, the background analyses do not include oil and grease, and do not include the 3 foot depth level.

8. The Run-on and Run-off controls discussed in Sections D-4a(1) and D-5a are not adequate to meet the requirements of 264.273(c) and (d) because it has not been demonstrated that the berms, swales and dtiches are designed to handle the peak discharge from at least a 25-year storm. Methods for estimating the volume of run-on and run-off are given in Section 8 of SW-874.

   The berms, swales and ditches may then be designed to meet the requirements of 264.273(c) and (d) based on these volume estimates. Design drawings of these berms, swales, and ditches must then be included as part of the application. Methods used to minimize erosion of these areas during the time a vegetative cover is being established also need to be described.

9. Section D and Figure D-2a indicate that an intermittent stream course is used to transport run-on and run-off to the facility's waste water treatment pond. This is not adequate for the following reasons:

   a. The stream bed is unlined. Therefore any release of hazardous constituents from the treatment areas which enters this stream may contribute to groundwater contamination beyond the point of compliance.

   b. The stream runs off of Union Oil's property for about 1600 feet before it returns to Union Oil's property. Thus, a release of hazardous constituents to the stream may contaminate soils and water not located on Union Oil's property.

10. Page D-27a indicates that the crown of the concrete pipe running under Area II is only 3 inches below the treatment zone (treatment zone is 36 inches deep and the crown of the pipe is 39 inches deep). Therefore run-on which passes through this pipe must also be tested for hazardous constituents because there is a high probability that untreated hazardous constituents may be washed into this pipe.

11. The source used to determine the depth to the seasonal high water table (Table E-2) is not adequate to meet the requirements of 264.271(c)(2). Because of the heterogeneous nature of glacial till deposits, this information must be obtained from water levels taken from the shallow monitoring wells (SW-4, 5, 7, 8). The water levels should be taken in the spring at a frequency of at least twice a month or within 24 hours of a significant rainfall event.

GROUNDWATER MONITORING

General

12. Page E-5 states that the bedrock dips to the east, whereas Page E-13 states that it slopes to the northwest.

13. Page E-12 states that the clayey, silty, fine to coarse sand (the second most predominent soil type) is known to be absent under certain portions of the land treatment area. However, the cross sections (figures E-3 to E-6) indicate that it is present under these areas.

14. The estimated permeability coefficients on page E-18 and Attachment E-3 are not adequate to characterize the soils at the site. In-situ permeability tests of all soil types and water bearing strata is necessary to determine the permeability and hydraulic properties of these soils. One in-situ test in MW-1 is not sufficient to meet this requirement. Furthermore, the assumed porosity of 0.30 indicated on page E-19 is only acceptable for mixed-grained sand that is densely compacted.

15. Page E-20 indicates that under unity gradient the rate of vertical migration is estimated to be approximately equivalent to that for horizontal flow. This would only apply for a homogeneous material, not one which exhibits layered heterogeneity as many glacial till deposits do.

Unsaturated Zone

16. Because the perched water table (Section E-4b) is hydraulically interconnected with the shallow dolomite aquifer, Section E-4b will be reviewed as part of saturated zone monitoring (Section E-3). Therefore, please address perched water table monitoring as part of Section E-3 in all future submittals.

17. The description of the depth of the treatment zone (i.e. 3 feet) is not adequate (264.271(c)(1)). It is very important to assure that samples from the active areas of the land treatment unit and background samples are monitoring similar horizions or layers of parent material. Because soils seldom consist of smooth, horizontal layers, the guidance manuals available state that it is not recommended to specify a single depth below the land surface as the bottom of the treatment zone. Rather, the bottom of the treatment zone should be defined as the bottom of a chosen diagnostic soil horizon. The sources used to identify the soil types in Section D-36 could be used to identify an applicable soil horizon once the specific soil(s) in the land treatment areas have been identified.

18. The locations of the lysimeters and soil cores are not adequate for the following reasons (264.278(b) and (d), 270.20(b)(3)(ii)):

    a. The method used to determine the random sample locations is not provided. The recommended method is described in Section 9.4.2.1 of SW-874 as well as Sections 3.3, 3.4, 4.4, 4.5 of EPA/530-SW-84-016;

    b. Documentation that at least six lysimeters are installed and six soil cores are taken at randomly selected locations per uniform area is not provided. If, however, a uniform area is greater than 12 acres, then at least two randomly selected soil cores should be taken per every 4 acres and composited in pairs and 2 lysimeters per every 4 acres should be installed;

    c. Because the bottom of the treatment zone has not been adequately described, it cannot be demonstrated that the depth of the lysimeters (pages E-50, 51) or soil cores (page E-60) are adequate;

    d. The locations of the above ground portions of the lysimeters are not provided. In order to prevent operational inconvenience and sample bias, the above ground portions of these devices must be located at least 30 feet from the sample location.

19. The sampling frequency of the lysimeters proposed in Section E-4c(3) is not adequate to meet 264.278(e). The available guidance manuals indicate that samples should be collected and analyzed at least quarterly unless the wastes are applied very infrequently. If liquid is not present at a regularly scheduled sampling event, the monitoring device should be evacuated prior to and checked within 24 hours following each significant waste application or rainfall event, and a sample drawn when sufficient liquid is present. Also, the sample preservation and shipment procedures E-4c(5) and E-4d(5) (E-3b(3)) are not adequate. See Appendix B, page B-6 of EPA/530-SW-84-016.

20. A description of the materials used to construct the lysimeters is not provided. Because these devices will be used to collect samples for organic analyses, inert materials such as glass, teflon, and stainless steel must be used for all parts of the sampling device which come in contact with the sample.

21. The installation of the lysimeters is not adequate to meet 264.278(e) for the following reasons:

    a. Page E-49 states that they are installed at a depth of 4-6 feet, page E-50 states that they are installed at a depth of 2-5 feet and pages E-50 & 51 state that they are installed at 28 and 40 inches;

    b. Page E-48 references Figure E-11a as a typical vacuum lysimeter installation. This figure shows that the lysimeter is not completely covered by soil, this is not consistent with the description in Section E-4c(1);

c. Page E-48 states that placement of bentonite pellets in the bottom of the hole is optional. This is not an acceptable installation method. Bentonite pellets must be placed below the lysimeter;

d. Section E-4(c)(1) does not indicate if the lysimeters were tested before they were installed;

e. Section E-4(c)(1) does not indicate how the existing lysimeters were installed.

22. The analytical methods (i.e. parameters being monitored) described in Section E-4c(6) and E-4d(6) are not adequate to meet the requirements of 264.278(e)(3) because they are not based on an acceptable treatment demonstration and monitoring for only these parameters would not be sufficient to determine if there is a statistically significant change over background values for any of the hazardous constituents to be monitored under 264.278(a). Also the analytical methods must be referenced to specific methods in SW-846.

23. The chain of custody procedures indicated in Section E-4c(7) and E-4d(7) (E-3b(5)) are not adequate to meet the requirements of 264.278(e)(4) because they do not include the following:

a. Sample labels;
b. Sample seals;
c. A field log book;
d. A chain of custody record which accompanies every sample;
e. A sample analysis request sheet;
f. The sample delivery to the laboratory;
g. The shipping of samples;
h. The receipt and logging of saples at the laboratory.

All of the above items are discussed in Appendix B of EPA/530-SW-84-016.

24. Section E-4c(8), background values for parameters, is not adequate to meet the requirements of 264.278(c) for the following reasons:

a. The parameters monitored are not adequate for the same reasons identified in Item 22 and 3a (264.278(c));

b. It has not been demonstrated that the soils in the background plot have similar characteristics to those in the treatment zone (264.278(c)(1) and (2)). If the response to item 5 determines that more than 1 uniform area exists, more than one background plot may be necessary due to the different soil types within the treatment unit;

c. Background soil-pore liquid values must be based on at least quarterly sampling for one year (264.278(c)(2));

d. At least 8 randomly selected soil cores must be taken within the 6 inch depth below the treatment zone. These may be composited into 4 composites.

e. The form that the background values are expressed in was not provided for the lysimeters and was not adequate for the soil cores (264.278(c)(3)). According to 264.278(d), the results of unsaturated zone monitoring must be in a form sufficient for determining statistically significant increases under 264.278(f). An example format is provided in Appendix C of EPA/530-SW-84-016, December 1984.

f. The locations and depths of the background samples are not adequate (264.278(c)(4) and 264.278(b)(1)) because the classification of the soil(s) (and therefore uniform areas) within the treatment areas is not adequate, and the depth of the treatment zone is not adequately defined.

25. Sections E-4c(9) and E-4d(9), evaluation of data, are not adequate to meet the requirements of 264.278(f) because they do not indicate how a statistically significant change over background values for any hazardous constituent to be monitored under 264.278(a) will be determined.

26. The term "anomalous increase" in Sections E-4c(10) and E-4d(10) needs to be defined. The appropriate actions as set forth in 40 CFR 264.278(g) and/or (h) also need to be defined.

27. Justifications of principle hazardous constituents to be monitored in the unsaturated zone monitoring program in Sections E-4c(2) and E-4d(2) are not adequate because they are not based on an acceptable treatment demonstration (264.278(a)(2)).

28. A description of the type of sampling equipment used for soil cores and the reason it was chosen is not provided (264.278(e)).

29. The soil core sampling procedure described in Section E-4d(4) (Page E-60) is not adequate to meet the requirements of 264.278(e) for the following reasons:

    a. Step by step procedures as described in Section 3.5 of EPA/530-SW-84-016 are not provided. These must include:
        i. Preliminary preparation of the site,
        ii. Vertical alignment of the tool in the hole,
        iii. Discarding soil from non sampling horizons,
        iv. Measuring the depth of the hole,
        v. Collecting soil samples from the tool, and
        vi. Backfilling the hole with soil to prevent vertical leakage of pollutants from the treatment zone;

b. It does not indicate how a sample will be obtained from within 6 inches from the bottom of the treatment zone;

c. It does not address the compositing of samples as described in Section 3.4.1 of EPA/530-SW-84-016;

d. It does not address decontamination of the sampling equipment as described in Section 3.6 of EPA/530-SW-84-016.

e. The methods used to prevent contamination of soil core samples are not provided. These methods should address cross contamination from other soil cores as well as contamination of the individual soil zone being sampled due to soil falling into the cavity from the land surface or from the walls of the borehole.

Saturated Zone

30. The interim period groundwater monitoring data required by 270.14(c)(1) are not adequate because of the following:

a. The most recent analytical and potentiometric data are not provided. This should include quarterly groundwater quality data since March 1984 and potentiometric contour maps of the data collected since the application was originally submitted;

b. Specific descriptions of the collection, preservation, shipping, and analytical procedures used to obtain the background samples along with copies of the chain of custody forms are not provided 265.92(a);

c. Copies of past statistical analyses, a description of the problems associated with the student t-test (pH) and a copy of Union Oil's notification of a statistically significant increase are not provided.

31. The identification of the uppermost aquifer and the data used to document this information (270.14(c)(2)) are not adequate for the following reasons:

a. The cross sections provided (Figure E-2) do not include all land treatment areas. Specifically:

i. Area II,
ii. The intermittent stream and any stream deposits associated with it;

b. The results of in-situ tests to determine the hydraulic conductivities of all shallow and deep wells need to be provided;

c. The results of in-situ and laboratory tests of the hydraulic conductivity of the silty clay/clayey silt zones need to be provided;

Detection Monitoring Program

32. The "selected organic/inorganic parameters" must be proposed for the detection monitoring program. Although the list of parameters will be dependent on the outcome of the treatment demonstration, an initial list based on laboratory analyses of both the hazardous and nonhazardous wastes for the parameters indicated in Attachment 1 to this letter needs to be provided with the next submission. Simply providing procedures for selecting parameters is not acceptable to meet the requirements of 264.98(a) for the following reasons:

    a. The types, quantities, and concentrations of hazardous constituents in the wastes have not been identified (264.98(a)(1));

    b. A description of the expected mobility, stability, and persistence of waste constituents, or their reaction products, in the unsaturated zone beneath the treatment zone is not provided (264.98(a)(2));

    c. The detectability of the indicator parameters, waste constituents, or their reaction products in the groundwater is not specified (264.98(a)(3)).

    d. Reasons for selecting the groundwater quality and indicator parameters (Page E-36) need to be provided. Will statistical analyses be run on all of these parameters as well the organic/inorganic parameters?

Groundwater Monitoring Program

33. The design of the wells (MW series) is not adequate to monitor the groundwater in the uppermost aquifer (264.97(a)(b), and (c)) for the following reasons:

    a. In order to obtain a representative sample from the strata being monitored, the screened interval must be less than or equal to 10 feet;

    b. The sand pack should extend a maximum of 1 foot above or below the screened interval;

    c. The annular space must be filled with expanding cement grout;

    d. The slotted screen must be manufactured (not hand cut with a hacksaw). The size of the slots must be based on the grain size of the sand pack around the screen as well as the grain size of the strata being monitored;

e. The section of the well which is placed in the saturated zone must be constructed of stainless steel (SS-316) or teflon because organic parameters are being monitored at this facility.

Based on the above design deficiencies, new monitoring wells must be installed at the facility.

34. The spacing of the wells must be 150 feet or less unless a demonstration (i.e. computer model) justifying a greater spacing is provided (264.97(a)).

35. The screened intervals for wells MW-4, MW-6, MW-7, and MW-9 and possibly MW-3 and MW-5 are unacceptable (264.97(a)). It appears that in order to adequately monitor the uppermost aquifer, wells should be placed in the 630' sand zone (where saturated) and the weathered dolomite. If a large portion of the dolomite (i.e. greater than 20 feet) is capable of producing water, additional wells at deeper elevations will be required. Therefore, nested wells are necessary to adequately monitor the uppermost aquifer.

36. The monitoring wells are not adequate to produce representative samples because the well placement is not adequate (264.97(a)(1) and (2)). They must be nested in the 630' sand and the dolomite.

37. Background values for each proposed monitoring parameter or constituent are not provided (264.98(c), 270.14(c)(6)(iii)). When a new monitoring system is installed, new background data must be collected in accordance with 264.97(g). The background values must be expressed in a form necessary for the determination of statistically significant increases under 264.97(h).

38. The procedures for sample collection are not adequate to meet the requirements of 264.97(d)(1) for the following reasons:

a. The type of bailer is not specified. The bailer must be constructed of stainless steel (SS-316) or teflon and have a bottom valve. The cord used with the bailer must be constructed of a material which does not conflict with the constituents being sampled;

b. It is not clear why pages E-30 and E-31 describe the decontamination of bailers when Page E-32 states that each well has its own dedicated bailer. In any case, each well must have a dedicated bailer which meets the criteria described in a. above;

c. Should decontamination be required, methanol should not be used. The available guidance manuals indicate that acetone or hexane should be used to decontaminate samplers used to collect samples for organic analysis;

d. The total depth of the wells must be measured and recorded each time the wells are sampled;

e. Procedures to ensure that parameters which are pH and/or volatile sensitive are sampled first are not specified;

f. The well evacuation procedures need to be modified to indicate that on the day of sampling, the wells are evacuated to dryness or have 3 well volumes removed. Under no circumstances should more than 3 hours pass between well evacuation and sampling;

g. Procedures to dispose of the evacuated well water need to be specified;

h. Procedures to sample "floaters" (if present) prior to well evacuation need to be provided;

i. Procedures to record any observations during sampling and well evacuation in a field notebook need to be provided;

j. Any special sampling procedures for organic compounds need to be specified.

39. The procedures for sample preservation and shipment are not adequate to meet the requirements of 264.97(d)(2) for the following reasons:

a. It is not adequate to state that "the methods are in accordance with EPA ... or approved alternative methods". The specific methods need to be stated in the application and referenced to SW-846;

b. The parameters which each aliquot will be sampled for (Attachment E-8) need to be specified.

40. The analytical procedures indicated in Section E-3b(4) are not adequate to meet the requirements of 264.97(d)(3) for the following reasons:

a. Specific analytical methods for each parameter being monitored need to be identified in the application. These methods must all be referenced to SW-846;

b. If pH and specific conductance are to be used as indicator parameters, their values must be determined in the field at the time of sampling. Procedures for the field measurement of these parameters are not provided;

c. The use of blanks, spikes or duplicates needs to be discussed.

41. The sampling and analysis period for organic and inorganic parameters must be semiannually (264.98(d)).

42. The procedures for determining the flow rate of groundwater in the uppermost aquifer is not provided (264.98(e)).

43. The procedures to be used to determine whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point are not provided (264.98(g)).

44. The statistical comparison procedures which will be used to evaluate whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance point are not provided (264.98(g)(1), 264.97(h)).

45. An estimate of the time period, subsequent to sampling completion, within which the results of the statistical analysis will be available is not provided (264.98(g)(2)).

Perched Water Table Monitoring

46. The well spacing for the SW series wells needs to be justified. This may require some computer modelling. Also, the design of the present wells is not adequate because of the large screened interval and sand pack, materials of construction and backfilling of the annulus with native clay.

47. The background data indicated in Section E-4b(8) should be provided.

48. The sampling and analysis problems for these wells are the same as those for the MW series wells.

49. Some form of statistical and/or graphical analyses need to be specified for the data collected from these wells.

50. The post 1984/1985 sampling schedule needs to be provided.

PROCEDURES TO PREVENT HAZARDS

51. Page D-40 states that wind dispersal control techniques are in place, but Section F does not include the inspection of these items (264.273(g)(2)).

52. As discussed in Item 9 above, run-off control as required by 270.14(b)(8)(iii) is not adequate because the run-off flows across Mobil Oil property in an unlined stream.

53. The precautions taken to prevent accidental ignition of the D001 waste are not adequate. The requirements of 264.281 need to be addressed. Also, the use of spark arresting mufflers and spark proof tools on and around the incorporation equipment (when D001 waste is present) needs to be discussed.

CONTINGENCY PLAN

54. The plan does not discuss the "immediate" implementation of the plan (264.51(b)).

55. The various emergency plans indicated in Section H of attachment G-1 need to be provided (264.56).

56. Documentation that copies of the contingency plan have been sent to the facilities listed in Table G-5 is not provided (264.53).

57. Did the recent explosion and napthaline spill require any modifications of the contingency plan?

PERSONNEL TRAINING

58. Attending one conference in 1980 and one in 1981 (Table H-2) is not adequate documentation that the operations engineer has been trained in hazardous waste management (264.16(a)(2)). This documentation should include items such as a resume, list of recent conferences/seminars attended, and a description of all experience involving the management of hazarous waste both at Union Oil and any other facilities.

59. Pages H-12, 13 and 15 state that each area shift supervisor is an emergency coordinator. This does not appear to be consistent with Page G-13 or Table G-2.

CLOSURE PLAN

60. Section I-1a does not describe how closure of the facility controls, minimizes, or eliminates threats to human health and the environment (264.111).

61. Partial closure is defined as closure of a discrete part or unit of the facility. In this case, a discrete unit would be a uniform area or one of Areas I, II, III, IV. Union Oil, however, indicates that after any of the three situations described on pages I-3 and I-4, the land treatment area will resume operations. Therefore, it appears that the procedures outlined in Section I-1b, Partial Closure, should be included in the contingency plan. Also, the procedures in paragraph F of Section I-1b regarding the clean up of incompatible wastes, need to be specified.

62. The procedures for final closure of the land treatment area are not adequate for the following reasons (264.112(a)(1)):

    a. The soil sampling procedures must be consistent with Section E;

    b. The accumulation of Appendix VIII constitutents other than metals (lead and chromium) is not addressed;

    c. In order to minimize infiltration, and therefore migration of hazaroud constituents from the treatment zone, it appears that a clay cap should be placed on the treatment area. 264.118(a)(2)(i) requires that this cap be maintained during post closure;

    d. Will the application of nonhazardous wastes continue during the 3 year closure period?

63. The maximum inventory of wastes needs to be expressed in gallons as well as dry tons.

64. The description of the vegetative cover as required by 270.20(f) and 264.280(a)(8) needs to include the following:

    a. Data showing that the cover can thrive in the soils and climate in which it will be planted;

    b. The minimum percentage of soil cover to be maintained on the closed land treatment area;

    c. The methods to be used to establish and maintain the cover.

65. How will it be demonstrated that all organics have been degraded within the 3 year closure period (264.280(a)(1))?

66. The frequency of the post closure monitoring is not adequate. As required by 264.98(d) sampling must be at least semi-annually. The closure cost estimate should be revised to reflect this change.

RW:sf/sp/2024e,1-14

ATTACHMENT 1

Appendix VIII Hazardous Constituents Suspected to be Present in Refinery Wastes

**Acetonitrile (Ethanenitrile)
**Acrolein (2-Propenal)
**Acrylonitrile (2-Propenenitrile)
Aniline (Benzenamine)
Antimony
Arsenic
Barium
Benz (c) acridine (3,4-Benzacridine)
Benz (a) anthracene (1,2-Benzanthracene)
**Benzene (Cyclohexatriene)
Benzenethiol (Thiophenol)
Benzidine (1,1-Biphenyl-4,4'diamine)
Benzo(b)fluoranthene (2,3-Benzofluoranthene)
Benzo(j)fluoranthene (7,8-Benzofluoranthene)
Benzo(a)pyrene (3,4-Benzopyrene)
**Benzyl chloride (Benzene, (chloromethyl)-)
Beryllium
Bis (2-chloroethyl) ether (Ethane, 1,1'-oxybis (2-chloro-))
Bis (2-chloroisopropyl) ether (Propane, 2,2'-oxybis (2-chloro-))
**Bis (chloromethyl) ether (Methane, oxybis (chloro))
Bis (2-ethylhexyl) phthalate (1,2-Benzenedicarboxylic acid, bis (2-ethylhexyl) ester)
Butyl benzyl phthalate (1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester)
Cadmium
Carbon disulfide (Carbon bisulfide)
p-Chloro-m-cresol
**Chlorobenzene (Benzene, chloro-)
**Chloroform (Methane, trichloro-)
**Chloromethane (Methyl chloride)
2- Chloronapthalene (Naphthalene, beta-chloro-)
2-Chlorophenol (Phenol, o-chloro-)
Chromium
Chrysene (1,2-Benzphenanthrene)
Cresols (Cresylic acid) (Phenol, methyl-)
**Crotonaldehyde (2-Butenal)
Cyanide
Dibenz(a,h)acridine (1,2,5,6-Dibenzacridine)
Dibenz(a,j)acridine (1,2,7,8-Dibenzacridine)
Dibenz(a,h)anthracene (1,2,5,6-Dibenzanthracene)
7H-Dibenzo(c,g)carbazole (3,4,5,6-Dibenzcarbazole)
Dibenzo(a,e)pyrene (1,2,4,5-Dibenzpyrene)
Dibenzo(a,h)pyrene (1,2,5,6-Dibenzpyrene)
Dibenzo(a,i)pyrene (1,2,7,8-Dibenzpyrene)
**1,2-Dibromoethane (Ethylene dibromide)
Di-n-butyl phthalate (1,2-Benzenedicarboxylic acid, dibutyl ester)
*Dichlorobenzenes
**1,2-Dichloroethane (Ethylene dichloride)
**trans-1,2-Dichloroethene (1,2-Dichlorethylene)
**1,1-Dichloroethylene (Ethene, 1,1-dichloro-)
**Dichloromethane (Methylene chloride)

**Dichloropropane
Dichloropropanol
Diethytl phthalate (1,2-Benzenedicarboxylic acid, diethyl ester)
7,12-Dimethyl-benz(a)anthracene
2,4-Dimethylphenol (Phenol, 2,4-dimethyl-)
Dimethyl phthalate (1,2-Benzenedicarboxylic acid, dimethyl ester)
4,6-Dinitro-o-cresol
2,4-Dinitrophenol (phenol, 2,4-nitro-)
2,4-Dinitrotoluene (Benzene, 1-methyl-2,4-dinitro-)
Di-n-octyl phthalate (1,2-Benzenedicarboxylic acid, dioctyl ester)
**1,4-Dioxane (1,4-Diethylene oxide)
1,2-Diphenylhydrazine (Hydrazine, 1,2-diphenyl-)
**Ethyleneimine (Azridine)
**Ethylene oxide (Oxirane)
Fluoranthene (Benzo (j,k) fluorene)
**Formaldehyde
Hydrogen sulfide (Sulfur hydride)
Indeno (1,2,3-cd)pyrene (1 10(1,2-phenylene)pyrene)
Lead
Mercury
Methanethiol (Thiomethanol)
3-Methylchlolanthrene (Benz(j)aceanthrylene, 1,2-dihydro-3-methyl-)
**Methyl ethyl ketone (MEK) (2-Butanone)
Naphthalene
Nickel
p-Nitroaniline (Benzenamine, 4-nitro-)
Nitrobenzene (Benzene, nitro-)
4-Nitrophenol (Phenol,pentachloro-)
Pentachlorophenol (Phenol, pentachloro-)
Phenol (Benzene, hydroxy-)
Pyridine
Selenium
*,**Tetrachloroethanes
**Tetrachloroethylene (Ethene, 1,1,2,2-tetra chloro-)
**Toluene (Benzene, methyl-)
*Trichlorobenzenes
*,**Trichloroethanes
**Trichloroethene (Trichloroethylene)
*Trichlorophenols
Vanadium

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* If any of these groups of compounds are found, the specific isomers listed in Appendix VIII should be identified.

** Use Test Method 8240 for these volatile compounds.

*** Use Test Method 3050 in SW-846 for all metals; see Attachment 2 for semivolatile organic compounds.

Non-Appendix VIII Constituents of Concern (may be added to App. VIII)

Cobalt
1-Methylnapthalene
Styrene
Hydroquinone
Anthracene
Indene
5-Nitro acenaphthene
Quinoline
Phenanthrene
Pyrene

Old Orchard Lane
Route #4, Box 102
Lockport, Illinois 60441

November 13, 1980

Illinois Environmental Protection Agency
Division of Land/Noise Pollution Control
2200 Churchill Road
Springfield, Illinois 62706

SUBJECT: UNION OIL COMPANY
TANK FARM
DU PAGE TOWNSHIP, WILL COUNTY

Gentlemen:

For the past several weeks a crane and heavy machinery have been working at the tank farm. As this area sits on bedrock which contains cracks and fissures, we, as homeowners in the area, are concerned about proper construction.

We question at this time whether any permits have been issued for the site which could be for a holding basin, or if not for a holding basin, the purpose of the permit. We shall appreciate your forwarding a copy of same.

May we hear from you soon.

Very truly yours,

Dawn Rohde

Dawn Rohde

Mel Schmidt

Mel Schmidt

Doris Gusich

Doris Gusich

Jan Keefer

Jan Keefer

DR:LH