

# **SUMMARY OF ALBERTA INDUSTRIAL WASTEWATER LIMITS AND MONITORING REQUIREMENTS**



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**Environmental Sciences Division  
Environmental Service**

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## **SUMMARY OF ALBERTA INDUSTRIAL WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### **PREFACE**

#### **Intended Audience and Use of this Document**

This document is intended to serve as a general reference on wastewater discharge limits and monitoring requirements for Alberta industries approved under *Alberta's Environmental Protection and Enhancement Act* (EPEA).

The information presented in this document is subject to continuous change. Because Approvals under EPEA are updated, differences to the limits and monitoring requirements presented in the attached tables are bound to arise. In addition, the evolution of departmental policy may affect the way monitoring requirements and limits are established on a sector-specific and facility-specific basis. The facility approvals (available from Alberta Environment) must be considered for current monitoring requirements and limits requirements for a particular facility.

The report should not be used to predict which limits or monitoring requirements may be imposed on new facilities or on facilities subject to approval renewals. The Department assigns limits and monitoring requirements only after an in-depth review of a facility.

Industrial wastewater limits and monitoring requirements are summarised for eleven different industrial sectors. The limits and monitoring requirements are presented in two distinct sets of tables on a sector-specific basis.

#### **Disclaimer**

No part of these tables may be cited in any form or used for anything other than their intended use as described above. Facility approvals should always be consulted for specific information.

**SUMMARY OF INDUSTRIAL LIMITS**

Table 1 represents a one page listing of the parameters that have associated limits in approvals under EPEA. The list of parameters for any sector is the total list for which there are limits in a sector, and should not be interpreted to mean that all parameters indicated apply to each facility. Shading is used to indicate what percentage of facilities, within the industrial sector, have limits for the parameter.

**SUMMARY OF INDUSTRIAL MONITORING**

Table 2 summarizes the monitoring required within each sector. These monitoring requirements are not necessarily common to each facility. Some of the substances actually represent groups of substances, for example heavy metals, and priority pollutants.

Shading is used in this table to indicate what percentage of facilities, within the industrial sector, monitor the parameter.

Table 1 - Summary of Industrial Sectors and Parameters with Associated Limited Parameters

INDUSTRY	LIMITED PARAMETERS
Chemical Plants	Acute Lethality Tests
	Adsorbable Organic Halides
	Ammonia-Nitrogen
	Biochemical Oxygen Demand
	Chemical Oxygen Demand
	Chloride
	Colour
	Cr, Cu, Pb, Hg, Zn
	Dioxins and Furans
	Dissolved Sulfide
	Fecal Coliforms
	Floating Solids and Visible Foam
	Flow Rate
	Free Available Chlorine
	Free Chlorine Residual
	Hydrazine Residual
	Iron
	Manganese
	Nitrate-Nitrogen
	Oil and Grease
Oil and Other Substances	
Organic Nitrogen	
pH	
Phenols	
Phosphate	
Plant Water Consumption Rate	
Resin and Fatty Acids	
Settleable Solids	
Sublethal/Chronic Toxicity	
Total Chlorine Residual	
Total Iron	
Total Kjeldahl Nitrogen	
Total Nitrogen	
Total Organic Carbon	
Total Phosphorus	
Coal Mines - Mountain	
Coal Mines - Prairie	
Fertilizer Manufacturing Plants	
Foundry	
Gas Plants	
Meat Processing Plants	
Oilseed Processing Plants	
Potato Processing Plants	
Power Plants	
Pulp and Paper Mills - TMP	
Pulp and Paper Mills - BKP	
Refineries	

White – no limits for parameter

Grey – some (<50%) of the facilities in this industry limit this particular parameter

Black – most (50% or greater) of the facilities in this industrial group put limits on this parameter.

NOTE: Limits may be for Industrial Wastewater, Industrial Runoff, Sanitary Sewage, Cooling Water, or Boiler Wet Storage Water

**Table 2 - Summary of Industrial Sectors and Parameters with Associated Monitoring Parameters**

Industry	Parameters with Monitoring Requirements
Chemical Plants	Biochemical Oxygen Demand
	Total Suspended Solids
	Chemical Oxygen Demand
	Oil and Other Substances
	Acute Toxicity Testing
	Chronic Toxicity Testing
	Ammonia-Nitrogen
	pH
	Flow/Discharge Volume
	Total Organic Carbon
	Floating Solids
	Visible Foam
	Cr,Cu,Pb,Hg,Zn
	Chlorine (free Chlorine)
	Microtox
	Dissolved Organic Carbon
	Priority Pollutants
	Receiving Water
	Total Kjeldahl Nitrogen
	Chloride
	Phosphate
	Organic Nitrogen
	Hydrogen Peroxide
	Alkyl Benzenes
	Vinyl Chloride Monomer
	Total Dissolved Solids
	Styrene, Benzene, Ethylbenzene, Toluene
	Total Phosphorus
	Dicyclopentadiene
	Total Phenolics
	Arsenic
	Mercury
	Chromium
	Zinc
	Lead
	Conductivity
	Chlorate
Coal Mines - Mountain	
Coal Mines - Prairie	
Fertilizer Plants	
Foundry	
Gas Plants	
Meat Processing Plants	
Oilseed Processing Plants	
Potato Processing Plants	
Power Plants	
Pulp and Paper Mills - TMP	
Pulp and Paper Mills - BKP	
Refineries	

White – no limits for parameter

Grey – some (<50%) of the facilities in this industry limit this particular parameter

Black – most (50% or greater) of the facilities in this industrial group put limits on this parameter.

NOTE: Monitoring requirements may be for Industrial Wastewater, Industrial Runoff, Sanitary Sewage, Blowdown Canal Effluent, Boiler Wet Storage Water, Chiller, or Cooling Waters.

NOTE: See individual approvals for breakdowns for heavy metals, nutrients, chlorinated phenolics, dioxins and furans, organic priority pollutants, and resin and fatty acids for each facility.

**-cont. Table 2 - Summary of Industrial Sectors and Parameters with Associated Monitoring Parameters**

Industry	Parameters with Monitoring Requirements																											
Chemical Plants	Hexavalent Chromium																											
	Turbidity																											
Coal Mines - Mountain	Nitrate/Nitrite																											
	Nitrate-Nitrogen																											
Coal Mines - Prairie	Iron																											
	Once a Year Comprehensive Analysis																											
Fertilizer Manufacturing Plants	Settleable Solids																											
	Uranium																											
Foundry	Gross-Alpha																											
	Gross-Beta																											
Gas Plants	Sodium Adsorption Ratio																											
	Heavy Metals																											
Meat Processing Plants	Oil and Grease																											
	Fluoride																											
Oliseed Processing Plants	Total Metals																											
	Total Iron																											
Potato Processing Plants	Sulphate																											
	Total Phosphate																											
Power Plants	Free Chlorine Residual																											
	Luminescent Bacterial Test																											
Pulp and Paper Mills - TMP	Total Hardness																											
	Temperature																											
Pulp and Paper Mills - BKP	Calcium, Sodium, Magnesium																											
	Faecal Coliforms																											
Refineries	Plant Water Consumption Rate																											
	Potassium																											
	Total Dissolved Phosphorus																											
	Dissolved Oxygen																											
	Total Nitrogen																											
	Free Available Chlorine																											
	Total Chlorine Residual																											
	Hydrazine Residual																											
	Colour																											
	Total Alkalinity																											
	Calcium, Sodium, Potassium																											
	Total Silica																											
	Resin and Fatty Acids																											
	Specific Conductance																											
	Nutrients																											

White – no limits for parameter

Grey – some (<50%) of the facilities in this industry limit this particular parameter

Black – most (50% or greater) of the facilities in this industrial group put limits on this parameter.

NOTE: Monitoring requirements may be for Industrial Wastewater, Industrial Runoff, Sanitary Sewage, Blowdown Canal Effluent, Boiler Wet Storage Water, Chiller, or Cooling Waters.

NOTE: See individual approvals for breakdowns for heavy metals, nutrients, chlorinated phenolics, dioxins and furans, organic priority pollutants, and resin and fatty acids for each facility.



- cont. Table 2 - Summary of Industrial Sectors and Parameters with Associated Monitoring Parameters

Industry	Parameters with Monitoring Requirements
	Organic Priority Pollutants
	Ultimate Biochemical Oxygen Demand
	Total Phenols
	Major Ions
	Chelators
	Sodium, Silicate
	Total Organic Carbon or Chemical Oxygen Demand
	Chemical Oxygen Demand or Biochemical Oxygen Demand
	Adsorbable Organic Halides
	Threshold Odour Number
	Chlorate/Chlorite
	Chlorinated Phenolics
	Toluene
	Chloroform
	Sulfides
	Dioxins and Furans
	Polychlorinated Biphenyls (PCB)
	Manganese (Soluble)
	Phenols
	Dissolved Sulfide
	Phosphorus
Chemical Plants	
Coal Mines - Mountain	
Coal Mines - Prairie	
Fertilizer Manufacturing Plants	
Foundry	
Gas Plants	
Meat Processing Plants	
Oilseed Processing Plants	
Potato Processing Plants	
Power Plants	
Pulp and Paper Mills - TMP	
Pulp and Paper Mills - BKP	
Refineries	

White – no limits for parameter

Grey – some (<50%) of the facilities in this industry limit this particular parameter

Black – most (50% or greater) of the facilities in this industrial group put limits on this parameter.

NOTE: Monitoring requirements may be for Industrial Wastewater, Industrial Runoff, Sanitary Sewage, Blowdown Canal Effluent, Boiler Wet Storage Water, Chiller, or Cooling Waters.

NOTE: See individual approvals for breakdowns for heavy metals, nutrients, chlorinated phenolics, dioxins and furans, organic priority pollutants, and resin and fatty acids for each facility.

## **Units and Limits Conventions**

Approval limits are expressed in various formats. Approval limits can be expressed as a total loading limit, e.g., kg/d, or a concentration based limit. A limit for a substance may be applied as an average monthly limit, a maximum monthly amount, daily limits or as an instantaneous maximum. The substance may be limited using one or more conventions depending on the substance and sampling regime.

Daily limits are normally determined from grab samples or composite samples collected over an entire day. Average monthly limits represent the arithmetic average of the daily results over one month. Instantaneous maximums are normally determined from grab samples or from in-line recorders. Parameters such as pH and conductivity are typically expressed as instantaneous maximum limits.

## **Limits Averaging Periods**

The concept of averaging periods is important when comparing facility performance. The averaging period is the length of time over which a measured quantity of a substance is averaged when assessing compliance with an approval limit. The averaging period can have a significant effect on a resultant limit. Limits may be specified with different averaging periods such as annually, semi-annually, monthly, daily (24-hour) or instantaneous.

## **Sample Type**

Substances are measured in effluent samples, which are taken in various ways. A commonly used sample is the 24-hour composite, which is comprised of small samples of the effluent taken at regular intervals over a 24-hour period. Another commonly used sample is the grab sample obtained by taking an effluent sample over a short time period. Representative grab samples are typically taken prior to batch discharges from a number of sampling points for one water source. Substances may also be measured continuously using in-line monitors or recorders.

## SUMMARY OF SECTORS

The attached Tabs are organized alphabetically according to industrial sector. These sectors may contain subsectors of similar facilities. Facilities within a subsector can be extremely diverse due to the range and combination of operations, treatment systems, and wastewaters that can be present at individual facilities.

Table 3 contains a summary of each industrial sector reviewed. Table 3 does not represent all of the facilities approved for wastewater discharges in the province (many minor discharges have not been included).

**Table 3 - Summary of Industrial Sectors**

INDUSTRY/ SECTOR	SUBSECTOR	NUMBER OF FACILITIES (IN THIS DOCUMENT)
Chemical Plants		11
Coal Mines		12
	Mountain	5
	Prairie	7
Fertilizer Manufacturing Plants		4
Foundry		1
Gas Plants		20
Meat Processing Plants		2
Oilseed Processing Plants		2
Potato Processing Plants		2
Power Plants		10
Pulp and Paper Mills		7
	Thermomechanical Process	3
	Bleached Kraft Process	4
Refineries		6

## **INTRODUCTION TO TABLES**

Limits and Monitoring requirements for each of the 11 selected industrial sectors are presented in the following sections, which are organized alphabetically by industrial sector. Each section is prefaced by an introduction, which provides a summary of each section.

Any abbreviation used in the following tables is defined at the bottom of each page. The tables contain two different sets of information. The first set of tables for each industry contains limits and related information. The second set of tables contains monitoring requirements for each industry.

On all of the tables, the facility names appear in the first column. This is followed by a column with the most current approval and amendment number. The third column contains the source of the wastewater, which for most facilities, is either Industrial Wastewater (IW) or Industrial Runoff (IR).

For pulp mill data, an extra column, called Production Capacity, has been inserted between the approval number column and the source column. Production Capacity for bleached kraft process mills and thermomechanical process mills is the design production capacity, which may be exceeded. This column has been included to make comparisons between facilities possible.

## **TAB 1. A      CHEMICAL PLANTS**

Limits and Monitoring for eleven chemical plants in Alberta are provided. Of the eleven plants, eight have effluent limits and ten have effluent monitoring requirements. One facility does not have any effluent limits or monitoring because it discharges to a municipal wastewater collection system. Two other facilities do not have limits associated with them. These facilities either do not directly discharge to a waterbody, or the industrial wastewater is disposed of in brine wells. However the industrial runoff is discharged to a watershed.

Four of the chemical plants discharge to the North Saskatchewan River, two discharge to the Red Deer River, and one releases wastewater to Jones Creek. There are many different parameters for these facilities because there are different chemicals produced at each of the plants.

### **Limits**

- Three of the chemical plants have limits for Industrial Runoff.
- Six have limits associated with Industrial Wastewater discharges.
- One has limits for Sanitary Sewage.
- Two have limits for Industrial Wastewater and Industrial Runoff.

### **Monitoring**

- Six of the chemical plants monitor Industrial Wastewater discharges.
- Two monitor Sanitary Sewage.
- Three monitor Industrial Runoff.
- One monitors Cooling Waters.
- Two monitor Industrial Wastewater and Industrial Runoff.

Chemical Plants - Limits

Chemical Plants			Parameters and Associated Limits (All units are in kg/d, unless otherwise specified)						
Facility	Approval #	Source	COD	TSS					O&O
				Time Period	MAA	MMA	MDA	MDL	
AT Plastics Inc. Edmonton Chemical Manufacturing Plant 1480-01-00	1480-01-00	IR1	In accordance with the City of Edmonton Sewers Use Bylaw.						In accordance with the City of Edmonton Sewers Use Bylaw.
		IR2	60 mg/L					20 mg/L	15 mg/L
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant 1349-01-04	1349-01-04	IR							
		IW1					440	1300	Not present in amounts sufficient to create a visible film or sheen
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant 236-00-20, 237-00-14	Being Renewed	IW2					400	750	Not present in amounts sufficient to create a visible film or sheen
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3					14	20	Not present in amounts sufficient to create a visible film or sheen
Geon Canada Inc. Scotford Polyvinyl Chloride Plant 194-01-01	194-01-01	IW4					14	42	Not present in amounts sufficient to create a visible film or sheen

COD= Chemical Oxygen Demand (mg/L)

IR= Industrial Runoff

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

MAA= Monthly Arithmetic Average

MMA= Maximum Monthly Amount (for any month)

O&O= Oil and Other Substances

TSS= Total Suspended Solids

Chemical Plants - Limits

Chemical Plants			Parameters and Associated Limits (All units are in kg/d, unless otherwise specified)									
Facility	Approval #	Source	Cr, Cu, Pb, Hg, Zn	NH <sub>3</sub> -N	pH (Units)	ALT	FS/VF	TOC				
			MDA	MDL	NTBE	(Rainbow trout)	Time Period	MMA	MDA	MDL		
AT Plastics Inc. Edmonton Chemical Manufacturing Plant 1480-01-00	1480-01-00	IR1	In accordance with the City of Edmonton Sewers Use Bylaw.	10 mg/L	6.0-9.5	50% or greater survival in 100% industrial wastewater sample	Not present					
		IR2		10 mg/L	6.0-9.5		Not present					
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant 1349-01-04	1349-01-04	IR			6.0-9.5							100 mg/L
		IW1			6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts			220	585	
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant 236-00-19, 237-00-00 93-WL-026 91-AL-087(F)	Being Renewed	IW2	20	40	6.0-9.5	50% or greater survival in 100% wastewater sample	None except in trace amounts			400	900	
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3	1 (net)	2 (net)	6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts					
Geon Canada Inc. Scotford Polyvinyl Chloride Plant 194-01-01	194-01-01	IW4			6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts			22	65	

ALT= Acute Lethality Tests

NH<sub>3</sub>-N= Ammonia-Nitrogen

Cr, Cu, Pb, Hg, Zn= Chromium, Copper, Lead, Mercury, and Zinc (total mg/L for each)

FS/VF= Floating Solids or Visible Foam

IR= Industrial Runoff

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

MMA= Maximum Monthly Amount (for any month)

NTBE= Not to be Exceeded

TOC= Total Organic Carbon

Chemical Plants - Limits

Chemical Plants			Parameters and Associated Limits (All units are in kg/d, unless otherwise specified)											
Facility	Approval #	Source	TKN			BOD		Phosphate		VCM		TP		CBOD
			MMA	MDA	MDL	MDA	MDL	MDA	MDL	MDA	MDL	MDA	MDL	MAA
AT Plastics Inc. Edmonton Chemical Manufacturing Plant 1480-01-00	1480-01-00	IR1												
		IR2												
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant 1349-01-04	1349-01-04	IR												
		IW1												
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant 236-00-19, 237-00-00 93-WL-026 91-AL-087(F)	Being Renewed	IW2		75	150									
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3				14	20	4	8					
Geon Canada Inc. Scotford Polyvinyl Chloride Plant 194-01-01	194-01-01	IW4								1.2	3.6			

BOD= Biochemical Oxygen Demand  
 CBOD= Carbonaceous Biochemical Oxygen Demand  
 IR= Industrial Runoff  
 IR1= Industrial Runoff from Storm Sewers  
 IR2= Industrial Runoff from the 5R Holding Pond

IW1= Industrial Wastewater from the South Flume  
 IW2= Industrial Wastewater from the Liquid Effluent Pond  
 IW3= Industrial Wastewater from the Final Effluent Sump  
 IW4= Industrial Wastewater from the Effluent Retention Basins  
 TKN= Total Kjeldahl Nitrogen  
 TP= Total Phosphorus  
 VCM= Vinyl Chloride Monomer



Chemical Plants - Limits

Chemical Plants			Parameters and Associated Limits (All units are in kg/d, unless otherwise specified)						
Facility	Approval #	Source	COD	TSS					O&O
				Time Period	MAA	MMA	MDA	MDL	
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06	IW				2520 kg		520	Not present in amounts sufficient to create a visible film or sheen
	95-IND-205	IW&IR1					145	430	Not present in amounts sufficient to create a visible film or sheen
		SS				25 mg/L			
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2					179	538	Not present in amounts sufficient to create a visible film or sheen
		IW&IR3		April-June			621	811	Not present in amounts sufficient to create a visible film or sheen
				July-March			515	790	
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW5					100	250	Not present in amounts sufficient to create a visible film or sheen
		IW6					100	250	Not present in amounts sufficient to create a visible film or sheen
		IR						25 mg/L	Not present in amounts sufficient to create a visible film or sheen
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*							
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	N/A*							
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	N/A*							

\*= See Appendix

COD= Chemical Oxygen Demand (mg/L)

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW= Industrial Wastewater

IW5= Industrial Wastewater (Prior to start-up of the Water Recovery System)

IW6= Industrial Wastewater (After start-up of the Water Recovery System)

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

MAA= Monthly Arithmetic Average

MMA= Maximum Monthly Amount (for any month)

N/A= Not Applicable

O&O= Oil and Other Substances

IW&IR3= Industrial Wastewater and Industrial Runoff from Retention Ponds and Effluent Ponds (After commencement of operation of EII)

IW&IR2= Industrial Wastewater and Industrial Runoff from Retention Ponds and Effluent Ponds (Prior to operation of EIII, PEII, or COGE)

IR= Industrial Runoff

SS= Sanitary Sewage

TSS= Total Suspended Solids

Chemical Plants - Limits

Chemical Plants			Parameters and Associated Limits (All units are in kg/d, unless otherwise specified)									
Facility	Approval #	Source	Cr, Cu, Pb, Hg, Zn		NH <sub>3</sub> -N	pH (Units)	ALT	FS/VF	TOC			
			MDA	MDL	MDL	NTBE	(Rainbow trout)		Time Period	MMA	MDA	MDL
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW				6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts		2100 kg		350
		IW&IR1				6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts			120	290
		SS										
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2				6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts			269	805 105 mg/L
		IW&IR3				6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts	April-June		1450	2200 25 mg/L
									July-Sept.		1000	1500 115 mg/L
									Oct.-Mar.		510	1000 100 mg/L
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW5				6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts			200	450
		IW6				6.0-9.5	50% or greater survival in 100% industrial wastewater sample	None except in trace amounts			200	450
		IR				6.0-9.5		None except in trace amounts				35 mg/L
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*										
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	N/A*										
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	N/A*										

\*= See Appendix

ALT= Acute Lethality Tests

NH<sub>3</sub>-N= Ammonia-Nitrogen

Cr, Cu, Pb, Hg, Zn= Chromium, Copper, Lead, Mercury, and Zinc (total mg/L for each)

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

FS/VF= Floating Solids or Visible Foam

IW= Industrial Wastewater

IW5= Industrial Wastewater (Prior to start-up of the Water Recovery System)

IW6= Industrial Wastewater (After start-up of the Water Recovery System)

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

MMA= Maximum Monthly Amount (for any month)

N/A= Not Applicable

NTBE= Not to be Exceeded

RP&EP(A)= Retention Pond and Effluent Pond (After commencement of operation of EIII, PEII, or COGEN)

RP&EP(P)= Retention Ponds and Effluent Ponds (Prior to operation of EIII, PEII, or COGEN)

SR= Surface Runoff

SS= Sanitary Sewage

TOC= Total Organic Carbon

Chemical Plants - Limits

Chemical Plants			Parameters and Associated Limits (All units are in kg/d, unless otherwise specified)											
Facility	Approval #	Source	TKN			BOD		Phosphate		VCM		TP		CBOD
			MMA	MDA	MDL	MDA	MDL	MDA	MDL	MDA	MDL	MDA	MDL	MAA
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06	IW	240 kg		40									
	95-IND-205	IW&IR1												
		SS												25 mg/L
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2												
		IW&IR3									9.1	15.2	1 mg/L	
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW5												
		IW6									3	5.2		
		IR												
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*												
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	N/A*												
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	N/A*												

\*= See Appendix

BOD= Biochemical Oxygen Demand

CBOD= Carbonaceous Biochemical Oxygen Demand

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW= Industrial Wastewater

IW5= Industrial Wastewater (Prior to start-up of the Water Recovery System)

IW6= Industrial Wastewater (After start-up of the Water Recovery System)

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

MMA= Maximum Monthly Amount (for any month)

N/A= Not Applicable

RP&EP(A)= Retention Pond and Effluent Pond (After commencement of operation of EIII, PEII, or COGEN)

RP&EP(P)= Retention Ponds and Effluent Ponds (Prior to operation of EIII, PEII, or COGEN)

SR= Surface Runoff

SS= Sanitary Sewage

TKN= Total Kjeldahl Nitrogen

TP= Total Phosphorus

VCM= Vinyl Chloride Monomer

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored							
Facility	Approval #	Source	BOD		TSS		COD		O&O	
			F	ST	F	ST	F	ST	F	ST
AT Plastics Inc. - Edmonton	1480-01-00	IR1	1/week	Composite	1/day	Composite	1/day	Composite	1/week	Composite
		IR2			1/day during periods of discharge	Grab	1/day during periods of discharge	Grab	1/day during periods of discharge	Grab
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant	1349-01-04	IW1	1/week and prior to discharge	Composite	1/day and prior to discharge	Composite	1/day and prior to discharge	Composite		
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant	236-00-20 237-00-14	IW2	1/week	Composite	1/day	Composite	1/week	Composite	1/day	Visual Inspection
		SS								
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3	1/day	Composite	1/day	Composite				
Geon Canada Inc. Scotford Polyvinyl Chloride Plant	194-01-01	IW	1/week	Composite					1/day	Visual Inspection
		IW4			1/day	Composite				

BOD= Biochemical Oxygen Demand  
 COD= Chemical Oxygen Demand  
 F= Frequency  
 IR1= Industrial Runoff from Storm Sewers  
 IR2= Industrial Runoff from the 5R Holding Pond

IW= Industrial Wastewater  
 IW1= Industrial Wastewater from the South Flume  
 IW2= Industrial Wastewater from the Liquid Effluent Pond  
 IW3= Industrial Wastewater from the Final Effluent Sump  
 IW4= Industrial Wastewater from the Effluent Retention Basins

O&O= Oil and Other Substances  
 SS= Sanitary Sewage  
 ST= Sample Type  
 TSS= Total Suspended Solids

Chemical Plants - Monitoring

Chemical Plants		Parameters to be Monitored								
Facility	Approval #	Source	Toxicity Testing		Ammonia - Nitrogen		pH		Flow	
			F	ST	F	ST	F	ST	F	ST
AT Plastics Inc. - Edmonton	1480-01-00	IR1	ALT 1/month*	Composite or Grab	1/week	Composite	1/day	Composite	1/day	Totalizer
		IR2			1/day during periods of discharge	Grab	1/day during periods of discharge	Grab	1/day during periods of discharge	Estimate or Totalizer
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant	1349-01-04	IW1	ALT (Rainbow trout) 1/month*	Composite or Grab			1/day and prior to discharge	Continuous	1/day and prior to discharge	Totalizer
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant	236-00-19 237-00-00 93-WL-026 91-AL-087(F)	IW2	ALT 1/month*	Composite or Grab	1/day	Composite	1/day	Composite and Continuous	1/day	Totalizer
		SS								
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3	ALT 1/month*	Composite or Grab	1/day	Composite	1/day	Composite	1/day	Totalizer
Geon Canada Inc. Scotford Polyvinyl Chloride Plant	194-01-01	IW			1/week	Composite	1/day per batch discharge	RG or Composite	1/day	totalizer
		IW4	ALT 1/month*	RG						

\*= See Appendix for More Information on Toxicity Testing

ALT= Acute Lethality Tests

F= Frequency

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

RG= Representative Grab

SS= Sanitary Sewage

ST= Sample Type

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored							
Facility	Approval #	Source	TOC		FS/VF		Cr, Cu, Pb, Hg, Zn		Chlorine (free chlorine)	
			F	ST	F	ST	F	ST	F	ST
AT Plastics Inc. - Edmonton	1480-01-00	IR1	1/week	Composite	1/week	Visual Inspection	1/2 months	Comosite	1/week	Composite
		IR2			1/day during periods of discharge	Visual Inspection			1/day during periods of discharge	Grab
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant	1349-01-04	IW1	1/day and prior to discharge	Composite						
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant	236-00-19	IW2	1/day	Composite						
	237-00-00 93-WL-026 91-AL-087(F)	SS								
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3	1/week	Composite						
Geon Canada Inc. Scottford Polyvinyl Chloride Plant	194-01-01	IW	1/day	Composite	1/day	Visual Inspection				
		IW4								

Cr, Cu, Pb, Hg, Zn= Chromium, Copper, Lead, Mercury, and Zinc (total mg/L for each)

F= Frequency

FS/VF= Floating Solids or Visible Foam

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

SS= Sanitary Sewage

ST= Sample Type

TOC= Total Organic Carbon

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored								
Facility	Approval #	Source	Microtox		DOC		PP		RW	Total Kjeldahl Nitrogen	
			F	ST	F	ST	F	ST		F	ST
AT Plastics Inc. - Edmonton	1480-01-00	IR1									
		IR2									
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant	1349-01-04	IW1	1/month*	Composite or Grab	1/week and prior to discharge	Composite	1/2 years	Grab	Will be Monitored		
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant	236-00-19 237-00-00 93-WL-026 91-AL-087(F)	IW2								1/week	Composite
		SS									
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3			1/week	Composite					
Geon Canada Inc. Scotford Polyvinyl Chloride Plant	194-01-01	IW									
		IW4									

\*= See Appendix for More Information

DOC= Dissolved Organic Carbon

F= Frequency

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

PP= Priority Pollutants

RW= Receiving Water

SS= Sanitary Sewage

ST= Sample Type

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored											
Facility	Approval #	Source	Chloride		Phosphate		CBOD		Organic Nitrogen		Hydrogen Peroxide		Alkyl Benzenes	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
AT Plastics Inc. - Edmonton	1480-01-00	IR1												
		IR2												
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant	1349-01-04	IW1												
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant	236-00-19 237-00-00 93-WL-026 91-AL-087(F)	IW2	1/week	Composite	1/week	Composite								
		SS					1/week*	Grab						
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3			1/day	Composite			1/week	Composite	1/week	Composite	1/year	Composite
Geon Canada Inc. Scotford Polyvinyl Chloride Plant	194-01-01	IW	1/week	Composite	1/week	Composite								
		IW4												

\*= See Appendix for More Information

CBOD= Carbonaceous Biochemical Oxygen Demand

F= Frequency

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

SS= Sanitary Sewage

ST= Sample Type



Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored									
Facility	Approval #	Source	VCM		TDS		S,B,E,T		Total Phosphorus		Dicyclopentadiene	
			F	ST	F	ST	F	ST	F	ST	F	ST
AT Plastics Inc. - Edmonton	1480-01-00	IR1										
		IR2										
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant	1349-01-04	IW1										
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant	236-00-19 237-00-00 93-WL-026 91-AL-087(F)	IW2										
		SS										
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3										
Geon Canada Inc. Scotford Polyvinyl Chloride Plant	194-01-01	IW	1/day	Composite	1/week	Composite						
		IW4										

F= Frequency

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

S,B,E,T= Styrene, Benzene, Ethylbenzene, Toluene

SS= Sanitary Sewage

ST= Sample Type

TDS= Total Dissolved Solids

VCM= Vinyl Chloride Monomer

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored							
Facility	Approval #	Source	Total Phenolics		Arsenic		Mercury		Chromium	
			F	ST	F	ST	F	ST	F	ST
AT Plastics Inc. - Edmonton	1480-01-00	IR1								
		IR2								
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant	1349-01-04	IW1								
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant	236-00-19 237-00-00 93-WL-026 91-AL-087(F)	IW2								
		SS								
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3								
Geon Canada Inc. Scotford Polyvinyl Chloride Plant	194-01-01	IW								
		IW4								

F= Frequency

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

SS= Sanitary Sewage

ST= Sample Type

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored											
Facility	Approval #	Source	Zinc		Lead		Conductivity		Chlorate		Nitrates		Hexavalent Chromium	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
AT Plastics Inc. - Edmonton	1480-01-00	IR1												
		IR2												
Celanese Canada Inc. Edmonton Petrochemical Manufacturing Plant	1349-01-04	IW1												
Dow Chemical Canada Inc. Fort Saskatchewan Chemical Manufacturing Plant	236-00-19 237-00-00 93-WL-026 91-AL-087(F)	IW2												
		SS												
Degussa Canada Ltd. Gibbons Hydrogen Peroxide Manufacturing Plant	1034-01-03 95-IND-062	IW3												
Geon Canada Inc. Scotford Polyvinyl Chloride Plant	194-01-01	IW												
		IW4												

F= Frequency

IR1= Industrial Runoff from Storm Sewers

IR2= Industrial Runoff from the 5R Holding Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the South Flume

IW2= Industrial Wastewater from the Liquid Effluent Pond

IW3= Industrial Wastewater from the Final Effluent Sump

IW4= Industrial Wastewater from the Effluent Retention Basins

SS= Sanitary Sewage

ST= Sample Type

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored							
Facility	Approval #	Source	BOD		TSS		COD		O&O	
			F	ST	F	ST	F	ST	F	ST
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW			Once per discharge	Composite			1/day	Visual Inspection
		IW&IR1	1/week	Composite	1/day	Composite	1/week	Composite	1/day	Visual Inspection
		IW1								
		SS1	1/month*	Composite	1/month*	Composite				
		SS2			3/week*	Composite				
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2	1/discharge	Grab	Once prior to Discharge	Grab	1/discharge	Grab	1/day	Visual Check
		IW&IR3			1/day*	Grab	1/day	Grab	1/day	Visual Check
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW	1/week	Composite	1/day	Composite	1/week	Composite	1/day	Visual Check
		IR			Once prior to Discharge	Grab			Once prior to Discharge	Visual Check
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*								
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	CW								
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	IR			Prior to Release*	Grab				

\*= See Appendix for More Information

BOD= Biochemical Oxygen Demand

COD= Chemical Oxygen Demand

CW= Cooling Water Blowdown

F= Frequency

IR= Industrial Runoff

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW&IR2= Industrial Wastewater and Industrial Runoff from the Effluent Pond

IW&IR3= Industrial Wastewater and Industrial Runoff from the Retention Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ethylene Glycol Plant

N/A= Not Applicable

O&O= Oil and Other Substances

SS1= Sanitary Sewage Prior to Treatment

SS2= Sanitary Sewage, Treated

ST= Sample Type

TSS= Total Suspended Solids

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored							
Facility	Approval #	Source	Toxicity Testing		Ammonia - Nitrogen		pH		Flow	
			F	ST	F	ST	F	ST	F	ST
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW	ALT 1/month*	Composite or Grab			Once per discharge	Composite	Once per discharge	Totalizer
		IW&IR1	ALT 1/month*	Composite or Grab			Continuous	Recorder	Continuous	Recorder
		IW1					1/day	Continuous	1/day	Totalizer
		SS1								
		SS2								
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2	ALT and CT*	Grab			Continuous	Continuous	1/day	Totalizer
		IW&IR3					1/day*	Grab	1/day*	Flow Estimate
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW	ALT on Rainbow trout 1/month*	Composite or Grab	1/day	Grab	Continuous	Continuous	1/day	Totalizer
		IR					Once prior to Discharge	Grab	1/day	Estimate
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*								
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	CW					1/month	Composite	1/month	Estimate
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	IR					Prior to Release*	Grab	1/month	Estimate

\*= See Appendix for More Information

ALT= Acute Lethality Tests

CT= Chronic Toxicity

CW= Cooling Water Blowdown

F= Frequency

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW&IR2= Industrial Wastewater and Industrial Runoff from the Effluent Pond

IW&IR3= Industrial Wastewater and Industrial Runoff from the Retention Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ethylene Glycol Plant

N/A= Not Applicable

SR= Surface Runoff

SS1= Sanitary Sewage Prior to Treatment

SS2= Sanitary Sewage, Treated

ST= Sample Type

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored							
Facility	Approval #	Source	TOC		FS/VF		Cr, Cu, Pb, Hg, Zn		Chlorine (free chlorine)	
			F	ST	F	ST	F	ST	F	ST
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW	Once per discharge	Composite	1/day	Visual Inspection				
		IW&IR1	1/day	Grab and Continuous	1/day	Visual Inspection				
		IW1								
		SS1								
		SS2								
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2	Once prior to Discharge	Grab						
		IW&IR3	1/day	Grab						
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW	1/day	Composite						
		IR	Once prior to Discharge	Grab	Once prior to Discharge	Visual Check				
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*								
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	CW								
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	IR								

\*= See Appendix for More Information

Cr, Cu, Pb, Hg, Zn= Chromium, Copper, Lead, Mercury, and Zinc (total mg/L for each)

CW= Cooling Water Blowdown

F= Frequency

FS/VF= Floating Solids or Visible Foam

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW&IR2= Industrial Wastewater and Industrial Runoff from the Effluent Pond

IW&IR3= Industrial Wastewater and Industrial Runoff from the Retention Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ethylene Glycol Plant

N/A= Not Applicable

SR= Surface Runoff

SS1= Sanitary Sewage Prior to Treatment

SS2= Sanitary Sewage, Treated

ST= Sample Type

TOC= Total Organic Carbon

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored								
Facility	Approval #	Source	Microtox		DOC		PP		RW	Total Kjeldahl Nitrogen	
			F	ST	F	ST	F	ST		F	ST
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW								Once per discharge	Composite
		IW&IR1								1/day	Composite
		IW1									
		SS1									
		SS2									
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2			1/discharge	Grab					
		IW&IR3			1/day	Grab					
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW			1/week	Composite				1/day	Composite
		IR									
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*									
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	CW									
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	IR									

\*= See Appendix for More Information

CW= Cooling Water Blowdown

DOC= Dissolved Organic Carbon

F= Frequency

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW&IR2= Industrial Wastewater and Industrial Runoff from the Effluent Pond

IW&IR3= Industrial Wastewater and Industrial Runoff from the Retention Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ethylene Glycol Plant

N/A= Not Applicable

PP= Priority Pollutants

RW= Receiving Water

SR= Surface Runoff

SS1= Sanitary Sewage Prior to Treatment

SS2= Sanitary Sewage, Treated

ST= Sample Type

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored											
Facility	Approval #	Source	Chloride		Phosphate		CBOD		Organic Nitrogen		Hydrogen Peroxide		Alkyl Benzenes	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW												
		IW&IR1												
		IW1												
		SS1												
		SS2					3/week	Composite						
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2												
		IW&IR3												
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW												
		IR												
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*												
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	CW	1/month	Composite										
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	IR	Prior to Release*	Grab										

\*= See Appendix for More Information

CBOD= Carbonaceous Biochemical Oxygen Demand

CW= Cooling Water Blowdown

F= Frequency

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW&IR2= Industrial Wastewater and Industrial Runoff from the Effluent Pond

IW&IR3= Industrial Wastewater and Industrial Runoff from the Retention Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ethylene Glycol Plant

N/A= Not Applicable

SR= Surface Runoff

SS1= Sanitary Sewage Prior to Treatment

SS2= Sanitary Sewage, Treated

ST= Sample Type



Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored									
Facility	Approval #	Source	VCM		TDS		S,B,E,T		Total Phosphorus		Dicyclopentadiene	
			F	ST	F	ST	F	ST	F	ST	F	ST
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW					1/month	Grab				
		IW&IR1										
		IW1										
		SS1										
		SS2										
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2			1/discharge	Grab			Once prior to Discharge	Grab	1/discharge	Grab
		IW&IR3							1/day*	Grab		
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW			1/day after commencement of PE	Composite			1/day	Composite		
		IR										
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*										
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	CW										
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	IR										

\*= See Appendix for More Information

CW= Cooling Water Blowdown

F= Frequency

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW&IR2= Industrial Wastewater and Industrial Runoff from the Effluent Pond

IW&IR3= Industrial Wastewater and Industrial Runoff from the Retention Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ethylene Glycol Plant

N/A= Not Applicable

PE= Polyethylene Production Unit

S,B,E,T= Styrene, Benzene, Ethylbenzene, Toluene

SR= Surface Runoff

SS1= Sanitary Sewage Prior to Treatment

SS2= Sanitary Sewage, Treated

ST= Sample Type

TDS= Total Dissolved Solids

VCM= Vinyl Chloride Monomer

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored							
Facility	Approval #	Source	Total Phenolics		Arsenic		Mercury		Chromium	
			F	ST	F	ST	F	ST	F	ST
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW								
		IW&IR1								
		IW1								
		SS1								
		SS2								
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2	1/discharge	Grab	1/month	Grab	1/month	Grab	1/week	Grab
		IW&IR3								
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW	1/month after commencement of PE	Grab	1/month after commencement of PE	Grab	1/month after commencement of PE	Grab	1/month after commencement of PE	Grab
		IR								
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*								
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	CW							1/month	Composite
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	IR								

\*= See Appendix for More Information

CW= Cooling Water Blowdown

F= Frequency

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW&IR2= Industrial Wastewater and Industrial Runoff from the Effluent Pond

IW&IR3= Industrial Wastewater and Industrial Runoff from the Retention Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ethylene Glycol Plant

N/A= Not Applicable

PE= Polyethylene Production Unit

SR= Surface Runoff

SS1= Sanitary Sewage Prior to Treatment

SS2= Sanitary Sewage, Treated

ST= Sample Type

Chemical Plants - Monitoring

Chemical Plants			Parameters to be Monitored											
Facility	Approval #	Source	Zinc		Lead		Conductivity		Chlorate		Nitrates		Hexavalent Chromium	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
Shell Chemicals Canada Ltd. Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)	9767-01-06 95-IND-205	IW												
		IW&IR1												
		IW1												
		SS1												
		SS2												
NOVA Chemicals Ltd. Joffre Petrochemical and Chemical Manufacturing Plant	48309-00-00	IW&IR2	1/week	Grab										
		IW&IR3												
Union Carbide Canada Inc. Prentiss Chemical Manufacturing Plant	70974-00-00	IW	1/month after commencement of PE	Grab	1/month after commencement of PE	Grab								
		IR												
Methanex Corporation Medicine Hat Methanol Plant	95-IND-238	N/A*												
Sterling Pulp Chemicals Ltd. Grande Prairie Sodium Chlorate Plant	10980-01-00	CW					1/month	Composite						
CXY Chemicals Canada Ltd. Bruderheim Chemical Manufacturing Plant	10346-01-04	IR							Prior to Release*	Grab	Prior to Release*	Grab	Prior to Release*	Grab

\*= See Appendix for More Information

CW= Cooling Water Blowdown

F= Frequency

IW&IR1= Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater

IW&IR2= Industrial Wastewater and Industrial Runoff from the Effluent Pond

IW&IR3= Industrial Wastewater and Industrial Runoff from the Retention Pond

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ethylene Glycol Plant

N/A= Not Applicable

PE= Polyethylene Production Unit

SR= Surface Runoff

SS1= Sanitary Sewage Prior to Treatment

SS2= Sanitary Sewage, Treated

ST= Sample Type

## **TAB 1.B COAL MINES - MOUNTAIN AND PRAIRIE**

Coal mines are categorized based on their geographic location. There are five mountain, and seven prairie coal mines in Alberta.

Because the volume and nature of wastewater from a coal mine are generally unrelated to coal production quantities, wastewater limits are expressed in terms of concentration, rather than units of production.

### **Limits**

#### **Mountain Coal Mines**

- All five of these mines have limits on Industrial Wastewater discharges.
- One has limits for Industrial Runoff.
- Two have limits on Sanitary Sewage releases.

#### **Prairie Coal Mines**

Five of these seven mines have limits associated with them.

- Five have limits for Industrial Wastewater releases.
- One has limits on Industrial Runoff.
- Two do not have limits because they direct wastewater to wastewater systems at different facilities.

### **Monitoring**

#### **Mountain Coal Mines**

Industrial Wastewater facilities are made up of major ponds and minor ponds.

- All five of these mines monitor Industrial Wastewater from both major and minor ponds.
- Four of the mountain coal mines monitor Sanitary Sewage releases.

#### **Prairie Coal Mines**

- Five of the prairie coal mines monitor Industrial Wastewater releases.
- Two of the mines monitor Sanitary Sewage discharges.
- One of the prairie coal mines monitors Cooling Water discharges once pr year.
- One of these mines does not monitor discharges because it discharges to wastewater systems at a different facility.

Prairie Coal Mines - Limits

<b>Coal Mines - Prairie</b>			<b>Parameters and Associated Limits (All units are in mg/L, unless otherwise specified)</b>				
Facility	Approval #	Source	TSS	O&O	pH (Units)	FS/VF	SeS
			MDL		NTBE	NTBE	
Luscar Ltd. Sheerness Coal Mine	11876-01-00	IW	50*	Not present in amounts sufficient to create a visible film or sheen	6.0-9.5		
Forestburg Collieries (1984) Ltd. Paintearth Coal Mine	11364-01-01	IW		Not present in amounts sufficient to create a visible film or sheen	6.0-9.5		Maximum 0.5 mL/L*
Manalta Coal Ltd Vesta Coal Mine	11607-01-01	IW		Not present in amounts sufficient to create a visible film or sheen	6.0-9.5	Not present except in trace amounts	Maximum 0.5 mL/L
Manalta Coal Ltd. Montgomery Coal Mine	10289-01-01	IW	50*		6.0-9.5		
		IR		Not present in amounts sufficient to create a visible film or sheen			
TransAlta Utilities Corporation Whitewood Coal Mine	11851-01-00	IW	50*	Not present in amounts sufficient to create a visible film or sheen	6.0-9.5	Not present except in trace amounts	
TransAlta Utilities Corporation Highvale Coal Mine	11187-01-00	N/A*					
Edmonton Power Inc. Genesee Coal Mine	10404-01-00	N/A*					

\*= See Appendix for More Information

FS/VF= Floating Solids or Visible Foam

IR= Industrial Runoff from Shop/Office Runoff Pond

IW= Industrial Wastewater

MDL= Maximum Daily Limit

N/A= Not Applicable

NTBE= Never to be Exceeded

O&O= Oil and Other Substances

SeS= Settleable Solids

TSS= Total Suspended Solids

Prairie Coal Mines - Monitoring

Coal Mines - Prairie			Parameters to be Monitored							
Facility	Approval #	Source	TSS			Flow		Visual(FS,VF,O&O)		
			Time Period	F	ST	F	ST	Time Period	F	ST
Luscar Ltd. Sheerness Coal Mine	11876-01-00	IW		1/week and Prior to Discharge	Grab				1/week and Prior to Discharge	N/A
Forestburg Collieries (1984) Ltd. Paintearth Coal Mine	11364-01-01	IW1							1/week	Grab
		SS		Once per Discharge	Grab	1/day	Volume Estimate			
Manalta Coal Ltd. Vesta Coal Mine	11607-01-01	IW							1/week and prior to release	N/A
Manalta Coal Ltd. Montgomery Coal Mine	10289-01-01	IW		1/week	Grab					
		SS		Once per Discharge	Grab	1/day	Volume Estimate			
TransAlta Utilities Corporation Whitewood Coal Mine	11851-01-00	IW	Summer	1/week	Grab			Summer	1/week	N/A
			Winter	1/month	Grab			Winter	1/month	N/A
TransAlta Utilities Corporation Highvale Coal Mine	11187-01-00	N/A*								
Edmonton Power Inc. Genesee Coal Mine	10404-01-00	IW								

\*= See Appendix for More Information

CW= Cooling Water

F= Frequency

FS= Floating Solids

IW= Industrial Wastewater

IW1= Industrial Wastewater during Normal precipitation events

N/A= Not Applicable

O&O= Oil and Other Substances

SS= Sanitary Sewage

ST= Sample Type

TSS= Total Suspended Solids

VF= Visible Foam

Prairie Coal Mines - Monitoring

Coal Mines			Parameters to be Monitored							
Facility	Approval #	Source	pH			Once a year Comprehensive*	SeS		BOD	
			Time Period	F	ST		F	ST	F	ST
Luscar Ltd. Sheerness Coal Mine	11876-01-00	IW		1/week and Prior to Discharge	Grab	Analyzed yearly*				
Forestburg Collieries (1984) Ltd. Paintearth Coal Mine	11364-01-01	IW1		1/week and Prior to Discharge	Grab		1/week and Prior to Discharge	Grab		
		SS							Once per Discharge	Grab
Manalta Coal Ltd. Vesta Coal Mine	11607-01-01	IW		1/week and prior to release	Grab	Settling Ponds Analyzed Yearly*	1/week and Prior to release	Grab		
Manalta Coal Ltd. Montgomery Coal Mine	10289-01-01	IW		1/week	Grab					
		SS							Once per Discharge	Grab
TransAlta Utilities Corporation Whitewood Coal Mine	11851-01-00	IW	Summer	1/week	Grab	Each discharge stream will be analyzed yearly*				
			Winter	1/month	Grab					
TransAlta Utilities Corporation Highvale Coal Mine	11187-01-00	N/A*								
Edmonton Power Inc. Genesee Coal Mine	10404-01-00	CW				Analyzed yearly*				

\*= See Appendix for More Information

BOD= Biochemical Oxygen Demand

CW= Cooling Water

F= Frequency

IW= Industrial Wastewater

IW1= Industrial Wastewater during Normal precipitation events

N/A= Not Applicable

SeS= Settleable Solids

SS= Sanitary Sewage

ST= Sample Type

Mountain Coal Mines - Limits

<b>Coal Mines - Mountain</b>			<b>Parameters and Associated Limits (All units are in mg/L, unless otherwise specified)</b>						
Facility	Approval #	Source	TSS		ALT (Rainbow trout)	O&O	pH (Units)	FS/VF	BOD
			MDA	MDL			NTBE	NTBE	NTBE
Luscar Ltd. Gregg River Coal Mine and Processing Plant	11903-01-10	IW	50*	350*	50% or greater survival in 100% industrial wastewater sample	Not present in amounts sufficient to create a visible film or sheen	6.0-9.5	None except in trace amounts	
		SS		25					
Cardinal River Coals Ltd. Cardinal River Coal Mine	11769-00-08	IW	50*	350*		Not present in amounts sufficient to create a visible film or sheen	6.0-9.5		
		SS		25*					
Obed Mountain Coal Ltd. Obed Mountain Coal Mine	10084-00-02	IW	50*	350*		Not present in amounts sufficient to create a visible film or sheen	6.0-9.5		
Luscar Sterco (1977) Ltd. Luscar Sterco (Coal Valley) Mine	1915-00-05	IW	50*	350*		Not present in amounts sufficient to create a visible film or sheen	6.0-9.5		
Smoky River Coal Limited Smoky River Coal Mine	11933-00-05	IW	50*	350*		Not present in amounts sufficient to create a visible film or sheen	6.0-9.5		
		SS		25*					

\*= See Appendix for Special Conditions

ALT= Acute Lethality Test

BOD= Biochemical Oxygen Demand

FS/VF= Floating Solids or Visible Foam

IR= Industrial Runoff

IW= Industrial Wastewater

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

NTBE= Never to be Exceeded

O&O= Oil and Other Substances

SS= Sanitary Sewage

TSS= Total Suspended Solids



Mountain Coal Mines - Monitoring

Coal Mines - Mountain			Parameters to be Monitored											
Facility	Approval #	Source	TSS			Turbidity			Nitrate/Nitrite		pH			
			Time Period	F	ST	Time Period	F	ST	F	ST	Time Period	F	ST	
Luscar Ltd. Gregg River Coal Mine and Processing Plant	11903-01-09	MP		1/week and when turbidity >50 NTU	Grab	Summer	3/week	Grab			Summer	3/week	Grab	
							Winter	1/week	Grab			Winter	1/week	Grab
		MiP		1/week	Grab								1/week	Grab
Cardinal River Coals Ltd. Cardinal River Coal Mine	11769-00-08	SS		1/week	Grab									
		MP	Summer	1/week and when turbidity >50 NTU	Grab	Summer	3/week	Grab	1/month	Grab		1/week	Grab	
			Winter	1/week	Grab									
		MiP		1/week	Grab				1/month	Grab		1/week	Grab	
		SS		1/week	Grab									
Obed Mountain Coal Ltd. Obed Mountain Coal Mine	10084-00-02	MP	Summer	1/week and when turbidity >50 NTU	Grab	Summer	3/week	Grab	1/month	Grab		1/week	Grab	
			Winter	1/week	Grab									
		MiP		1/week	Grab				1/month	Grab		1/week	Grab	
		SS		Prior to release	Grab									
Luscar Sterco (1977) Ltd. Luscar Sterco (Coal Valley) Mine	1915-00-05	MP	Summer	1/week and when turbidity >50 NTU	Grab	Summer	3/week	Grab	1/month	Grab		1/week	Grab	
			Winter	1/week	Grab									
		MiP		1/week	Grab				1/month	Grab		1/week	Grab	
				SS		1/week	Grab							
Smoky River Coal Limited Smoky River Coal Mine	11933-00-05	MP	Summer	1/week and when turbidity >50 NTU	Grab	Summer	3/week	Grab	1/month	Grab		1/week	Grab	
			Winter	1/week	Grab									
		MiP		1/week	Grab				1/month	Grab		1/week	Grab	
				SS		1/week	Grab							

F= Frequency  
 MiP= Minor Ponds  
 MP= Major Ponds

NTU= Nephelometric Turbidity Unit  
 SS= Sanitary Sewage  
 ST= Sample Type  
 TSS= Total Suspended Solids

Mountain Coal Mines - Monitoring

Coal Mines - Mountain			Parameters to be Monitored											
Facility	Approval #	Source	Flow			BOD		Nitrate-Nitrogen		RW	Iron		Visual(FS,VF,O&O)	
			Time Period	F	ST	F	ST	F	ST		F	ST	F	ST
Luscar Ltd. Gregg River Coal Mine and Processing Plant	11903-01-09	MP	Summer	3/week	Weir			1/week	Grab	Must be Monitored			1/day	N/A
			Winter	1/week	Weir									
		MiP						1/month	Grab					1/week
Cardinal River Coals Ltd. Cardinal River Coal Mine	11769-00-08	MP				1/week	Grab				1/month	Grab	1/week	N/A
		MiP									1/month	Grab	1/week	N/A
		SS				1/week	Grab							
Obed Mountain Coal Ltd. Obed Mountain Coal Mine	10084-00-02	MP								Must be Monitored*	1/month	Grab	1/week	N/A
		MiP									1/month	Grab	1/week	N/A
		SS				Prior to release	Grab							
Luscar Sterco (1977) Ltd. Luscar Sterco (Coal Valley) Mine	1915-00-05	MP								Must be Monitored*	1/month	Grab	1/week	N/A
		MiP									1/month	Grab	1/week	N/A
		SS				1/week	Grab							
Smoky River Coal Limited Smoky River Coal Mine	11933-00-05	MP								Must be Monitored*	1/month	Grab	1/week	N/A
		MiP									1/month	Grab	1/Week	N/A
		SS				1/week	Grab							

\*= See Appendix for More Information

BOD= Biochemical Oxygen Demand

F= Frequency

FS= Floating Solids

MiP= Minor Ponds

MP= Major Ponds

N/A= Not Applicable

O&O= Oil and Other Substances

RW= Receiving Water

SS= Sanitary Sewage

ST= Sample Type

VF= Visible Foam

## **TAB 1.C FERTILIZER MANUFACTURING PLANTS**

There are currently four fertilizer manufacturing facilities in Alberta that release wastewater effluent to the environment. Two of the fertilizer plants release wastewater to the North Saskatchewan River, one releases to 12 Mile Coulee and another plant discharges to the South Saskatchewan River.

Three of the five facilities have wastewater limits. One uses wastewater for irrigation, and the other plant discharges to another facility's wastewater treatment system.

### **Limits**

- One of the fertilizer manufacturing plants has limits associated with Industrial Wastewater and Industrial Runoff releases.
- One plant has limits for Industrial Runoff.

### **Monitoring**

- All four of the plants monitor Industrial Wastewater.
- One of the plants monitors Industrial Runoff.

Fertilizer Manufacturing Plants - Limits

<b>Fertilizer Manufacturing Plants</b>			<b>Parameters and Associated Limits</b> (All units in kg/day, unless otherwise specified)										
Facility	Approval #	Source	Ammonia-Nitrogen			Nitrate-Nitrogen			Organic Nitrogen				pH (units)
			Effective Date	MDA	MDL	Effective Date	MDA	MDL	Effective Date	MDA	MDL	ODA	NTBE
Agrium Products Inc. Fort Saskatchewan Fertilizer Manufacturing Plant	20477-00-00	N/A*	All Discharges Directed to Sherritt International Effluent Management System										
Agrium Products Inc. Redwater Fertilizer Manufacturing Plant	210-01-05	IW&IR	Current	250	480	Current	240	500	Current	50	250		6.0-9.5
			Oct. 1, 1999	115	250	Oct. 1, 1999	145	375	Oct. 1, 1999	30	125		
			Oct. 1, 2002	50	125	Oct. 1, 2002	75	250	Oct. 1, 2002	17	65		
Agrium Products Inc. Carseland Fertilizer Manufacturing Plant	1580-01-00	N/A*											
Canadian Fertilizers Limited Medicine Hat Fertilizer Manufacturing Plant	1336-00-07	IW	Current	170	700					80	300	220	6.0-9.5
			Jan. 1, 2000	170	400								
			Sept. 1, 2000	105	250								
			Sept. 1, 2005	40	100								
Sherritt International Corporation Fort Saskatchewan Fertilizer Manufacturing & Metal Manufacturing Plant	211-01-00	IW&IR	Current	505	1010				Current	284	852		6.0-9.5
			Sept. 1, 2000	280	580				Sept. 1, 2000	70	335		
			Sept. 1, 2005	60	150								

\*= See Appendix for More Information

IW= Industrial Wastewater

IW&IR= Industrial Wastewater and Industrial Runoff

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

N/A= Not Applicable

NTBE= Never to be Exceeded

ODA= One Day Amount (may be exceeded one day a month only)

Fertilizer Manufacturing Plants - Limits

<b>Fertilizer Manufacturing Plants</b>			<b>Parameters and Associated Limits</b> (All units in kg/day, unless otherwise specified)										
Facility	Approval #	Source	Phosphate				TSS				ALT (Rainbow trout)	FS&VF	O&O
			Effective Date	MDA	MDL	ODA	Effective Date	MDA	MDL	ODA			
Agrium Products Inc. Fort Saskatchewan Fertilizer Manufacturing Plant	20477-00-00	N/A*											
Agrium Products Inc. Redwater Fertilizer Manufacturing Plant	210-01-05	IW&IR	Current	60	200		Current	300	800		50% or greater survival in 100% industrial wastewater sample	Not present except in trace amounts	Not present in amounts sufficient to create a visible film or sheen
			Oct. 1, 1999	45	140		Oct. 1, 1999	235	650				
			Oct. 1, 2002	35	90		Oct. 1, 2002	150	500				
Agrium Products Inc. Carseland Fertilizer Manufacturing Plant	1580-01-00	N/A*											
Canadian Fertilizers Limited Medicine Hat Fertilizer Manufacturing Plant	1336-00-07	IW		20	100	50		150	500	350			Not present in amounts sufficient to create a visible film or sheen, or other than trace amounts
Sherritt International Corporation Fort Saskatchewan Fertilizer Manufacturing & Metal Manufacturing Plant	211-01-00	IW&IR	Current	44	132		Current	529	1587		50% or greater survival in 100% industrial wastewater sample	Not present except in trace amounts	Not present in amounts sufficient to create a visible film or sheen
			Sept. 1, 2000	30	60		Sept. 1, 2000	200	700				

\*= See Appendix for More Information

ALT= Acute Lethality Test

FS&VF= Floating Solids and Visible Foam

IW= Industrial Wastewater

IW&IR= Industrial Wastewater and Industrial Runoff

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

N/A= Not Applicable

O&O= Oil and Other Substances

ODA= One Day Amount (may be exceeded one day a month only)

TSS= Total Suspended Solids

Fertilizer Manufacturing Plants - Monitoring

Fertilizer Manufacturing Plants			Parameters to be Monitored									
Facility	Approval #	Source	Phosphate		TSS		Ammonia-Nitrogen		TKN		Nitrate-Nitrogen	
			F	ST	F	ST	F	ST	F	ST	F	ST
Agrium Products Inc. Fort Saskatchewan Fertilizer Manufacturing Plant	20477-00-00	IW	1/week	Composite	1/week	Composite	1/week	Composite	1/week	Composite	1/week	Composite
Agrium Products Inc. Redwater Fertilizer Manufacturing Plant	210-01-05	IW	1/day and prior to release	Composite	1/day and prior to release	Composite	1/day and prior to release	Composite			1/day and prior to release	Composite
		IR	Prior to & during discharge to settling pond	Grab	Prior to & during discharge to settling pond	Grab	Prior to & during discharge to settling pond	Grab			Prior to & during discharge to settling pond	Grab
Agrium Products Inc. Carseland Fertilizer Manufacturing Plant	1580-01-00	IW1			1/month*	RG	1/month*	RG			1/month*	RG
		IW2										
Canadian Fertilizers Limited Medicine Hat Fertilizer Manufacturing Plant	1336-00-07	IW	3/week	Composite	3/week	Composite	1/day	Composite			3/week	Composite
Sherritt International Corporation Fort Saskatchewan Fertilizer Manufacturing & Metal Manufacturing Plant	211-01-00	IW&IR	1/day	Composite	1/day	Composite	1/day	Composite	1/day	Composite	1/day	Composite

\*= See Appendix for More Frequency Information

F= Frequency

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater from Irrigation and Evaporation Ponds

IW2= Industrial Wastewater from Stormwater Ponds

RG= Representative Grab

ST= Sample Type

TKN= Total Kjeldahl Nitrogen

TSS= Total Suspended Solids

Fertilizer Manufacturing Plants - Monitoring

Fertilizer Manufacturing Plants			Parameters to be Monitored									
Facility	Approval #	Source	Organic Nitrogen		pH		Flow/Discharge Volume		ALT		COD	
			F	ST	F	ST	F	ST	F	ST	F	ST
Agrium Products Inc. Fort Saskatchewan Fertilizer Manufacturing Plant	20477-00-00	IW	1/week	Composite	1/day	Continuous						
Agrium Products Inc. Redwater Fertilizer Manufacturing Plant	210-01-05	IW	1/day and prior to release	Composite	1/day and prior to release	Composite and Continuous	1/day and prior to release	Totalizer	1/month and prior to release*	Composite or Grab	1/week and prior to release	Composite
		IR	Prior to & during discharge to settling pond	Grab	Prior to & during discharge to settling pond	Grab	Prior to & during discharge to settling pond	Estimate				
Agrium Products Inc. Carseland Fertilizer Manufacturing Plant	1580-01-00	IW1	1/month*	RG	1/month*	RG	1/month*	RG				
		IW2			1/day							
Canadian Fertilizers Limited Medicine Hat Fertilizer Manufacturing Plant	1336-00-07	IW	1/day	Composite	1/day	Composite	1/day	Totalizer	1/month*	Composite	1/week	Composite
Sherritt International Corporation Fort Saskatchewan Fertilizer Manufacturing & Metal Manufacturing Plant	211-01-00	IW&IR	1/day	Composite	1/day	and	1/day	Totalizer	1/month	or Grab	1/week	Composite

\*= See Appendix for More Frequency Information

ALT= Acute Lethality Tests

COD= Chemical Oxygen Demand

F= Frequency

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater from Irrigation and Evaporation Ponds

IW2= Industrial Wastewater from Stormwater Ponds

RG= Representative Grab

ST= Sample Type

Fertilizer Manufacturing Plants - Monitoring

Fertilizer Manufacturing Plants			Parameters to be Monitored											
Facility	Approval #	Source	BOD		TOC		DOC		Uranium (238)		Gross-alpha		Gross-beta	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
Agrium Products Inc. Fort Saskatchewan Fertilizer Manufacturing Plant	20477-00-00	IW												
Agrium Products Inc. Redwater Fertilizer Manufacturing Plant	210-01-05	IW	1/week and prior to release	Composite	1/week and prior to release	Composite	1/week and prior to release	Composite	1/3 months and prior to release	Composite	1/3 months and prior to release	Composite	1/3 months and prior to release	Composite
		IR												
Agrium Products Inc. Carseland Fertilizer Manufacturing Plant	1580-01-00	IW1												
		IW2												
Canadian Fertilizers Limited Medicine Hat Fertilizer Manufacturing Plant	1336-00-07	IW												
Sherritt International Corporation Fort Saskatchewan Fertilizer Manufacturing & Metal Manufacturing Plant	211-01-00	IW&IR	1/week	Composite										

BOD= Biochemical Oxygen Demand  
 DOC= Dissolved Organic Carbon  
 F= Frequency  
 IR= Industrial Runoff  
 IW= Industrial Wastewater

IW1= Industrial Wastewater from Irrigation and Evaporation Ponds  
 IW2= Industrial Wastewater from Stormwater Ponds  
 ST= Sample Type  
 TOC= Total Organic Carbon



Fertilizer Manufacturing Plants - Monitoring

Fertilizer Manufacturing Plants			Parameters to be Monitored										
Facility	Approval #	Source	RW	TP		SAR		EC		HM		O&G	
				F	ST	F	ST	F	ST	F	ST	F	ST
Agrium Products Inc. Fort Saskatchewan Fertilizer Manufacturing Plant	20477-00-00	IW											
Agrium Products Inc. Redwater Fertilizer Manufacturing Plant	210-01-05	IW											
		IR											
Agrium Products Inc. Carseland Fertilizer Manufacturing Plant	1580-01-00	IW1	Must be Monitored	1/month*	RG	1/month*	RG	1/month*	RG	1/year*	RG		
		IW2								1/year*	RG		
Canadian Fertilizers Limited Medicine Hat Fertilizer Manufacturing Plant	1336-00-07	IW	Must be Monitored									1/day	Visual
Sherritt International Corporation Fort Saskatchewan Fertilizer Manufacturing & Metal Manufacturing Plant	211-01-00	IW&IR											

\*= See Appendix for More Frequency Information

EC= Electrical Conductivity

F= Frequency

HM= Heavy Metals

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater from Irrigation and Evaporation Ponds

IW2= Industrial Wastewater from Stormwater Ponds

O&G= Oil and Grease

RG= Representative Grab

RW= Receiving Water

SAR= Sodium Adsorption Ratio

ST= Sample Type

TP= Total Phosphorus

Fertilizer Manufacturing Plants - Monitoring

<b>Fertilizer Manufacturing Plants</b>			<b>Parameters to be Monitored</b>								
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>Nickel</b>		<b>Copper</b>		<b>Cobalt</b>		<b>Cyanide</b>		
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	
Agrium Products Inc. Fort Saskatchewan Fertilizer Manufacturing Plant	20477-00-00	IW									
Agrium Products Inc. Redwater Fertilizer Manufacturing Plant	210-01-05	IW									
		IR									
Agrium Products Inc. Carseland Fertilizer Manufacturing Plant	1580-01-00	IW1									
		IW2									
Canadian Fertilizers Limited Medicine Hat Fertilizer Manufacturing Plant	1336-00-07	IW									
Sherritt International Corporation Fort Saskatchewan Fertilizer Manufacturing & Metal Manufacturing Plant	211-01-00	IW&IR	1/day	Composite	1/day	Composite	1/day	Composite	1/day	Composite	Composite

## **TAB 1.D      FOUNDRY**

There is one foundry facility in Alberta which releases wastewater to the environment.

### **Limits**

- This facility has limits associated with Industrial Wastewater releases. There are two sets of limits, one for normal runoff periods, and one for high runoff periods.

### **Monitoring**

- This facility has a monitoring program for Industrial Wastewater discharges.

## Foundry - Limits

<b>Foundry</b>			<b>Parameters and Associated Limits</b>									
<b>(All units are in mg/L, unless otherwise specified)</b>												
Facility	Approval #	Source	COD		TSS		pH (Units)	Total Iron		O&O	FS/VF	ALT (Rainbow trout)
			MDA	MDL	MDA	MDL	NTBE	MDA	MDL		NTBE	
AltaSteel Ltd. Edmonton Steel Producing Plant	1408-01-00	IW1	60	100	25	75	6.0-9.5	1.5	3	Not present in amounts sufficient to create a visible film or sheen	Not present except in trace amounts	50% or greater survival in 100% industrial wastewater sample
		IW2	60	100	25	150	6.0-9.5	1.5	5	Not present in amounts sufficient to create a visible film or sheen	Not present except in trace amounts	50% or greater survival in 100% industrial wastewater sample

ALT= Acute Lethality Test

COD= Chemical Oxygen Demand

FS/VF= Floating Solids or Visible Foam

IW1= Industrial Wastewater during Normal Runoff periods

IW2= Industrial Wastewater during High Runoff periods

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

NTBE= Never to be Exceeded

O&O= Oil and Other Substances

TSS= Total Suspended Solids

Foundry - Monitoring

<b>Foundry</b>			<b>Parameters to be Monitored</b>									
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>COD</b>		<b>TSS</b>		<b>Flow</b>		<b>Acute Lethality Tests</b>		<b>Fluoride</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>
AltaSteel Ltd. Edmonton Steel Producing Plant	1408-01-00	IW	1/week	Composite	M/W/F	Composite	1/day	Totalizer	Semi-annually*	Grab	1/week	Composite

<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>Total Metals</b>		<b>pH</b>		<b>O&amp;G</b>		<b>Total Iron</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>
AltaSteel Ltd. Edmonton Steel Producing Plant	1408-01-00	IW	Semi-annually	Composite	M/W/F	Composite	M/W/F	Composite	1/week	Composite

\*= See Appendix for More Frequency Information

COD= Chemical Oxygen Demand

F= Frequency

IW= Industrial Wastewater

M/W/F= Monday, Wednesday, and Friday are the sampling days

O&G= Oil and Grease

ST= Sample Type

TSS= Total Suspended Solids

## **TAB 1.E      GAS PLANTS**

There are approximately 600 approved gas plants in Alberta. They can be divided into three general types, Acid Gas Flaring, Sulfur Recovery, and Acid Gas Re-injection.

Limits and Monitoring for twenty gas plants, which are representative of the majority of facilities in the province, is provided. Four of the gas plants do not have limits or monitoring requirements associated with them.

### **Limits**

- Four of the gas plants have limits associated with Industrial Wastewater discharges.
- Sixteen have limits for Industrial Runoff releases.

### **Monitoring**

- Three of the gas plants monitor parameters on Industrial Wastewater discharges.
- Sixteen of the twenty gas plants monitor parameters on Industrial Runoff discharges.
- Three of the gas plants monitor parameters on Sanitary Sewage discharges.

Gas Plants - Limits

Gas Plants			Parameters and Associated Limits (All units are in mg/L, unless otherwise specified)						
Facility	Approval #	Source	COD		TSS		Chloride		Oil and Grease
			MDA	MDL	MDA	MDL	MDA	MDL	
Shell Canada Limited - Caroline Sour Gas Plant	11323-01-00	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Shell Canada Limited - Waterton sour gas plant	258-01-02	IW	60 kg/d	120 Kg/d	13 kg/d	25 kg/d	100 kg/d	200 kg/d	Not present in amounts sufficient to create a visible film or sheen
		IR		50		25		250	Not present in amounts sufficient to create a visible film or sheen
Husky Oil Operations Ltd. - Ram River Sour Gas Plant	57-01-01	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Chevron Canada Resources Limited Kaybob South - Beaverhill Lake Gas Unit No. 3 Sour Gas Plant	1508-01-02	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Amoco Canada Petroleum Company Ltd. Kaybob South - Beaverhill Lake Sour Gas Plant	279-01-00	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Petro-Canada Resources Wildcat Hills Sour Gas Plant	9859-01-00	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Shell Canada Limited - Jumping Pound Sour Gas Plant	11588-00-01	IW	75 kg/d	150	12.5 kg/d	30		500	Not present in amounts sufficient to create a visible film or sheen
		IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Gulf Canada Resources Limited - Strachan Sour Gas Plant	1350-00-03 93-WL-119A 93-AL-164A(94)	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen

COD= Chemical Oxygen Demand  
 IR= Industrial Runoff  
 IW= Industrial Wastewater

MDA= Maximum Daily Average (for any month)  
 MDL= Maximum Daily Limit  
 TSS= Total Suspended Solids

Gas Plants - Limits

Gas Plants		Parameters and Associated Limits (All units are in mg/L, unless otherwise specified)								
Facility	Approval #	Source	NH <sub>3</sub> -N		pH (Units)		ALT	FCR		FS/VF
			MDA	MDL	NTBE			MDA	MDL	
Shell Canada Limited - Caroline Sour Gas Plant	11323-01-00	IR		5	6.0-9.5					
Shell Canada Limited - Waterton sour gas plant	258-01-02	IW	2 kg/d	4 kg/d	6.0-9.5	50% or greater survival in 100% industrial wastewater sample				Not present except in trace amounts
		IR		2	6.0-9.5					Not present except in trace amounts
Husky Oil Operations Ltd. - Ram River Sour Gas Plant	57-01-01	IR		5	6.0-9.5					
Chevron Canada Resources Limited Kaybob South - Beaverhill Lake Gas Unit No. 3 Sour Gas Plant	1508-01-02	IR		5	6.0-9.5					
Amoco Canada Petroleum Company Ltd. Kaybob South - Beaverhill Lake Sour Gas Plant	279-01-00	IR		5	6.0-9.5					
Petro-Canada Resources Wildcat Hills Sour Gas Plant	9859-01-00	IR		5	6.0-9.5					
Shell Canada Limited - Jumping Pound Sour Gas Plant	11588-00-01	IW	2 kg/d	5	6.0-9.5					Not present except in trace amounts
		IR		5	6.0-9.5					Not present except in trace amounts
Gulf Canada Resources Limited - Strachan Sour Gas Plant	1350-00-03 93-WL-119A 93-AL-164A(94)	IR		5	6.0-9.5					

ALT= Acute Lethality Test  
 FCR= Free Chlorine Residual  
 FS/VF= Floating Solids or Visible Foam

IR= Industrial Runoff  
 IW= Industrial Wastewater  
 MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit  
 NH<sub>3</sub>-N= Ammonia-Nitrogen  
 NTBE= Not to be Exceeded



Gas Plants - Limits

Gas Plants			Parameters and Associated Limits (All units are in mg/L, unless otherwise specified)						
Facility	Approval #	Source	COD		TSS		Chloride		Oil and Grease
			MDA	MDL	MDA	MDL	MDA	MDL	
Crestar Energy Inc. - Vulcan Sour Gas Plant	282-01-00	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Vintage Resource Corp. - West Drumheller Sour Gas Plant	10384-01-00	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Union Pacific Resources Inc. - Spirit River Sour Gas Plant	11096-01-00	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
AltaGas Services Inc. - Sedgewick Sour Gas Plant	11098-01-00	N/A*							
Shell Canada Limited - Hope Creek Sour Gas Plant	16441-01-00	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Petro-Canada Resources - Whitecourt Sour Gas Plant	10315-01-01	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #3	46565-00-00	N/A*							
PanCanadian Petroleum Limited - Wayne-Rosedale Sour Gas Plant	17-00-01 95-IND-002	IR		50		25		500	Not present in amounts sufficient to create a visible film or sheen
Morrison Petroleum Ltd. - Wizard Lake Sour Gas Plant	1558-00-04 95-IND-010A	N/A*							
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #2	95-IND-036	N/A*							
Petro-Canada - Empress Straddle Gas Plant	289-01-04	IW	82.5 kg/d	150	27.5 kg/d	50			Not present in amounts sufficient to create a visible film or sheen
		IR		50		25			Not present in amounts sufficient to create a visible film or sheen
Alberta Natural Gas Company Ltd. Cochrane Extraction (Straddle) Gas Plant	979-01-01	IR		50		25			Not present in amounts sufficient to create a visible film or sheen
		IW	35 kg/d	150	10 kg/d	50			Not present in amounts sufficient to create a visible film or sheen

\*= See Appendix for More Information  
 COD= Chemical Oxygen Demand  
 IR= Industrial Runoff

IW= Industrial Wastewater  
 MDA= Maximum Daily Average (for any month)  
 MDL= Maximum Daily Limit

N/A= Not Applicable  
 TSS= Total Suspended Solids

Gas Plants - Limits

Gas Plants		Parameters and Associated Limits (All units are in mg/L, unless otherwise specified)								
Facility	Approval #	Source	NH <sub>3</sub> -N		pH (Units)		ALT	FCR		FS/VF
			MDA	MDL	NTBE	MDA		MDL		
Crestar Energy Inc. - Vulcan Sour Gas Plant	282-01-00	IR		5	6.0-9.5					
Vintage Resource Corp. - West Drumheller Sour Gas Plant	10384-01-00	IR		5	6.0-9.5					
Union Pacific Resources Inc. - Spirit River Sour Gas Plant	11096-01-00	IR		5	6.0-9.5					
AltaGas Services Inc. - Sedgewick Sour Gas Plant	11098-01-00	N/A*								
Shell Canada Limited - Hope Creek Sour Gas Plant	16441-01-00	IR		5	6.0-9.5					
Petro-Canada Resources - Whitecourt Sour Gas Plant	10315-01-01	IR		5	6.0-9.5					
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #3	46565-00-00	N/A*								
PanCanadian Petroleum Limited - Wayne-Rosedale Sour Gas Plant	17-00-01 95-IND-002	IR		5	6.0-9.5					
Morrison Petroleum Ltd. - Wizard Lake Sour Gas Plant	1558-00-04 95-IND-010A	N/A*								
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant	95-IND-036	N/A*								
Petro-Canada - Empress Straddle Gas Plant	289-01-04	IW	2.8 kg/d	5	6.0-9.5	50% or greater survival in 100% process wastewater sample	0.28 kg/d	0.5		
		IR		5	6.0-9.5					
Alberta Natural Gas Company Ltd. Cochrane Extraction (Straddle) Gas Plant	979-01-01	IR		5	6.0-9.5					
		IW	1 kg/d	5	6.0-9.5		0.15 kg/d	0.5		

\*= See Appendix for More Information  
 ALT= Acute Lethality Test  
 FCR= Free Chlorine Residual  
 FS/VF= Floating Solids or Visible Foam

IR= Industrial Runoff  
 IW= Industrial Wastewater  
 MDA= Maximum Daily Average (for any month)  
 MDL= Maximum Daily Limit

N/A= Not Applicable  
 NH<sub>3</sub>-N= Ammonia-Nitrogen  
 NTBE= Not to be Exceeded

Gas Plants - Monitoring

Gas Plants			Parameters to be Monitored										
Facility	Approval #	Source	COD		TSS		Flow/Discharge Volume		pH		Toxicity Testing		
			F	ST	F	ST	F	ST	F	ST	F	ST	
Shell Canada Limited Caroline Sour Gas Plant	11323-01-00	IR	1/week and Prior to Release	Grab	1/week and Prior to Release	Grab	1/day	Volume Estimate	1/day and Prior to Release	Grab			
Shell Canada Limited Waterton Sour Gas Plant	258-01-02	IW	1/day	Composite	1/day	Composite	1/day	Totalizer	1/day	Continuous	ALT* And CT*	Composite or Grab	
		IR	1/day	Composite	1/day	Composite	1/day	Totalizer	1/day	Continuous			
		IR1	1 prior to and during release	Grab	1 prior to and during release	Grab	1/day	Volume Estimate	1/day and prior to release	Grab			
Husky Oil Operations Ltd. Ram River Sour Gas Plant	57-01-01	IR	1/week and prior to release	Grab	1/week and prior to release	Grab	1/day and prior to release	Grab	1/day and prior to release	Grab	ALT* 1/month*	Grab	
		SS			1/release	Grab	1/day	Volume Estimate					
Chevron Canada Resources Limited Kaybob South - Beaverhill Lake Gas Unit No. 3 Sour Gas Plant	1508-01-02	IR	1/week	Grab	1/week	Grab	1/day	Grab	1/day	Grab			
		SS			1/release	Grab	1/day	Volume Estimate					
Amoco Canada Petroleum Company Ltd. Kaybob South - Beaverhill Lake Sour Gas Plant	279-01-00	IR	1/week	Grab	1/week	Grab	1/day	Grab	1/day	Grab			
		SS			1/release	Grab	1/day	Volume Estimate					
Petro-Canada Resources Wildcat Hills Sour Gas Plant	9859-01-00	IR	1/week and prior to release	Grab	1/week and prior to release	Grab	1/day and prior to release	Grab	1/day and prior to release	Grab			
Shell Canada Limited Jumping Pound Sour Gas Plant	11588-00-01	IW	1/day	Composite	1/day	Composite	1/day	Continuous	1/day	Composite	ALT* 1/month*	Grab or Composite	
		IR	during discharge	Grab or Composite	during discharge	Grab or Composite	during discharge	Continuous	during discharge	Grab or Composite			
Gulf Canada Resources Limited Strachan Sour Gas Plant	93-WL-119A 93-AL-164A(94) 1350-00-02	IR	1/week and Prior to Release	Grab	1/week and Prior to Release	Grab	1/day and Prior to Release	Grab	1/day and Prior to Release	Grab			

\*= See Appendix for More Frequency Information

ALT= Acute Lethality Tests

COD= Chemical Oxygen Demand

CT= Chronic Toxicity

F= Frequency

IR= Industrial Runoff

IR1= Industrial Runoff from Batch Releases

IW= Industrial Wastewater

SS= Sanitary Sewage

ST= Sample Type

TSS= Total Suspended Solids

Gas Plants - Monitoring

Gas Plants			Parameters to be Monitored										
Facility	Approval #	Source	Ammonia-Nitrogen		Total Phosphate		DOC		RW	FCR		Conductivity	
			F	ST	F	ST	F	ST		F	ST	F	ST
Shell Canada Limited Caroline Sour Gas Plant	11323-01-00	IR	1/week and Prior to Release	Grab									
Shell Canada Limited Waterton Sour Gas Plant	258-01-02	IW	1/day	Grab	1/week	Composite			Must be monitored				
		IR	1/day	Grab	1/week	Composite							
		IR1	1 prior to and during release	Grab	1/year	Grab							
Husky Oil Operations Ltd. Ram River Sour Gas Plant	57-01-01	IR	1/week and prior to release	Grab									
		SS											
Chevron Canada Resources Limited Kaybob South - Beaverhill Lake Gas Unit No. 3 Sour Gas Plant	1508-01-02	IR	1/week	Grab									
		SS											
Amoco Canada Petroleum Company Ltd. Kaybob South - Beaverhill Lake Sour Gas Plant	279-01-00	IR	1/week	Grab									
		SS											
Petro-Canada Resources Wildcat Hills Sour Gas Plant	9859-01-00	IR	1/week and prior to release	Grab									
Shell Canada Limited Jumping Pound Sour Gas Plant	11588-00-01	IW	1/day	Composite	1/week	Composite	1/week	Composite				1/week	Composite
		IR	during discharge	Grab or Composite									
Gulf Canada Resources Limited Strachan Sour Gas Plant	93-WL-119A 93-AL-164A(94) 1350-00-02	IR	1/week and Prior to Release	Grab									

DOC= Dissolved Organic Carbon  
F= Frequency  
FCR= Free Chlorine Residual

IR= Industrial Runoff  
IR1= Industrial Runoff from Batch Releases  
IW= Industrial Wastewater

RW= Receiving Water  
SS= Sanitary Sewage  
ST= Sample Type

Gas Plants - Monitoring

Gas Plants			Parameters to be Monitored									
Facility	Approval #	Source	Total Metals		Sulphate		O&O		LBT		Chloride	
			F	ST	F	ST	F	ST	F	ST	F	ST
Shell Canada Limited Caroline Sour Gas Plant	11323-01-00	IR			1/week and Prior to Release	Grab	1/day and Prior to Release	Grab			1/week and Prior to Release	Grab
Shell Canada Limited Waterton Sour Gas Plant	258-01-02	IW	1/month	Grab	1/day	Composite			1/month	Composite or Grab	1/day	Composite
		IR	1/month	Grab	1/day	Composite					1/day	Composite
		IR1	1/year	Grab	1 prior to and during release	Grab	Prior to release	Visual			1 prior to and during release	Grab
Husky Oil Operations Ltd. Ram River Sour Gas Plant	57-01-01	IR			1/week and prior to release	Grab	1/day and prior to release	Grab			1/week and prior to release	Grab
		SS										
Chevron Canada Resources Limited Kaybob South - Beaverhill Lake Gas Unit No. 3 Sour Gas Plant	1508-01-02	IR			1/week	Grab	1/day	Grab			1/week	Grab
		SS										
Amoco Canada Petroleum Company Ltd. Kaybob South - Beaverhill Lake Sour Gas Plant	279-01-00	IR			1/week	Grab	1/day	Grab			1/week	Grab
		SS										
Petro-Canada Resources Wildcat Hills Sour Gas Plant	9859-01-00	IR			1/week and prior to release	Grab	1/day and prior to release	Grab			1/week and prior to release	Grab
Shell Canada Limited Jumping Pound Sour Gas Plant	11588-00-01	IW	1/3 months	Composite	1/week	Composite	1/week	Composite	1/week	Composite	1/day	Composite
		IR			during discharge	Grab or Composite	during discharge	Grab or Composite			during discharge	Grab or Composite
Gulf Canada Resources Limited Strachan Sour Gas Plant	93-WL-119A 93-AL-164A(94) 1350-00-02	IR			1/week and Prior to Release	Grab	1/day and Prior to Release	Grab			1/week and Prior to Release	Grab

F= Frequency  
 IR= Industrial Runoff  
 IR1= Industrial Runoff from Batch Releases  
 IW= Industrial Wastewater

LBT= Luminescent Bacterial Test (EC50, 15 min)  
 O&O= Oil and Other Substances  
 SS= Sanitary Sewage  
 ST= Sample Type

Gas Plants - Monitoring

Gas Plants			Parameters to be Monitored							
Facility	Approval #	Source	Total Hardness		TDS		BOD		Temperature	
			F	ST	F	ST	F	ST	F	ST
Shell Canada Limited Caroline Sour Gas Plant	11323-01-00	IR								
Shell Canada Limited Waterton Sour Gas Plant	258-01-02	IW							1/day	Grab or Recorder
		IR							1/Week	Grab or Recorder
		IR1								
Husky Oil Operations Ltd. Ram River Sour Gas Plant	57-01-01	IR								
		SS					1/release	Grab		
Chevron Canada Resources Limited Kaybob South - Beaverhill Lake Gas Unit No. 3 Sour Gas Plant	1508-01-02	IR								
		SS					1/release	Grab		
Amoco Canada Petroleum Company Ltd. Kaybob South - Beaverhill Lake Sour Gas Plant	279-01-00	IR								
		SS					1/release	Grab		
Petro-Canada Resources Wildcat Hills Sour Gas Plant	9859-01-00	IR								
Shell Canada Limited Jumping Pound Sour Gas Plant	11588-00-01	IW	1/week	Composite	1/week	Composite				
		IR								
Gulf Canada Resources Limited Strachan Sour Gas Plant	93-WL-119A 93-AL-164A(94) 1350-00-02	IR								

BOD= Biochemical Oxygen Demand  
 F= Frequency  
 IR= Industrial Runoff  
 IR1= Industrial Runoff from Batch Releases

IW= Industrial Wastewater  
 SS= Sanitary Sewage  
 ST= Sample Type  
 TDS= Total Dissolved Solids  
 TOC= Total Organic Carbon

Gas Plants - Monitoring

Gas Plants			Parameters to be Monitored									
Facility	Approval #	Source	COD		TSS		Flow/Discharge Volume		pH		Toxicity Testing	
			F	ST	F	ST	F	ST	F	ST	F	ST
Crestar Energy Inc. Vulcan Sour Gas Plant	282-01-00	IR	1/week	Grab	1/week	Grab	1/day	Grab	1/day	Grab		
Vintage Resource Corp. West Drumheller Sour Gas Plant	10384-01-00	IR	1/week and Prior to Release	Grab	1/week and Prior to Release	Grab	1/day and Prior to Release	Grab	1/day and Prior to Release	Grab		
Union Pacific Resources Inc. Spirit River Sour Gas Plant	11096-01-00	IR	1/week and Prior to Release	Grab	1/week and Prior to Release	Grab	1/day and Prior to Release	Grab	1/day and Prior to Release	Grab		
AltaGas Services Inc. - Sedgewick Sour Gas Plant	11098-01-00	N/A*										
Shell Canada Limited Hope Creek Sour Gas Plant	16441-01-00	IR	1/week and Prior to Release	Grab	1/week and Prior to Release	Grab	1/day and Prior to Release	Grab	1/day and Prior to Release	Grab		
Petro-Canada Resources Whitecourt Sour Gas Plant	10315-01-01	IR	1/week and Prior to Release	Grab	1/week and Prior to Release	Grab	1/day and Prior to Release	Grab	1/day and Prior to Release	Grab		
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #3	46565-00-00	N/A*										
PanCanadian Petroleum Limited Wayne-Rosedale Sour Gas Plant	95-IND-002 17-00-01	IR	1/week and Prior to Release	Grab	1/week and Prior to Release	Grab	1/day and Prior to Release	Grab	1/day and Prior to Release	Grab		
Morrison Petroleum Ltd. Wizard Lake Sour Gas Plant	95-IND-010A 1558-00-03	N/A*										
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #2	95-IND-036	N/A*										
Petro-Canada Empress Straddle Gas Plant	289-01-04	IW	1/week	Grab	1/week	Grab	1/day	Continuous	1/day	Grab	ALT*	Grab
		IR	1/week and prior to release	Grab	1/week and prior to release	Grab	1/day and prior to release	Grab	1/day and prior to release	Grab	1/month*	
Alberta Natural Gas Company Ltd. Cochrane Extraction (Straddle) Gas Plant	979-01-01	IR	1/week and Prior to Release	Grab	1/week and Prior to Release	Grab	1/day and Prior to Release	Grab	1/day and Prior to Release	Grab		

\*= See Appendix for More Information

ALT= Acute Lethality Tests

COD= Chemical Oxygen Demand

F= Frequency

IR= Industrial Runoff

IW= Industrial Wastewater

N/A= Not Applicable

ST= Sample Type

TSS= Total Suspended Solids

Gas Plants - Monitoring

Gas Plants			Parameters to be Monitored										
Facility	Approval #	Source	Ammonia-Nitrogen		Total Phosphate		DOC		RW	FCR		Conductivity	
			F	ST	F	ST	F	ST		F	ST		
Crestar Energy Inc. Vulcan Sour Gas Plant	282-01-00	IR	1/week and	Grab									
Vintage Resource Corp. West Drumheller Sour Gas Plant	10384-01-00	IR	1/week and Prior to Release	Grab									
Union Pacific Resources Inc. Spirit River Sour Gas Plant	11096-01-00	IR	1/week and Prior to Release	Grab									
AltaGas Services Inc. - Sedgewick Sour Gas Plant	11098-01-00	N/A*											
Shell Canada Limited Hope Creek Sour Gas Plant	16441-01-00	IR	1/week and Prior to Release	Grab									
Petro-Canada Resources Whitecourt Sour Gas Plant	10315-01-01	IR	1/week and Prior to Release	Grab									
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #3	46565-00-00	N/A*											
PanCanadian Petroleum Limited Wayne-Rosedale Sour Gas Plant	95-IND-002 17-00-01	IR	1/week and Prior to Release	Grab									
Morrison Petroleum Ltd. Wizard Lake Sour Gas Plant	95-IND-010A 1558-00-03	N/A*											
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #2	95-IND-036	N/A*											
Petro-Canada Empress Straddle Gas Plant	289-01-04	IW	1/week	Grab	1/week	Grab	1/week	Grab	Must be Monitored	1/day	Grab	1/week	Grab
		IR	1/week and prior to release	Grab									
Alberta Natural Gas Company Ltd. Cochrane Extraction (Straddle) Gas Plant	979-01-01	IR	1/week and Prior to Release	Grab									

\*= See Appendix for More Information  
 DOC= Dissolved Organic Carbon  
 F= Frequency  
 FCR= Free Chlorine Residual

IR= Industrial Runoff  
 IW= Industrial Wastewater  
 N/A= Not Applicable  
 RW= Receiving Water  
 ST= Sample Type



Gas Plants - Monitoring

Gas Plants			Parameters to be Monitored									
Facility	Approval #	Source	Total Metals		Sulphate		O&O		LBT		Chloride	
			F	ST	F	ST	F	ST	F	ST	F	ST
Crestar Energy Inc. Vulcan Sour Gas Plant	282-01-00	IR					1/day	Grab			1/week	Grab
Vintage Resource Corp. West Drummheller Sour Gas Plant	10384-01-00	IR					1/day and Prior to Release	Grab			1/week and Prior to Release	Grab
Union Pacific Resources Inc. Spirit River Sour Gas Plant	11096-01-00	IR					1/day and Prior to Release	Grab			1/week and Prior to Release	Grab
AltaGas Services Inc. - Sedgewick Sour Gas Plant	11098-01-00	N/A*										
Shell Canada Limited Hope Creek Sour Gas Plant	16441-01-00	IR					1/day and Prior to Release	Grab			1/week and Prior to Release	Grab
Petro-Canada Resources Whitecourt Sour Gas Plant	10315-01-01	IR					1/day and Prior to Release	Grab			1/week and Prior to Release	Grab
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #3	46565-00-00	N/A*										
PanCanadian Petroleum Limited Wayne-Rosedale Sour Gas Plant	95-IND-002 17-00-01	IR			1/week and Prior to Release	Grab	1/day and Prior to Release	Grab			1/week and Prior to Release	Grab
Morrison Petroleum Ltd. Wizard Lake Sour Gas Plant	95-IND-010A 1558-00-03	N/A*										
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #2	95-IND-036	N/A*										
Petro-Canada Empress Straddle Gas Plant	289-01-04	IW	1/3 months	Grab	1/week	Grab	1/week	Grab	1/month	Grab		
		IR					1/day and prior to release	Grab				
Alberta Natural Gas Company Ltd. Cochrane Extraction (Straddle) Gas Plant	979-01-01	IR					1/day and Prior to Release	Grab				

\*= See Appendix for More Information

F= Frequency

IR= Industrial Runoff

IW= Industrial Wastewater

LBT= Luminescent Bacterial Test (EC50, 15 min)

N/A= Not Applicable

O&O= Oil and Other Substances

ST= Sample Type

Gas Plants - Monitoring

Gas Plants			Parameters to be Monitored							
Facility	Approval #	Source	Total Hardness		TDS		BOD		Temperature	
			F	ST	F	ST	F	ST	F	ST
Crestar Energy Inc. Vulcan Sour Gas Plant	282-01-00	IR								
Vintage Resource Corp. West Drumheller Sour Gas Plant	10384-01-00	IR								
Union Pacific Resources Inc. Spirit River Sour Gas Plant	11096-01-00	IR								
AltaGas Services Inc. - Sedgewick Sour Gas Plant	11098-01-00	N/A*								
Shell Canada Limited Hope Creek Sour Gas Plant	16441-01-00	IR								
Petro-Canada Resources Whitecourt Sour Gas Plant	10315-01-01	IR								
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #3	46565-00-00	N/A*								
PanCanadian Petroleum Limited Wayne-Rosedale Sour Gas Plant	95-IND-002 17-00-01	IR								
Morrison Petroleum Ltd. Wizard Lake Sour Gas Plant	95-IND-010A 1558-00-03	N/A*								
Novagas Clearinghouse Ltd. - Zama Sour Gas Plant #2	95-IND-036	N/A*								
Petro-Canada Empress Straddle Gas Plant	289-01-04	IW IR								
Alberta Natural Gas Company Ltd. Cochrane Extraction (Straddle) Gas Plant	979-01-01	IR								

\*= See Appendix for More Information  
 BOD= Biochemical Oxygen Demand  
 F= Frequency  
 IR= Industrial Runoff  
 IW= Industrial Wastewater

N/A= Not Applicable  
 ST= Sample Type  
 TDS= Total Dissolved Solids  
 TOC= Total Organic Carbon

## **TAB 1.F MEAT PROCESSING PLANTS**

There are currently two meat processing plants in Alberta that discharge wastewater. One of these plants uses the wastewater for irrigation purposes.

### **Limits**

- One meat processing plant has limits associated with Industrial Wastewater and Industrial Runoff.
- The limits for the irrigating facility are for Industrial Wastewater, and stipulate that releases are not to exceed the nutrient requirements of the crop to be grown.

### **Monitoring**

- Both meat processing plants have monitoring on Industrial Wastewater releases.

Meat Processing Plants - Limits

<b>Meat Processing Plants</b>			<b>Parameters and Associated Limits</b>												
			<b>(All units are in kg/d, unless otherwise specified)</b>												
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>BOD</b>		<b>TSS</b>		<b>pH(Units)</b>	<b>Phosphate</b>	<b>Faecal Coliform</b>	<b>NH<sub>3</sub>-N</b>		<b>FS/VF</b>	<b>O&amp;G</b>	<b>FCR</b>	
			<b>MDA</b>	<b>MDL</b>	<b>MDA</b>	<b>MDL</b>	<b>NTBE</b>		<b>NTBE</b>	<b>MDA</b>	<b>MDL</b>			<b>NTBE</b>	
Cargill Foods High River Red Meat Integrated Plant	683-01-06 95-IND-158	IW&IR	80	160	160	320	6.0-9.5	To be determined after study is completed	400 MPN/100 mL	160	270	Not present except in trace amounts	Not present in amounts sufficient to create a visible film or sheen	0.5 mg/L	
Lakeside Packers (A Division of Lakeside Feeders Ltd.) Brooks Red Meat Processing Plant	287-01-03 95-IND-174	INDUSTRIAL (PROCESS) WASTEWATER RELEASES ARE NOT TO EXCEED THE NUTRIENT REQUIREMENTS OF THE CROP TO BE GROWN.													

BOD= Biochemical Oxygen Demand  
 FCR= Free Chlorine Residual  
 FS/VF= Floating Solids or Visible Foam  
 IW&IR= Industrial Wastewater and Industrial Runoff  
 MDA= Maximum Daily Average (for any month)  
 MDL= Maximum Daily Limit

MPN= Most Probable Number  
 NH<sub>3</sub>-N= Ammonia-Nitrogen  
 NTBE= Never to be Exceeded  
 O&G= Oil and Grease  
 TSS= Total Suspended Solids

Meat Processing Plants - Monitoring

Meat Processing Plants			Parameters to be Monitored											
Facility	Approval #	Source	BOD		TSS		Flow		pH		NH <sub>3</sub> -N		TKN	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
Cargill Foods High River Red Meat Integrated Plant	95-IND-158 683-01-06	IW	3/week	Composite	3/week	Composite	1/day	Totalizer	1/day	Recorder	3/week	Grab	1/month	Grab
Lakeside Packers, a Division of Lakeside feeders Ltd. Brooks Red Meat Processing Plant *See Appendix	95-IND-174 287-01-03	IW					1/day and Prior to Release	Totalizer	1/month and Prior to Release	RG	1/month and Prior to Release	RG	1/month and Prior to Release	RG

Facility	Approval #	Source	N,P,C,S,M		EC		SAR (Calculated)		Faecal Coliforms		FCR		Chloride	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
Cargill Foods High River Red Meat Integrated Plant	95-IND-158 683-01-06	IW	1/month	Composite	1/month	Composite	1/month	Composite	3/week	Grab	1/day	Grab		
Lakeside Packers, a Division of Lakeside feeders Ltd. Brooks Red Meat Processing Plant *See Appendix	95-IND-174 287-01-03	IW	1/month and Prior to Release	RG	1/month and Prior to Release	RG	1/month and Prior to Release	RG					1/month and Prior to Release	RG

BOD= Biochemical Oxygen Demand

EC= Electrical Conductivity

F= Frequency

FCR= Free Chlorine Residual

IW= Industrial Wastewater

N,P,C,S,M= Nitrate-Nitrogen, Phosphate, Calcium, Sodium, Magnesium

NH<sub>3</sub>-N= Ammonia-Nitrogen

RG= Representative Grab

SAR= Sodium Adsorption Ratio

ST= Sample Type

TKN= Total Kjeldahl Nitrogen

TSS= Total Suspended Solids

## **TAB 1.G OILSEED PROCESSING PLANTS**

There are currently two oilseed processing plants in Alberta that discharge wastewater. One falls subject to city bylaws, as it discharges to a municipal sanitary system.

### **Limits**

- One of the facilities has limits associated with Industrial Wastewater and Industrial Runoff.

### **Monitoring**

- One plant monitors Industrial Wastewater and Industrial Runoff.

Oilseed Processing Plants - Limits

<b>Oilseed Processing Plants</b>			<b>Parameters and Associated Limits</b> (All units are in mg/L, unless otherwise specified)					
Facility	Approval #	Source	COD	TSS	pH (Units)	FS	VF	O&O
			MDL	MDL	NTBE			
ADM Agri-Industries Ltd. Lloydminster Oilseed Processing Plant	144-01-00	IW	INDUSTRIAL WASTEWATER IS SUBJECT TO THE CITY OF LLOYDMINSTER BYLAWS.*					
Canadian Agra Foods Inc. Sexsmith Oilseed Processing Plant	1421-01-00	IW&IR	300	50	6.0-9.5	Not present except in trace amounts	Not present except in trace amounts	Not present in amounts sufficient to create a visible film or sheen
Canamera	9773-01-00	IW&IR is subject to the Capital Region Sewage Regulations						

\*= See Appendix for More Information

COD= Chemical Oxygen Demand

FS= Floating Solids

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

MDL= Maximum Daily Limit

NTBE= Not to be Exceeded

O&O= Oil and Other Substances

TSS= Total Suspended Solids

VF= Visible Foam

## Oilseed Processing Plants - Monitoring

<b>Oilseed Processing Plants</b>			<b>Parameters to be Monitored</b>											
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>COD</b>		<b>TSS</b>		<b>pH</b>		<b>FS</b>		<b>VF</b>		<b>O&amp;O</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>
ADM Agri-Industries Ltd. Lloydminster Oilseed Processing Plant	144-01-00	IW	INDUSTRIAL WASTEWATER IS SUBJECT TO THE CITY OF LLOYDMINSTER BYLAWS.*											
Canadian Agra Foods Inc. Sexsmith Oilseed Processing Plant	1421-01-00	IW&IR	1/week and prior to discharge	Grab	1/week and prior to discharge	Grab	1/week and prior to discharge	Grab	1/day	Visual	1/day	Visual	1/day	Visual
Canamera	9773-01-00	Capital Region Sewage Collection												

\*= See Appendix for More Information

COD= Chemical Oxygen Demand

F= Frequency

FS= Floating Solids

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

O&O= Oil and Other Substances

ST= Sample Type

TSS= Total Suspended Solids

VF= Visible Foam



## **TAB 1.H POTATO PROCESSING PLANTS**

There are currently two potato processing plants in Alberta that discharge wastewater. One of them uses Industrial Wastewater for irrigation purposes, but has limits associated with Industrial Runoff.

### **Limits**

- One facility has limits associated with Industrial Wastewater releases.
- The other plant has limits for Industrial Runoff discharges.

### **Monitoring**

- Both potato processing plants have monitoring programs for Industrial Wastewater.
- One potato processing plant monitors Industrial Runoff.

Potato Processing Plants - Limits

<b>Potato Processing Plants</b>			<b>Parameters and Associated Limits</b> (All units are in mg/L, unless otherwise specified)										
Facility	Approval #	Source	BOD		TSS		PWCR	COD	NH <sub>3</sub> -N	Cl <sup>-</sup>	pH (Units)	FS/VF	O&O
			Effective Date	MC	Effective Date	MC	Maximum	MC	MC	MC	Maximum		
Pak-Wel Produce Limited Vauxhall Potato Processing Plant	10330-01-00	IW	Current	75	Current	150	5000 m <sup>3</sup> /month						
			Sept. 1, 1999	50	Sept. 1, 1999	100							
ConAgra Limited Taber Vegetable Processing Plant	67726-00-01	IR				50		50	5	250	6.0-9.5	Not present except in trace amounts	Not present in amounts sufficient to create a visible film or sheen
		IW	INDUSTRIAL WASTEWATER RELEASES ARE NOT TO EXCEED THE NUTRIENT REQUIREMENTS OF THE CROP TO BE GROWN.										

BOD= Biochemical Oxygen Demand

Cl<sup>-</sup>= Chloride

COD= Chemical Oxygen Demand

FS/VF= Floating Solids or Visible Foam

IR= Industrial Runoff

IW= Industrial Wastewater

MC= Maximum Concentration

NH<sub>3</sub>-N= Ammonia-Nitrogen

O&O= Oil and Other Substances

PWCR= Plant Water Consumption Rate

TSS= Total Suspended Solids

Potato Processing Plants - Monitoring

Potato Processing Plants			Parameters to be Monitored							
Facility	Approval #	Source	BOD		TSS		Discharge Flow		Total Kjeldahl Nitrogen	
			F	ST	F	ST	F	ST	F	ST
Pak-Wel Produce Limited Vauxhall Potatoe Processing Plant	10330-01-00	IW	1/month	Grab	1/month	Grab	After Sept. 1, 1999 1/month *	Weir	1/month	Grab
ConAgra Limited Taber Vegetable Processing Plant	67726-00-01	IW	1/week during irrigation, and 1/month*	Composite	1/week during irrigation, and 1/month*	Composite	1/day*	Totalizer	1/week during irrigation, and 1/month*	Composite
		IR			1 prior to release	Grab	1/day	Volume Estimate		

Potato Processing Plants			Parameters to be Monitored							
Facility	Approval #	Source	Nitrate-Nitrogen		PWCR		Nitrate		NH <sub>3</sub> -N	
			F	ST	F	ST	F	ST	F	ST
Pak-Wel Produce Limited Vauxhall Potatoe Processing Plant	10330-01-00	IW	1/month	Grab	1/day	Meter				
ConAgra Limited Taber Vegetable Processing Plant	67726-00-01	IW	1/week during irrigation, and 1/month*	Composite			1/week during irrigation, and 1/month*	Composite	1/week during irrigation, and 1/month*	Composite
		IR							Prior to release	Grab

\*= See Appendix for More Frequency Information

BOD= Biochemical Oxygen Demand

F= Frequency

IR= Industrial Runoff

IW= Industrial Wastewater

NH<sub>3</sub>-N= Ammonia-Nitrogen

PWCR= Plant Water Consumption Rate

ST= Sample Type

TSS= Total Suspended Solids

Potato Processing Plants - Monitoring

Potato Processing			Parameters to be Monitored									
Facility	Approval #	Source	Total Phosphorus		Potassium		TDP		EC		SAR	
			F	ST	F	ST	F	ST	F	ST	F	ST
Pak-Wel Produce Limited Vauxhall Potatoe Processing Plant	10330-01-00	IW										
ConAgra Limited Taber Vegetable Processing Plant	67726-00-01	IW	1/week during irrigation, and 1/month*	Composite	1/week during irrigation, and 1/month*	Composite	1/week during irrigation, and 1/month*	Composite	1/week	Composite	1/week	Composite
		IR										

Potato Processing			Parameters to be Monitored									
Facility	Approval #	Source	pH		COD		Chloride		FS		O&O	
			F	ST	F	ST	F	ST	F	ST	F	ST
Pak-Wel Produce Limited Vauxhall Potatoe Processing Plant	10330-01-00	IW										
ConAgra Limited Taber Vegetable Processing Plant	67726-00-01	IW	1/week	Composite								
		IR	1/day	Grab	Prior to release	Grab	Prior to release	Grab	1/day	Visual	1/day	Visual

\*= See Appendix for More Frequency Information

COD= Chemical Oxygen Demand

EC= Electrical Conductivity

F= Frequency

FS= Floating Solids

IR= Industrial Runoff

IW= Industrial Wastewater

O&O= Oil and Other Substances

SAR= Sodium Adsorption Ratio

ST= Sample Type

TDP= Total Dissolved Phosphorus

## **TAB 1.I      POWER PLANTS**

There are currently ten power plants in Alberta with limits and monitoring requirements. Four of the power plants discharge into the North Saskatchewan River, two discharge into Lake Wabamun, one releases into the Smoky River, one into the Battle River, one into the Red Deer River, one to Genesee Creek, and one to the South Saskatchewan River. Power Plants can be divided into 2 types, coal fired and natural gas powered. Seven are coal powered, while the Rossdale, Clover Bar, and Medicine Hat Thermal Power Plants are Natural Gas Powered.

### **Limits**

- Seven of the power plants have limits associated with Industrial Wastewater discharges.
- One has limits for Industrial Runoff discharges.
- Four have limits on Cooling Waters.
- One has limits on Boiler Wet Storage Water.
- One has limits for Industrial Wastewater and Industrial Runoff.

### **Monitoring**

- Eight of the power plants monitor Industrial Wastewater discharges.
- One monitors Industrial Runoff releases.
- One monitors Sanitary Sewage discharges.
- Three monitor Cooling Water discharges.
- One monitors Blowdown Canal Effluent.
- One monitors Boiler Wet Storage Water.

Power Plants - Limits

<b>Power Plants</b>			<b>Parameters and Associated Limits</b> (Units are in kg/d, unless otherwise specified)										
Facility	Approval #	Source	O&G			pH (Units)		TSS			Iron		
			MDA	MDL	MC	NTBE	MDA	MDL	MC	MDA	MDL	MC	
Alberta Power Limited H.R. Milner Thermal Electric Power Plant	9814-01-01	IW	15	30	5 mg/L	6.0-9.5	150	300	*	6	12	*	
		IR	Not present in amounts sufficient to create a visible film or sheen			6.0-9.5	50 mg/L	350 mg/L					
Alberta Power Limited Battle River Thermal Electric Power Generating Plant	1512-01-01 95-IND-108	IW1	21	68		6.0-9.5	1050	2400					
Alberta Power Limited Sheerness Thermal Electric Power Generating Plant	94-IND-061B(95)	IW	375	924		6.0-9.5	3750	9245		263	647		
TransAlta Utilities Corporation Sundance Thermal Electric Power Plant	9830-01-06	IW2	140	275		6.0-9.5	1430	2750		56	110		
		IW3*				6.0-9.5			50 mg/L			3.5 mg/L	
TransAlta Utilities Corporation Wabamun Thermal Electric Power Plant	10323-01-03	IW&IR	20	125		6.0-9.5	576	1130		25	50		
TransAlta Utilities Corporation Keephills Thermal Electric Power Plant	10324-01-02	IW2	144	262		6.0-9.5	2000	3183		50	100		
		IW3			10 mg/L				50 mg/L			3.5 mg/L	
Edmonton Power Authority Genesee Thermal Electric Power Generating Plant	773-01-00 95-IND-044	IW	282.5	565		6.0-9.5	2825	5650		113	226		
Edmonton Power Inc. Rossdale Thermal Electric Power Generating Plant	1395-01-00	BWSW				6.0-9.5							
Edmonton Power Inc. Clover Bar Thermal Electric Power Generating Plant	1391-01-00	IW			10 mg/L	6.0-9.5							
		CCCW											
The City of Medicine Hat Medicine Hat Thermal Power Plant	93-WL-154 11610-00-02	CCW	Not present in amounts sufficient to create a visible film or sheen										

\*= See Appendix for More Information

BWSW= Boiler Wet Storage Water

CCCW= Chlorinated Condenser Cooling Water

CCW= Condenser Cooling Water

IR= Industrial Runoff

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ash Lagoon

IW2= Industrial Wastewater from Cooling Ponds

IW3= Industrial Wastewater from Settling Ponds

MC= Maximum Concentration

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

NTBE= Never to be Exceeded

O&G= Oil and Grease

TSS= Total Suspended Solids

Power Plants - Limits

Power Plants			Parameters and Associated Limits (Units are in kg/d, unless otherwise specified)											
Facility	Approval #	Source	Total Phosphorus			FAC			ALT (Rainbow trout)	TCR	Total Nitrogen		HR	FS/VF
			MDA	MDL	MC	MDA	MDL	MC			MDL	MDA		
Alberta Power Limited H.R. Milner Thermal Electric Power Plant	9814-01-01	IW	6	12	2 mg/L	0.6	1.2	0.2 mg/L	50% or greater survival in 100% industrial wastewater sample					
		IR												
Alberta Power Limited Battle River Thermal Electric Power Generating Plant	1512-01-01 95-IND-108	IW1							50% or greater survival in 100% release sample					
Alberta Power Limited Sheerness Thermal Electric Power Generating Plant	94-IND-061B(95)	IW								275	558			
TransAlta Utilities Corporation Sundance Thermal Electric Power Plant	9830-01-06	IW2	56	110		5.6	11							
		IW3*			1 mg/L									
TransAlta Utilities Corporation Wabamun Thermal Electric Power Plant	10323-01-03	IW&IR	3.2	6.4										
TransAlta Utilities Corporation Keephills Thermal Electric Power Plant	10324-01-02	IW2	50	100										
		IW3												
Edmonton Power Authority Genesee Thermal Electric Power Generating Plant	773-01-00 95-IND-044	IW	113	226										
Edmonton Power Inc. Rossdale Thermal Electric Power Generating Plant	1395-01-00	BWSW								5.0 mg/L			5.0 ug/L	
Edmonton Power Inc. Clover Bar Thermal Electric Power Generating Plant	1391-01-00	IW												
		CCCW						0.5 mg/L		0.5 mg/L				
The City of Medicine Hat Medicine Hat Thermal Power Plant	93-WL-154 11610-00-02	CCW												None other than trace amounts

ALT= Acute Lethality Test  
 BWSW= Boiler Wet Storage Water  
 CCCW= Chlorinated Condenser Cooling Water  
 CCW= Condenser Cooling Water  
 FAC= Free Available Chlorine  
 FS/VF= Floating Solids or Visible Foam

HR= Hydrazine Residual  
 IR= Industrial Runoff  
 IW&IR= Industrial Wastewater and Industrial Runoff  
 IW= Industrial Wastewater  
 IW1= Industrial Wastewater from the Ash Lagoon  
 IW2= Industrial Wastewater from Cooling Ponds

IW3= Industrial Wastewater from Settling Ponds  
 MC= Maximum Concentration  
 MDA= Maximum Daily Average (for any month)  
 MDL= Maximum Daily Limit  
 NTBE= Never to be Exceeded  
 TCR= Total Chlorine Residual

Power Plants - Monitoring

Power Plants			Parameters to be Monitored									
Facility	Approval #	Source	pH		TSS		Flow		O&G		Iron	
			F	ST	F	ST	F	ST	F	ST	F	ST
Alberta Power Limited H.R. Milner Thermal Electric Power Plant	9814-01-01	IW	1/day	Recorder	1/week	Composite	1/day	Totalizer	1/week	Composite	1/week	Composite
			1/week	Composite								
		IR	1/day during releases	Grab	1/day during releases	Grab	1/day during releases	Estimate	1/day during releases	Visual Check		
Alberta Power Limited Battle River Thermal Electric Power Generating Plant	1512-01-01 95-IND-108	IW1	1/day	Continuous	3/week	Composite	Continuous	Continuous	1/week	Composite	1/week	Composite
		SS			Once during discharge	Grab	1/day	Volume Estimate				
Alberta Power Limited Sheerness Thermal Electric Power Generating Plant	94-IND-061B(95)	IW	1/day	Composite or Continuous	1/week	Composite	1/day	Totalizer	1/week	Composite	1/week	Composite
		BCE										
TransAlta Utilities Corporation Sundance Thermal Electric Power Plant	9830-01-06	IW2	3/week	Composite	3/week	Composite	1/day	Continuous	1/week	Composite	1/week	Composite
		IW3	1/day	Grab	1/day	Grab					1/day	Grab
		IW4			1 after first day of discharge	Grab	1 after discharge	Volume Estimate				
TransAlta Utilities Corporation Wabamun Thermal Electric Power Plant	10323-01-03	IW1	3/week	Composite	3/week	Composite	Continuous	Recorder	3/week	Composite	3/week	Composite
		CW					Continuous	Recorder				
TransAlta Utilities Corporation Keephills Thermal Electric Power Plant	10324-01-02	IW2	3/week	Composite	1/week during discharge	Composite	Continuous during discharge	Recorder	1/week during discharge	Composite	1/week during discharge	Composite
		IW3			Prior to release	Grab			Prior to release	Grab	Prior to release	Grab
Edmonton Power Authority Genesee Thermal Electric Power Generating Plant	773-01-00 95-IND-044	IW	3/week	Composite	3/week	Composite	Continuous	Continuous	3/week	Composite	3/week	Composite
Edmonton Power Inc. Rossdale Thermal Electric Power Generating Plant	1395-01-00	BWSW	Prior to Release	Grab								
Edmonton Power Inc. Clover Bar Thermal Electric Power Generating Plant	1391-01-00	CCCW	Half way through chlorination or every 4 hrs	Grab								
		IW	1/week	Grab					1/week	Grab		
The City of Medicine Hat Medicine Hat Thermal Power Plant	93-WL-154 11610-00-02	CCW					1/day	Estimate				

BCE= Blowdown Canal Effluent (from regeneration lagoon)  
 BWSW= Boiler Wet Storage Water  
 CCCW= Chlorinated Condenser Cooling Water  
 CCW= Condenser Cooling Water  
 CW= Cooling Waters  
 F= Frequency

IR= Industrial Runoff  
 IW= Industrial Wastewater  
 IW1= Industrial Wastewater from the Ash Lagoon  
 IW2= Industrial Wastewater from Cooling Ponds  
 IW3= Industrial Wastewater from Settling Ponds  
 IW4= Industrial Wastewater from Stabilization Ponds

O&G= Oil and Grease  
 SS= Sanitary Sewage (from the sewage lagoon)  
 ST= Sample Type  
 TSS= Total Suspended Solids



Power Plants - Monitoring

Power Plants			Parameters to be Monitored									
Facility	Approval #	Source	Heavy Metals		Total Phosphorous		Temperature		TDS		Dissolved Oxygen	
			F	ST	F	ST	F	ST	F	ST	F	ST
Alberta Power Limited H.R. Milner Thermal Electric Power Plant	9814-01-01	IW	1/year	Grab	1/week	Composite	1/day	Recorder	1/month	Composite	1/month	Grab
		IR										
Alberta Power Limited Battle River Thermal Electric Power Generating Plant	1512-01-01 95-IND-108	IW1	1/year	Composite					1/week	Composite		
		SS										
Alberta Power Limited Sheerness Thermal Electric Power Generating Plant	94-IND-061B(95)	IW			1/month	Composite	1/day	Continuous or Grab	1/month	Composite	1/month	Composite
		BCE	1/year during discharge	Composite								
TransAlta Utilities Corporation Sundance Thermal Electric Power Plant	9830-01-06	IW2	1/6 months	Grab	1/week	Composite			1/week	Composite	1/week	Grab
		IW3			1/day	Grab						
		IW4										
TransAlta Utilities Corporation Wabamun Thermal Electric Power Plant	10323-01-03	IW1	1/year	Grab	3/week	Composite						
		CW	6/year	Grab			Continuous	Recorder				
TransAlta Utilities Corporation Keephills Thermal Electric Power Plant	10324-01-02	IW2	1/year during discharge	Grab	1/month during discharge	Composite						
		IW3										
Edmonton Power Authority Genesee Thermal Electric Power Generating Plant	773-01-00 95-IND-044	IW	1/year	Composite	3/week	Composite			1/week	Composite	1/week	Grab
Edmonton Power Inc. Rossdale Thermal Electric Power Generating Plant	1395-01-00	BWSW										
Edmonton Power Inc. Clover Bar Thermal Electric Power Generating Plant	1391-01-00	CCCW					Half way through chlorination or every 4 hrs	Grab				
		IW										
The City of Medicine Hat Medicine Hat Thermal Power Plant	93-WL-154 11610-00-02	CCW					Inlet and outlet temperatures measured daily	Continuous				

BCE= Blowdown Canal Effluent (from regeneration lagoon)  
 BWSW= Boiler Wet Storage Water  
 CCCW= Chlorinated Condenser Cooling Water  
 CCW= Condenser Cooling Water  
 CW= Cooling Waters  
 F= Frequency

IR= Industrial Runoff  
 IW= Industrial Wastewater  
 IW1= Industrial Wastewater from the Ash Lagoon  
 IW2= Industrial Wastewater from Cooling Ponds  
 IW3= Industrial Wastewater from Settling Ponds  
 IW4= Industrial Wastewater from Stabilization Ponds

SS= Sanitary Sewage (from the sewage lagoon)  
 ST= Sample Type  
 TDS= Total Dissolved Solids

Power Plants - Monitoring

Power Plants			Parameters to be Monitored										
Facility	Approval #	Source	Toxicity Testing		Total Nitrogen		COD		FAC		TCR		RW
			F	ST	F	ST	F	ST	F	ST	F	ST	
Alberta Power Limited H.R. Milner Thermal Electric Power Plant	9814-01-01	IW	ALT 1/3 months*	Composite or Grab			1/month	Composite	1/week*	Composite			
		IR											
Alberta Power Limited Battle River Thermal Electric Power Generating Plant	1512-01-01 95-IND-108	IW1	ALT 1/3 months*	Composite or Grab									Must be Monitored
		SS											
Alberta Power Limited Sheerness Thermal Electric Power Generating Plant	94-IND-061B(95)	IW			1/week	Composite	1/month	Composite					
		BCE											
TransAlta Utilities Corporation Sundance Thermal Electric Power Plant	9830-01-06	IW2			1/month	Composite			1/month	Grab			
		IW3											
		IW4											
TransAlta Utilities Corporation Wabamun Thermal Electric Power Plant	10323-01-03	IW1	ALT and SCLT*	Grab									Monitored for Temp.
		CW											
TransAlta Utilities Corporation Keephills Thermal Electric Power Plant	10324-01-02	IW2											
		IW3											
Edmonton Power Authority Genesee Thermal Electric Power Generating Plant	773-01-00 95-IND-044	IW			1/week	Composite	1/week	Composite					
Edmonton Power Inc. Rossdale Thermal Electric Power Generating Plant	1395-01-00	BWSW									Prior to Release	Grab	
Edmonton Power Inc. Clover Bar Thermal Electric Power Generating Plant	1391-01-00	CCCW							Half way through chlorination or every 4 hrs	Grab	Half way through chlorination or every 4 hrs	Grab	
		IW											
The City of Medicine Hat Medicine Hat Thermal Power Plant	93-WL-154 11610-00-02	CCW											

\*= See Appendix for More Frequency Information  
 ALT= Acute Lethality Tests  
 BCE= Blowdown Canal Effluent (from regeneration lagoon)  
 BWSW= Boiler Wet Storage Water  
 CCCW= Chlorinated Condenser Cooling Water  
 CCW= Condenser Cooling Water

COD= Chemical Oxygen Demand  
 CW= Cooling Waters  
 F= Frequency  
 FAC= Free Available Chlorine  
 IR= Industrial Runoff  
 IW= Industrial Wastewater

IW1= Industrial Wastewater from the Ash Lagoon  
 IW2= Industrial Wastewater from Cooling Ponds  
 IW3= Industrial Wastewater from Settling Ponds  
 IW4= Industrial Wastewater from Stabilization Ponds  
 RW= Receiving Water  
 SCLT= Subacute/Chronic Lethality Tests

SS= Sanitary Sewage (from the sewage lagoon)  
 ST= Sample Type  
 TCR= Total Chlorine Residual

Power Plants - Monitoring

Power Plants			Parameters to be Monitored												
Facility	Approval #	Source	Conductivity		BOD		Turbidity		HR		Nitrate and Nitrite		TKN		
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST	
Alberta Power Limited H.R. Milner Thermal Electric Power Plant	9814-01-01	IW										1/week	Composite	1/month	Composite
		IR													
Alberta Power Limited Battle River Thermal Electric Power Generating Plant	1512-01-01 95-IND-108	IW1	3/week	Composite											
		SS			Once during discharge	Grab									
Alberta Power Limited Sheerness Thermal Electric Power Generating Plant	94-IND-061B(95)	IW													
		BCE	1/year during discharge	Composite			1/year during discharge	Composite							
TransAlta Utilities Corporation Sundance Thermal Electric Power Plant	9830-01-06	IW2													
		IW3					1/day	Grab							
		IW4			1 after the first day of discharge	Grab									
TransAlta Utilities Corporation Wabamun Thermal Electric Power Plant	10323-01-03	IW1													
		CW													
TransAlta Utilities Corporation Keephills Thermal Electric Power Plant	10324-01-02	IW2													
		IW3													
Edmonton Power Authority Genesee Thermal Electric Power Generating Plant	773-01-00 95-IND-044	IW													
Edmonton Power Inc. Rossdale Thermal Electric Power Generating Plant	1395-01-00	BWSW								Prior to Release	Grab				
Edmonton Power Inc. Clover Bar Thermal Electric Power Generating Plant	1391-01-00	CCCW													
		IW													
The City of Medicine Hat Medicine Hat Thermal Power Plant	93-WL-154 11610-00-02	CCW													

BCE= Blowdown Canal Effluent (from regeneration lagoon)  
 BOD= Biochemical Oxygen Demand  
 BWSW= Boiler Wet Storage Water  
 CCCW= Chlorinated Condenser Cooling Water  
 CCW= Condenser Cooling Water  
 CW= Cooling Waters

F= Frequency  
 HR= Hydrazine Residual  
 IR= Industrial Runoff  
 IW= Industrial Wastewater  
 IW1= Industrial Wastewater from the Ash Lagoon  
 IW2= Industrial Wastewater from Cooling Ponds

IW3= Industrial Wastewater from Settling Ponds  
 IW4= Industrial Wastewater from Stabilization Ponds  
 SS= Sanitary Sewage (from the sewage lagoon)  
 ST= Sample Type  
 TKN= Total Kjeldahl Nitrogen

Power Plants - Monitoring

Power Plants			Parameters to be Monitored											
Facility	Approval #	Source	Colour		Total Alkalinity		Total Hardness		Ca, Na, K, Cl, SO4		Total Silica		TOC	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
Alberta Power Limited H.R. Milner Thermal Electric Power Plant	9814-01-01	IW												
		IR												
Alberta Power Limited Battle River Thermal Electric Power Generating Plant	1512-01-01 95-IND-108	IW1												
		SS												
Alberta Power Limited Sheerness Thermal Electric Power Generating Plant	94-IND-061B(95)	IW												
		BCE	1/year during discharge	Composite	1/year during discharge	Composite	1/year during discharge	Composite	1/year during discharge	Composite	1/year during discharge	Composite	1/year during discharge	Composite
TransAlta Utilities Corporation Sundance Thermal Electric Power Plant	9830-01-06	IW2												
		IW3												
		IW4												
TransAlta Utilities Corporation Wabamun Thermal Electric Power Plant	10323-01-03	IW1												
		CW												
TransAlta Utilities Corporation Keephills Thermal Electric Power Plant	10324-01-02	IW2												
		IW3												
Edmonton Power Authority Genesee Thermal Electric Power Generating Plant	773-01-00 95-IND-044	IW												
Edmonton Power Inc. Rossdale Thermal Electric Power Generating Plant	1395-01-00	BWSW												
Edmonton Power Inc. Clover Bar Thermal Electric Power Generating Plant	1391-01-00	CCCW												
		IW												
The City of Medicine Hat Medicine Hat Thermal Power Plant	93-WL-154 11610-00-02	CCW												

BCE= Blowdown Canal Effluent (from regeneration lagoon)  
 BWSW= Boiler Wet Storage Water  
 Ca, Na, K, Cl, SO4= Calcium, Sodium, Potassium, Sulphate, and Chloride  
 CCCW= Chlorinated Condenser Cooling Water  
 CCW= Condenser Cooling Water  
 CW= Cooling Waters

F= Frequency  
 IR= Industrial Runoff  
 IW= Industrial Wastewater  
 IW1= Industrial Wastewater from the Ash Lagoon  
 IW2= Industrial Wastewater from Cooling Ponds  
 IW3= Industrial Wastewater from Settling Ponds

IW4= Industrial Wastewater from Stabilization Ponds  
 SS= Sanitary Sewage (from the sewage lagoon)  
 ST= Sample Type  
 TOC= Total Organic Carbon

## **TAB 1.J PULP AND PAPER MILLS – BKP AND TMP**

There are currently seven pulp and paper mills operating in Alberta. All of them practice direct discharge. Four of these mills are located on the Athabasca River, and a fifth is located on a tributary to the Athabasca. The two remaining pulp mills are located farther to the north, in the Peace River basin.

The seven mills can be subdivided into two general categories, according to the processes employed at each one. Four of the mills employ a Bleached Kraft Process (BKP) and three employ a Thermomechanical Process (TMP).

### **Limits**

#### **BKP mills:**

- Three have limits associated with Industrial Wastewater discharges.
- One has limits for Industrial Runoff discharges.
- One has limits on Industrial Wastewater and Industrial Runoff discharges.

#### **TMP mills:**

- Three have limits associated with Industrial Wastewater discharges.
- One has limits for Industrial Runoff discharges.

### **Monitoring**

#### **BKP mills:**

- Three monitor Industrial Wastewater discharges.
- Two monitor Industrial Runoff discharges.
- One monitors Industrial Wastewater and Industrial Runoff discharges.
- Two monitor Non-Contact Cooling Water discharges.
- One monitors Chiller Water.

#### **TMP mills:**

- Three monitor Industrial Wastewater discharges.
- Two monitor Non-Contact Cooling Water.
- Two monitor Industrial Runoff.

Pulp and Paper Mills - TMP - Limits

<b>Pulp &amp; Paper Mills - TMP</b>				<b>Parameters and Associated Limits</b> (All units are in kg/day, unless otherwise specified)								
Facility	Approval #	Production Capacity (ADT/day)	Source	BOD			TSS		Colour		ALT (Rainbow trout)	pH
				Flow	MDA	MDL	MDA	MDL	MDA	MDL		
Alberta Newsprint Company Ltd.	103-01-00	700	IW		2100	4200	3500	7000	31500	42000	50% or greater survival in 100% industrial wastewater sample	6.0-9.5 standard pH units
			IR									
Millar Western Pulp (Whitecourt) Ltd.	107-01-07	680	IW	>= 17 m <sup>3</sup> /s	2040	4080	3400	6800	30600	40800	50% or greater survival in 100% industrial wastewater sample	6.0-9.5 standard pH units
				<17 m <sup>3</sup> /s	1600	3200						
Slave Lake Pulp Corporation	108-01-09	400	IW		1050	2100	2500	5000	22500	30000	50% or greater survival in 100% industrial wastewater sample	6.0-9.5 standard pH units

ADT/day= Air Dried Tonnes of Pulp Produced per Day

ALT= Acute Lethality Test

BOD= Biochemical Oxygen Demand

IR= Industrial Runoff from the Stormwater Pond

IW= Industrial Wastewater

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

NTBE= Never to be Exceeded

TMP= Thermomechanical Pulp

TSS= Total Suspended Solids

Pulp and Paper Mills - TMP - Limits

<b>Pulp &amp; Paper Mills - TMP</b>				<b>Parameters and Associated Limits</b> (All units are in kg/day, unless otherwise specified)			
Facility	Approval #	Production Capacity (ADT/day)	Source	RFA	COD	O&G	FS/VF
				NTBE			
Alberta Newsprint Company Ltd. 103-01-00	103-01-00	700	IW	2 mg/L		Not present in amounts sufficient to create a visible film or sheen	Not present except in trace amounts
			IR		50 mg/L	Not present in amounts sufficient to create a visible film or sheen	Not present except in trace amounts
Millar Western Pulp (Whitecourt) Ltd. 107-01-07	107-01-07	680	IW	2 mg/L		Not present in amounts sufficient to create a visible film or sheen	Not present except in trace amounts
Slave Lake Pulp Corporation 108-01-09	108-01-09	400	IW	2 mg/L		Not present in amounts sufficient to create a visible film or sheen	Not present except in trace amounts

ADT/day= Air Dried Tonnes of Pulp Produced per Day

COD= Chemical Oxygen Demand

FS/VF= Floating Solids or Visible Foam

IR= Industrial Runoff from the Stormwater Pond

IW= Industrial Wastewater

NTBE= Never to be Exceeded

O&G= Oil and Grease

RFA= Resin and Fatty Acids

TMP= Thermomechanical Pulp

Pulp and Paper Mills - TMP - Monitoring

<b>Pulp &amp; Paper Mills - TMP</b>			<b>Parameters to be Monitored</b>							
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>BOD</b>		<b>TSS</b>		<b>Colour</b>		<b>RFA</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>
Alberta Newsprint Company Ltd.	103-01-00	IW	3/week	Composite	1/day	Composite	1/week	Composite	1/month with trout bioassay	Grab
		IR	1/day during discharge	Grab						
		NCCW	1/month	Grab	1/month	Grab				
Millar Western Pulp (Whitecourt) Ltd.	107-01-07	IW	3/week	Composite	1/day	Composite	1/week	Composite	1/month with trout bioassay	Grab or Composite
		NCCW								
Slave Lake Pulp Corporation	108-01-09	IW	3/week	Composite	1/day	Composite	1/week	Composite	1/month with trout bioassay	Grab or Composite
		IR	Prior to discharge	Grab	Prior to discharge	Grab				

BOD= Biochemical Oxygen Demand  
 F= Frequency  
 IR= Industrial Runoff from the Stormwater Pond

IW= Industrial Wastewater  
 NCCW= Non-Contact Cooling Water  
 RFA= Resin and Fatty Acids

ST= Sample Type  
 TMP= Thermomechanical Pulp  
 TSS= Total Suspended Solids



Pulp and Paper Mills - TMP - Monitoring

<b>Pulp &amp; Paper Mills - TMP</b>			<b>Parameters to be Monitored</b>							
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>Toxicity Testing</b>		<b>NH<sub>3</sub>-N</b>		<b>Temperature</b>		<b>Flow</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>
Alberta Newsprint Company Ltd.	103-01-00	IW	ALT and SCT*	Grab	1/month with trout bioassay	Grab	1/day	Grab or Instantaneous	Continuous	Recorder
		IR							1/day during discharge	Estimate
		NCCW	ALT and SCT*	Grab					Continuous	Recorder
Millar Western Pulp (Whitecourt) Ltd.	107-01-07	IW	ALT and SCT*	Grab or Composite			Continuous	Recorder	Continuous	Recorder
		NCCW							Continuous	Recorder
Slave Lake Pulp Corporation	108-01-09	IW	ALT and SCT*	Grab or Composite			Continuous	Recorder	Continuous	Recorder
		IR							During discharge event	Estimate

\*= See Appendix for More Frequency Information

ALT= Acute Lethality Testing

F= Frequency

IR= Industrial Runoff from the Stormwater Pond

IW= Industrial Wastewater

NCCW= Non-Contact Cooling Water

NH<sub>3</sub>-N= Ammonia-Nitrogen

SCT= Sublethal/Chronic Toxicity

ST= Sample Type

TMP= Thermomechanical Pulp

TT= Toxicity Testing

Pulp and Paper Mills - TMP - Monitoring

<b>Pulp &amp; Paper Mills - TMP</b>			<b>Parameters to be Monitored</b>									
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>COD</b>		<b>pH</b>		<b>SC</b>		<b>HM</b>		<b>Nutrients</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>
Alberta Newsprint Company Ltd.	103-01-00	IW	1/week	Composite	Continuous	Recorder	Continuous	Recorder	1/year	Grab	1/week	Grab
		IR	1/day during discharge	Grab	1/day during discharge	Grab						
		NCCW	1/week	Grab	Continuous	Recorder	Continuous	Recorder				
Millar Western Pulp (Whitecourt) Ltd.	107-01-07	IW	3/week	Composite	Continuous	Recorder	Continuous	Recorder	2/year	Composite	1/week	Composite
		NCCW	1/week	Grab			Continuous	Recorder				
Slave Lake Pulp Corporation	108-01-09	IW	3/week	Composite	Continuous	Recorder	Continuous	Recorder	2/year	Composite	1/week	Composite
		IR			Prior to discharge	Grab						

COD= Chemical Oxygen Demand

F= Frequency

HM= Heavy Metals

IR= Industrial Runoff from the Stormwater Pond

IW= Industrial Wastewater

NCCW= Non-Contact Cooling Water

SC= Specific Conductance

ST= Sample Type

TMP= Thermomechanical Pulp

Pulp and Paper Mills - TMP - Monitoring

<b>Pulp &amp; Paper Mills - TMP</b>			<b>Parameters to be Monitored</b>											
Facility	Approval #	Source	OPP		BODu		TP		MI		TOC, DOC		Chelators	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
Alberta Newsprint Company Ltd.	103-01-00	IW	once every 5 years	Grab	1/year	Composite	1/month	Grab	2/year	Grab	1/month	Grab	1/month (if used)	Grab
		IR												
		NCCW												
Millar Western Pulp (Whitecourt) Ltd.	107-01-07	IW			4/year	Composite	1/month	Grab					1/month (if used)	Composite
		NCCW												
Slave Lake Pulp Corporation	108-01-09	IW			4/year	Composite	1/month	Grab					1/month (if used)	Composite
		IR												

BODu= Ultimate Biochemical Oxygen Demand  
 DOC= Dissolved Organic Carbon  
 F= Frequency  
 IR= Industrial Runoff from the Stormwater Pond

IW= Industrial Wastewater  
 MI= Major Ions  
 NCCW= Non-Contact Cooling Water  
 OPP= Organic Priority Pollutants

ST= Sample Type  
 TMP= Thermomechanical Pulp  
 TOC= Total Organic Carbon  
 TP= Total Phenols

Pulp and Paper Mills - TMP - Monitoring

<b>Pulp &amp; Paper Mills - TMP</b>			<b>Parameters to be Monitored</b>											
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>O&amp;G</b>		<b>SSS</b>		<b>FC</b>		<b>TOC or COD</b>		<b>RW</b>	<b>COD or BOD1</b>		
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>		<b>F</b>	<b>ST</b>	
Alberta Newsprint Company Ltd.	103-01-00	IW										Must be Monitored	1/day from Dec. 1 to Mar. 1	Composite
		IR	1/day during discharge	visual inspection										
		NCCW												
Millar Western Pulp (Whitecourt) Ltd.	107-01-07	IW			1/month	Composite						Must be Monitored		
		NCCW												
Slave Lake Pulp Corporation	108-01-09	IW			1/month	Composite	1/month	Grab				Must be Monitored		
		IR								Prior to discharge	Grab (for quick release)			

BOD1= 1 Day BOD  
 COD= Chemical Oxygen Demand  
 F= Frequency  
 FC= Faecal Coliforms

IR= Industrial Runoff from the Stormwater Pond  
 IW= Industrial Wastewater  
 NCCW= Non-Contact Cooling Water  
 O&G= Oil and Grease

RW= Receiving Water  
 SSS= Sulphate, Sodium, Silicate  
 ST= Sample Type  
 TMP= Thermomechanical Pulp  
 TOC= Total Organic Carbon

Pulp and Paper Mills - BKP -Limits

<b>Pulp &amp; Paper Mills - BKP</b>				<b>Parameters and Associated Limits</b> (All units are in kg/day, unless otherwise specified)							
Facility	Approval #	Production Capacity (ADT/day)	Source	BOD		Colour			AOX		
				MDA	MDL	Effective Date	MDA	MDL	Effective Date	MDA	MDL
Alberta Pacific Forest Industries Inc.	111-01-02	1500*	IW&IR	2250	4500		104000	185500		818	1390
Daishowa-Marubeni International Ltd.	115-01-02	1350*	IW	4050	8100	Current	182000	224000	Current	1400	2800
						January 1, 2000	121500	182250	January 1, 2000	880	1350
			IR								
Weldwood of Canada Limited	99-01-02	1100*	IW	3300	6600		60000	85000		800	1600
Weyerhaeuser Canada Ltd.	113-01-01	820*	IW	2460	4920	Current	73800	109060		1230	2460
						July 1, 2002	50000	70000			
						March 1, 2007	37400	47000			

\*= See Appendix for More Information

ADT/day= Air Dried Tonnes of Pulp Produced per Day

AOX= Adsorbable Organic Halides

BKP= Bleached Kraft Pulp

BOD= Biochemical Oxygen Demand

MDL= Maximum Daily Limit

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

MDA= Maximum Daily Average (for any month)

IR= Industrial Runoff from the Stormwater Retention Pond

Pulp and Paper Mills - BKP -Limits

<b>Pulp &amp; Paper Mills - BKP</b>				<b>Parameters and Associated Limits</b> (All units are in kg/day, unless otherwise specified)						
Facility	Approval #	Production Capacity (ADT/day)	Source	TSS		ALT (Rainbow trout)	pH (units)	RFA	D&F	O&G
				MDA	MDL		NTBE	NTBE	NTBE	
Alberta Pacific Forest Industries Inc.	111-01-02	1500	IW&IR	4500	9000	50% or greater survival in 100% industrial wastewater sample	6.0-9.5	2 mg/L	BDL	Not present in amounts sufficient to create a visible film or sheen
Daishowa-Marubeni International Ltd.	115-01-02	1350	IW	6750	13500	50% or greater survival in 100% industrial wastewater sample	6.0-9.5	2 mg/L	BDL	Maximum Concentration 10 mg/L
			IR		50 mg/L		6.0-9.5			
Weldwood of Canada Limited	99-01-02	1100	IW	5500	11000	50% or greater survival in 100% industrial wastewater sample	6.0-9.5	2 mg/L	BDL	Not present in amounts sufficient to create a visible film or sheen
Weyerhaeuser Canada Ltd.	113-01-01	820	IW	4100	8200	50% or greater survival in 100% industrial wastewater sample	6.0-9.5	2 mg/L	BDL	Not present in amounts sufficient to create a visible film or sheen

ADT/day= Air Dried Tonnes of Pulp Produced per Day

ALT= Acute Lethality Test

BDL= Below Detectable Limits

BKP= Bleached Kraft Pulp

D&F= Dioxins and Furans

MDL= Maximum Daily Limit

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

MDA= Maximum Daily Average (for any month)

NTBE= Not to be Exceeded

O&G= Oil and Grease

RFA= Resin and Fatty Acids

SRP= Stormwater Retention Pond

TSS= Total Suspended Solids

Pulp and Paper Mills - BKP -Limits

<b>Pulp &amp; Paper Mills - BKP</b>				<b>Parameters and Associated Limits</b> (All units are in kg/day, unless otherwise specified)					
Facility	Approval #	Production Capacity (ADT/day)	Source	FS/VF	COD	SCT	Mn		
							Effective Date	MDA	MDL
Alberta Pacific Forest Industries Inc.	111-01-02	1500	IW&IR	Not present except in trace amounts					
Daishowa-Marubeni International Ltd.	115-01-02	1350	IW						
			IR		Maximum Concentration 100 mg/L				
Weldwood of Canada Limited	99-01-02	1100	IW	Not present except in trace amounts					
Weyerhaeuser Canada Ltd.	113-01-01	820	IW	Not present except in trace amounts		>6.25% no observable effects concentration*	Current	65	88
							July 1, 2002	45	68

\*= See Appendix for More Details

ADT/day= Air Dried Tonnes of Pulp Produced per Day

BKP= Bleached Kraft Pulp

COD= Chemical Oxygen Demand

MDL= Maximum Daily Limit

FS/VF= Floating Solids or Visible Foam

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

MDA= Maximum Daily Average (for any month)

Mn= Manganese

SCT= Sublethal/Chronic Toxicity

SRP= Stormwater Retention Pond

Pulp and Paper Mills - BKP - Monitoring

<b>Pulp &amp; Paper Mills - BKP</b>			<b>Parameters to be Monitored</b>										
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>BOD</b>		<b>TSS</b>		<b>Colour</b>		<b>RFA</b>		<b>Toxicity Testing</b>		
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	
Alberta Pacific Forest Industries Inc.	111-01-02	IW&IR	3/week	Composite	1/day	Composite	1/week	Composite	1/month (with bioassays)	Grab	ALT and SCT*	Grab	
Daishowa-Marubeni International Ltd.	115-01-02	IW	3/week	Composite	1/day	Composite	1/week	Composite	1/month (with bioassays)	Grab	ALT and SCT*	Grab	
		IR			1/day during discharge	Grab							
		NCCW	1/month	Composite	1/month	Composite						ALT*	Grab
		CW											
Weldwood of Canada Limited	99-01-02	IW	3/week	Composite	1/day	Composite	1/week	Composite	1/month (with bioassays)	Grab	ALT and SCT*	Grab	
		NCCW											
Weyerhaeuser Canada Ltd.	113-01-01	IW	3/week	Composite	1/day	Composite	1/week	Composite	1/month (with bioassays)	Grab	ALT and SCT*	Grab	
		IR1	1/day during discharge	Grab	1/day during discharge	Grab							

\*= See Appendix for More Frequency Information

ALT= Acute Lethality Testing

BKP= Bleached Kraft Pulp

BOD= Biochemical Oxygen Demand

CW= Chiller Water

F= Frequency

IR= Industrial Runoff from the Stormwater Retention Pond

IR1= Industrial Runoff from the Storm Sewer

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

NCCW= Non-Contact Cooling Water

RFA= Resin and Fatty Acids

SCT= Sublethal/Chronic Toxicity

ST= Sample Type

TSS= Total Suspended Solids



Pulp and Paper Mills - BKP - Monitoring

<b>Pulp &amp; Paper Mills - BKP</b>			<b>Parameters to be Monitored</b>							
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>NH<sub>3</sub>-N</b>		<b>Temperature</b>		<b>Flow</b>		<b>COD</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>
Alberta Pacific Forest Industries Inc.	111-01-02	IW&IR	1/month (with bioassays)	Grab	Continuous	Recorder	Continuous	Recorder	3/week	Composite
Daishowa-Marubeni International Ltd.	115-01-02	IW	1/month (with bioassays)	Grab	Continuous	Recorder	Continuous	Recorder	1/day	Composite
		IR					1/day during discharge	Estimate	1/day during discharge	Grab
		NCCW					Continuous (after Nov. 1, 1999)*	Recorder (after Nov. 1, 1999)*		
		CW								
Weldwood of Canada Limited	99-01-02	IW			Continuous	Recorder	Continuous	Recorder	3/week	Composite
		NCCW					1/day during discharge	Flow Meter		
Weyerhaeuser Canada Ltd.	113-01-01	IW	1/month (with bioassays)	Grab	Continuous	Recorder	Continuous	Recorder	3/week	Composite
		IR1					1/day during discharge	Water Level	1/day during discharge	Grab

\*= See Appendix for More Information

BKP= Bleached Kraft Pulp

COD= Chemical Oxygen Demand

CW= Chiller Water

F= Frequency

IR= Industrial Runoff from the Stormwater Retention Pond

IR1= Industrial Runoff from the Storm Sewer

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

NCCW= Non-Contact Cooling Water

NH<sub>3</sub>-N= Ammonia-Nitrogen

ST= Sample Type

Pulp and Paper Mills - BKP - Monitoring

<b>Pulp &amp; Paper Mills - BKP</b>			<b>Parameters to be Monitored</b>											
Facility	Approval #	Source	pH		Specific Conductance		HM		Nutrients		OPP		BODu	
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST
Alberta Pacific Forest Industries Inc.	111-01-02	IW&IR	Continuous	Recorder	Continuous	Recorder	1/year	Grab	1/month	Grab	1/year	Grab	4/year	Composite
Daishowa-Marubeni International Ltd.	115-01-02	IW	Continuous	Recorder	Continuous	Recorder	1/year	Grab	1/two months	Grab	once every 5 years	Grab		
		IR	1/day during discharge	Grab										
		NCCW	Continuous*	Recorder*	Continuous*	Recorder*								
		CW	Continuous	Recorder	Continuous	Recorder								
Weldwood of Canada Limited	99-01-02	IW	Continuous	Recorder	Continuous	Recorder	1/year	Grab	1/month	Grab	2/approval period	Grab	1/year	Composite
		NCCW												
Weyerhaeuser Canada Ltd.	113-01-01	IW	Continuous	Recorder	Continuous	Recorder	1/year	Grab	1/month	Grab	1/year	Grab	1/year	Composite
		IR1	1/day during discharge	Grab	1/day during discharge	Grab								

\*= See Appendix for More Information  
 BKP= Bleached Kraft Pulp  
 BODu= Ultimate Biochemical Oxygen Demand  
 CW= Chiller Water

F= Frequency  
 HM= Heavy Metals  
 IR= Industrial Runoff from the Stormwater Retention Pond  
 IR1= Industrial Runoff from the Storm Sewer

IW&IR= Industrial Wastewater and Industrial Runoff  
 IW= Industrial Wastewater  
 NCCW= Non-Contact Cooling Water  
 OPP= Organic Priority Pollutants  
 ST= Sample Type

Pulp and Paper Mills - BKP - Monitoring

<b>Pulp &amp; Paper Mills - BKP</b>			<b>Parameters to be Monitored</b>														
Facility	Approval #	Source	TP		Major Ions		TOC and DOC		O&G		AOX		TON		C/C		
			F	ST	F	ST	F	ST	F	ST	F	ST	F	ST			
Alberta Pacific Forest Industries Inc.	111-01-02	IW&IR	1/year	Grab	2/year	Grab	1/month	Grab	1/day	Visual Check	1/week	Composite	1/month	Grab	1/month	Grab	
Daishowa-Marubeni International Ltd.	115-01-02	IW									1/week	Composite			1/two months	Grab	
		IR							1/day during discharge	Grab							
		NCCW															
		CW															
Weldwood of Canada Limited	99-01-02	IW	1/year	Grab							1/week	Composite			3/year*	Grab	
		NCCW															
Weyerhaeuser Canada Ltd.	113-01-01	IW	1/year	Grab	2/year	Grab	1/month	Grab			1/week	Composite	1/month	Grab	1/month	Grab	
		IR1								1/day during discharge	Grab						

AOX= Adsorbable Organic Halides  
 BKP= Bleached Kraft Pulp  
 C/C= Chlorate/Chlorite  
 CW= Chiller Water  
 DOC= Dissolved Organic Carbon

F= Frequency  
 IR= Industrial Runoff from the Stormwater Retention Pond  
 IR1= Industrial Runoff from the Storm Sewer  
 IW&IR= Industrial Wastewater and Industrial Runoff  
 IW= Industrial Wastewater

NCCW= Non-Contact Cooling Water  
 O&G= Oil and Grease  
 ST= Sample Type  
 TOC= Total Organic Carbon  
 TON= Threshold Odour Number  
 TP= Total Phenols

Pulp and Paper Mills - BKP - Monitoring

<b>Pulp &amp; Paper Mills - BKP</b>			<b>Parameters to be Monitored</b>									
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>CP</b>		<b>Toluene</b>		<b>Chloroform</b>		<b>Sulfides</b>		<b>Dioxins and Furans</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>
Alberta Pacific Forest Industries Inc.	111-01-02	IW&IR			1/month	Grab	1/two months	Grab	1/month	Grab	As per Federal Regulations	Composite
Daishowa-Marubeni International Ltd.	115-01-02	IW	1/two months*	Grab			1/two months	Grab			As per Federal Regulations	Composite
		IR										
		NCCW										
		CW										
Weldwood of Canada Limited	99-01-02	IW	3/year*	Grab			1/year	Grab			As per Federal Regulations	Composite
		NCCW										
Weyerhaeuser Canada Ltd.	113-01-01	IW	4/year	Grab			1/two months	Grab	1/month	Grab	As per Federal Regulations	Composite
		IR1										

\*= See Appendix for More Frequency Information

BKP= Bleached Kraft Pulp

CP= Chlorinated Phenolics

CW= Chiller Water

F= Frequency

IR= Industrial Runoff from the Stormwater Retention Pond

IR1= Industrial Runoff from the Storm Sewer

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

NCCW= Non-Contact Cooling Water

ST= Sample Type

Pulp and Paper Mills - BKP - Monitoring

<b>Pulp &amp; Paper Mills - BKP</b>			<b>Parameters to be Monitored</b>										
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>Floating Solids</b>		<b>Visible Foam</b>		<b>PCB</b>		<b>DOC</b>		<b>RW</b>	<b>Mn (Soluble)</b>	
			<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>	<b>F</b>	<b>ST</b>		<b>F</b>	<b>ST</b>
Alberta Pacific Forest Industries Inc.	111-01-02	IW&IR	1/day	Visual Check	1/day	Visual Check							
Daishowa-Marubeni International Ltd.	115-01-02	IW					4/year in 1999	Grab or Composite					
		IR											
		NCCW											
		CW											
Weldwood of Canada Limited	99-01-02	IW							1/month	Grab	Must be Monitored		
		NCCW											
Weyerhaeuser Canada Ltd.	113-01-01	IW					1/month in 1998	Grab				1/week	Composite
		IR1											

BKP= Bleached Kraft Pulp

CW= Chiller Water

F= Frequency

IR= Industrial Runoff from the Stormwater Retention Pond

IR1= Industrial Runoff from the Storm Sewer

IW&IR= Industrial Wastewater and Industrial Runoff

IW= Industrial Wastewater

Mn= Manganese

NCCW= Non-Contact Cooling Water

PCB= Polychlorinated Biphenyls

RW= Receiving Water

ST= Sample Type

## **TAB 1.K      REFINERIES**

There are currently seven refineries (one Asphalt and five oil) in Alberta. All except one, which does not discharge into a water body, have limits and monitoring requirements. Three of the refineries discharge into the North Saskatchewan River.

### **Limits**

- Five of the refineries have limits for Industrial Wastewater discharges.
- Two of the facilities have limits associated with Industrial Runoff releases.

### **Monitoring**

- Five of the refineries have monitoring on Industrial Wastewater discharges.
- Two of the facilities have monitoring associated with Industrial Runoff releases.

Refineries - Limits

Refineries			Parameters and Associated Limits (All units are kg/d, unless otherwise specified)								
Facility	Approval #	Source	TSS				COD				
			MODAMA	MMA	MDA	MDL	Effective Date	MODAMA	MMA	MDA	MDL
Canadian Turbo (1993) Inc. Southern Alberta Refinery - Balzac	20687-01-00	IW				30 mg/L*					
HUB Oil Company Ltd. - Calgary	9790-01-03	N/A*									
Imperial Oil - Strathcona	10192-01-03	IW1			116	334				600	937
		IW2			155*	738*				750	2070
		IR				30 mg/L					
Shell Canada Products Limited Scotford	59-01-01	IW3	284	5100 kg		355		1315	21210 kg		1774
Parkland Refining Ltd. Bowden Oil Refinery	1452-01-01	IW				50 mg/L					200 mg/L
Petro-Canada Products Edmonton Oil Refinery	10184-01-01	IW			72*	350*	Current			1000	2500
							June 1, 2001			800	2000
							June 1, 2006			600	1500
Husky Oil Operations Ltd. Lloydminster Asphalt Refinery	1427-01-01	IR				50 mg/L					

\*= See Appendix for More Information

COD= Chemical Oxygen Demand

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater During Normal Runoff Periods

IW2= Industrial Wastewater During High Runoff Periods

IW3= Industrial Wastewater from the Effluent Pond

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

MMA= Maximum Monthly Amount

MODAMA= Maximum One Day A Month Amount

N/A= Not Applicable

TSS= Total Suspended Solids

Refineries - Limits

<b>Refineries</b>			<b>Parameters and Associated Limits</b> (All units are kg/d, unless otherwise specified)												
Facility	Approval #	Source	O&G				Phenols				DS				
			MODAMA	MMA	MDA	MDL	MODAMA	MMA	MDA	MDL	MODAMA	MMA	MDA	MDL	
Canadian Turbo (1993) Inc. Southern Alberta Refinery - Balzac	20687-01-00	IW				10 mg/L				1 mg/L					
HUB Oil Company Ltd. - Calgary	9790-01-03	N/A*													
Imperial Oil - Strathcona	10192-01-03	IW1			34	95			0.67	1			0.67	3	
		IW2			46	198			0.9	2			0.9	4	
		IR				10 mg/L				1 mg/L					
Shell Canada Products Limited Scotford	59-01-01	IW3	66	1050 kg		89	6.6	105 kg		8.9	3.5	36 kg		5.8	
Parkland Refining Ltd. Bowden Oil Refinery	1452-01-01	IW				10 mg/L				1 mg/L				0.35 mg/L	
Petro-Canada Products Edmonton Oil Refinery	10184-01-01	IW			24	60			0.5	2			0.5	1.25	
Husky Oil Operations Ltd. Lloydminster Asphalt Refinery	1427-01-01	IR	Not present in amounts sufficient to create a visible film or sheen												

\*= See Appendix for More Information

DS= Dissolved Sulfide

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater During Normal Runoff Periods

IW2= Industrial Wastewater During High Runoff Periods

IW3= Industrial Wastewater from the Effluent Pond

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

MMA= Maximum Monthly Amount

MODAMA= Maximum One Day A Month Amount

N/A= Not Applicable

O&G= Oil and Grease



## Refineries - Limits

<b>Refineries</b>			<b>Parameters and Associated Limits (All units are kg/d, unless otherwise specified)</b>						
<b>Facility</b>	<b>Approval #</b>	<b>Source</b>	<b>ALT (Rainbow Trout)</b>	<b>pH (Units)</b>	<b>Ammonia-Nitrogen</b>				<b>FR</b>
				<b>NTBE</b>	<b>MODAMA</b>	<b>MMA</b>	<b>MDA</b>	<b>MDL</b>	
Canadian Turbo (1993) Inc. Southern Alberta Refinery - Balzac	20687-01-00	IW		6.0-9.5					
<b>HUB Oil Company Ltd. - Calgary</b>	<b>9790-01-03</b>	<b>N/A*</b>							
Imperial Oil - Strathcona	10192-01-03	IW1	50% or greater survival in 100% industrial wastewater sample	6.0-9.5			68	170	
		IW2	50% or greater survival in 100% industrial wastewater sample	6.0-9.5			91	190	
		IR							
<b>Shell Canada Products Limited Scotford</b>	<b>59-01-01</b>	<b>IW3</b>	<b>50% or greater survival in undiluted sample</b>	<b>6.0-9.5</b>	<b>69</b>	<b>1290 kg</b>		<b>85</b>	
Parkland Refining Ltd. Bowden Oil Refinery	1452-01-01	IW	50% or greater survival in 100% industrial wastewater sample	6.0-9.5				5 mg/L	Maximum 1000 m3/d
<b>Petro-Canada Products Edmonton Oil Refinery</b>	<b>10184-01-01</b>	<b>IW</b>	<b>50% or greater survival in 100% industrial wastewater sample</b>	<b>6.0-9.5</b>			<b>48</b>	<b>120</b>	
Husky Oil Operations Ltd. Lloydminster Asphalt Refinery	1427-01-01	IR		6.0-9.5					

\*= See Appendix for More Information

ALT= Acute Lethality Test

FR= Flow Rate

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater During Normal Runoff Periods

IW2= Industrial Wastewater During High Runoff Periods

IW3= Industrial Wastewater from the Effluent Pond

MDA= Maximum Daily Average (for any month)

MDL= Maximum Daily Limit

MMA= Maximum Monthly Amount

MODAMA= Maximum One Day A Month Amount

N/A= Not Applicable

NTBE= Never to be Exceeded

## Refineries - Monitoring

Refineries			Parameters to be Monitored							
Facility	Approval #	Source	TSS		Acute Lethality Tests		Ammonia-Nitrogen		Flow/Discharge Volume	
			F	ST	F	ST	F	ST	F	ST
Canadian Turbo (1993) Inc. Southern Alberta Refinery - Balzac	20687-01-00	IW	1/day during release periods	Composite					1/day during release periods	Estimate Flow Rate
HUB Oil Company Ltd. - Calgary	9790-01-03	N/A*								
Imperial Oil - Strathcona	10192-01-03	IW1	3/week	Composite	1/month*	Grab or Composite	3/week*	Composite	Continuous	Recorder
		IW2	3/week	Composite	1/month*	Grab or Composite	3/week*	Composite	Continuous	Recorder
		IR	1/week during release periods	Grab					Continuous	Recorder
Shell Canada Products Limited Scotford	59-01-01	IW3	1/day during release periods	Composite	Rainbow trout 1/3 months*	Grab or Composite	1/day during release periods	Composite	1/day during release periods	totalizer
Parkland Refining Ltd. Bowden Oil Refinery	1452-01-01	IW	1/week and 1/day during release periods	Grab	Rainbow trout 1/release*	Grab	1/week and 1/day during release periods	Grab	1/day	Weir
Petro-Canada Products Edmonton Oil Refinery	10184-01-01	IW	3/week	Composite	1/month*	Grab	3/week*	Composite	Continuous	Recorder
Husky Oil Operations Ltd. Lloydminster Asphalt Refinery	1427-01-01	IR	1/day	Grab					1/day	Grab

\*= See Appendix for More Information

F= Frequency

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater During Normal Runoff Periods

IW2= Industrial Wastewater During High Runoff Periods

IW3= Industrial Wastewater from the Effluent Pond

N/A= Not Applicable

ST= Sample Type

TSS= Total Suspended Solids

## Refineries - Monitoring

<b>Refineries</b>			<b>Parameters to be Monitored</b>							
Facility	Approval #	Source	pH		Phenols		O&G		DS	
			F	ST	F	ST	F	ST	F	ST
Canadian Turbo (1993) Inc. Southern Alberta Refinery - Balzac	20687-01-00	IW	1/day during release periods	Composite	1/day during release periods	Composite	1/day during release periods	Composite		
HUB Oil Company Ltd. - Calgary	9790-01-03	N/A*								
Imperial Oil - Strathcona	10192-01-03	IW1	Continuous	Recorder	3/week	Composite	3/week	Composite	3/week	Grab
		IW2	Continuous	Recorder	3/week	Composite	3/week	Composite	3/week	Grab
		IR			1/week during release periods	Grab	1/week during release periods	Grab		
Shell Canada Products Limited Scotford	59-01-01	IW3	1/day during release periods	Composite	1/day during release periods	Composite	1/day during release periods	Composite	1/day during release periods	Composite
Parkland Refining Ltd. Bowden Oil Refinery	1452-01-01	IW	1/week and 1/day during release periods	Grab	1/week and 1/day during release periods	Grab	1/week and 1/day during release periods	Grab	1/week and 1/day during release periods	Grab
Petro-Canada Products Edmonton Oil Refinery	10184-01-01	IW	Continuous	Recorder	3/week	Composite	3/week	Composite	3/week	Composite
Husky Oil Operations Ltd. Lloydminster Asphalt Refinery	1427-01-01	IR	1/day	Grab			1/day	Grab		

\*= See Appendix for More Information

DS= Dissolved Sulfide

F= Frequency

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater During Normal Runoff Periods

IW2= Industrial Wastewater During High Runoff Periods

IW3= Industrial Wastewater from the Effluent Pond

N/A= Not Applicable

O&G= Oil and Grease

ST= Sample Type

## Refineries - Monitoring

<b>Refineries</b>			<b>Parameters to be Monitored</b>								
Facility	Approval #	Source	Phosphorus		HM		COD		Zinc		
			F	ST	F	ST	F	ST	F	ST	
Canadian Turbo (1993) Inc. Southern Alberta Refinery - Balzac	20687-01-00	IW									
HUB Oil Company Ltd. - Calgary	9790-01-03	N/A*									
Imperial Oil - Strathcona	10192-01-03	IW1	1/month	Composite	1/month	Composite or Grab	1/week	Composite			
		IW2	1/month	Composite	1/month	Composite or Grab	1/week	Composite			
		IR									
Shell Canada Products Limited Scotford	59-01-01	IW3					1/day during release periods	Composite			
Parkland Refining Ltd. Bowden Oil Refinery	1452-01-01	IW	1/week and 1/day during release periods	Grab			1/week and 1/day during release periods	Grab			
Petro-Canada Products Edmonton Oil Refinery	10184-01-01	IW	1/month	Composite	1/month	Grab	1/week	Composite	1/month	Composite	
Husky Oil Operations Ltd. Lloydminster Asphalt Refinery	1427-01-01	IR									

\*= See Appendix for More Information

COD= Chemical Oxygen Demand

F= Frequency

HM= Heavy Metals

IR= Industrial Runoff

IW= Industrial Wastewater

IW1= Industrial Wastewater During Normal Runoff Periods

IW2= Industrial Wastewater During High Runoff Periods

IW3= Industrial Wastewater from the Effluent Pond

N/A= Not Applicable

ST= Sample Type

## **APPENDIX A**

### **SECTOR SPECIFIC WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

## **CHEMICAL PLANTS**

### **WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

#### AT Plastics Inc. – Edmonton Chemical Manufacturing Plant

##### Toxicity Testing – Acute Toxicity

At least once per month, a 96-hour static acute bioassay on Rainbow trout, and a 48-hour static acute bioassay using Daphnia magna from grab or composite samples must be performed. If <50% of Rainbow trout survive in 100% concentration test sample, another sample of the Storm Sewer Wastewater is measured for 96-hour multiple concentration Acute Lethality Testing using Rainbow trout. Measurement of both acute toxicity tests increases to one per week, until three consecutive Rainbow trout bioassays demonstrate 50% or greater survival. Then sampling reverts to once per month.

If <50% survive in 100% concentration sample, increased monitoring frequency and TRE (after February 28, 1999 when TRE is developed) are followed.

#### Celanese Canada Inc. – Edmonton Petrochemical Manufacturing Plant

The approval holder shall perform the 96-Hour Multiple Concentration Acute Lethality Test Using Rainbow Trout and the Microtox test on the same subsamples of the composite or grab samples taken.

##### Toxicity Testing – Acute Toxicity (Rainbow trout only)

At least once per month a 96-Hour Multiple Concentration Acute Lethality Test Using Rainbow Trout is performed. If less than 50% survive, another grab sample of the industrial wastewater is for acute lethality on rainbow trout. Sampling for acute lethality on rainbow trout increases to at least once per week thereafter. Unless otherwise directed by the Director of Pollution Control, the approval holder may revert to a sampling frequency of once per month after three consecutive tests demonstrate 50% or greater survival of the rainbow trout in the 100% test sample.

If less than 50% survive, the approval holder shall implement the most recently updated Toxicity Reduction Evaluation (TRE) Plan.

#### Dow Chemical Canada Inc. - Fort Saskatchewan Chemical Manufacturing Plant

Industrial Wastewater is discharged from the Liquid Effluent Ponds to the North Saskatchewan River. They are sampled at the discharge point, prior to mixing with the North Saskatchewan River or any other waters.

Flow measurement devices selected are capable of measuring flows with a maximum deviation of less than +/- 5% from true discharge rates throughout the range of expected flow volumes.

Sanitary Sewage is discharged from the Liquid Effluent pipeline system into the North Saskatchewan River.

Any CBOD results which exceed a value of 25 mg/L shall immediately be reported to the Director.

##### Toxicity Testing – Acute Toxicity

Acute Lethality Tests are conducted once per month, on Rainbow trout and Daphnia magna. If <50% survive, another grab sample of the industrial wastewater is analyzed. Acute lethality on Rainbow trout sampling increases to at least once per week thereafter; and a TRE Plan is developed and implemented. After three consecutive tests demonstrate 50% or greater survival, sampling frequency returns to once per month. If <50% survive, implement the TRE plan, and continue with it until completed, unless otherwise directed by the Director.

Both Acute Lethality Tests will be conducted on the same samples.

#### Degussa Canada Ltd. - Gibbons Hydrogen Peroxide Manufacturing Plant

Flow measurement devices are capable of measuring flows with a maximum deviation of less than +/- 5% from true discharge rates throughout the range of expected flow volumes.

Industrial Wastewater is released from the Final Effluent Sump or the 1202 sump into the North Saskatchewan River. Industrial Wastewater samples are collected at the discharge point from the Final Effluent Sump, prior to mixing with the North Saskatchewan River or any other waters.

##### Toxicity Testing – Acute Toxicity

## **CHEMICAL PLANTS**

### **WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

Once per month Acute Lethality Tests on Rainbow trout and Daphnia magna will be performed. If <50% survive, another grab sample is analyzed for acute lethality on Rainbow trout. Sampling increases to at least once per week. After three consecutive tests demonstrate 50% or greater survival, sampling frequency returns to once per month. If <50% survive, the TRE plan, is implemented and continues until completed, unless otherwise directed by the Director.

Both Acute Lethality Tests are conducted on the same samples.

#### Geon Canada Inc. – Scotford Polyvinyl Chloride Plant

Industrial Wastewater is released to the Effluent Retention Basins, and the discharged into the North Saskatchewan River.

Industrial Wastewater is sampled prior to entering the Effluent Retention Basins. Industrial Wastewater from the Effluent Retention Basins is sampled from the circulation line.

#### Toxicity Testing – Acute Toxicity (Rainbow trout only)

96-hour Multiple Concentration Acute Lethality Test using Rainbow trout, and Toxicity Testing using Luminescent Bacteria are both performed once per month.

If the 100% test sample of Industrial Wastewater for the Acute Lethality Test shows acute lethality (<50% survive), another grab sample of the Industrial Wastewater is analyzed. Sampling frequency for acute lethality on Rainbow trout increases to at least once per week. After three consecutive tests demonstrate 50% or greater survival, sampling frequency returns to once per month.

If <50% survive, the TRE plan is implemented and continues until completed, unless otherwise directed by the Director.

#### Shell Chemicals Canada Ltd. - Scotford Chemical Manufacturing Plant (styrene monomer) and Petrochemical Manufacturing Plant (ethylene glycol)

Sanitary Sewage samples are analyzed for BOD5 and TSS prior to and after treatment. Sanitary Sewage samples are taken prior to discharge to the cooling tower basin.

Industrial Wastewater comes from the Industrial Wastewater effluent pond, and is discharged into the North Saskatchewan River.

Industrial Wastewater and Industrial Runoff from the Ethylene Glycol Plant Biotreater discharge to the North Saskatchewan River.

Treated Sanitary Sewage is sample prior to discharge to the Industrial Wastewater Effluent Pond.

#### Toxicity Testing – Acute Toxicity

Once per month Acute Lethality Tests on Rainbow trout and Daphnia magna will be performed. If <50% survive, another grab sample is analyzed for acute lethality on Rainbow trout. Sampling increases to at least once per week. After three consecutive tests demonstrate 50% or greater survival, sampling frequency returns to once per month. If <50% survive, the TRE plan, is implemented and continues until completed, unless otherwise directed by the Director.

Both Acute Lethality tests have to be performed on the same sample.

#### NOVA Chemicals Ltd. – Joffre Petrochemical and Chemical Manufacturing Plant

Retention Ponds discharge to the cooling tower, the Effluent Pond, and the Red Deer River via a creek. Discharge from the Retention Ponds to the Red Deer River will be monitored throughout the release period. Discharge from the Retention Pond into the Effluent Pond will be monitored for the following when discharges occur: Flow, Total Phosphorus, TSS, and pH.

Effluent Pond discharges are sampled at the discharge point from the final Effluent Pond prior to mixing with the Red deer River, or any other waters.

Retention Pond discharges are sampled at the discharge point from the Retention Pond, prior to mixing with the Red Deer River via a creek.

Toxicity Testing - Acute Toxicity

## **CHEMICAL PLANTS**

### **WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

Once per month Acute Lethality Tests on Rainbow trout and Daphnia magna will be performed on grab samples. If <50% survive, another grab sample is analyzed for acute lethality on Rainbow trout. Sampling increases to at least once per week, and the TRE Plan is implemented. After three consecutive tests demonstrate 50% or greater survival, sampling frequency returns to once per month.

#### Chronic Toxicity

Chronic Toxicity tests using Daphnia (or Ceriodaphnia), Selenastrum, and fathead minnows are performed once every three months on grab samples.

#### Union Carbide Canada Inc. – Prentiss Chemical Manufacturing Plant

##### Industrial Wastewater

Industrial Wastewater is sampled at the final discharge to the Red Deer River.

Until the water recovery system is in full operation, only treated Industrial Wastewater from Ethylene Glycol Plant 1 and Ethylene Glycol Plant 2 final effluent sump can be discharged into the Red Deer River. After the wastewater recovery system is in full operation treated Industrial Wastewater from the water recovery system and demineralization regeneration discharge can be released to the Red Deer River (when the wastewater recovery system is operating).

After the wastewater recovery system is in full operation treated Industrial Wastewater from the water recovery system bypass and demineralization regeneration discharge can be released to the Red Deer River (when the wastewater recovery system is shut down).

##### Industrial Runoff

Industrial Runoff is sampled from the non-process area Industrial Runoff collection pond.

##### General

Prior to startup of Polyethylene Plant, the all Industrial Wastewater and Industrial Runoff releases from Industrial Runoff collection pond are monitored.

Once operation of Polyethylene Plant commences, intake water from the Red Deer River will be monitored. Once operation of Polyethylene Plant commences, contents of the Industrial Runoff collection pond are monitored, prior to discharging to Jones Creek.

Treated domestic wastewater is used for irrigation purposes.

##### Toxicity Testing – Acute Toxicity (Rainbow trout only)

Acute Lethality Tests on Rainbow trout must be conducted once per month. If the 100% test sample of Industrial Wastewater shows less than 50% survival, another grab sample is analyzed for acute lethality on Rainbow trout. Sampling increases to at least once per week, and the TRE Plan is implemented. Once at least three consecutive tests demonstrate 50% or greater survival, sampling returns to once per month.

#### Methanex Corporation – Medicine Hat Methanol Plant

Industrial Wastewater is released into the City of Medicine Hat sanitary system, therefore no monitoring requirements or limits are associated with this facility.

#### Sterling Pulp Chemicals Ltd. – Grande Prairie Sodium Chlorate Plant

Cooling Water and Industrial Wastewater are not directly discharged to a waterbody, so they have no associated limits at this facility.

All Industrial Wastewater is recycled or reused within the plant or shall be disposed of at a facility as authorized in writing by the Director.

Cooling Water Blowdown shall be discharged via pipeline to the Weyerhaeuser Grande Prairie Pulp Mill treatment facilities.

#### CXY Chemicals Canada Ltd. – Bruderheim Chemical Manufacturing Plant

There are no limits associated with this facility. There are monitoring requirements.



**CHEMICAL PLANTS**  
**WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

The Industrial Runoff pond is sampled ten days or less prior to any release from the Industrial Runoff pond. If releases continue for more than one week, the Industrial Runoff pond is sampled weekly. Industrial Runoff is used as a process water supply, or discharged to a brine well, or released from the Industrial Runoff pond to the surrounding watershed with prior written authorization from the Director. Industrial Wastewater can be discharged into plant brine wells. These brine wells are monitored.

## **COAL MINES WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### **Mountain Mines**

Most of the mountain coal mine approvals are currently being renewed, and will hopefully be standardized according to the Alberta Coal Mining Wastewater Guidelines (1998).

Industrial Wastewater handling facilities include major and minor ponds.

For all mountain coal mines, TSS limits are waived for a period of 48 hours after a storm event has occurred at the mine.

#### Luscar Ltd. – Gregg River Coal Mine and Processing Plant

Industrial Wastewater is directed to settling ponds which capture Industrial Wastewater and then discharge to the surrounding watershed.

#### Cardinal River Coals Ltd. – Cardinal River Coal Mine

Luscar Creek is monitored yearly.

#### Obed Mountain Coal Ltd. – Obed Mountain Coal Mine

Receiving Water will be monitored with grab samples yearly between June 15 and September 15.

#### Luscar Sterco (1977) Ltd. – Luscar Sterco (Coal Valley) Coal Mine

Receiving Water will be monitored with grab samples yearly between June 15 and September 15.

#### Smoky River Coal Limited – Smoky River Coal Mine

Sanitary Sewage discharge will be directed to the Plant site settling pond.

Between June 15 and September 15, grab samples shall be taken from the Sheep Creek (Receiving Water) and analyzed.

### **Prairie Mines**

Once a year Comprehensive monitoring involves taking a sample and analyzing it for BOD, BTEX, Colour, Oil and Grease, Phenols, Total Phosphorus, Dissolved Oxygen, TDS, Temperature, Total Sulfide, TSS, and inorganic parameters.

#### Luscar Ltd. – Sheerness Coal Mine

TSS limits shall be waived for a period of 48 hours after a storm event has occurred at the mine.

Industrial Wastewater is discharged from the wastewater handling facilities.

One mine wastewater handling facility is sampled for a Once a year Comprehensive analysis.

#### Forestburg Collieries (1984) Ltd. – Paintearth Coal Mine

Industrial Wastewater is discharged from the Industrial Wastewater handling facilities.

Sanitary Sewage is directed to a sewage lagoon, where it can be discharged.

#### Manalta Coal Ltd. - Vesta Coal Mine

Settleable Solids limits shall be waived for a period of 48 hours after a storm event has occurred at the mine.

Industrial Wastewater discharges from Settling ponds will be sampled on a yearly basis for a Once a Year Comprehensive analysis.

#### Manalta Coal Ltd. – Montgomery Coal Mine

TSS limits shall be waived for a period of 48 hours after a storm event has occurred at the mine.

## **COAL MINES WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### TransAlta Utilities Corporation – Whitewood Coal Mine

Industrial Wastewater is discharged from the Wabamun drainage to the TransAlta Utilities Corporation Wabamun Power Plant Wet Ash Lagoon, or to the Lac Ste. Anne drainage.

Discharges to the Lac Ste. Anne drainage have limits associated with them.

TSS limits shall be waived for a period of 48 hours after a storm event has occurred at the mine.

Each separate discharge stream in the Lac Ste. Anne drainage will be sampled for comprehensive parameters on a yearly basis (during August, September, or October).

### TransAlta Utilities Corporation - Highvale Coal Mine

All Industrial Wastewater in the Industrial Wastewater handling facilities shall be directed to the Sundance Cooling Pond, so there are no limits or monitoring associated with this facility.

### Edmonton Power Inc. – Genesee Coal Mine

There are no limits associated with wastewater at this facility, as it is discharged to the Genesee Power Plant systems.

Industrial wastewater is sampled on a yearly basis and comprehensive analysis is performed.

## **FERTILIZER MANUFACTURING PLANTS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### Agrium Products Inc. – Fort Saskatchewan Fertilizer Manufacturing Plant

There are no limits associated with the wastewater, as this facility discharges to the Sherritt wastewater system. All discharges are considered under the Sherritt International approval.

### Agrium Products Inc. – Redwater Fertilizer Manufacturing Plant

Industrial Wastewater is released from the settling pond via pipeline to the North Saskatchewan River. Industrial Wastewater discharges are sampled prior to mixing with the North Saskatchewan River or any other waters.

#### Toxicity Testing – Acute Toxicity

Industrial Wastewater is sampled once a month for 96-hour 100% concentration Acute Lethality Test using Rainbow trout, and 48-hour static Acute Lethality Test using Daphnia magna.

If 50% or less survive the acute lethality test, monitoring frequency increases to at least once per week.

Once three consecutive tests demonstrate >50% survival the sampling frequency reverts to once per month.

### Agrium Products Inc. – Carseland Manufacturing Plant

There are no limits associated with the wastewater because it is used for irrigation, and not directly released to a waterbody.

Industrial Wastewater is released to the Evaporation Pond or the Irrigation Pond. Industrial Wastewater from the Irrigation Pond is used for irrigation onto arable land.

Industrial Runoff is collected in the Stormwater Pond and directed to the Irrigation Pond or Evaporation Pond.

Receiving Waters (12 Mile Coulee) are monitored.

Industrial Wastewater is sampled once a month in May, June, July, August, and September. (Sampling occurs during irrigation, which only occurs during these months).

Heavy metals are sampled for once a year, in the spring.

The results of the monitoring are to be compared to the Canadian water quality guidelines for irrigation.

### Canadian Fertilizers Limited – Medicine Hat Fertilizer Manufacturing Plant

Discharges from the equalization pond include sanitary sewage and process wastewater. Discharges from the equalization pond shall be directly to the South Saskatchewan River.

Industrial Wastewater samples will be taken prior to equalization pond discharges mixing with the South Saskatchewan River or any other waters.

#### Toxicity Testing – Acute Toxicity

96-hour static acute bioassays using Rainbow trout will be performed at least once per calendar month. 48-hour static acute lethality tests using Daphnia magna will be conducted on the same samples as the 96-hour bioassay, at least once per calendar month.

### Sherritt International Corporation

Industrial wastewater and runoff is directed to the Effluent Management System consisting of 2 stormwater ponds, lime precipitator, an ammonia stripper absorption column and three effluent ponds. Discharge occurs daily to the North Saskatchewan River.

#### Toxicity Testing – Acute Toxicity

96-hour acute bioassays using Rainbow trout will be performed at least once per calendar month. 48-hour static acute lethality tests using Daphnia magna will be conducted on the same samples as the 96-hour bioassay, at least once per calendar month.

## **FOUNDRY**

### **WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

#### AltaSteel Ltd. – Edmonton Steel Producing Plant

Industrial Wastewater is discharged from the Industrial Wastewater control facility directly to Gold Bar Creek. Discharge to Gold Bar Creek can occur only under conditions which permit the free flow of liquid effluent to the North Saskatchewan River.

Industrial Wastewater is sampled prior to the discharge mixing with Gold Bar Creek or any other waters.

#### Toxicity Testing - Acute Toxicity

A 96-hour multiple concentration Acute Lethality Test using Rainbow trout from a composite or grab sample, and a 48-hour static acute bioassay using Daphnia magna on a grab or a composite sample will be conducted semi-annually. These two analyses are conducted on the same samples. If <50% survive, sampling frequency increases to once per week. After three consecutive tests demonstrate 50% or greater survival, sampling frequency returns to semi-annually.

## **GAS PLANTS**

### **WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

#### Shell Canada Limited – Caroline Sour Gas Plant

Industrial Runoff samples are taken at the discharge point of the Industrial Runoff holding ponds.

#### Shell Canada Limited - Waterton Sour Gas Plant

Industrial Wastewater is sampled prior to mixing with North Drywood Creek.

Industrial Runoff is sampled in the surface runoff building.

Industrial Runoff from Batch Releases is monitored prior to release to North Drywood Creek or Foothills Creek.

#### Toxicity Testing – Acute Toxicity

Acute Lethality Tests on Rainbow Trout are performed at least once per month. If the 100% test sample of Industrial Wastewater shows acute lethality (<50% survive), another grab sample of the Industrial Wastewater is analyzed. Sampling frequency for acute lethality on Rainbow trout increases to at least once per week. A TRE Plan is developed and implemented. After three consecutive tests demonstrate 50% or greater survival, sampling frequency returns to once per month.

At least once per month a 48-hour static acute bioassay using Daphnia magna is performed.

#### Chronic Toxicity

Chronic/sublethal toxicity sampling and analysis is required to be conducted at a minimum of four times per year for two years, as defined in approval #258-01-00.

#### Husky Oil Operations Ltd. - Ram River Sour Gas Plant

Industrial Wastewater is sampled from the groundwater hydrocarbon recovery system water before it goes back to the hydrocarbon recovery system disposal wells.

Industrial Runoff is sampled where the water drains from the plant process area.

#### Toxicity Testing – Acute Toxicity (Rainbow trout only)

During authorized disposal of the wastewater collected from the groundwater hydrocarbon recovery system back to the hydrocarbon recovery system disposal wells, a 96-hour acute lethality bioassay test using rainbow trout (Oncorhynchus mykiss) on a treated undiluted grab sample of the wastewater is performed.

#### Chevron Canada Resources Limited – Kaybob South - Beaverhill Lake Gas Unit No. 3 Sour Gas Plant

Industrial Runoff is sampled in the Surface Runoff control facilities.

#### Amoco Canada Petroleum Company Ltd. – Kaybob South Sour Gas Plant

Industrial Runoff is sampled in the Surface Runoff control facilities.

#### Petro-Canada Resources - Wildcat Hills Sour Gas Plant

Industrial Runoff is sampled in the Surface Runoff control facilities.

#### Shell Canada Limited - Jumping Pound Sour Gas Plant

Samples are collected prior to mixing with the Pile of Bones Creek or any other waters.

Flow measurement devices selected for liquid effluent discharges shall be capable of measuring flows with a maximum deviation of less than +/- 5% from true discharge rates throughout the range of expected flow volumes.

Industrial Runoff water is released directly from the Surface Runoff treatment facilities to the Pile of Bones Creek watershed.

#### Toxicity Testing – Acute Toxicity (Rainbow trout only)

## **GAS PLANTS**

### **WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

At least once per calendar month a 96-hour acute static bioassay, using rainbow trout (*Oncorhynchus mykiss*) on an undiluted grab or composite sample is performed prior to discharge to the Pile of Bones Creek.

#### Gulf Canada Resources Limited - Strachan Sour Gas Plant

Industrial Runoff samples are taken from within the Surface Runoff control facilities.

#### Crestar Energy Inc. – Vulcan Sour Gas Plant

Industrial Runoff samples are taken within the Surface Runoff control facilities.

#### AltaGas Services Inc. - Sedgewick Sour Gas Processing Plant

There are no limits or monitoring requirements associated with this facility.

#### Novagas Clearinghouse Ltd. – Zama Sour Gas Plant #3

There are no limits or monitoring requirements associated with this facility.

#### Morrison Petroleum Ltd. – Wizard Lake Sour Gas Plant

There are no limits or monitoring requirements associated with this facility.

#### Novagas Clearinghouse Ltd. – Zama Sour Gas Plant #2

There are no limits or monitoring requirements associated with this facility.

#### Petro-Canada – Empress Straddle Gas Plant

Toxicity Testing – Acute Toxicity (Rainbow trout only)

Acute Lethality Test on Rainbow trout is performed once per month. If the sample of wastewater shows acute lethality (less than 50% survive), another grab sample of the wastewater is analyzed with a 96-hour Multiple Concentration Acute Lethality Test Using Rainbow Trout. Sampling for Acute Lethality on Rainbow Trout (Multiple Concentration Test) increases to at least once per week thereafter.

Sampling frequency returns to once every month after three consecutive tests demonstrate 50% or greater survival, unless otherwise directed by the Director of Pollution Control.

#### Alberta Natural Gas – Cochrane Extraction Gas Plant

Industrial Runoff is released to surrounding watershed areas.

Industrial Wastewaters are released from the cooling water system to the Bow River.

## **MEAT PROCESSING PLANTS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### Cargill Foods - High River Red Meat Integrated Plant

Industrial Wastewater is discharged from the treatment facility to the Frank Lake pipeline.

Industrial Wastewater is sampled after the treatment processes are complete, and prior to discharge to the Frank Lake pipeline.

### Lakeside Packers, a Division of Lakeside feeders Ltd. Brooks Red Meat Processing Plant

Industrial Wastewater is sampled for flow on the outfall to the wastewater ponds.

Sampling is done at the final effluent lagoons prior to irrigation.

Monitoring is only done during April, May, June, July, August, and September (when irrigation is performed).

Samples are taken at least 20 days apart.



**OILSEED PROCESSING PLANTS**  
**WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

The approvals for both facilities are currently being renewed, and information in this document is taken from the draft versions of the renewals.

ADM Agri-Industries Ltd. – Lloydminster Oilseed Processing Plant

Industrial Wastewater is released to the City of Lloydminster municipal sanitary system subject to the City's bylaws. Therefore, there are no limits or monitoring for this facility.

Canadian Agra Foods Inc. – Sexsmith Oilseed Processing Plant

Industrial Wastewater and Industrial Runoff are released from the Industrial Wastewater Control System.

## **POTATO PROCESSING PLANTS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### Pak-Wel Produce Limited – Vauxhall Potato Processing Plant

Discharge Flow from the Industrial Wastewater control facilities will be monitored on a monthly basis after September 1, 1999, at the same time grab samples are taken to monitor the other parameters.

Industrial Wastewater is monitored during periods of measurable flow from the Industrial Wastewater control facilities.

### ConAgra Limited – Taber Vegetable Processing Plant

Industrial Runoff is released from the Industrial Runoff control system to the surrounding watershed or to the Industrial Wastewater control system.

Wastewater irrigation releases onto land, from the Industrial Wastewater control system shall only occur if EC and SAR water quality values meet the application conditions as specified.

Treated Industrial Wastewater will be used for irrigation on lands authorized in writing by the Director.

Flow is measured at the discharge points of the aerated storage ponds, and the dissolved air floatation unit of the Industrial Wastewater control system.

Flow is monitored on a daily basis from both of these locations, but only during irrigation season (May through September) from the discharge points of the aerated storage ponds.

## **POWER PLANTS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### Alberta Power Limited - H.R. Milner Thermal Electric Power Plant

TSS concentration limit shall be 50 mg/L absolute or 10mg/L absolute above the background level, whichever is greater.

Iron concentration limit shall be 2 mg/L absolute or the concentration of iron in the background level, whichever is greater.

Industrial Wastewater samples are taken from the discharge point of the wastewater ponds prior to mixing with the Smoky River.

Industrial Runoff samples are taken from the discharge point from the plant site runoff ponds prior to mixing with the Smoky river (when discharges occur).

Monitoring for Free Available Chlorine is required during and 2 weeks after chlorine addition to the cooling towers.

### Toxicity Testing – Acute Toxicity

A 96-hour multiple concentration Acute Lethality Test using Rainbow trout, and a 48-hour static acute bioassay using Daphnia magna are conducted once every three months.

### Alberta Power Limited - Battle River Thermal Electric Power Generating Plant

Industrial Wastewater from the Ash Lagoon is released to the cooling water return canal and the Battle River reservoir.

### Toxicity Testing – Acute Toxicity (Rainbow trout only)

A 96-hour Acute Lethality Test using Rainbow trout is performed at least once every three months.

If the 100% test sample of industrial wastewater for the Acute Lethality Test on Rainbow trout shows acute lethality (<50% survive), another grab sample of the industrial wastewater is analyzed. Sampling for acute lethality on Rainbow trout increases to at least once per week, and a TRE Plan is developed and implemented. After three consecutive tests demonstrate 50% or greater survival, sampling frequency returns to once every three months.

### Alberta Power Limited - Sheerness Thermal Electric Power Generating Plant

Industrial Wastewater is sampled at the flow metering station after it is released from the cooling pond and the regeneration lagoon.

Blowdown Canal Effluent is sampled from the flow metering station or immediately downstream after release from the regeneration lagoon.

### TransAlta Utilities Corporation - Sundance Thermal Electric Power Plant

Cooling Pond Wastewater is Industrial Wastewater released from the cooling pond into the North Saskatchewan River.

Settling Pond Wastewater consists of releases of Industrial Wastewater from the settling ponds into Lake Wabamun during periods of excessive rainfall.

Limits on Industrial Wastewater from settling ponds are only applicable when runoff is <190 L/s.

### TransAlta Utilities Corporation - Wabamun Thermal Electric Power Plant

Receiving waters are monitored for Temperature.

Cooling Water samples taken at the inlet and outlet locations of the cooling water ponds.

Receiving Water samples are taken outside the zone of influence of thermal discharge from the plant.

The final Industrial Wastewater flow measurements shall not deviate from the true release rate by more than +/- 10%, throughout the range of flow volumes.

Industrial Wastewater is sampled from the Ash Lagoon prior to being released into Lake Wabamun.

## **POWER PLANTS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### Toxicity Testing – Acute Toxicity

A 96-Hour multiple concentration Acute Lethality Test using Rainbow trout, from a grab sample, and a 48-hour static acute bioassay using Daphnia magna on grab or a composite sample are conducted once every year. These two analyses are to be conducted on the same samples. If the control response exceeds 10% in any of the bioassays, it is repeated.

### Chronic Toxicity

#### Subacute/chronic lethality tests

At least once every two months 7-day Fathead minnow, 4-day Selenastrum capricornutum, and 7-day Ceriodaphnia dubia bioassays from grab samples are performed. If the control response exceeds 20% in any of the bioassays, it is repeated.

Chronic toxicity is monitored until the Director is satisfied that chronic toxicity is not a problem for this effluent.

### TransAlta Utilities Corporation - Keephills Thermal Electric Power Plant

The final industrial wastewater flow measurements shall not deviate from the true release rate by more than +/- 10%, throughout the range of flow volumes.

Cooling Pond Wastewater is Industrial Wastewater released from the cooling pond into the North Saskatchewan River.

Settling Pond Wastewater consists of releases of Industrial Wastewater from the settling ponds.

### Edmonton Power Inc. - Clover Bar Thermal Electric Power Generating Plant

Industrial Wastewater is sampled downstream of the oil trap prior to mixing with the North Saskatchewan River.

Chlorinated Condenser Cooling Water is sampled from the outfall at the North Saskatchewan River.

During chlorination of Condenser Cooling Water, the chlorine dosage rate shall not exceed 130 kg/hr.

Sodium Fluorescein dye can be used for cooler leak detection, providing releases into the North Saskatchewan River are less than 0.1 mg/L.

### Edmonton Power Inc. - Rosedale Thermal Electric Power Generating Plant

Sodium Fluorescein dye can be used for cooler leak detection, providing the solution concentration released into the North Saskatchewan River is less than 0.1 mg/L.

Boiler Wet Storage Water is released to the North Saskatchewan River.

### Edmonton Power Authority - Genesee Thermal Electric Power Generating Plant

Industrial Wastewater is released from the cooling pond via the cooling pond blowdown line to the North Saskatchewan River.

### The City of Medicine Hat - Medicine Hat Thermal Power Plant

Condenser Cooling Water is released into the South Saskatchewan River.

## **PULP AND PAPER MILLS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

Production Capacity is design production capacity, which may be exceeded.

Acute Lethality Testing is performed as follows:

At least once per calendar month a 96-hour static acute bioassay is performed. If <50% survive the bioassay is repeated. Monitoring increases to at least once per week, until three consecutive tests show 50% or more survival, then monitoring returns to once per month. If <50% of the rainbow trout survive, a Toxicity Reduction Evaluation (TRE) plan is implemented.

At least once per week a 48-hour static acute bioassay using Daphnia magna is performed. If <50% survive in the 100% concentration test sample, the process is repeated on rainbow trout. Measurements increase to at least three times per week, with at least 48 hours between separate grab samples, until three consecutive bioassays demonstrate >50% survival. Then sampling frequency reverts to once per week. If <50% of the rainbow trout survive, increased monitoring frequency and TRE plan is followed as specified. If any control response exceed 10% in any bioassay, that bioassay is be repeated.

### **THERMOMECHANICAL PROCESS (TMP)**

Alberta Newsprint Company Ltd.

Non-Contact Cooling Water is released to the Athabasca River or the stormwater retention pond.

Industrial Runoff is released to the stormwater retention pond for release directly to the Athabasca River, or to the Industrial Wastewater control system for treatment.

Industrial Wastewater samples are taken prior to mixing with the Athabasca River or any other waters

Stormwater Pond discharges are sampled at the outlet structure of the Stormwater Pond, prior to mixing with the Athabasca River or any other waters.

Non-Contact Cooling Water is sampled at the Non-Contact Cooling Water discharge location, prior to mixing with the Athabasca River or any other waters.

If the dissolved oxygen in the Peace River falls below 6.5 mg/L, the approval holder shall reduce or cease discharging as authorized in writing by the Director.

Final Industrial Wastewater flow measurements can not deviate from the true release rates by more than +/- 10%, throughout the normal range of flow volumes.

Resin and Fatty Acids and Ammonia-Nitrogen samples will be obtained on the same day as the acute lethality bioassay on Rainbow trout, as both parameters are common causes of toxicity in pulpmill wastewater.

Toxicity Testing

Acute Lethality Testing is performed as described above.

Both the 96-hour static acute and 48-hour static acute bioassays will be conducted on the same samples.

Sublethal/chronic toxicity

At least semi-annually, with one summer and one winter test each year, the 7-day Fathead minnow, 4-day Selenastrum capricornutum, and 7-day Ceriodaphnia dubia bioassays are performed. If the control response exceeds 20% in any of the bioassays, it is repeated.

Millar Western Pulp (Whitecourt) Ltd.

Industrial Wastewater samples are taken prior to mixing with the Athabasca River or any other waters, including surface runoff.

Sanitary sewage is discharge to the Town of Whitecourt sanitary sewage system.

Non-Contact Cooling Water is sampled at the Non-Contact Cooling Water discharge, prior to mixing with the wastewater or the McLeod River.

## **PULP AND PAPER MILLS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

### **Toxicity**

Acute Lethality Testing is performed as described above.

### **Sublethal/chronic toxicity**

At least four times per year, once every three years, the 7-day Fathead minnow, 4-day Selenastrum capricornutum, and 7-day Ceriodaphnia dubia bioassays are performed. If the control response exceeds 20% in any of the bioassays, it is repeated.

### **Slave Lake Pulp Corporation**

Industrial Wastewater samples are taken prior to mixing with the Lesser Slave River or any other waters, including surface runoff.

The Stormwater Pond water is sampled from the stormwater and chip and log storage runoff ponds prior to mixing with the wastewater or any other waters.

The discharge from the Stormwater Pond and the chip and log storage runoff pond may be directed to the Lesser Slave River, but shall be controlled in such a manner that the sum of BOD and TSS in this discharge, when added to the BOD and TSS respectively in the wastewater discharged, does not exceed the Daily Limit or the Maximum Daily Average discharge of BOD and TSS allowed in the wastewater limits.

### **Toxicity Testing**

Acute Lethality Testing is performed as described above.

### **Sublethal/chronic toxicity**

At least four times per year, once every three years, the 7-day Fathead minnow, 4-day Selenastrum capricornutum, and 7-day Ceriodaphnia dubia bioassays are performed. If the control response exceeds 20% in any of the bioassays, it is repeated.

## **BLEACHED KRAFT PROCESS (BKP)**

### **Alberta Pacific Forest Industries Inc.**

Final effluent flow devices must be capable of measuring flows within +/-5% of true discharge rates at all times.

Industrial Wastewater is released from the effluent treatment facilities via pipeline to the Athabasca River. Samples are taken prior to mixing with the Athabasca River, or any other waters.

### **Toxicity**

Acute Lethality Testing is performed as described above.

Both the 96-hour static acute and 48-hour static acute bioassays will be conducted on the same samples.

### **Sublethal/chronic toxicity**

At least four times per calendar year, with at least two months between tests, the 7-day Fathead minnow, 4-day Selenastrum capricornutum, and 7-day Ceriodaphnia dubia bioassays are performed. If the control response exceeds 20% in any of the bioassays, it is repeated.

### **Daishowa-Marubeni International Ltd.**

Final Industrial Wastewater flow measurements shall not deviate from the true release rates by more than +/- 10%, throughout the normal range of flow volumes.

Industrial Wastewater will be released from the Industrial Wastewater control facility via pipeline to the Peace River.

Industrial Runoff is released from the Stormwater Retention Pond directly to the Peace River.

## **PULP AND PAPER MILLS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

If the dissolved oxygen in the Peace River falls below 6.5 mg/L, the approval holder shall reduce or cease discharging as authorized in writing by the Director.

Flows of Non-Contact Cooling Water discharge can be estimated until Nov. 1, 1999, after which the approval holder shall continuously measure the flows with a recorder.

If the BOD or TSS of the Non-Contact Cooling Water sample exceeds 10 mg/L, sampling frequency is increased to three composite samples per week for 30 days. If these results show the discharge exceeds 10 mg/L on a consistent basis, the approval holder collects samples of the Non-Contact Cooling Water discharge on a daily basis and determines the BOD and TSS. The mass determination for BOD and TSS is then summed to obtain the mass discharge of the industrial wastewater. The combined total is subject to the Industrial Wastewater limits.

Resin and Fatty Acids and Ammonia-Nitrogen samples will be obtained on the same day as the Acute Lethality Test on Rainbow trout, as both parameters are common causes of toxicity in pulpmill wastewater.

The samples for Chlorinated Phenolics and Chlorate/Chlorite will be obtained on the same day.

Industrial Wastewater samples are taken prior to mixing with the Peace River or any other waters. Stormwater Retention Pond discharges are sampled at the discharge location of the Stormwater Retention Pond, prior to mixing with the Peace River or any other waters.

Non-Contact Cooling Water is sampled at the Non-Contact Cooling Water discharge location, prior to mixing with the Peace River or any other waters.

Chiller Water is sampled at the discharge location prior to mixing with the Non-Contact Cooling Water or any other waters.

Flow, pH and Specific Conductance of Non-Contact Cooling Waters are analyzed for prior to mixing with chiller water.

### Toxicity

Acute Lethality Testing is performed as described above.

Both the 96-hour static acute and 48-hour static acute bioassays will be conducted on the same samples.

### Sublethal/chronic toxicity

At least twice per calendar year the 7-day Fathead minnow, 72-hour Selenastrum capricornutum, and 7-day Ceriodaphnia dubia bioassays are performed. If the control response exceeds 20% in any of the bioassays, it is repeated.

### Weldwood of Canada Limited

Final Industrial Wastewater flow measurements shall not deviate from the true release rates by more than +/- 10%, throughout the normal range of flow volumes.

Resin and Fatty Acids and Ammonia-Nitrogen samples will be obtained on the same day as the Acute Lethality Test on Rainbow trout, as both parameters are common causes of toxicity in pulpmill wastewater.

This facility discharges to the Athabasca River.

If the dissolved oxygen in the Peace River falls below 6.5 mg/L, the approval holder shall reduce or cease discharging as authorized in writing by the Director.

The samples for Chlorinated Phenolics and Chlorate/Chlorite will be obtained on the same day.

### Toxicity Testing

Acute Lethality Testing is performed as described above.

## **PULP AND PAPER MILLS WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

Both the 96-hour static acute and 48-hour static acute bioassays will be conducted on the same samples.

### Sublethal/chronic toxicity

At least twice per calendar year, for each year over the three year cycles required under federal regulations, the 7-day Fathead minnow, 4-day Selenastrum capricornutum, and 7-day Ceriodaphnia dubia bioassays are performed. If the control response exceeds 20% in any of the bioassays, it is repeated.

Non-Contact Cooling Water is sampled prior to mixing with the release from the aerated stabilization basin.

Industrial Wastewater includes sewage, plant wastewater, and landfill leachate.

### Weyerhaeuser Canada Ltd.

Storm Sewer samples are taken from the discharge point of the Storm Sewer, prior to the discharge mixing with the Wapiti River.

Resin and Fatty Acids and Ammonia-Nitrogen samples will be obtained on the same day as the Acute Lethality Test on Rainbow trout, as both parameters are common causes of toxicity in pulpmill wastewater.

Final Industrial Wastewater flow measurements shall not deviate from the true release rates by more than +/- 10%, throughout the normal range of flow volumes.

If the dissolved oxygen in the Peace River falls below 6.5 mg/L, the approval holder shall reduce or cease discharging as authorized in writing by the Director.

### Toxicity

Acute Lethality Testing is performed as described above.

Both the 96-hour static acute and 48-hour static acute bioassays will be conducted on the same samples.

### Sublethal/chronic toxicity

At least once per month for December, January, February, and March of each year (at intervals greater than three weeks,) the 7-day Fathead minnow, and 4-day Selenastrum capricornutum bioassays are performed. If the control response exceeds 20% in any of the bioassays, it is repeated.



## **REFINERIES**

### **WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

#### Canadian Turbo (1993) Inc. – Southern Alberta Refinery – Balzac

Industrial Wastewater released from the refinery site to McDonald Lake consists of storm runoff water and some treated process area wash water.

TSS limits include the volatile portion only.

#### HUB Oil Company Ltd. – Calgary

No monitoring or limits associated with this facility because no wastewaters are directly discharged to a water body.

Sanitary sewage shall be directed to a septic tank and subsequently hauled to a municipal plant.

The approval holder disposes of wastewater by deepwell injection to an Alberta Energy and Utility Board approved well, to the City of Calgary sewage system or as authorized in writing by the Director.

#### Imperial Oil – Strathcona

This facility release wastewaters into the North Saskatchewan River

Final industrial flow measurements shall not deviate from the true release rate by more than +/- 10%, throughout the range of flow volumes.

Limits for TSS during high Industrial Wastewater runoff shall include only the volatile portion if the flow of industrial wastewater released exceeds 8500 m<sup>3</sup>/d on the day the sample was obtained.

Industrial Runoff samples are from South Tank Farm Retention Pond (RIB#5) or Distribution Runoff Pond (RIB#4), or any other pond that collects only Industrial Runoff.

Ammonia-Nitrogen must be analyzed for in a sample collected within 24 hours of the sample used for the acute Rainbow trout bioassay.

#### Toxicity Testing

A 96-hour static acute bioassay on Rainbow trout is performed at least once per month on grab or composite samples of industrial wastewater.

A 48-hour static acute bioassay using Daphnia magna is performed at least once per month on grab or composite samples of industrial wastewater. If the control response exceeds 10% in any of the bioassays, it is repeated.

The 96-hour and 48-hour static acute bioassays are performed on the same samples.

#### Shell Canada Products Limited – Scotford Oil Refinery

Industrial Wastewater is sampled at the release point from the Effluent Pond, prior to mixing with the North Saskatchewan River, or any other waters.

#### Toxicity Testing

A 96-Hour Multiple Concentration Acute Lethality Test using Rainbow Trout and a 48-hour static acute bioassay using Daphnia magna is conducted once every three months.

#### Parkland Refining Ltd. – Bowden Oil Refinery

Acute Lethality Tests using Rainbow trout are conducted once per release.

#### Petro-Canada Products – Edmonton Oil Refinery

Final industrial wastewater flow measurements shall not deviate from the true release rate by more than +/- 10%, throughout the range of flow volumes.

Industrial Wastewater is released to the North Saskatchewan River.

Ammonia-Nitrogen analysis is performed on the same day as the Rainbow trout bioassays.

TSS limits include the volatile portion only.

**REFINERIES**  
**WASTEWATER LIMITS AND MONITORING REQUIREMENTS**

Toxicity Testing

A 96-Hour Multiple Concentration Acute Lethality Test using Rainbow Trout, and a 48-hour static acute bioassay using Daphnia magna is conducted once every month.

Husky Oil Operations Ltd. – Lloydminster

Grab samples of Runoff are taken prior to release.