



Sulphur Recovery and Sulphur Emissions at Alberta Sour Gas Plants

Annual Report for the 2008 Operating Year

July 2009



ENERGY RESOURCES CONSERVATION BOARD
ST101-2009: Sulphur Recovery and Sulphur Emissions at Alberta Sour Gas Plants for the 2008
Operating Year

July 2009

Published by
Energy Resources Conservation Board
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1 Introduction

The Energy Resources Conservation Board's (ERCB's) annual summary report on industry performance regarding sulphur recovery and sulphur emissions is published in accordance with *Interim Directive (ID) 2001-03: Sulphur Recovery Guidelines for the Province of Alberta* as part of its commitment to monitor the sulphur recovery of grandfathered¹ sour gas plants. This report covers both grandfathered sour gas plants (sulphur recovery and larger acid gas flaring sour gas plants) and nongrandfathered² sour gas plants (sulphur recovery and acid gas injection sour gas plants). A complete list of the grandfathered and nongrandfathered plants is in Appendices 2.1 through 2.4.

While *ID 2001-03* did not change the recovery levels expected for new gas plants, it set out clear expectations on when older grandfathered plants are required to meet the same requirements as new plants. The ID incorporated a phased approach to the more stringent requirements and encouraged operators of sulphur recovery plants to take early action to improve performance. The ID allowed older plants that were reducing throughput by 7.5 per cent each year (and thus emissions) to continue to operate under their existing approvals until December 31, 2016, at which time grandfathering would end for all plants.

Grandfathered sulphur recovery plants that perform better than the minimum requirements specified in *ID 2001-03* have the option to file sulphur emission performance credit report forms and may use the credits to meet a portion of the sulphur recovery requirements at a future date (i.e., operate for a longer time or at a higher inlet rate before having to degrandfather the plant). All grandfathered sulphur recovery plants are taking advantage of the emission credit program, and credits are still increasing every year.

Acid gas flaring plants have no ability to earn credits and are subject to more stringent requirements over time.

In the last nine years a number of plants have degrandfathered:³ 15 plants have made modifications to their plant, 13 plants have been relicensed to meet the requirements for new plants, and 8 plants have ceased operating. There are 24 grandfathered plants remaining. In addition, sulphur emissions have decreased substantially from 2000 to 2008 for both grandfathered acid gas flaring plants (emissions down 75 per cent) and grandfathered sulphur recovery plants (emissions down 52 per cent).

2 Summary of Performance for Grandfathered Plants, 2000-2008

2.1 Grandfathered Plants That Have Been Degrandfathered

In the last nine years, 15 plants have made modifications to improve or install sulphur recovery to meet the more stringent sulphur recovery requirements for new plants. In addition, 13 other plants have been relicensed to meet these more stringent sulphur

¹ Grandfathered plants are those that do not meet the sulphur recovery requirements for new plants listed in *ID 2001-03*. This includes some sulphur recovery plants and larger (sulphur inlet greater than 1 tonne per day [t/d]) acid gas flaring plants. All grandfathering will end by December 31, 2016.

² Nongrandfathered plants are those with an approved sulphur inlet greater than 1 t/d meeting the requirements for new plants, as listed in *ID 2001-03*. This includes both sulphur recovery plants and acid gas injection plants.

³ Degrandfathered plants are those that did not previously meet the requirements of *ID 2001-03* for new plants but have now been relicensed to meet the requirements for new plants, as set out in the ID.

recovery requirements, and 8 grandfathered plants have shut down. Further details on these plants are in Appendix 1.

Plants degrandfathered in 2008 include

- 1) Boundary Lake South - Talisman Energy Inc.
- 2) Carstairs – Bonavista Petroleum Ltd. (shut down)

As of December 2008, there were 15 grandfathered sulphur recovery plants and 9 grandfathered acid gas flaring plants remaining (see Appendix 2).

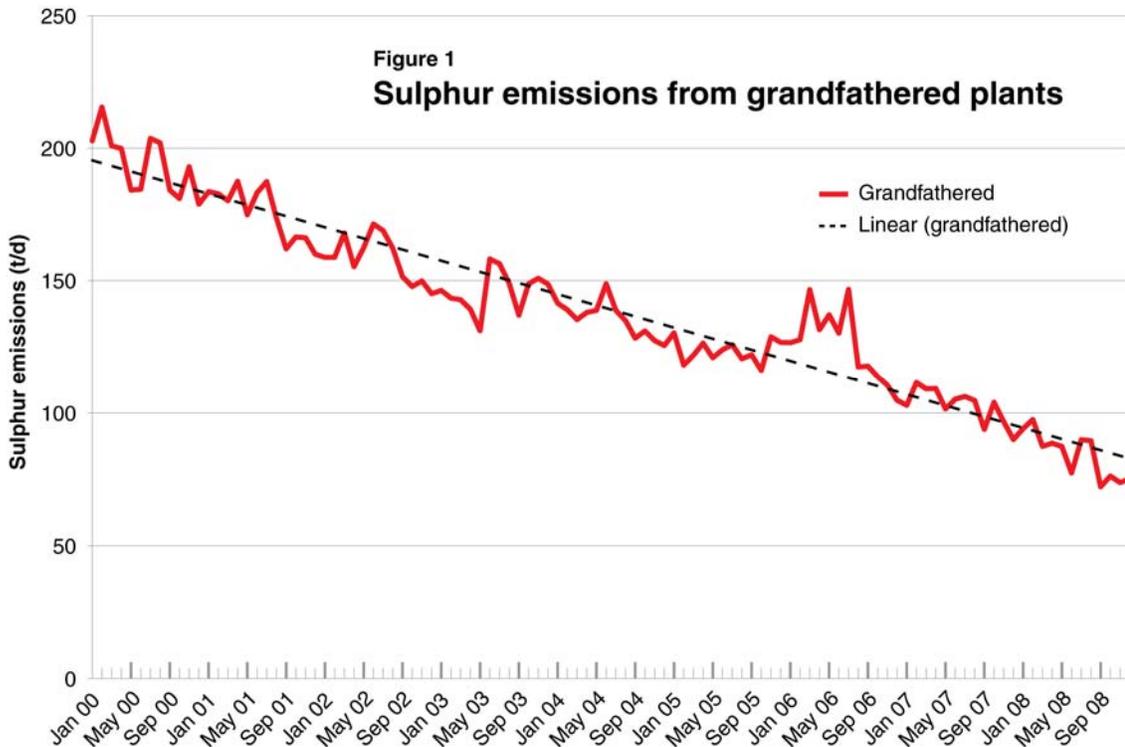
A detailed list of plants that have been degrandfathered in the last nine years is in Appendix 3, along with the process used for improving sulphur recovery.

2.2 Sulphur Emissions and Inlets at Grandfathered Plants, 2000-2008

An analysis of the sulphur emissions and sulphur inlet for the specific plants listed in *ID 2001-03* as grandfathered follows in Sections 2.2.1 and 2.2.2. For the purpose of this analysis, plants that have been degrandfathered since *ID 2001-03* was issued are included with the grandfathered plants.

2.2.1 Sulphur Emissions Reduction

The grandfathered plants substantially reduced sulphur emissions from 2000 to 2008, as shown in Figure 1.



The 57 per cent drop in emissions from grandfathered plants from the 2000 baseline year to 2008, shown in Figure 1, is due to a decrease of about 75 per cent in emissions from the grandfathered acid gas flaring plants and a decrease of about 52 per cent from the grandfathered sulphur recovery plants.

As can be seen in Figure 1, there was a significant decrease in emissions (about 18 per cent) from the grandfathered plants from 2007 to 2008. This decrease was due in large part to a decrease in throughput at Shell Waterton and Husky Strachan (Ram River) and improved sulphur recovery performance at Husky Strachan (Ram River).

The 75 per cent decrease in emissions from grandfathered acid gas flaring plants from 2000 to 2008 was accompanied by a 40 per cent decrease in sulphur inlet. The decrease in emissions is due in part to acid gas injection facilities installed at Apache Hope Creek (Virginia Hills), ConocoPhillips Vulcan (Long Coulee), Pengrowth Judy Creek (Swan Hills South), Harvest Operations Bellshill Lake, and Taylor Management Turin (Retlaw) and the installation of sulphur recovery at Petro-Canada Wilson Creek and AltaGas Bantry. Between 2000 and 2008, 27 of the 28 grandfathered acid gas flaring plants showed emissions reductions.

The 52 per cent decrease in emissions from grandfathered sulphur recovery facilities from 2000 to 2008 was accompanied by a 33 per cent decline in sulphur inlet. The decrease in emissions is due in large part to plant modifications and/or improved operations at Shell Waterton, Semcams Kabob S. 3, Semcams West Whitecourt (Windfall), Husky Ram River (Strachan), Brazeau Keyera, Shell Burnt Timber, and Shell Jumping Pound. Of the 28 grandfathered sulphur recovery plants, 26 reduced emissions, as shown in Appendix 4.1.

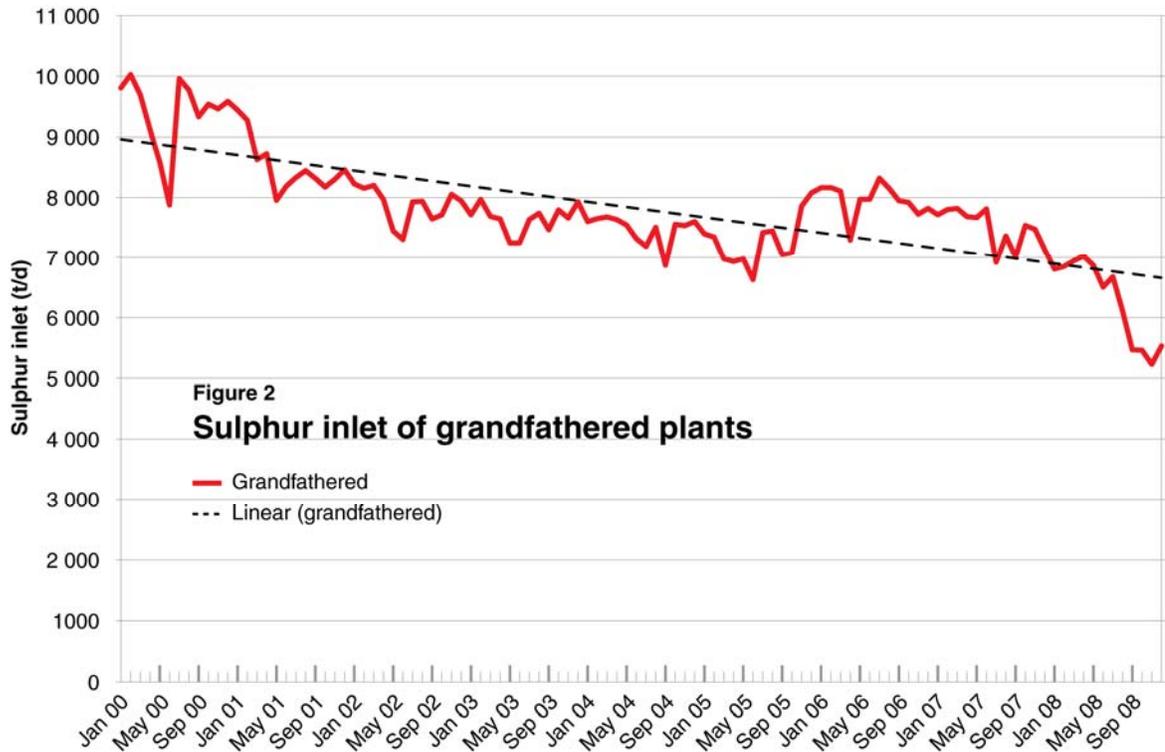
Appendix 4 lists sulphur production and emissions for each of the sulphur recovery plants for the years 2000 and 2008.

2.2.2 Decline in Sulphur Inlet

Improvements in operation and plant modifications have played a significant role in emission reductions at the grandfathered plants. As noted above, the reduction is also due to a 33 per cent decline in sulphur inlets of these plants from 2000 to 2008, as shown in Figure 2.

As also shown in Figure 2, there was about a 16 per cent decrease in sulphur inlet from the grandfathered plants from 2007 to 2008. This was primarily due to a decrease in throughput at three facilities: Shell Waterton, Husky Ram River (Strachan), and Keyera Strachan.

Figure 2 shows the overall decline in sulphur inlets of grandfathered gas plants.



2.3 Sulphur Emission Performance Credits

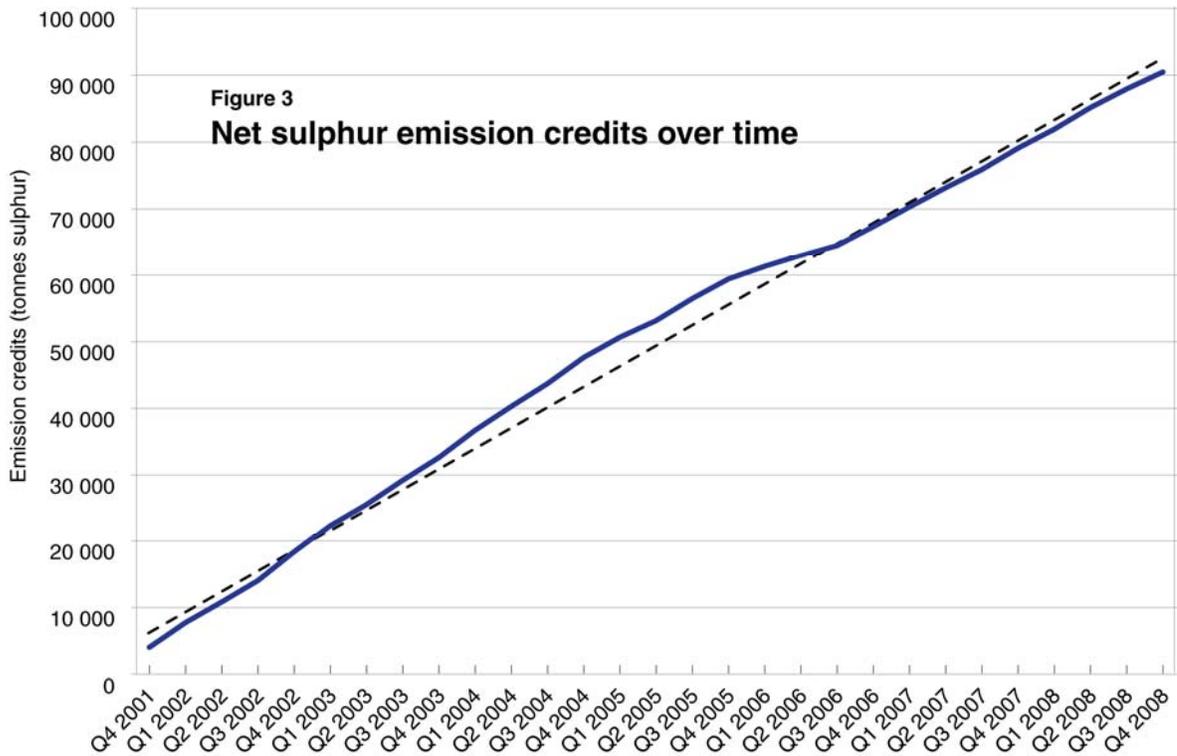
Sulphur emission performance credits (emission credits) can be earned by grandfathered sour gas plants with sulphur recovery that achieve recovery efficiencies higher than their required blended sulphur recovery efficiency. Credits may not be transferred between facilities and do not apply to acid gas flaring plants.

Credit reports can help an operator

- operate at higher sulphur inlets,
- meet the required blended sulphur recovery efficiency, and
- defer upgrading for a longer period of time.

Each sulphur emission credit represents 1 t of sulphur emissions that would have been emitted if the plant exactly met its minimum requirement. Credits must be earned before they can be used.

All plants that are able to file credit reports are doing so, and the emission credits are still increasing. As of the end of the fourth quarter of 2008, about 90 500 t of sulphur emission credits had been earned (see Figure 3 and Appendix 5). The total sulphur emissions from grandfathered sulphur recovery plants in 2008 was 27 000 t. Emission credits as of December 2008 equate to about 40 months of emissions from the grandfathered sulphur recovery plants.



Appendix 5 lists quarterly credits earned and cumulative credits for each of the grandfathered sulphur recovery plants in 2008.

3 Summary of Performance for Nongrandfathered Plants, 2000-2008

The ERCB also examined the sulphur emissions and sulphur inlet for each sour gas plant that had a sulphur inlet greater than 1 t/d and that met the requirements for new plants when *ID 2001-03* was issued.

The drop in sulphur emissions from these nongrandfathered plants was about 40 per cent between 2000 and 2008. The reduction in sulphur inlet was about 35 per cent over the same period. Details on these reductions on an individual plant basis for plants with sulphur recovery are given in Appendix 4.

4 Summary of Overall Performance for Grandfathered and Nongrandfathered Plants, 2000-2008

Examining sulphur inlet and sulphur emissions from both the grandfathered acid gas flaring and sulphur recovery facilities and nongrandfathered acid gas injection and sulphur recovery facilities reveals a 53 per cent drop in emissions from 2000 to 2008, together with a reduction in sulphur inlet of 34 per cent. From 2007 to 2008, emissions dropped about 15 per cent and sulphur inlet dropped about 13 per cent.

Appendix 1 Grandfathered Plants That Have Been Degrandfathered, 2000-2008

In the last nine years, 15 plants have made modifications to improve or install sulphur recovery to meet the more stringent sulphur recovery requirements for new plants in *ID 2001-03*. In addition, 13 other plants have been relicensed to meet these more stringent sulphur recovery requirements, and 8 grandfathered plants have shut down.

The 15 plants listed below had significant physical modifications to their plants to achieve higher sulphur recoveries.

Plants making modifications to meet the requirements for new plants

Plant name	Operator
1. Brazeau River	Keyera
2. Garrington (Olds)	Esprit
3. Homeglen (Rimbey)	Keyera
4. Bantry	AltaGas
5. Vulcan (Long Coulee)	ConocoPhillips
6. Wilson Creek	Petro-Canada
7. Rainbow	Husky
8. Edson	Talisman
9. Retlaw (Turin)	Taylor Management
10. Virginia Hills	Apache
11. Bellshill	Harvest Operations
12. Simonette	Suncor
13. Swan Hills South (Judy Creek)	Pengrowth
14. Kaybob S. 3	Semcams
15. South Rosevear	Suncor

Of the 13 plants listed below, 4 were relicensed to a higher sulphur recovery efficiency with existing equipment and/or minor modifications and 9 were relicensed to a lower throughput without modifications.

Plants relicensing to meet the requirements for new plants

Plant name	Operator
1. Okotoks (Mazeppa)	MPP
2. Crossfield East	Primewest
3. Sylvan Lake	NAL Resources
4. Sturgeon Lake	Kereco
5. Carson Creek	Pengrowth
6. Holmberg (Strome)	CNRL
7. Wilson Creek	Imperial
8. Strachan	Keyera
9. Big Bend	CNRL
10. Enchant	Taylor Management
11. Gold Creek	CNRL
12. Spirit River	Bonavista
13. Boundary Lake South	Talisman (2008)

Grandfathered plants that have ceased operating

Plant name	Operator
1. North Rosevear	Suncor
2. Bittern Lake	CNRL
3. North Caroline	BP Canada
4. South Caroline	BP Canada
5. Harmattan - Elkton	Bonavista
6. Leduc - Woodbend	Imperial
7. West Drummheller	Penn West
8. Carstairs	Bonavista (2008)

A detailed list of plants that have been degrandfathered in the last eight years is in Appendix 3, along with the process used for improving the sulphur recovery.

As of December 2008, there are 15 grandfathered sulphur recovery plants and 9 grandfathered acid gas flaring plants remaining (see Appendices 2.1 and 2.2).

Appendix 2.1. Grandfathered Sulphur Recovery (SR) Gas Plants, 2008

				Guideline			
			Current Approved	Recovery for		Baseline	
			Sulphur Recovery	Approved	Approved	Capacity	Change in
	Plant	Efficiency	Sulphur Inlet	S Inlet	1999 S Inlet	Status	
	Code	(%)	(%)	(t/d)	(t/d)	(from ID 2001-03)	
1	Balzac (Crossfield) - Nexen Inc.	1050	98.0	98.5	1,730.50	414.6	
2	Brazeau River - Keyera Energy Ltd.	1108	98.4	98.4	466.00	67.3	Degrandfathered in 2003; became AGI
3	Burnt Timber (Undefined) - Shell Canada Limited	1131	96.5	98.4	560.00	412.4	
4	Caroline North (Caroline) - BP Canada Energy Company	1374	69.7	69.7	5.00	5.0	Plant shut down in 2003
5	Caroline South (Caroline) - BP Canada Energy Company	1104	85.0	89.7	9.83	6.8	Plant shut down in 2003
6	Carstairs - Bonavista Petroleum Ltd.	1020	90.0	98.2	72.7*	9.5	Plant shut down in 2008
7	Edson - Talisman Energy Inc.	1084	98.4	98.4	350.00	220.9	Degrandfathered in 2003; upgraded SR
8	Gold Creek - Canadian Natural Resources Limited	1129	95.9	95.9	49.90	64.1	Degrandfathered in 2007
9	Jumping Pound - Shell Canada Limited	1037	96.2	98.4	619.00	472.1	
10	Kaybob South 1 & 2 (Kaybob South) - Semcams ULC	1107	98.4	98.5	1,107.70	540.6	
11	Kaybob South 3 (Kaybob South) - Semcams ULC	1144	98.5	98.5	1,999.00	1,009.6	Degrandfathered in 2006; upgraded SR
12	Lone Pine Creek - Exxonmobil Canada Ltd. and Exxonmobil Resources Ltd.	1139	98.0	98.3	165.40	129.5	
13	Mazeppa (Okotoks) - MPP Ltd.	1530	98.4	98.4	586.60	263.4	Degrandfathered in 2002
14	Minnehik-Buck Lake - Penn West Petroleum Ltd.	1047	95.6	95.9	49.17	22.0	
15	Nordegg (Brazeau River) - Keyera Energy Ltd.	1121	93.5	95.9	49.80	38.2	
16	Ram River (Strachan) - Husky Oil Operations Limited	1141	98.1	99.5	4660.5*	2,301.8	
17	Redwater - ARC Resources Ltd.	1028	Fluctuating	95.9	12.2*	3.1	
18	Rosevear North - Suncor Energy Inc.	1206					Plant shut down; consolidation with 1268
19	Rosevear South - Suncor Energy Inc.	1268	98.3	98.3	100.70	76.0	Degrandfathered in 2007; became AGI
20	Simonette - Suncor Energy Inc.	1113	98.3	98.3	120.00	92.3	Degrandfathered in 2005; upgraded SR
21	Strachan - Keyera Energy Ltd.	1133	98.4	98.4	971.10	264.9	Degrandfathered in 2005
22	Sturgeon Lake (Sturgeon Lake South) - Barrick Energy Inc.	1112	95.9	95.9	49.81	40.6	Degrandfathered in 2005
23	Teepee - Talisman Energy Inc.	1296	92.0	95.9	25.00	17.5	
24	Waterton - Shell Canada Limited	1056	98.7	99.5	1,450.00	2,099.6	
25	West Whitecourt (Windfall) - Semcams ULC	1034	98.3	98.5	1,356.00	777.6	
26	Wildcat Hills (Jumping Pound) - Petro-Canada	1054	97.5	98.3	287.50	181.3	
27	Wimborne - Penn West Petroleum Ltd.	1081	95.5	98.3	235.00	182.1	
28	Zama ¹ (Zama) - Apache Canada Ltd.	1219	92.0	98.2	80.30	38.6	Baseline revision 2001
*Annual average sulphur inlet.							
¹ As of October 2004, has been delivering acid gas to its Apache Zama plant 1878.							

Appendix 2.2. Grandfathered Acid Gas Flaring Plants, 2008							
			Guideline				
			Recovery for			Baseline	
			Approved	2008	Approved	Capacity	Change in
	Plant	Sulphur Inlet	S Emissions	S Inlet	1999 S Inlet	Status	
	Code	(%)	(t/d)	(t/d)	(t/d)	(from ID 2001-03)	
1	Bantry - Altagas Ltd.	1114	60.0	0.34	2.00	1.0	Degrandfathered in 2002; became SR
2	Bellshill Lake - Harvest Operations Corp.	1280	89.7	0.02	5.77	3.8	Degrandfathered in 2005; became AGI
3	Big Bend - Canadian Natural Resources Limited	1293	0	0.02	0.67	1.0	Degrandfathered in 2006
4	Bigoray - Penn West Petroleum Ltd.	1138	0	0.70	1.70	1.8	
5	Bittern Lake - Canadian Natural Resources Limited	1124	69.7		2.48	1.0	Plant shut down in 2000
6	Boundary Lake South - Talisman Energy Inc.	1024	0	0.29	0.99	1.0	Degrandfathered in 2008
7	Carson Creek - Pengrowth Corporation	1062	0	0.25	0.83	1.0	Degrandfathered in 2004
8	Enchant - Taylor Management Inc.	1039	0	0.36	0.99	1.0	Degrandfathered in 2006
9	Forestburg - Signalta Resources Limited	1365	69.7	0.67	4.50	4.0	
10	Galloway (Ansell) - Canadian Natural Resources Limited	1417	69.7	0.23	1.40	1.3	
11	Greencourt - Canadian Natural Resources Limited	1127	69.7	0.80	1.00	1.3	
12	Harmattan-Elkton ¹ - Bonavista Petroleum Ltd.	1083	0		0.53	1.0	Plant shut down in 2005
13	Hope Creek (Virginia Hills) - Apache Canada Ltd.	1135	95.9	0.03	16.00	5.2	Degrandfathered in 2004; became AGI
14	Judy Creek (Swan Hills South) - Pengrowth Corporation	1069	69.7	0.04	3.75	2.7	Degrandfathered in 2006; became AGI
15	Kaybob - Trilogy Energy Ltd.	1058	89.7	0.98	5.15	1.0	
16	Leduc-Woodbend - Imperial Oil Resources Limited	1023	69.7		1.01	1.0	Plant shut down in 2006
17	Neptune (Boundary Lake South) - Penn West Petroleum Ltd.	1202	69.7	0.84	1.63	1.1	
18	Sedgewick (Killam) - Altagas Ltd.	1510	69.7	1.18	4.75	2.2	
19	Spirit River - Bonavista Petroleum Ltd.	1560	0	0.53	0.99	1.0	Degrandfathered in 2007
20	Strome Holmberg (Holmberg) - Canadian Natural Resources Limited	1179	0	0.20	0.61	1.6	Degrandfathered in 2005
21	Sylvan Lake - NAL Resources Limited	1070	0	0.20	0.75	1.0	Degrandfathered in 2002
22	Travers (Little Bow) - Bonavista Petroleum Ltd.	1150	69.7	0.59	1.50	1.2	
23	Turin (Retlaw) - Taylor Management Inc.	1191	69.7	0.03	4.64	1.7	Degrandfathered in 2004; became AGI
24	Vulcan (Long Coulee) - Conocophillips Canada Resources Corp.	1100	69.7	0.03	4.90	2.7	Degrandfathered in 2002; became AGI
25	West Drumheller - Sirius Energy Inc.	1109	69.7	0.00	2.99	1.1	Plant shut down in 2007
26	Whitecourt - Taqa North Ltd.	1115	89.7	1.69	7.50	3.5	
27	Wilson Creek - Imperial Oil Resources Limited	1399	0	0.01	0.95	1.0	Degrandfathered in 2005
28	Wilson Creek - Petro-Canada	1096	85.0	0.13	4.70	2.3	Degrandfathered in 2001; became SR

¹ Now operating as a compressor.

Appendix 2.3 Nongrandfathered Sulphur Recovery Plants, 2008				
			Current Approved Sulphur Recovery Efficiency (%)	Approved S Inlet (t/d)
	Plant Code			
1	Bonnie Glenn (Bonnie Glen) ¹ - Imperial Oil Resources Limited	1045	89.7	10.00
2	Brazeau River - Blaze Energy Ltd.	1482	98.4	500.00
3	Carbondale (Morinville) - ATCO Midstream Ltd.	1638	69.7	1.15*
4	Caroline - Shell Canada Limited	1662	99.5	5,445.00
5	Coleman (Savanna Creek) - Devon Canada Corporation	1051	98.6	800.00
6	Crossfield East - Taqa North Ltd.	1079	98.4	863.82
7	Hanlan-Robb (Basing) - Petro-Canada	1360	98.5	1,270.00
8	Harmattan-Elkton - Taylor Processing Inc.	1060	95.9	49.99
9	Hays - Canadian Natural Resources Limited	1585	90.0	9.90
10	Homeglen-Rimbey - Keyera Energy Ltd.	1004	98.3	150.00
11	Hythe Brainard (Sinclair) - Encana Oil & Gas Co. Ltd.	1147	98.3	127.80
12	Nevis - Spectra Energy Midstream Corporation	1002	98.4	300.00
13	Olds (Garrington) - Pengrowth Corporation	1021	98.4	404.90
14	Progress - Canadian Natural Resources Limited	1506	96.5	49.50
15	Progress - Suncor Energy Inc.	1629	69.7	2.51
16	Quirk Creek - Imperial Oil Resources Limited	1134	98.3	306.4*
17	Rainbow - Altagas Ltd.	1658	95.9	23.18
18	Rainbow ² - Husky Oil Operations Limited	1105	98.3	213.49
19	Sexsmith (La Glace) - Encana Oil & Gas Co. Ltd.	1892	98.4	483.10
20	Swalwell ³ - Taqa North Ltd.	1654	69.7	4.60
21	West Pembina (Brazeau River) - Keyera Energy Ltd.	1458	98.4	520.00
* Annual average sulphur inlet.				
¹ Started as an AGI facility in March 2007.				
² Started as an AGI facility in January 2002.				
³ Started as an AGI facility in August 2005.				

Appendix 2.4. Nongrandfathered Acid Gas Injection Plants Processing > 1 t/d of Sulphur, 2008

		Sulphur Recovery		2008		
		Equivalent	Approved	2008	Sulphur	
		Required	S Inlet	S Emissions	Injected	
		(%)	(t/d)	(t/d)	(t/d)	
Nongrandfathered acid gas injection plants		Plant Code				
1	Acheson - Penn West Petroleum Ltd.	1628	69.7	4.65	0.02	2.41
2	Bigoray - Keyera Energy Ltd.	1357	98.2	64.00	0.16	31.47
3	Bistcho Lake - Paramount Resources Ltd.	1975	95.9	25.00	0.12	8.18
4	Calmar (Leduc-Woodbend) - MEC Operating Company Ulc	1676	95.9	15.50	0.01	2.88
5	Clear Hills (Boundary Lake South) - Canadian Natural Resources Limited	1880	95.9	19.21	0.06	7.14
6	Dunvegan - Devon Canada Corporation	1169	89.7	9.90	0.01	0.45
7	Fourth Creek (Mulligan) - Spectra Energy Midstream Corporation	1895	89.7	10.00	0.06	10.66
8	Golden Spike - ATCO Midstream Ltd.	1547	95.9	26.46	0.01	1.83
9	Gordondale - Spectra Energy Midstream Corporation	1668	98.2	54.31	0.01	25.89
10	Hansman Lake (Provost) - Husky Oil Operations Limited	1698	89.7	6.90	0.00	4.29
11	Hastings Coulee (Galahad) - Husky Oil Operations Limited	1690	89.7	10.90	0.01	1.28
12	Holmberg (Kelsey) - Sword Energy Inc.	1244	69.7	3.07	0.01	0.32
13	Marlowe (Dizzy) - Bears paw Petroleum Ltd.	1765	95.9	20.90	0.00	0.00
14	Mitsue ¹ - Penn West Petroleum Ltd.	1123	69.7	4.60	0.00	0.15
15	Normandville - Devon Canada Corporation	1990	69.7	1.90	0.00	0.07
16	O'Chiese (Pembina) - Conocophillips Canada (Brc) Ltd.	1970	95.9	14.53	0.01	0.85
17	Paddle River - Keyera Energy Ltd.	1089	69.7	1.50	0.00	0.46
18	Pembina - Imperial Oil Resources Limited	1625	89.7	7.23	0.01	2.47
19	Pembina - Keyera Energy Ltd.	1402	95.9	29.70*	0.02	4.32
20	Pouce Coupe - Spectra Energy Midstream Corporation	1746	95.9	26.18	0.09	15.84
21	Puskwaskau - Devon Canada Corporation	1964	89.7	5.15	0.00	0.12
22	Rainbow - Exxonmobil Canada Ltd. And Exxonmobil Resources Ltd.	1155	95.9	20.10*	0.03	5.69
23	Rycroft - Birchcliff Energy Ltd.	1793	95.9	21.00	0.03	3.47
24	Steen River (Dizzy) - Jed Production Inc.	1738	95.9	34.40	0.36	0.91
25	Thompson Lake (Provost) - Husky Oil Operations Limited	1695	95.9	12.00	0.02	4.80
26	Wayne-Rosedale - Encana Corporation	1888	89.7	5.90*	0.04	0.86
27	Wembley - Conocophillips Canada Resources Corp.	1520	98.3	124.00	0.02	68.23
28	West Culp (Eaglesham North) - Devon Canada Corporation	1775	95.9	17.20	0.01	0.35
29	Wizard Lake (Watelete) - Atco Midstream Ltd.	1672	69.7	3.30	0.01	0.57
30	Zama 2 & 3 - Apache Canada Ltd. (1878 & 1978 amalgamated)	1878	98.3	247.00	0.21	38.08
Grandfathered and nongrandfathered sulphur recovery or acid gas flaring plants that are now AGI facilities						
31	Bellshill Lake - Harvest Operations Corp.	1280	89.7	5.77	0.02	2.83
32	Bonnie Glenn (Bonnie Glen) - Imperial Oil Resources Limited	1045	89.7	10.00	0.00	0.92
33	Brazeau River - Keyera Energy Ltd.	1108	98.4	466.00	0.14	209.28
34	Hope Creek (Virginia Hills) - Apache Canada Ltd.	1135	95.9	16.00	0.03	6.37
35	Judy Creek (Swan Hills South) - Pengrowth Corporation	1069	69.7	3.75	0.04	1.75
36	Rainbow - Husky Oil Operations Limited	1105	98.3	213.49	0.76	148.99
37	Rosevear South (Rosevear) - Suncor Energy Inc.	1268	98.3	100.70	0.08	39.19
38	Swalwell - Taqa North Ltd.	1654	69.7	4.60	0.00	0.00
39	Turin (Retlaw) - Taylor Management Inc.	1191	69.7	4.64	0.03	1.77
40	Vulcan (Long Coulee) - Conocophillips Canada Resources Corp.	1100	69.7	4.90	0.03	0.88
* Annual average sulphur inlet.						
¹ Previously a nongrandfathered acid gas flaring plant that had emissions of less than 1 t/d and is now an AGI facility.						

Appendix 3. Plants That Have Been Degrandfathered				Approved	
				S Inlet (t/d)	Modification Process
Plants that have made modifications	Plant Code	Plant Name			
1	Plant Mods	1108	Brazeau R. - Keyera	400.00	(AGI)
2	Plant Mods	1021	Garrington (Olds) - Pengrowth	404.90	(SuperClaus)
3	Plant Mods	1004	Homeglen Rimbey - Keyera	150.00	(SuperClaus)
4	Plant Mods	1114	Bantry - AltaGas	2.00	(Xergy)
5	Plant Mods	1100	Vulcan - ConocoPhillips	4.90	(AGI)
6	Plant Mods	1096	Wilson Creek - Petro-Canada	4.70	(Claus)
7	Plant Mods	1105	Rainbow - Husky	213.50	(AGI)
8	Plant Mods	1084	Edson - Talisman	350.00	(SuperClaus)
9	Plant Mods	1191	Retlaw (Turin) - Taylor Management	4.64	(AGI)
10	Plant Mods	1135	Virginia Hills (Hope Creek) - Apache	16.00	(AGI)
11	Plant Mods	1280	Bellshill Lake - Harvest Operations	5.77	(AGI)
12	Plant Mods	1113	Simonette - Suncor	120.00	(SuperClaus)
13	Plant Mods	1069	Swan Hills South (Judy Creek) - Pengrowth	3.75	(AGI)
14	Plant Mods	1144	Kaybob S. 3 - Semcams	1999.00	(SuperClaus)
15	Plant Mods	1268	Rosevear (South) - Suncor	100.70	(AGI)
Plants that have been relicensed to higher sulphur recovery efficiency or lower sulphur inlets					
1	Relicensed	1530	Okotoks (Mazeppa) - MPP	586.60	
2	Relicensed	1079	Crossfield E. - Primewest	863.82	
3	Relicensed	1070	Sylvan Lake - NAL Resources	0.75	
4	Relicensed	1112	Sturgeon Lake - Cadence	49.81	
5	Relicensed	1062	Carson Creek - Pengrowth	0.83	
6	Relicensed	1179	Holmberg (Strome Holmberg) - CNRL	0.61	
7	Relicensed	1399	Wilson Creek - Imperial	0.95	
8	Relicensed	1133	Strachan - Keyera	971.10	
9	Relicensed	1293	Big Bend - CNRL	0.67	
10	Relicensed	1039	Enchant - Taylor Management	0.99	
11	Relicensed	1129	Gold Creek - CNRL	49.90	
12	Relicensed	1560	Spirit River - Bonavista	0.99	
13	Relicensed	1024	Boundary Lake - Talisman	0.99	

Appendix 4.1. Gas Plants with Sulphur Recovery, Year 2008 Minus Year 2000				
			Change in production and emissions year 2008 minus year 2000	
Plant			2008-2000	2008-2000
Code	Field-Licensee		S Production (t/y)	S Emissions (t/y)
Grandfathered plants (in 2001)				
1	1056	Waterton - Shell Canada Limited	(487,103.5)	(5,083.8)
2	1144	Kaybob South 3 (Kaybob South) - Semcams Ulc	(90,519.3)	(4,528.1)
3	1034	West Whitecourt (Windfall) - Semcams Ulc	(213,644.7)	(3,494.6)
4	1141	Ram River (Strachan) - Husky Oil Operations Limited	(204,568.1)	(2,514.8)
5	1108	Brazeau River - Keyera Energy Ltd.	(35,158.5)	(2,100.9)
6	1131	Burnt Timber (Undefined) - Shell Canada Limited	(21,710.8)	(1,941.3)
7	1037	Jumping Pound - Shell Canada Limited	46,345.9	(1,914.5)
8	1107	Kaybob South 1 & 2 (Kaybob South) - Semcams Ulc	(152,202.9)	(1,442.7)
9	1050	Balzac (Crossfield) - Nexen Inc.	(41,134.6)	(943.0)
10	1081	Wimborne - Penn West Petroleum Ltd.	(32,071.6)	(876.6)
11	1219	Zama 1 (Zama) - Apache Canada Ltd.	(14,405.1)	(583.9)
12	1206	Rosevear - Suncor Energy Inc.	(12,290.7)	(499.6)
13	1268	Rosevear South (Rosevear) - Suncor Energy Inc.	(18,426.7)	(429.4)
14	1054	Wildcat Hills (Jumping Pound) - Petro-Canada	(18,592.3)	(424.3)
15	1113	Simonette - Suncor Energy Inc.	2,539.3	(403.0)
16	1121	Nordegg (Brazeau River) - Keyera Energy Ltd.	(7,294.8)	(371.5)
17	1104	Caroline South (Caroline) - Bp Canada Energy Company	(2,186.0)	(349.5)
18	1530	Mazeppa (Okotoks) - Mpp Ltd.	(11,332.6)	(306.6)
19	1112	Sturgeon Lake (Sturgeon Lake South) - Barrick Energy Inc.	(3,592.0)	(301.2)
20	1129	Gold Creek - Canadian Natural Resources Limited	(12,963.8)	(258.1)
21	1139	Lone Pine Creek - Exxonmobil Canada Ltd. And Exxonmobil Resources Ltd.	(12,172.9)	(216.5)
22	1020	Carstairs - Bonavista Petroleum Ltd.	(1,969.2)	(193.3)
23	1084	Edson - Talisman Energy Inc.	16,221.1	(186.2)
24	1047	Minnehik-Buck Lake - Penn West Petroleum Ltd.	(3,439.0)	(163.9)
25	1296	Teepee - Talisman Energy Inc.	(821.0)	(94.3)
26	1374	Caroline North (Caroline) - Bp Canada Energy Company	(903.1)	(86.8)
27	1028	Redwater - Arc Resources Ltd.	(376.0)	19.1
28	1133	Strachan - Keyera Energy Ltd.	80,887.6	388.9
Totals			(1,252,885.4)	(29,300.3)
Grandfathered plants that were previously acid gas flaring and are now sulphur recovery				
1	1096	Wilson Creek - Petro-Canada	360.7	(989.3)
2	1114	Bantry - AltaGas	284.8	(186.0)
Totals			645.5	(1,175.4)
Nongrandfathered plants (plants meeting the requirements for new plants)				
1	1079	Crossfield East - Taqa North Ltd.	(97,095.8)	(2,236.1)
2	1360	Hanlan-Robb (Basing) - Petro-Canada	(97,449.4)	(1,529.5)
3	1021	Olds (Garrington) - Pengrowth Corporation	(20,797.2)	(1,024.2)
4	1004	Homeglen-Rimbey - Keyera Energy Ltd.	(6,171.2)	(921.2)
5	1105	Rainbow - Husky Oil Operations Limited	(22,351.5)	(845.3)
6	1662	Caroline - Shell Canada Limited	(762,823.2)	(811.3)
7	1134	Quirk Creek - Imperial Oil Resources Limited	(49,081.4)	(475.3)
8	1002	Nevis - Spectra Energy Midstream Corporation	(24,498.4)	(235.0)
9	1654	Swalwell - Taqa North Ltd.	(533.4)	(138.9)
10	1045	Bonnie Glenn (Bonnie Glen) - Imperial Oil Resources Limited	(3,062.0)	(124.9)
11	1585	Hays - Canadian Natural Resources Limited	(429.3)	(74.5)
12	1458	West Pembina (Brazeau River) - Keyera Energy Ltd.	13,535.8	(69.7)
13	1051	Coleman (Undefined) - Devon Canada Corporation	(24,896.7)	(67.6)
14	1060	Harmattan-Elkton - Taylor Processing Inc.	(6,570.5)	(55.5)
15	1147	Hythe Brainard (Sinclair) - Encana Oil & Gas Co. Ltd.	(9,369.1)	(47.9)
16	1658	Rainbow - Altagas Ltd.	1,197.9	(33.3)
17	1892	Sexsmith (La Glace) - Encana Oil & Gas Co. Ltd.	(18,188.3)	(0.8)
18	1638	Carbondale (Morinville) - Atco Midstream Ltd.	(327.7)	(0.2)
19	1629	Progress - Suncor Energy Inc.	11.6	0.0
20	1506	Progress - Canadian Natural Resources Limited	4,807.6	2.4
21	1482	Brazeau River - Blaze Energy Ltd.	9,622.3	335.4
Totals			(1,114,469.8)	(8,353.3)
Grand totals			(2,366,709.7)	(38,828.9)

Appendix 4.2. Gas Plants with Sulphur Recovery, Year 2000

		Total	Total Annual	Actual Sulphur	Current Approved Sulphur	Total Annual	
Plant		Inlet	Emissions	Recovery Effic.	Recovery Effic.	Production	
Code	Field-Licensee	(t/y)	(t/y)	(%)	(%)	(t/y)	
Grandfathered plants (in 2001)							
1	1056	Waterton - Shell Canada Limited	671,377.4	6,233.1	99.1	98.7	679,224.2
2	1144	Kaybob South 3 (Kaybob South) - Semcams Ulc	360,565.8	6,646.1	98.2	98.1	369,708.4
3	1034	West Whitecourt (Windfall) - Semcams Ulc	286,311.3	4,616.6	98.4	98.3	292,237.0
4	1141	Ram River (Strachan) - Husky Oil Operations Limited	791,052.9	7,877.7	99.0	98.1	781,009.3
5	1108	Brazeau River - Keyera Energy Ltd.	36,697.0	2,152.6	94.2	92.1	35,158.5
6	1131	Burnt Timber (Undefined) - Shell Canada Limited	156,959.7	4,844.0	96.9	96.5	152,115.5
7	1037	Jumping Pound - Shell Canada Limited	161,744.1	5,509.7	96.6	96.2	158,522.1
8	1107	Kaybob South 1 & 2 (Kaybob South) - Semcams Ulc	234,341.8	2,756.9	98.9	98.4	250,134.3
9	1050	Balzac (Crossfield) - Nexen Inc.	144,323.2	2,408.8	98.3	98.0	141,245.3
10	1081	Wimborne - Penn West Petroleum Ltd.	57,618.0	1,833.9	96.7	95.5	54,008.0
11	1219	Zama 1 (Zama) - Apache Canada Ltd.	15,117.5	583.9	96.1	92.0	14,405.1
12	1206	Rosevear - Suncor Energy Inc.	10,771.6	499.6	96.1	94.6	12,290.7
13	1268	Rosevear South (Rosevear) - Suncor Energy Inc.	16,104.4	457.5	97.6	95.6	18,426.7
14	1054	Wildcat Hills (Jumping Pound) - Petro-Canada	71,413.7	1,220.0	98.2	97.5	66,931.2
15	1113	Simonette - Suncor Energy Inc.	32,358.2	793.8	97.5	96.5	31,239.2
16	1121	Nordegg (Brazeau River) - Keyera Energy Ltd.	12,991.3	727.9	94.6	93.5	12,842.1
17	1104	Caroline South (Caroline) - Bp Canada Energy Company	2,483.7	349.5	86.2	85.0	2,186.0
18	1530	Mazeppa (Okotoks) - Mpp Ltd.	95,120.2	1,260.7	98.7	98.3	95,760.9
19	1112	Sturgeon Lake (Sturgeon Lake South) - Barrick Energy Inc.	18,698.9	729.2	96.2	94.0	18,456.1
20	1129	Gold Creek - Canadian Natural Resources Limited	20,071.4	514.9	97.6	97.0	20,883.0
21	1139	Lone Pine Creek - Exxonmobil Canada Ltd. and Exxonmobil Resources Ltd.	38,390.2	599.7	98.4	98.0	37,232.3
22	1020	Carstairs - Bonavista Petroleum Ltd.	3,815.5	324.6	91.2	90.0	3,370.0
23	1084	Edson - Talisman Energy Inc.	73,009.3	1,421.2	98.1	97.9	73,337.4
24	1047	Minnehik-Buck Lake - Penn West Petroleum Ltd.	7,018.8	270.4	96.1	95.6	6,748.4
25	1296	Teepee - Talisman Energy Inc.	5,424.7	372.2	93.2	92.0	5,079.9
26	1374	Caroline North (Caroline) - Bp Canada Energy Company	1,039.2	86.8	91.2	89.7	903.1
27	1028	Redwater - Arc Resources Ltd.	1,184.9	88.3	92.7	Fluctuating	1,118.3
28	1133	Strachan - Keyera Energy Ltd.	97,769.5	1,169.6	98.8	98.1	97,129.6
Totals			3,423,774.2	56,349.3	98.4		3,431,693.7
Grandfathered plants that were previously acid gas flaring and are now sulphur recovery							
1	1096	Wilson Creek - Petro-Canada	908.0	1,036.4	0.0%	-	-
2	1114	Bantry - AltaGas	310.6	310.7	0.0%	-	-
Totals			1,218.5	1,347.1	0.0%		-
Nongrandfathered plants (plants meeting the requirements for new plants)							
1	1079	Crossfield East - Taqa North Ltd.	170,668.1	3,028.6	98.2	98.0	169,921.2
2	1360	Hanlan-Robb (Basing) - Petro-Canada	299,824.2	3,434.8	98.8	98.5	288,911.9
3	1021	Olds (Garrington) - Pengrowth Corporation	103,220.0	2,152.2	97.9	97.1	101,783.0
4	1004	Homeglen-Rimbey - Keyera Energy Ltd.	19,957.4	1,003.0	94.8	92.0	18,208.7
5	1105	Rainbow - Husky Oil Operations Limited	25,910.0	1,123.5	95.2	95.0	22,351.5
6	1662	Caroline - Shell Canada Limited	1,833,270.9	2,458.5	99.9	99.8	1,844,827.3
7	1134	Quirk Creek - Imperial Oil Resources Limited	86,771.0	1,002.1	98.9	98.3	90,372.6
8	1002	Nevis - Spectra Energy Midstream Corporation	37,590.7	467.5	98.8	98.4	37,091.8
9	1654	Swalwell - Taqa North Ltd.	517.6	138.9	79.3	70.0	533.4
10	1045	Bonnie Glenn (Bonnie Glen) - Imperial Oil Resources Limited	3,281.6	125.7	96.1	95.9	3,062.0
11	1585	Hays - Canadian Natural Resources Limited	2,390.2	129.0	94.5	90.0	2,217.5
12	1458	West Pembina (Brazeau River) - Keyera Energy Ltd.	107,983.1	1,624.1	98.6	98.4	112,615.2
13	1051	Coleman (Undefined) - Devon Canada Corporation	137,197.0	1,369.9	99.0	98.6	136,352.7
14	1060	Harmattan-Elkton - Taylor Processing Inc.	11,515.1	164.6	98.6	98.6	11,875.6
15	1147	Hythe Brainard (Sinclair) - Encana Oil & Gas Co. Ltd.	28,431.8	296.2	99.0	98.3	28,291.8
16	1658	Rainbow - Altgas Ltd.	1,882.0	127.9	92.6	70.0	1,597.4
17	1892	Sexsmith (La Glace) - Encana Oil & Gas Co. Ltd.	125,906.9	1,292.2	99.0	98.4	126,382.7
18	1638	Carbondale (Morinville) - Atco Midstream Ltd.	364.6	0.2	100.0	69.7	403.5
19	1629	Progress - Suncor Energy Inc.	389.1	0.0	100.0	69.7	336.7
20	1506	Progress - Canadian Natural Resources Limited	9,215.7	237.8	97.4	96.5	9,060.8
21	1482	Brazeau River - Blaze Energy Ltd.	97,601.0	917.1	99.1	98.4	96,505.4
Totals			3,103,887.8	21,093.7	99.3		3,102,702.7
Grand totals			6,528,880.6	78,790.1	98.8		6,534,396.4

Appendix 4.3. Gas Plants with Sulphur Recovery, Year 2008

			Total	Total Annual	Actual	Current	
Plant			Inlet	Emissions	Sulphur	Approved Sulphur	Total Annual
Code	Field-Licensor		(t/y)	(t/y)	Recovery Effic.	Recovery Effic.	Production
					(%)	(%)	(t/y)
Grandfathered plants (in 2001)							
1	1056	Waterton - Shell Canada Limited	188,801.7	1,149.4	99.4	98.7	192,120.7
2	1144	Kaybob South 3 (Kaybob South) - Semcams Ulc	281,449.2	2,118.0	99.2	98.5	279,189.1
3	1034	West Whitecourt (Windfall) - Semcams Ulc	80,955.3	1,122.0	98.6	98.3	78,592.3
4	1141	Ram River (Strachan) - Husky Oil Operations Limited	582,320.1	5,362.9	99.1	98.1	576,441.2
5	1108	Brazeau River - Keyera Energy Ltd.	81,623.6	51.7	99.9	98.4	Injected (76,596.3)
6	1131	Burnt Timber (Undefined) - Shell Canada Limited	128,136.3	2,902.7	97.8	96.5	130,404.7
7	1037	Jumping Pound - Shell Canada Limited	207,514.8	3,595.2	98.3	96.2	204,868.0
8	1107	Kaybob South 1 & 2 (Kaybob South) - Semcams Ulc	99,522.9	1,314.2	98.7	98.4	97,931.4
9	1050	Balzac (Crossfield) - Nexen Inc.	100,968.6	1,465.8	98.6	98.0	100,110.7
10	1081	Wimborne - Penn West Petroleum Ltd.	22,709.8	957.3	95.8	95.5	21,936.4
11	1219	Zama 1 (Zama) - Apache Canada Ltd.	0.0	0.0		92.0	0.0
12	1206	Rosevear - Suncor Energy Inc.	0.0	0.0	0.0	94.6	0.0
13	1268	Rosevear South (Rosevear) - Suncor Energy Inc.	13,990.9	28.1	99.8	98.3	Injected (14,344.3)
14	1054	Wildcat Hills (Jumping Pound) - Petro-Canada	49,847.2	795.7	98.4	97.5	48,338.9
15	1113	Simonette - Suncor Energy Inc.	34,645.8	390.8	98.9	98.3	33,778.5
16	1121	Nordegg (Brazeau River) - Keyera Energy Ltd.	5,851.9	356.4	94.0	93.5	5,547.3
17	1104	Caroline South (Caroline) - Bp Canada Energy Company	0.0	0.0	0.0	69.7	0.0
18	1530	Mazeppa (Okotoks) - Mpp Ltd.	83,023.4	954.1	98.9	98.4	84,428.3
19	1112	Sturgeon Lake (Sturgeon Lake South) - Barrick Energy Inc.	15,336.1	428.0	97.2	95.9	14,864.1
20	1129	Gold Creek - Canadian Natural Resources Limited	8,213.3	256.9	96.9	95.9	7,919.2
21	1139	Lone Pine Creek - Exxonmobil Canada Ltd. And Exxonmobil Resources Ltd.	25,553.7	383.2	98.5	98.0	25,059.3
22	1020	Carstairs - Bonavista Petroleum Ltd.	1,511.7	131.3	91.4	90.0	1,400.8
23	1084	Edson - Talisman Energy Inc.	91,708.8	1,235.0	98.6	98.4	89,558.5
24	1047	Minnehik-Buck Lake - Penn West Petroleum Ltd.	3,361.4	106.5	96.9	95.6	3,309.4
25	1296	Teepee - Talisman Energy Inc.	4,538.7	277.9	93.9	92.0	4,249.9
26	1374	Caroline North (Caroline) - Bp Canada Energy Company	0.0	0.0	0.0	85.0	0.0
27	1028	Redwater - Arc Resources Ltd.	800.3	107.3	87.4	Fluctuating	742.3
28	1133	Strachan - Keyera Energy Ltd.	180,284.4	1,558.5	99.1	98.4	178,017.2
Totals			2,292,669.9	27,049.0	98.8		2,178,808.3
Grandfathered plants that were previously acid gas flaring and are now sulphur recovery							
1	1096	Wilson Creek - Petro-Canada	445.9	47.1	88.5	85.0	360.7
2	1114	Bantry - AltaGas	341.0	124.7	69.6	60.0	284.8
Totals			786.9	171.8	79.0		645.5
Nongrandfathered plants (plants meeting the requirements for new plants)							
1	1079	Crossfield East - Taqa North Ltd.	75,814.2	792.5	98.9	98.4	72,825.4
2	1360	Hanlan-Robb (Basing) - Petro-Canada	193,900.1	1,905.3	99.0	98.5	191,462.6
3	1021	Olds (Garrington) - Pengrowth Corporation	81,631.6	1,128.0	98.6	98.4	80,985.8
4	1004	Homeglen-Rimby - Keyera Energy Ltd.	12,449.3	81.8	99.3	98.3	12,037.5
5	1105	Rainbow - Husky Oil Operations Limited	47,342.6	278.2	99.5	98.3	Injected (54,531.1)
6	1662	Caroline - Shell Canada Limited	1,049,034.4	1,647.2	99.8	99.5	1,082,004.1
7	1134	Quirk Creek - Imperial Oil Resources Limited	39,815.2	526.8	98.7	98.3	41,291.2
8	1002	Nevis - Spectra Energy Midstream Corporation	12,905.3	232.5	98.2	98.4	12,593.4
9	1654	Swalwell - Taqa North Ltd.	0.0	0.0	0.0	69.7	0.0
10	1045	Bonnie Glenn (Bonnie Glen) - Imperial Oil Resources Limited	258.3	0.8	99.8	89.7	Injected (338.5)
11	1585	Hays - Canadian Natural Resources Limited	1,883.5	54.6	97.0	90.0	1,788.2
12	1458	West Pembina (Brazeau River) - Keyera Energy Ltd.	122,746.9	1,554.4	98.8	98.4	126,151.0
13	1051	Coleman (Undefined) - Devon Canada Corporation	111,207.3	1,302.3	98.8	98.6	111,456.0
14	1060	Harmattan-Elkton - Taylor Processing Inc.	5,258.9	109.0	98.0	95.9	5,305.1
15	1147	Hythe Brainard (Sinclair) - Encana Oil & Gas Co. Ltd.	18,672.1	248.3	98.7	98.3	18,922.7
16	1658	Rainbow - Altagas Ltd.	2,929.2	94.6	96.7	95.9	2,795.3
17	1892	Sexsmith (La Glace) - Encana Oil & Gas Co. Ltd.	106,286.2	1,291.5	98.8	98.4	108,194.4
18	1638	Carbondale (Morinville) - Atco Midstream Ltd.	71.4	0.0	100.0	69.7	75.8
19	1629	Progress - Suncor Energy Inc.	369.7	0.0	100.0	69.7	348.3
20	1506	Progress - Canadian Natural Resources Limited	14,725.2	240.2	98.3	96.5	13,868.4
21	1482	Brazeau River - Blaze Energy Ltd.	96,763.2	1,252.5	98.8	98.4	106,127.7
Totals			1,994,064.3	12,740.4	99.4		1,988,232.9
Grand totals			4,287,521.1	39,961.1	99.1		4,167,686.7

Appendix 5. Sulphur Credits Earned										
		Credits				Cumulative Credits				
Grandfathered sulphur recovery gas plants		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Status
	Plant Code									
1	1108	Brazeau R. - Keyera				-	-	-	-	Degrandfathered
2	1121	Brazeau R. (Nordegg) - Keyera	13.9	-2.6	8.0	7.1	689.1	686.5	694.5	701.6
3	1131	Burnt Timber - Shell	212.9	155.1	257.9	307.2	1,603.7	1,758.8	2,016.7	2,323.8
4	1374	Caroline (North) 1-11 - BP Canada					-	-	-	Plant shut down
5	1104	Caroline (South) 4-20 - BP Canada					-	-	-	Plant shut down
6	1020	Carstairs - Bonavista	11.3	9.8	2.2	0.0	281.6	291.3	293.5	293.5
7	1050	Crossfield (Balzac) - Nexen	106.3	50.4	147.2	221.9	2,176.5	2,226.9	2,374.1	2,596.1
8	1084	Edson - Talisman					122.2	122.2	122.2	122.2
9	1129	Gold Creek - CNRL					189.5	189.5	189.5	189.5
10	1037	Jumping Pound - Shell	403.7	444.1	527.3	552.4	7,853.6	8,297.6	8,825.0	9,377.4
11	1107	Kaybob S. 1 & 2 - Cams Midstream Services	156.7	93.8	0.0	26.2	3,762.0	3,855.8	3,855.8	3,882.0
12	1144	Kaybob S. 3 - Semcams					3,213.9	3,213.9	3,213.9	3,213.9
13	1139	Lone Pine Ck. - ExxonMobil	33.5	29.7	27.9	34.6	353.5	383.3	411.2	445.8
14	1047	Minnehik B. L. - Penn West	8.0	11.5	11.3	12.2	123.7	135.3	146.5	158.7
15	1530	Okotoks - MPP					-	-	-	Degrandfathered
16	1028	Redwater - Imperial	31.2	31.0	40.8	15.1	513.6	544.6	585.4	600.5
17	1206	Rosevear (North) - Suncor ¹					-	-	-	Plant shut down
18	1268	Rosevear (South) - Suncor ¹					1,634.7	1,634.7	1,634.7	1,634.7
19	1113	Simonette - Suncor					663.7	663.7	663.7	663.7
20	1141	Strachan (Ram River) - Husky	895.5	1,644.0	1,635.0	1,177.2	32,008.3	33,652.3	35,287.4	36,464.6
21	1133	Strachan - Keyera					1,229.7	1,229.7	1,229.7	1,229.7
22	1112	Sturgeon Lk. - Cadence					590.6	590.6	590.6	590.6
23	1296	Teepee - Talisman	8.3	17.6	1.1	25.8	841.9	859.5	860.6	886.4
24	1056	Waterton - Shell	712.5	612.1	-33.1	0.0	12,767.2	13,379.4	13,346.2	13,346.2
25	1054	Wildcat Hills - Petro-Canada	115.5	89.5	65.3	78.0	2,885.3	2,974.7	3,040.1	3,118.1
26	1081	Wimborne - Vault	46.2	16.5	0.6	9.9	2,062.1	2,078.6	2,079.2	2,089.1
27	1034	Windfall (West Whitecourt) - Semcams	65.1	32.6	88.6	62.4	5,380.6	5,413.2	5,501.8	5,564.2
28	1219	Zama - Apache ²	0.0	0.0	0.0	0.0	982.4	982.4	982.4	982.4
		Totals	2,820.7	3,235.1	2,780.1	2,530.1	81,929.5	85,164.5	87,944.6	90,474.7
		¹ Plant consolidation.								
		² Apache Zama - shipping acid gas to adjacent AGI gas plant.								