

# Existing and Proposed Canadian Commercial Oil Sands Projects

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## Summary

### Existing and Proposed Upgraders

	Capacities (b/d)	
	Bitumen	Products
Operating	1,209,000	1,037,500
Construction	90,000	91,000
Suspended	210,400	173,300
Approved	883,800	761,300
Application	705,000	670,400
Withdrawn	363,200	318,200
Disclosure	-	-
Announced	1,264,000	1,071,200
Total	4,725,400	4,122,900

### Existing and Proposed Bitumen Producers

	Capacities (b/d bitumen)					Total
	Mining	In Situ				
		N Athabasca	S Athabasca	Cold Lake	Peace River	
Operating	1,018,000	128,000	297,600	300,000	13,500	1,757,100
Construction	210,000	-	117,000	-	-	327,000
Suspended	-	74,500	-	-	-	74,500
Approved	740,000	240,000	346,600	50,000	-	1,376,600
Application	520,000	282,200	521,255	44,200	1,475	1,369,130
Withdrawn	114,500	30,000	-	-	87,500	232,000
Disclosure	210,000	80,000	149,000	35,000	-	474,000
Announced	593,000	440,000	653,000	-	13,000	1,699,000
Total	3,405,500	1,274,700	2,084,455	429,200	115,475	7,309,330

### Definitions

Operating	Projects that are in operation.
Construction	Projects that are under construction (beyond site preparation).
Suspended	Projects that began construction (beyond site preparation) that is no longer underway.
Approved	Projects that have received regulatory approvals but have not commenced construction.
Application	Projects that have filed applications that are being reviewed by regulatory agencies.
Withdrawn	Projects that have filed applications that were subsequently withdrawn.
Disclosure	Projects that have issued formal public disclosures but have not filed applications.
Announced	Projects that have been announced but have not issued formal public disclosures.

Startup	Year of commencement of operations for "Operating" projects and announced years for commencement of operations for projects under "Construction". Since startup dates for other projects are uncertain in the current economic environment, their "Startup" dates have been marked as TBD (to be determined).
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#### Notes:

Capacities of the Husky Lloydminster and Federated Coop Regina upgraders are not included.  
 Capacities of upgrading (conversion) units at Canadian refineries are not included.  
 Capacities of primary, secondary and experimental in situ recovery projects are not included.

### Errors and Omissions

Strategy West accepts no liability for errors or inaccuracies in the information provided in this report. No implied warranty of merchantability or fitness for a particular purpose shall apply.

## Upgraders

Design Bitumen and Product Capacities Company/Project Name	Status	Startup	Capacities (b/d)	
			Bitumen	Products
<b>AOSP (Shell) Scotford Upgrader 1</b>				
AOSP Scotford 1	Operating	2003	155,000	158,000
AOSP Scotford 1 Expansion	Construction	2010	90,000	91,000
			<u>245,000</u>	<u>249,000</u>
<b>BA Energy (Value Creation) Heartland</b>				
Phase 1	Suspended	TBD	54,400	46,300
Phase 2	Approved	TBD	54,400	46,300
Phase 3	Approved	TBD	54,400	46,300
			<u>163,200</u>	<u>138,900</u>
<b>Bluesky Refining</b>				
Phase 1	Announced	TBD	50,000	42,500
Phase 2	Announced	TBD	50,000	42,500
Phase 3	Announced	TBD	50,000	42,500
Phase 4	Announced	TBD	50,000	42,500
			<u>200,000</u>	<u>170,000</u>
<b>CNRL Horizon</b>				
Phase 1	Operating	2008	135,000	114,000
Phases 2 & 3	Approved	TBD	135,000	118,000
Phase 4	Announced	TBD	145,000	125,000
Phase 5	Announced	TBD	162,000	140,000
			<u>577,000</u>	<u>497,000</u>
<b>CNRL Primrose</b>				
Phase 1	Announced	TBD	145,000	125,000
Phase 2	Announced	TBD	58,000	50,000
			<u>203,000</u>	<u>175,000</u>
<b>Fort Hills (Petro-Canada) Sturgeon</b>				
Phase 1	Approved	TBD	165,000	145,000
Phase 2/3	Approved	TBD	175,000	145,000
			<u>340,000</u>	<u>290,000</u>
<b>Long Lake (Nexen)</b>				
Phase 1	Operating	2008	72,000	58,500
Phase 2	Approved	TBD	72,000	58,500
Phase 3	Announced	TBD	72,000	58,500
Phase 4	Announced	TBD	72,000	58,500
Phase 5	Announced	TBD	72,000	58,500
Phase 6	Announced	TBD	72,000	58,500
			<u>432,000</u>	<u>351,000</u>
<b>Northern Lights (Total) Sturgeon</b>				
Phase 1	Withdrawn	TBD	56,600	50,600
Phase 2	Withdrawn	TBD	56,600	50,600
			<u>113,200</u>	<u>101,200</u>
<b>North West Upgrading Sturgeon</b>				
Phase 1	Approved	TBD	50,000	46,400
Phase 2	Approved	TBD	50,000	46,400
Phase 3	Approved	TBD	50,000	46,400
			<u>150,000</u>	<u>139,200</u>

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## Upgraders (continued)

Design Bitumen and Product Capacities Company/Project Name	Status	Startup	Capacities (b/d)	
			Bitumen	Products
<b>Shell Scotford Upgrader 2</b>				
Phase 1	Application	TBD	100,000	97,750
Phase 2	Application	TBD	100,000	97,750
Phase 3	Application	TBD	100,000	97,750
Phase 4	Application	TBD	100,000	97,750
			400,000	391,000
<b>StatoilHydro Strathcona</b>				
Phase 1	Withdrawn	TBD	75,000	65,000
Phase 2	Withdrawn	TBD	175,000	152,000
			250,000	217,000
<b>Suncor Base and Millennium</b>				
Base U1 and U2	Operating	1967	281,000	225,000
Millennium Vacuum Unit	Operating	2005	43,000	35,000
Millennium Coker Unit	Operating	2008	116,000	97,000
			440,000	357,000
<b>Suncor Voyageur</b>				
Voyageur Phase 1	Suspended	TBD	156,000	127,000
Voyageur Phase 2	Approved	TBD	78,000	63,000
			234,000	190,000
<b>Syncrude Mildred Lake</b>				
Stages 1 & 2	Operating	1978	290,700	250,000
Stage 3 Expansion	Operating	2006	116,300	100,000
Stage 3 Debottleneck	Announced	TBD	46,500	40,000
Stage 4 Expansion	Announced	TBD	139,500	120,000
			593,000	510,000
<b>Total Strathcona</b>				
Phase 1	Application	TBD	150,000	138,000
Phase 2	Application	TBD	95,000	87,000
Debottlenecking	Application	TBD	50,000	46,000
			295,000	271,000
<b>Value Creation Terre de Grace</b>				
Pilot	Application	TBD	10,000	8,400
Phase 1	Announced	TBD	40,000	33,600
Phase 2	Announced	TBD	40,000	33,600
			90,000	75,600
<b>Total Upgrading Capacities (Existing &amp; Proposed Projects)</b>			4,725,400	4,122,900

**Notes:**

Each phase of proposed North West Upgrader has approval to process 77,000 b/d of feedstocks consisting of 50,000 b/d of bitumen and 27,000 b/d of other crudes. In addition to 46,400 b/d of ULS Doesel, products include 31,600 b/d of condensate, naphtha and butanes. It is assumed that Phases 4-5 of CNRL's Horizon Upgrader and Phases 1-2 of CNRL's Primrose Upgrader would have the same liquid yields as Horizon Phases 1-3. The Husky Lloydminster and NewGrade Regina Upgraders are not included since they process primarily conventional heavy crude oil. This list does not include Canadian refineries with upgrading capacity.

## Athabasca Mining Projects

Design Bitumen Capacities Company/Project Name	Status	Startup	Capacity (b/d)
AOSP (Shell) Jackpine			
Phase 1A	Construction	2010	100,000
Phase 1B	Approved	TBD	100,000
Phase 2	Application	TBD	100,000
			300,000
AOSP (Shell) Muskeg River			
Existing Facilities	Operating	2002	155,000
Expansion and Debottlenecking	Approved	TBD	115,000
			270,000
AOSP (Shell) Pierre River			
Phase 1	Application	TBD	100,000
Phase 2	Application	TBD	100,000
			200,000
CNRL Horizon			
Phase 1	Operating	2008	135,000
Phases 2&3	Approved	TBD	135,000
Phase 4	Announced	TBD	145,000
Phase 5	Announced	TBD	162,000
			577,000
Fort Hills (Petro-Canada)			
Phase 1	Approved	TBD	165,000
Debottleneck	Approved	TBD	25,000
			190,000
Imperial/ExxonMobil Kearl Lake			
Phase 1	Construction	2012	110,000
Phase 2	Approved	TBD	100,000
Phase 3	Approved	TBD	100,000
			310,000
Northern Lights (Total)			
Phase 1	Withdrawn	TBD	57,250
Phase 2	Withdrawn	TBD	57,250
			114,500
Suncor Millennium & North Steepbank			
Millennium Mine	Operating	1967	294,000
Steepbank Debottleneck Phase 3	Operating	2007	4,000
Millennium Debottlenecking	Operating	2008	23,000
North Steepbank Extension	Construction	2010	-
			321,000
Suncor Voyageur South			
Phase 1	Application	TBD	120,000
			120,000

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## Athabasca Mining Projects (continued)

Design Bitumen Capacities Company/Project Name	Status	Startup	Capacity (b/d)
Syn crude Mildred Lake & Aurora			
Stages 1 & 2	Operating	1978	290,700
Stage 3 Expansion	Operating	2006	116,300
Stage 3 Debottleneck	Announced	TBD	46,500
Stage 4 Expansion	Announced	TBD	139,500
			593,000
Total Joslyn			
North Mine	Application	TBD	100,000
South Mine	Announced	TBD	100,000
			200,000
UTS/Teck Cominco			
Equinox	Disclosure	TBD	50,000
Frontier 1	Disclosure	TBD	100,000
Frontier 2	Disclosure	TBD	60,000
			210,000
Total Athabasca Mining Bitumen Capacity (Existing & Proposed Projects)			3,405,500

## North Athabasca Commercial In Situ Projects

### Athabasca In Situ Projects North of Fort McMurray

Design Bitumen Capacities Company/Project Name	Status	Startup	Capacity (b/d)
Athabasca Oil Sands Dover Pilot	Application	TBD	2,000 <u>2,000</u>
Athabasca Oil Sands MacKay Pilot	Application	TBD	2,200 <u>2,200</u>
Chevron Canada Ells River SAGD Project	Announced	TBD	85,000 <u>85,000</u>
CNRL Birch Mountain Phase 1	Announced	TBD	60,000 <u>60,000</u>
EnCana Borealis Phase 1	Application	TBD	35,000
Phase 2	Announced	TBD	32,500
Phase 3	Announced	TBD	32,500 <u>100,000</u>
E-T Energy Poplar Creek Pilot	Application	TBD	10,000 <u>10,000</u>
Husky Sunrise Phase 1	Approved	TBD	50,000
Phase 2	Approved	TBD	50,000
Phase 3	Approved	TBD	50,000
Phase 4	Approved	TBD	50,000 <u>200,000</u>
Ivanhoe Tamarack Phase 1	Announced	TBD	20,000 <u>20,000</u>
Petro-Canada Lewis Phase 1	Disclosure	TBD	40,000
Phase 2	Disclosure	TBD	40,000 <u>80,000</u>
Petro-Canada MacKay River Phase 1	Operating	2002	33,000
Phase 2	Approved	TBD	40,000 <u>73,000</u>
Southern Pacific McKay Phase 1	Application	TBD	12,000 <u>12,000</u>
Suncor Firebag Phase 1	Operating	2004	35,000
Phase 2	Operating	2006	35,000
Cogeneration and Expansion	Operating	2007	25,000
Phase 3	Suspended	TBD	62,500
Phase 4	Application	TBD	62,500
Phase 5	Application	TBD	62,500
Phase 6	Application	TBD	62,500
Stages 3-6 Debottlenecking	Application	TBD	23,500 <u>368,500</u>

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## North Athabasca Commercial In Situ Projects (continued)

## Athabasca In Situ Projects North of Fort McMurray

Design Bitumen Capacities Company/Project Name	Status	Startup	Capacity (b/d)
Sunshine Oilsands Harper CSS Pilot	Application	TBD	-
Sunshine Oilsands Thickwood Phase 1	Announced	TBD	10,000
Phase 2	Announced	TBD	30,000
Phase 3	Announced	TBD	25,000
			<u>65,000</u>
Sunshine Oilsands West Ells Phase 1	Announced	TBD	10,000
Phase 2	Announced	TBD	30,000
Phase 3	Announced	TBD	25,000
			<u>65,000</u>
Total (Deer Creek) Joslyn Phase 1	Suspended	TBD	2,000
Phase 2	Suspended	TBD	10,000
Phase 3a	Withdrawn	TBD	15,000
Phase 3b	Withdrawn	TBD	15,000
			<u>42,000</u>
Value Creation Terre de Grace Pilot	Application	TBD	10,000
Phase 1	Announced	TBD	40,000
Phase 2	Announced	TBD	40,000
			<u>90,000</u>
Total North Athabasca In Situ Bitumen Capacity (Existing & Proposed Projects)			<u><u>1,274,700</u></u>

*Note:*

List does not include Athabasca primary production, secondary recovery and experimental projects



## South Athabasca Commercial In Situ Projects

### Athabasca In Situ Projects South of Fort McMurray

Design Bitumen Capacities Company/Project Name	Status	Startup	Capacity (b/d)
Alberta Oil Sands Clearwater			
Pilot	Announced	TBD	2,000
Clearwater West	Announced	TBD	10,000
Clearwater East	Announced	TBD	10,000
			<u>22,000</u>
Black Pearl Resources (Serrano) Blackrod			
Pilot	Application	TBD	500
			<u>500</u>
CNRL Gregoire Lake			
Phase 1	Announced	TBD	60,000
			<u>60,000</u>
CNRL Grouse			
Phase 1	Announced	TBD	60,000
			<u>60,000</u>
CNRL Kirby			
Phase 1	Application	TBD	45,000
			<u>45,000</u>
CNRL Leismer			
Phase 1	Announced	TBD	30,000
			<u>30,000</u>
Connacher Great Divide			
Great Divide Pod 1	Operating	2007	10,000
Great Divide Pod 2 (Algar)	Construction	2011	10,000
Great Divide Expansion	Disclosure	TBD	24,000
			<u>44,000</u>
ConocoPhillips Surmont			
Phase 1	Operating	2006	27,000
Phase 2	Approved	TBD	83,000
			<u>110,000</u>
Devon Jackfish			
Jackfish 1	Operating	2008	35,000
Jackfish 2	Construction	2011	35,000
			<u>70,000</u>
EnCana Christina Lake			
Phase 1A	Operating	2002	10,000
Phase 1B	Operating	2008	8,800
Phase 1C	Construction	2010	40,000
Phase 1D	Approved	TBD	40,000
Phase 1E	Announced	TBD	40,000
Phase 1F	Announced	TBD	40,000
Phase 1G	Announced	TBD	40,000
Unnamed Expansion	Announced	TBD	30,000
			<u>248,800</u>

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## South Athabasca Commercial In Situ Projects (continued)

## Athabasca In Situ Projects South of Fort McMurray

Design Bitumen Capacities Company/Project Name	Status	Startup	Capacity (b/d)
EnCana Foster Creek			
Phase 1A	Operating	2001	24,000
Phase 1B - Debottlenecking	Operating	2003	6,000
Phase 1C - Stage 1	Operating	2005	10,000
Phase 1C - Stage 2	Operating	2007	20,000
Phase 1D	Operating	2009	30,000
Phase 1E	Operating	2009	30,000
Phase 1F	Application	TBD	30,000
			150,000
Enerplus Kirby			
Phase 1	Application	TBD	10,000
Phase 2	Announced	TBD	25,000
			35,000
Husky McMullen			
Pilot	Application	TBD	755
			755
JACOS Hangingstone			
Demonstration Project	Operating	2002	10,000
Expansion	Disclosure	TBD	35,000
			45,000
KNOC BlackGold			
Phase 1	Application	TBD	10,000
Phase 2	Announced	TBD	20,000
			30,000
Laricina Germain			
Pilot	Approved	TBD	600
Phase 1	Announced	TBD	10,000
			10,600
Laracina Saleski			
Pilot	Approved	TBD	1,200
Phase 1	Announced	TBD	10,000
			11,200
Long Lake (Nexen)			
Phase 1	Operating	2007	72,000
Phase 2	Announced	TBD	72,000
Phase 3	Announced	TBD	72,000
Phase 4	Announced	TBD	72,000
			288,000
Long Lake South (Nexen)			
Phase 1	Approved	TBD	70,000
Phase 2	Approved	TBD	70,000
			140,000

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## South Athabasca Commercial In Situ Projects (continued)

## Athabasca In Situ Projects South of Fort McMurray

Design Bitumen Capacities Company/Project Name	Status	Announced Startup	Capacity (b/d)
MEG Christina Lake			
Phase 1 Pilot	Operating	2007	3,000
Phase 2A	Construction	2009	22,000
Phase 2B	Application	TBD	35,000
Phase 3A	Application	TBD	75,000
Phase 3B	Application	TBD	75,000
			210,000
Patch Ells River			
Phase 1	Announced	TBD	10,000
			10,000
Petrobank			
Whitesands Phase 1 Pilot	Operating	2006	1,800
Whitesands Phase 2 Pilot	Approved	TBD	1,800
May River Phase 1	Application	TBD	10,000
May River Subsequent Phases	Disclosure	TBD	90,000
			103,600
Petro-Canada Chard			
Phase 1	Announced	TBD	40,000
			40,000
Petro-Canada Meadow Creek			
Phase 1	Approved	TBD	40,000
Phase 2	Approved	TBD	40,000
			80,000
StatoilHydro Kai Kos Dehseh			
Leismer Demonstration	Construction	2009	10,000
Leismer Commercial	Application	TBD	10,000
Leismer Expansion	Application	TBD	20,000
Corner	Application	TBD	40,000
Thornbury	Application	TBD	40,000
Corner Expansion	Application	TBD	40,000
Hangingstone	Application	TBD	20,000
Thornbury Expansion	Application	TBD	20,000
Northwest Leismer	Application	TBD	20,000
South Liesmer	Application	TBD	20,000
			240,000
Total South Athabasca In Situ Bitumen Capacity (Existing & Proposed Projects)			2,084,455

*Note:*

List does not include Athabasca primary production, secondary recovery and experimental projects

## Cold Lake Commercial In Situ Projects

Design Bitumen Capacities Company/Project Name	Status	Startup	Capacity (b/d)
<b>CNRL Primrose/Wolf Lake</b>			
Wolf lake	Operating	1985	13,000
Primrose South	Operating	1985	45,000
Primrose North	Operating	2006	30,000
Primrose East	Operating	2008	32,000
Wolf Lake SAGD	Application	TBD	5,500
Production Capacity Increase	Application	TBD	25,000
			150,500
<b>Husky Caribou Lake</b>			
Demonstration Project	Approved	TBD	10,000
			10,000
<b>Husky Tucker</b>			
Phase 1	Operating	2006	30,000
			30,000
<b>Imperial Oil Cold Lake</b>			
Phases 1-10: Leming, Maskwa, Mahikan	Operating	1985	110,000
Phases 11-13: Mahkeses	Operating	2003	30,000
Phases 14-16: Nabiye, Mahikan North	Approved	TBD	30,000
			170,000
<b>Koch Exploration Gemini</b>			
Phase 1 Pilot	Application	TBD	1,200
Phase 2	Application	TBD	10,000
			11,200
<b>OSUM Taiga</b>			
Potential Capacity	Disclosure	TBD	35,000
			35,000
<b>Pengrowth Lindberg</b>			
Pilot	Application	TBD	2,500
			2,500
<b>Shell (BlackRock) Orion (Hilda Lake)</b>			
Phase 1	Operating	2007	10,000
Phase 2	Approved	TBD	10,000
			20,000
<b>Total Cold Lake In Situ Bitumen Capacity (Existing &amp; Proposed Projects)</b>			429,200

*Note:*

List does not include Cold Lake primary recovery, secondary recovery and experimental projects

## Peace River Commercial In Situ Projects

Design Bitumen Capacities Company/Project Name	Status	Startup	Capacity (b/d)
Andora Sawn Lake Demonstration Project	Application	TBD	<u>1,400</u> 1,400
North Peace Red Earth Pilot	Operating	2009	1,000
Pilot Expansion	Announced	TBD	3,000
Commercial Project	Announced	TBD	10,000
			14,000
Penn West Seal CSS Pilot	Application	TBD	<u>75</u> 75
Shell Peace River Cadotte Lake	Operating	1986	12,500
Carmon Creek Phase 1	Withdrawn	TBD	37,500
Carmon Creek Phase 2	Withdrawn	TBD	50,000
			<u>100,000</u>
Total Peace River In Situ Bitumen Capacity (Existing & Proposed Projects)			<u><u>115,475</u></u>

*Note:*

List does not include Peace River primary recovery, secondary recovery and experimental projects