Lindbergh Project

2021 Annual Performance Report

STRATHCONA
RESOURCES LTD

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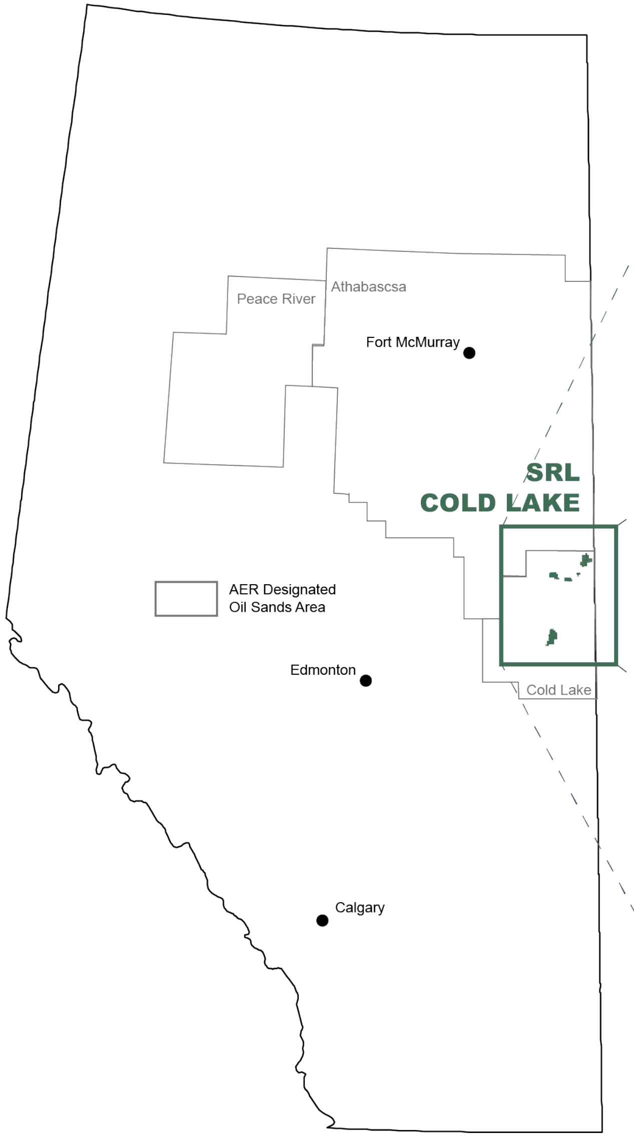
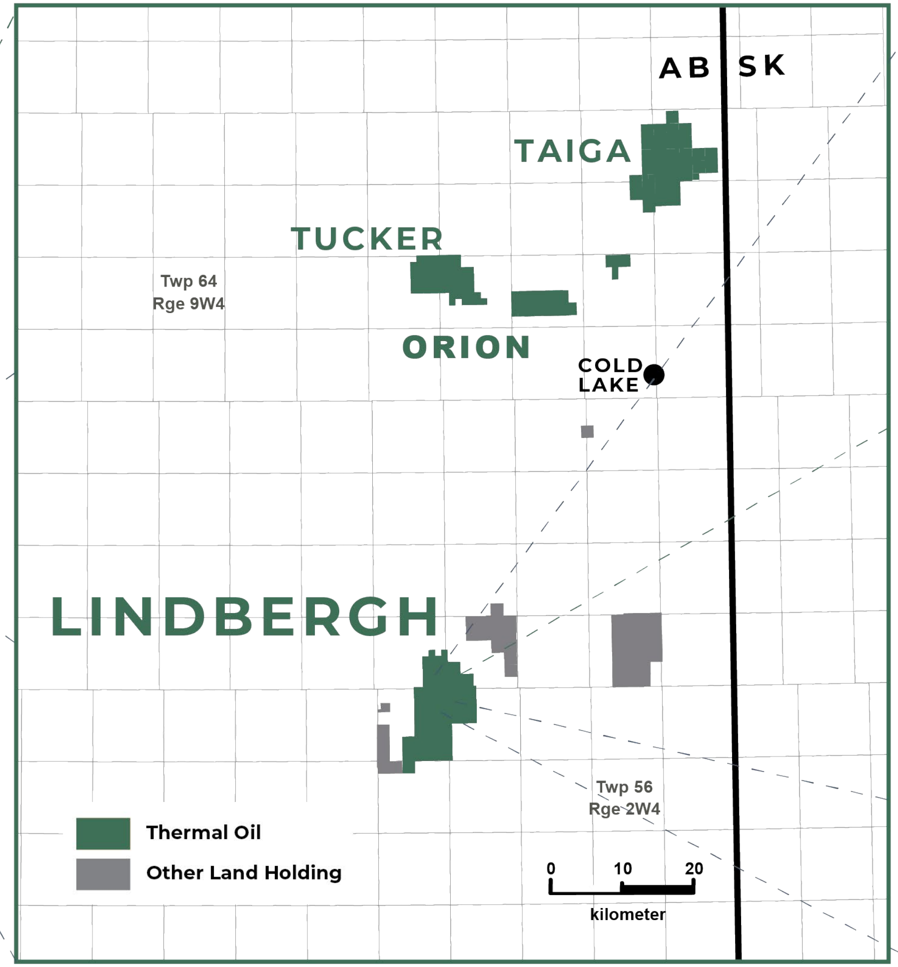
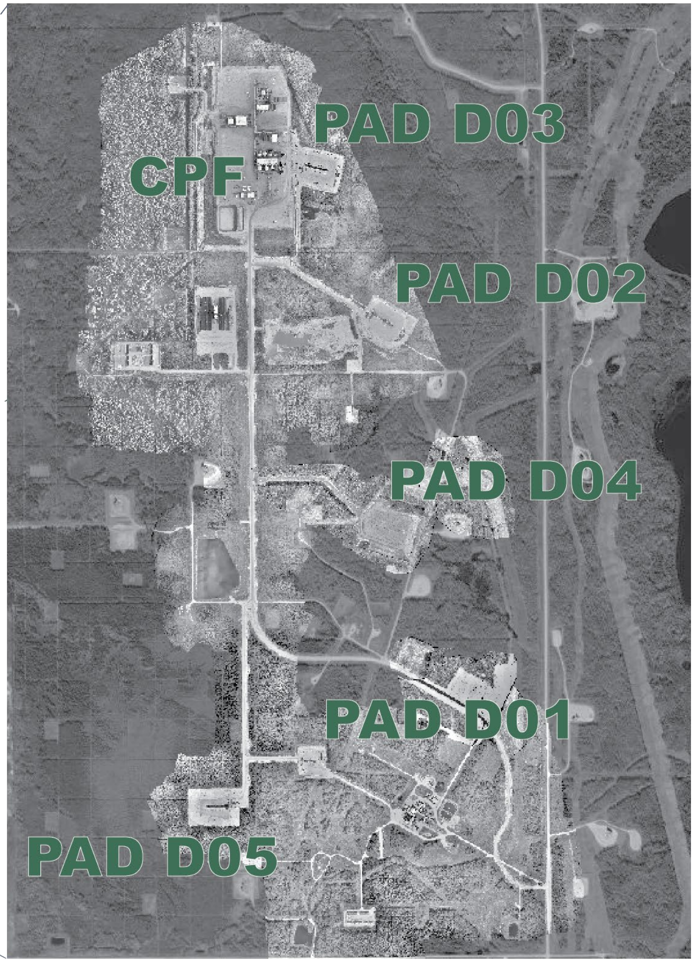
Introduction- Project Location







Lindbergh is an in-situ oil sands steam-assisted gravity drainage (SAGD) project consisting of a central processing facility (CPF) and five well pads situated in 04-25-58-05 W4M, approximately 30 km south-east of Bonnyville, Alberta.

Project Overview and History

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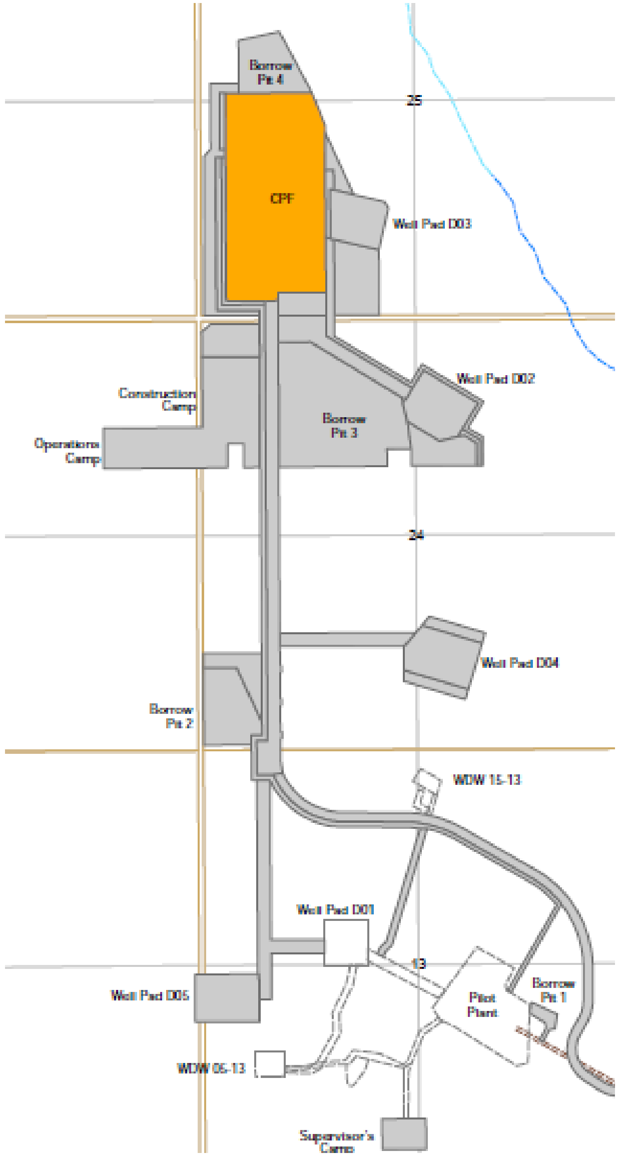
- Murphy Oil piloted and then commercialized CSS production in the Lloydminster and Rex formations in Section 13 from 1972-1998.
- Pengrowth acquired the Lindbergh lease from Murphy Canada in April, 2004.
- All CSS wells have been abandoned.
- Pilot project implemented to evaluate the SAGD recovery process in the Mannville Lloydminster Formation:
  - 2 pilot SAGD wells – began steam circulation Feb 2012 (still operating).
- 12,500 bpd SAGD facility completed Q4, 2014:
  - 20 new SAGD wells in Pads D02, D03 and D05 – first steam in Dec 2014,
  - 1 new SAGD well and 2 Infill wells in Pad D01 (pilot) – first steam in June 2017,
  - 9 new SAGD wells in Pad D04 – first steam Sep 2017 to Feb 2018,
  - 8 infill wells in D05 – first steam in July 2018 ,
  - 1 new SAGD well and 7 infill wells in Pad D03 – first steam Sep 2020, and
  - 4 new SAGD wells and 5 infill wells in Pad D02 – first steam Oct 2021.
- Pilot SAGD CPF decommissioned upon start-up of the Phase 1 CPF and then recommissioned for steam production side only in April 2018 to handle increasing production from the field.
- Phase 2 approved to increase production capacity to 40,000 bpd in 2016.

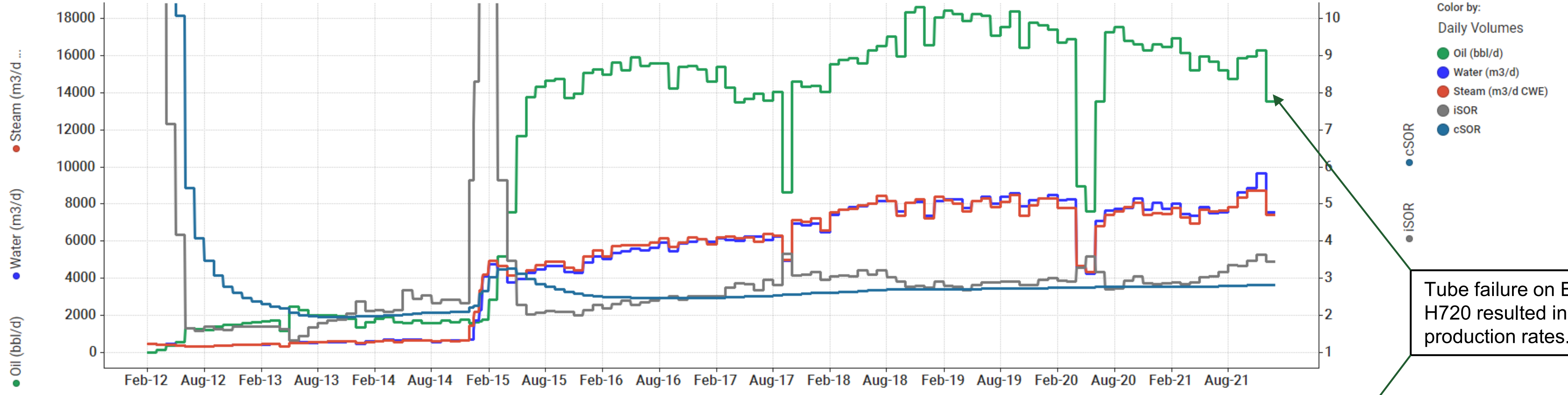


Subsurface

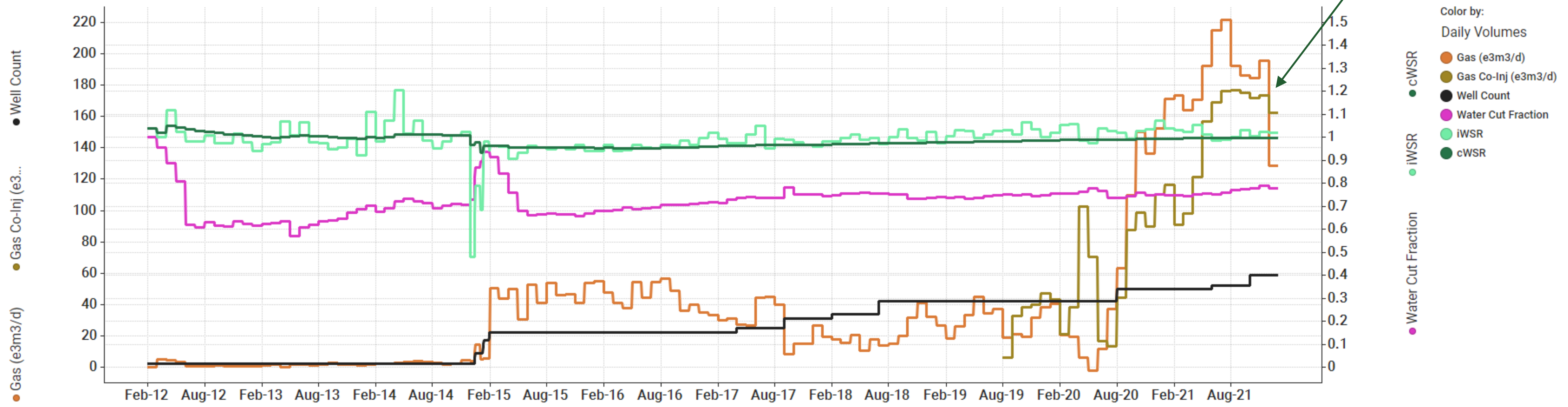
Lindbergh In Situ Oil Sands

Scheme Lifespan Production Plot

Lindbergh Production History



Tube failure on Boiler H720 resulted in reduced production rates.



Drilled and Approved Drainage Patterns

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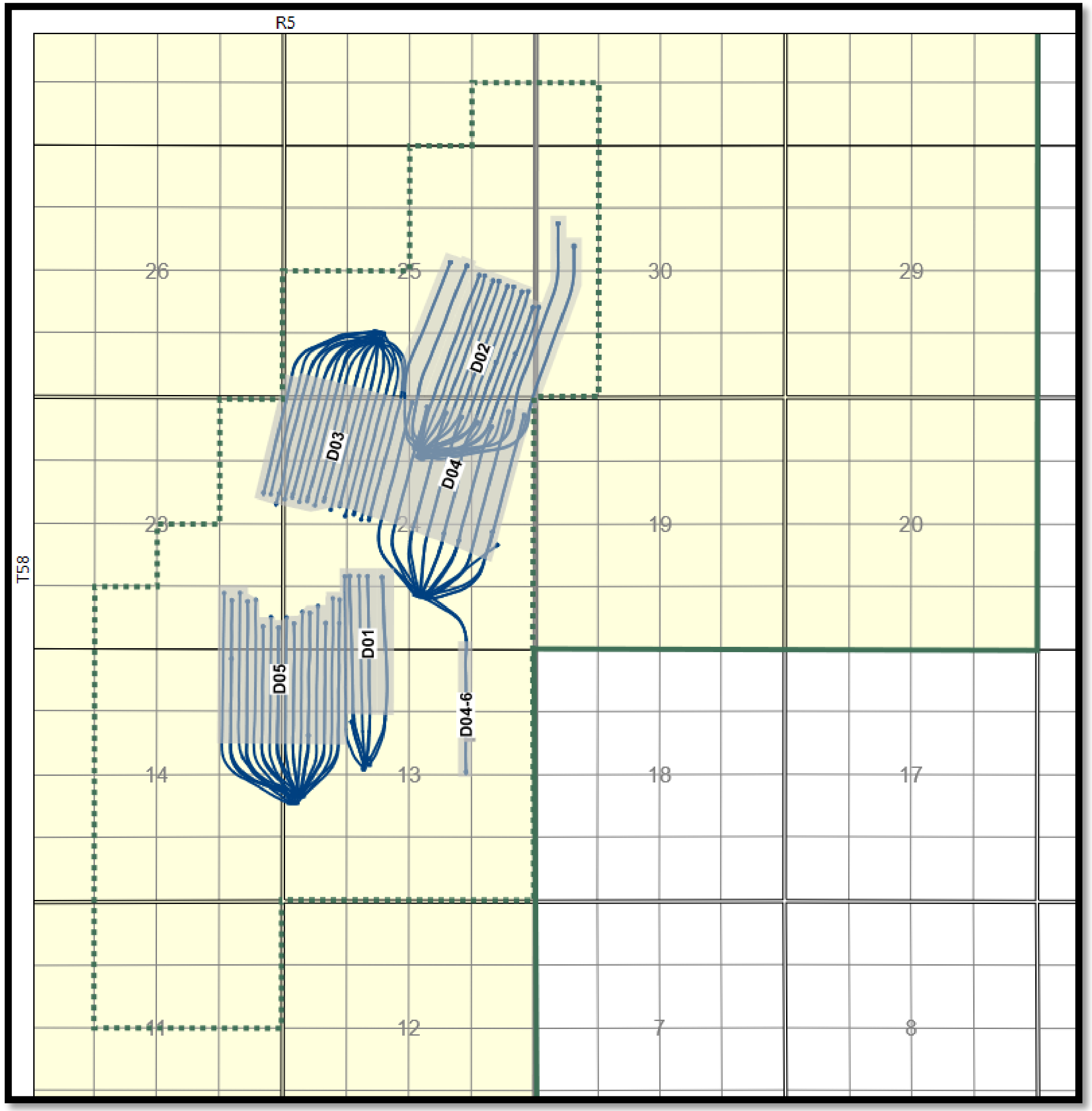

Lindbergh Development Area

Lindbergh Project Area

Strathcona Lease Area

GeoScience

Lindbergh In Situ Oil Sands

Project Area and Well Data

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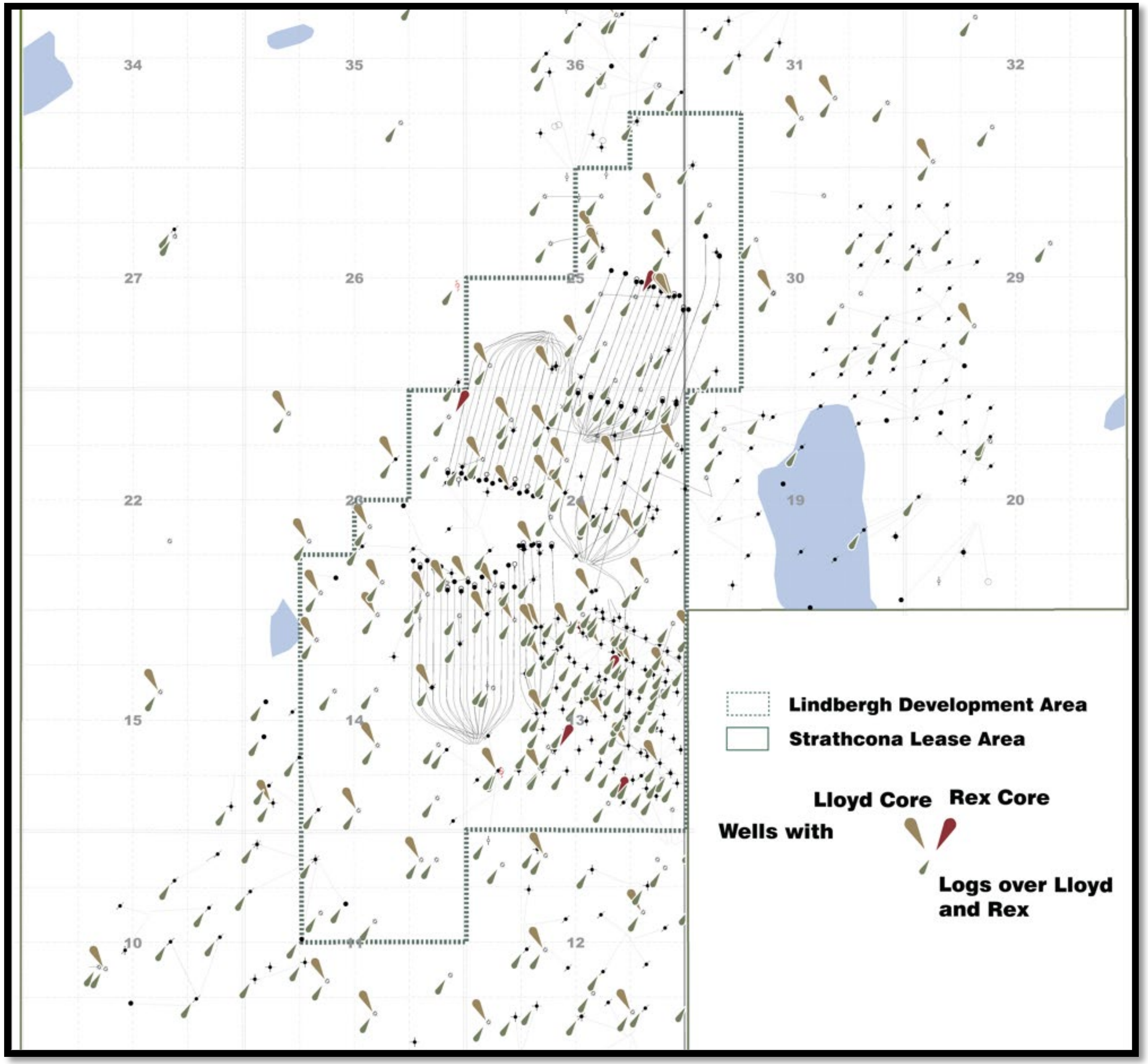

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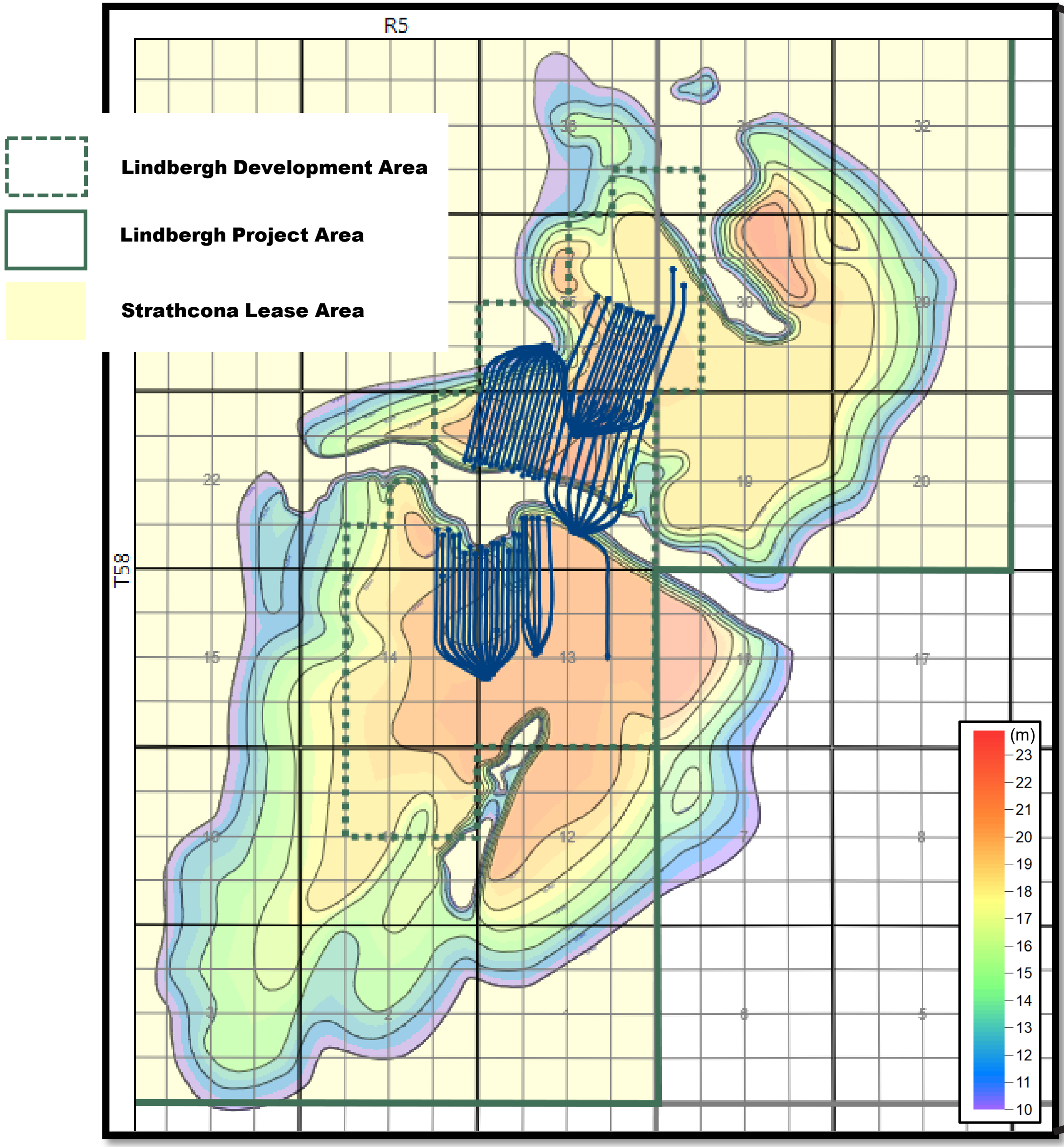
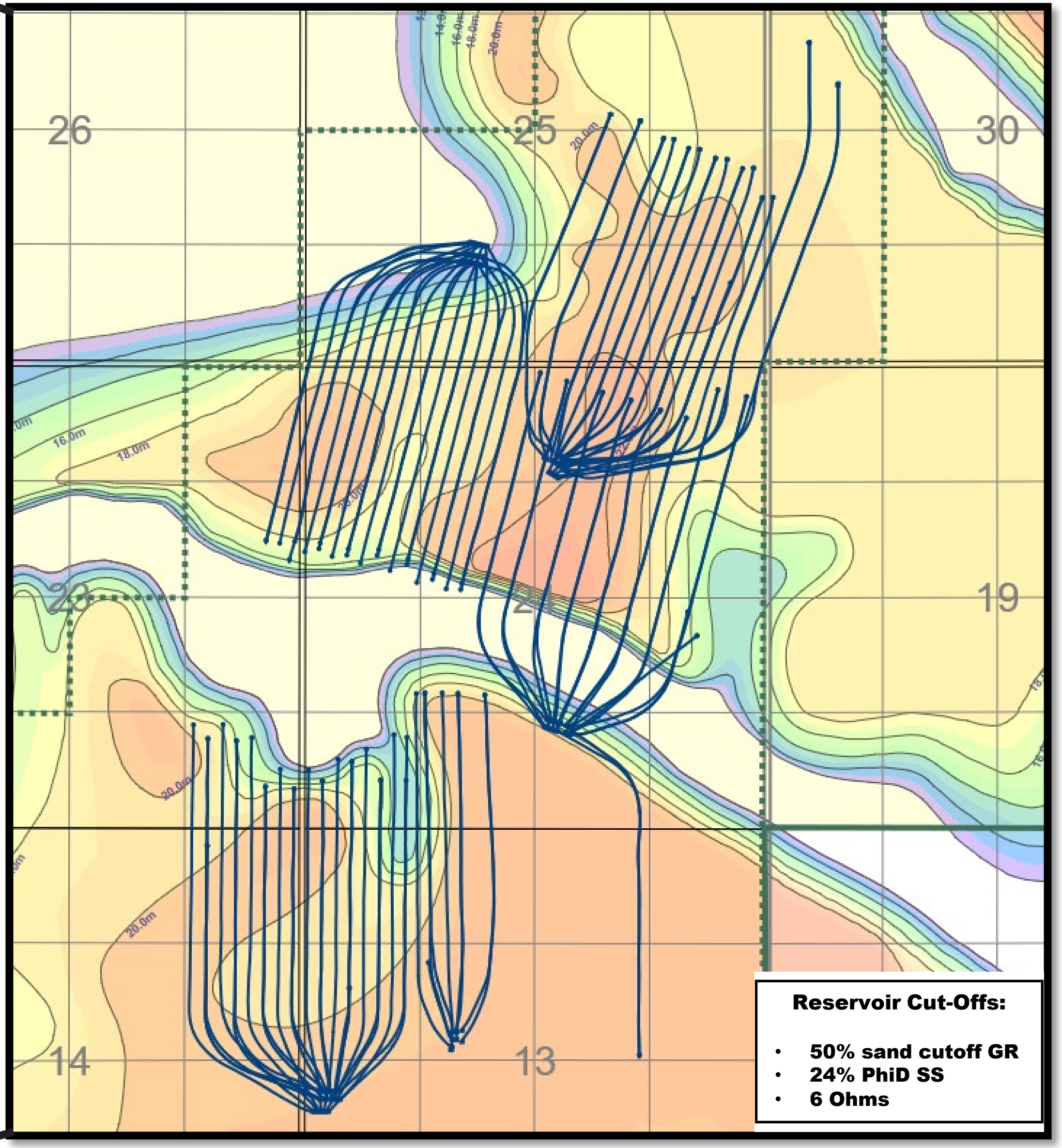
3D, 2D & Swath Datasets:

- 102 km^2 of 3D data exist over most of the Lindbergh and Muriel Lake leases with exploitable resource.
- 1.32 sq km 4D Seismic over D01 wellpad:
  - Baseline acquired Feb 2012,
  - First monitor acquired Dec 2013, and
  - Second monitor acquired Dec 2016.
- No new seismic acquired in 2020.

No Seismic Data Acquired Since 2016

Lloydminster SAGD Reservoir Isopach





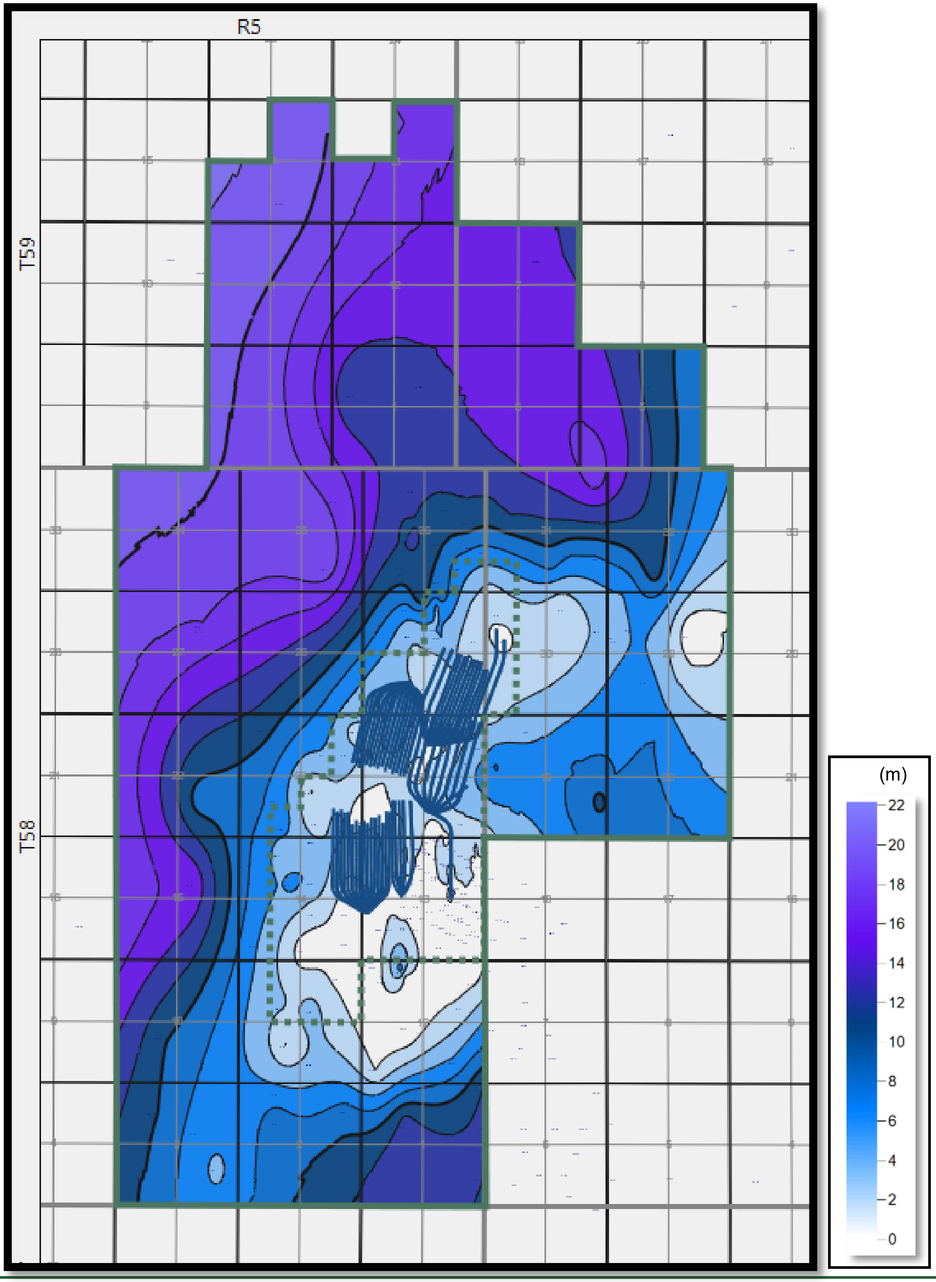
Contour Interval: 2m, 10m cutoff

Reservoir Basal Water Isopach

Lindbergh Development Area

Lindbergh Project Area

Strathcona Lease Area



Contour Interval: 2m

Structural Cross-Section

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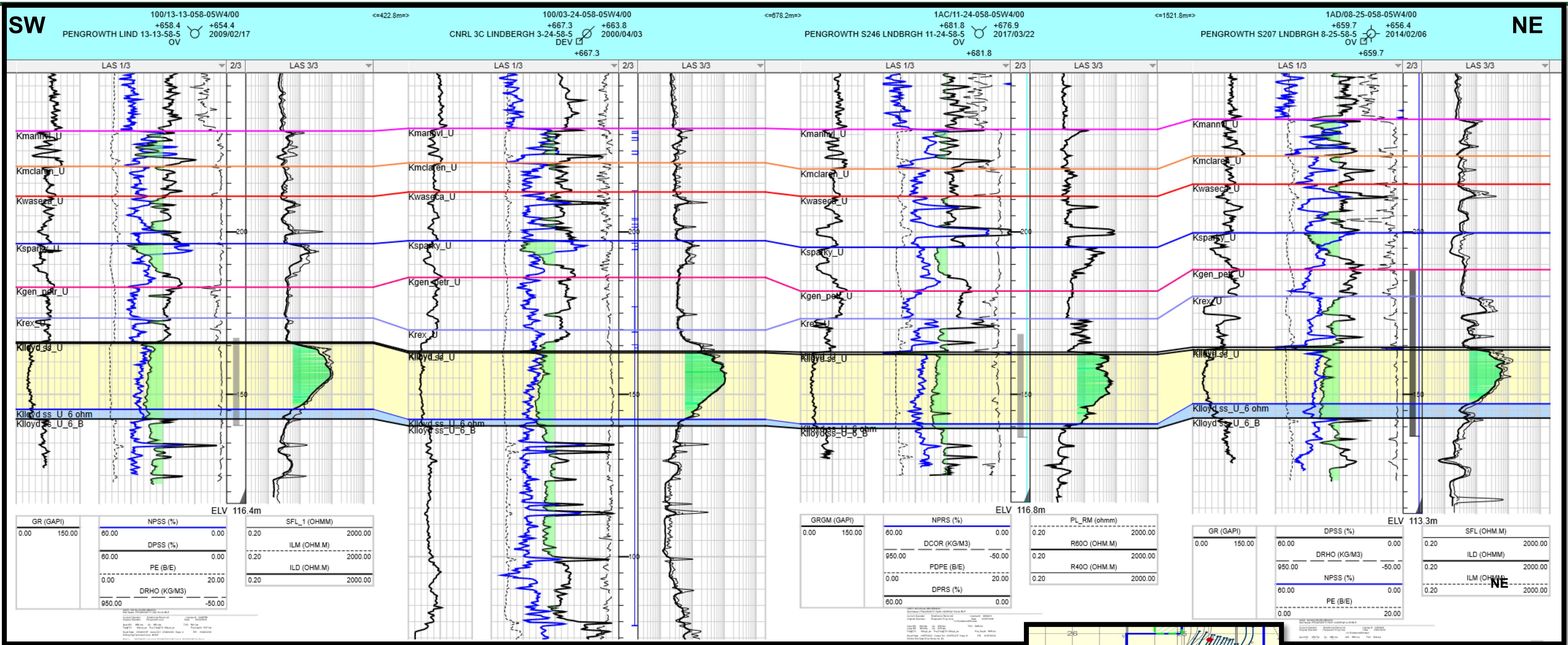

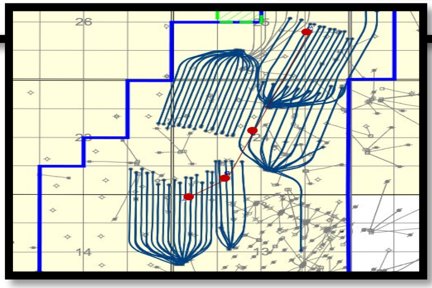

SAGD Pay

Bottom Water

* No gas cap present

Reservoir Properties and Original Bitumen in Place (OBIP)

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OBIP and Recovery to Date (1)

Pad	Start Date	Operating Well Pairs	Well Length	Well Pair Spacing (2)	Area	Pay	Phi	So	Total OBIP (3)	Current Recovery (4)	Estimated Ultimate Recovery	PBIP
Name	Date	#	m	m	m^2	m			10^3m^3	%	%	10^3m^3
Pad D01	Feb-12	3 WP / 2 infill	837	100	296,003	20.3	0.37	0.85	1,880	56.9%	75	1,371
Pad D02	Jan-15	9WP / 5 infill	903	100	878,115	19.4	0.36	0.83	5,065	20.3%	70	4,021
Pad D03	Dec-14	8 WP / 7 infill	765	100	645,922	19	0.36	0.85	3,737	45.5%	70	2,852
Pad D04	Sep-17	9 WP	809	100	781,658	20	0.36	0.83	4,648	22.4%	65	3,416
Pad D05	Jan-15	8 WP / 8 Infill	778	100	755,315	18.5	0.37	0.83	4,270	49.1%	70	3,901

Area	Total OBIP	Current Recovery Factor (4)
Total Active Well Pattern Area	19,602	35.4 %
Total Development Area	40,794	17 %
Total Project Area	157,216	4.4 %

Development Area Reservoir Properties

Depth	metres	500
Pay Thickness	metres	18-22
Average Porosity	%	35
Average Oil Saturation	%	75
Average Bitumen Weight	%	14
Horizontal Permeability	Darcies	2 to 6
Kv:Kh	X	0.8
Temperature	°C	16
Pressure	MPa	3.0
Oil Gravity	°API	10
Viscosity at 16°C	cP	300,000

(1) As of December 2021
(2) Approximate Well Pair Spacing, m
(3) OBIP=Area x Pad Thickness x Porosity x Oil Saturation
(4) Recovery as of December 2021, on OBIP basis

NCG Co-Injection

Strategy:

- NCG co-injection initiated with new infill production:
  - Infills timing is typically at 30-35% recovery of SAGD well pairs.
- NCG rates are up to 3 mole % or 10 e^3m^3/d gas injection with steam per well:
  - Requested a temporary increase to mitigate a boiler repair in December 2021,
    - 100 mol% or 10 e^3m^3/d.
- Positive & Negative Impacts
  - \+ Pad steam reductions of up to 20%,
  - \+ iSOR reduction of up to 0.5 m^3/m^3,
  - \+ Lower per barrel operating cost with reduced steam demand,
  - \+ No negative impact on ultimate recovery observed,
  - \+ No wellbore integrity issues observed,
  - \+ No interaction with bottom water,
  - \- Significantly increased produced gas volumes, and
  - \- Lower heating value in produced gas decreases boiler burner efficiency.

Steam Injection Only Wells	
UWI	Field Ref.
113/10-25-058-05W4/00	D02-J02
114/10-25-058-05W4/00	D02-J03
104/12-30-058-04W4/00	D02-J09
105/12-30-058-04W4/00	D02-J10
107/09-23-058-05W4/00	D03-J08
105/15-24-058-05W4/00	D04-J01
106/15-24-058-05W4/00	D04-J02
107/15-24-058-05W4/00	D04-J03
109/15-24-058-05W4/00	D04-J04
104/16-24-058-05W4/00	D04-J05
109/10-13-058-05W4/00	D04-J06
108/16-24-058-05W4/02	D04-J07
109/16-24-058-05W4/00	D04-J08
110/16-24-058-05W4/00	D04-J09

NCG Co-Injection Wells	
UWI	Field Ref.
103/06-24-058-05W4/00	D01-J01
104/06-24-058-05W4/00	D01-J02
115/06-24-058-05W4/00	D01-J03
106/08-25-058-05W4/00	D02-J04
107/08-25-058-05W4/00	D02-J05
108/08-25-058-05W4/00	D02-J06
109/08-25-058-05W4/02	D02-J07
110/08-25-058-05W4/00	D02-J08
104/11-24-058-05W4/00	D03-J01
100/11-24-058-05W4/00	D03-J02
103/12-24-058-05W4/00	D03-J03
104/12-24-058-05W4/00	D03-J04
105/12-24-058-05W4/00	D03-J05
106/12-24-058-05W4/00	D03-J06
102/09-23-058-05W4/00	D03-J07
107/01-23-058-05W4/00	D05-J01
108/01-23-058-05W4/00	D05-J02
109/01-23-058-05W4/00	D05-J03
110/01-23-058-05W4/00	D05-J04
106/04-24-058-05W4/00	D05-J05
107/04-24-058-05W4/00	D05-J06
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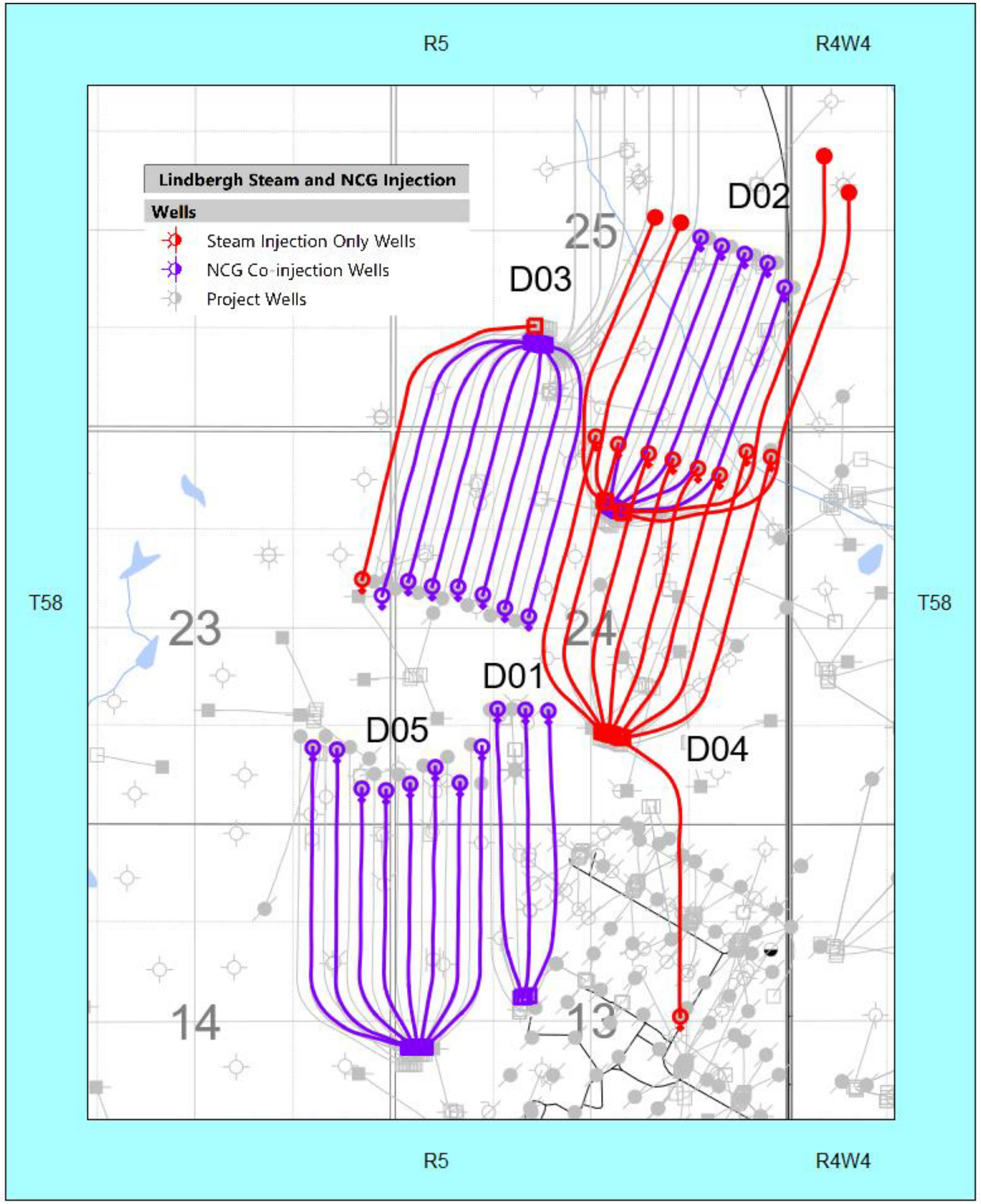
109/04-24-058-05W4/00	D05-J08



Surface Operations

Lindbergh In Situ Oil Sands

Facility Highlights

Modifications done to the CPF and Pilot requiring AER approval for 2021 are outlined below; facility highlights are associated with operation optimization activities such as:

- Replacement of OTSGs at the Pilot - 50 MMBTU OTSGs (increase in 900m^3/d steam capacity;
- HIPVAP installation 100 t/d Steam Generator pilot in partnership Scovan engineering;
- Pad D02 in-fill wells brought on production;
- Kicked off Engineering and Regulatory for installation of a new 7.5 MW/ 1,300 t/d Cogeneration package to be installed in 2022;
- No significant operational or regulatory changes to the facility; and
- No abandonment/suspension of producing wells was undertaken in 2021.

Lindbergh Central Processing Facility Plot Plan

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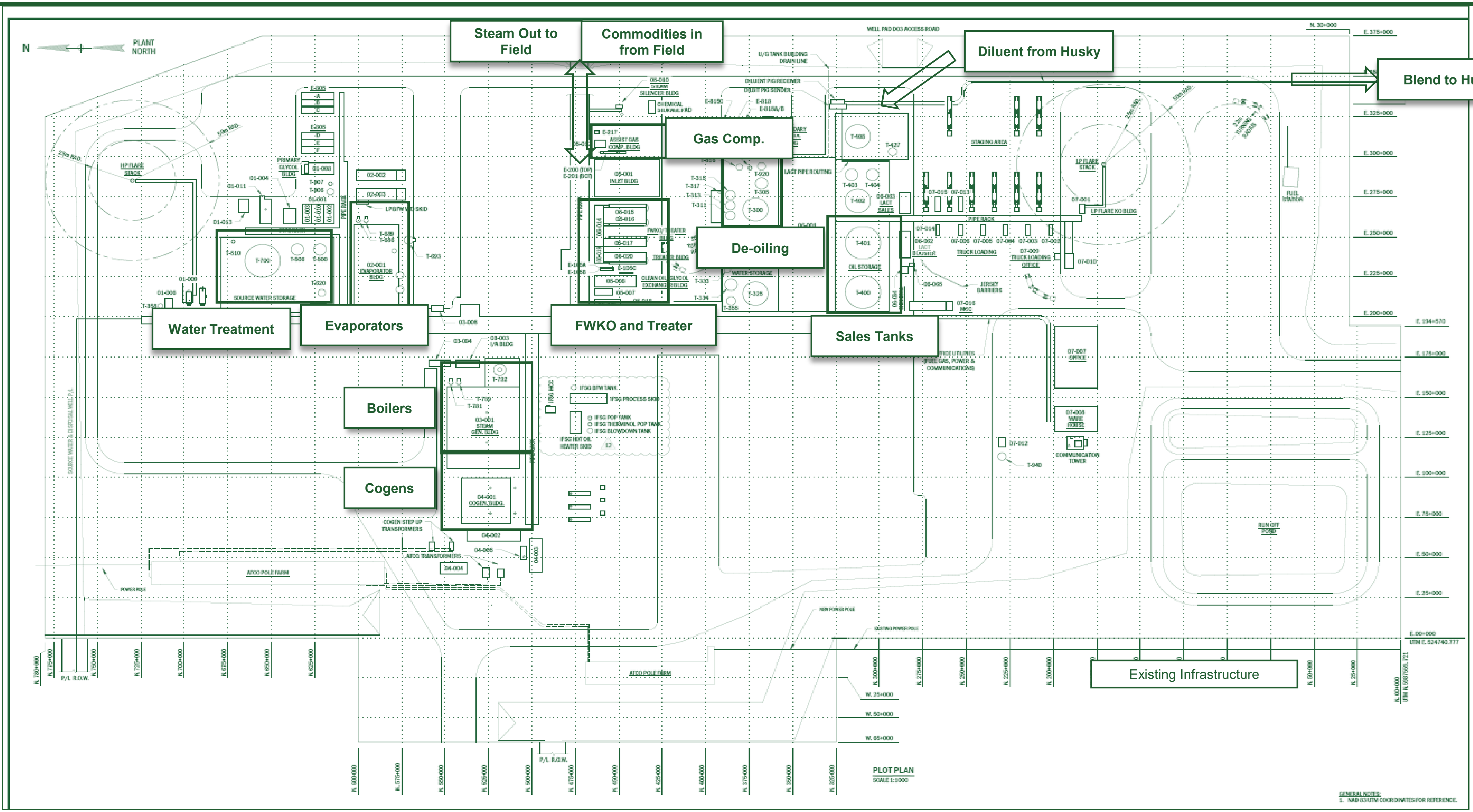
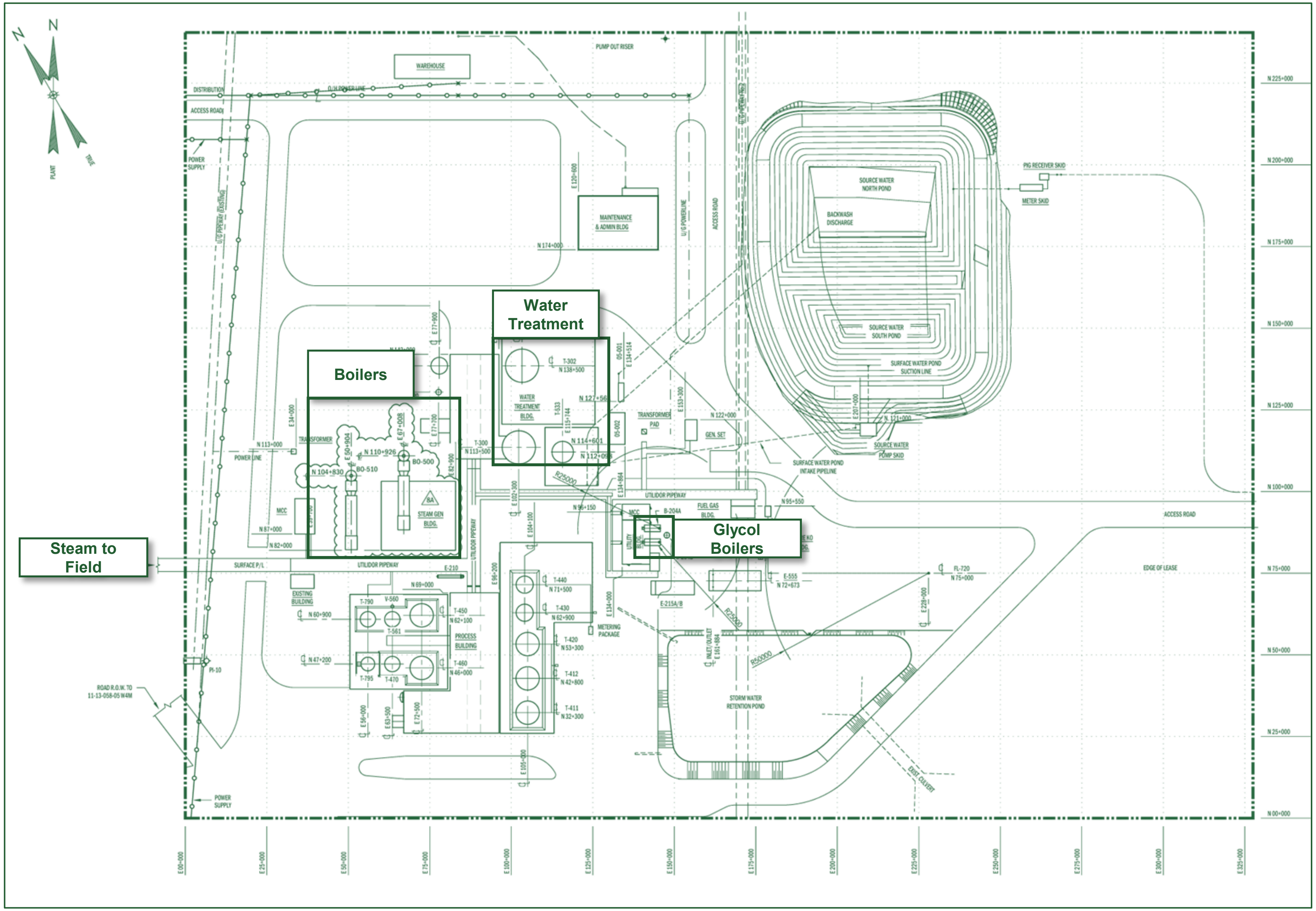
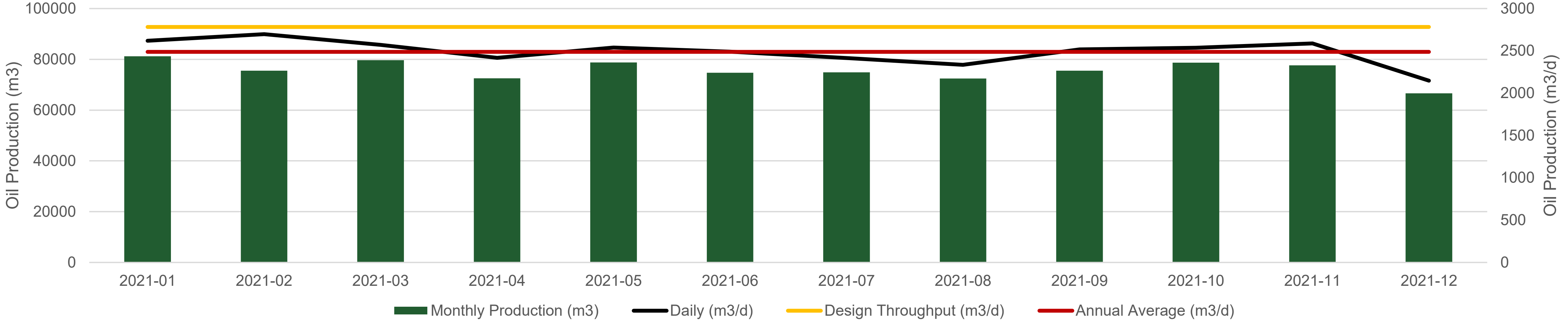


Lindbergh Pilot Plot Plan

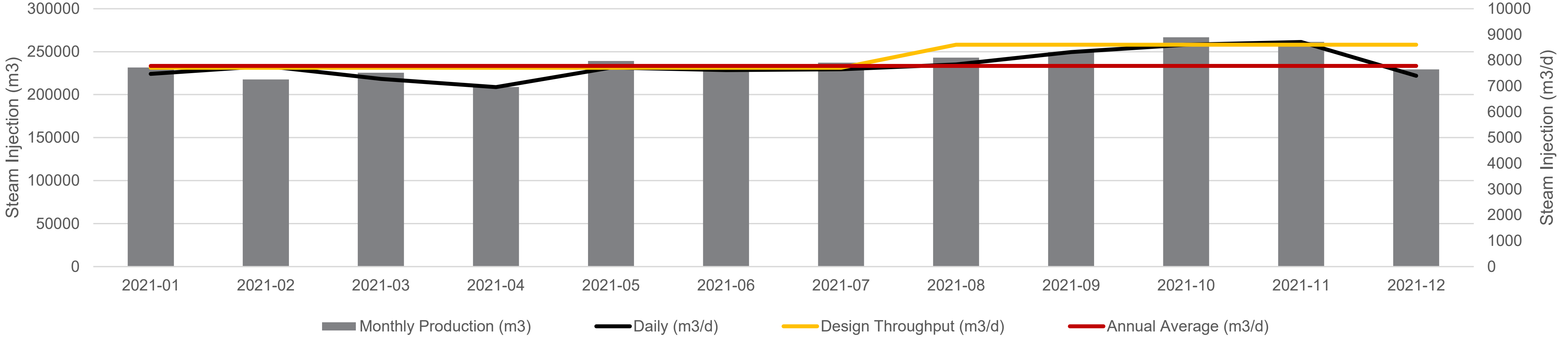


Lindbergh Bitumen and Steam Performance

Lindbergh Bitumen and Steam Performance



Annual Steam Production Against Design Throughput



2021 Scheme/EPEA Amendments

Scheme 6410/EPEA 1581 Amendments	Description	Submission / Approved Date
6410 X Application #1932976	Replacement of two pilot OTSGs	May 11, 2021/ August 12, 2021
6410 Y Application #1934688 EPEA 1581-02-08	Application to add cogen unit (7.5 MW/ 111.6 GJ heat output) to facility.	October 22, 2021/ December 9, 2021
6410 Z Transfer of Ownership	Transfer of Ownership from Cona Resources Ltd.to Strathcona Resources Ltd.	December 14, 2021
6410 AA Application 1935208 D08 Well Pad Addition	Request to expand pad D03 referenced (D08); drill 8 WP and 11 infills	December 13, 2021/ May 2, 2022
EPEA1581-02-08	Addition	
EPEA 1581-02-00 (as amended)	EPEA Renewal Application	December 24, 2021/ October 21, 2022

2021 Compliance Summary

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Approval Number	Compliance Reporting	Corrective Actions
EPEA 00001581	Sept 30, 2021- CEMS 90% uptime requirement.	CEMS replacement
Water Act License 00029768	Compliant with all conditions of the approval	
Water Act License 00215352	Compliant with all conditions of the approval	
Water Act License 00479554	Compliant with all conditions of the approval	
Public Lands Act (various dispositions)	Compliant with all conditions of the approvals	
Directive 13/IEWCP Program	Compliant	Completed all required suspensions and abandonments
Reportable Incidents	EDGE 268313- Tank 333 Overflow EDGE 379152- Tank PSE Fire EDGE 379362-Tank PSE Fire EDGE 385852- Tank 333 Gasket Failure EDGE 386524- Utility Line Crack	- Restrict volume of salt delivered per load - Replacement of PSE, change of heat trace - Replacement of PSE, change of heat trace - Heat trace repair - Heat trace insufficient around joint

Future Plans

Lindbergh In Situ Oil Sands

5 Year Development Plan: Summary

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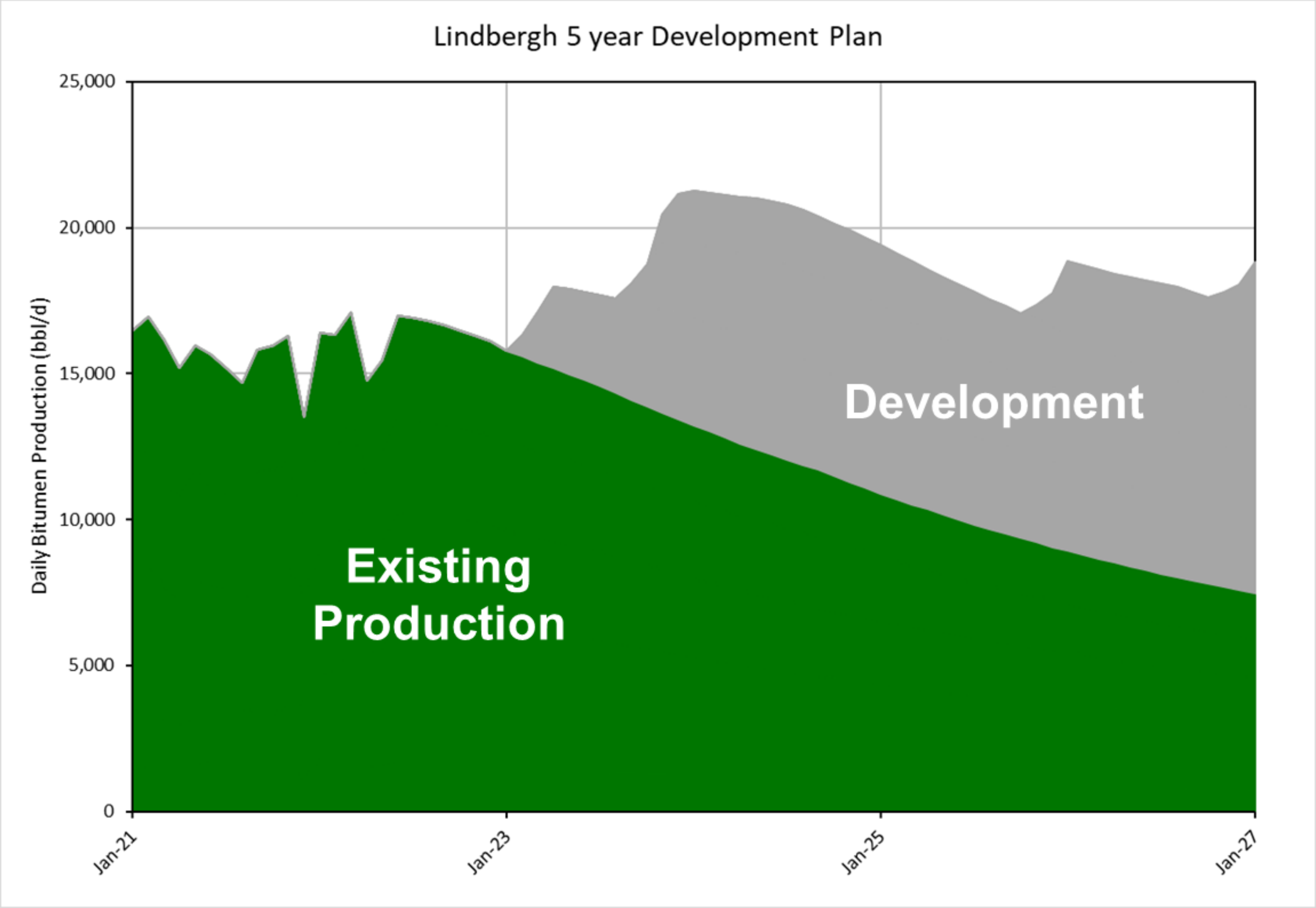
- Current Lindbergh plans are to continue with sustaining development
- Development pace is scheduled based on facility steam constraint
- Future well pairs will continue with 100m spacing
- Infill production wells will be added when the well pairs reach ~35% recovery



2022 Scheme Amendments

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Scheme 6410/ EPEA 1581 Amendments	Description	Submission Date
Full Field NCG- Conditions Modification Application 1938356	Request to modify approved NCG conditions	Submitted June 15, 2022
Burner Upgrade H710, H720 Joint Application 1938433	Request to change burners to low NOx burners	Submitted June 22, 2022
Sulphur Recovery	Amendment to implement Sulphur recovery	November 14, 2022

5 Year Development Plan: **Map**

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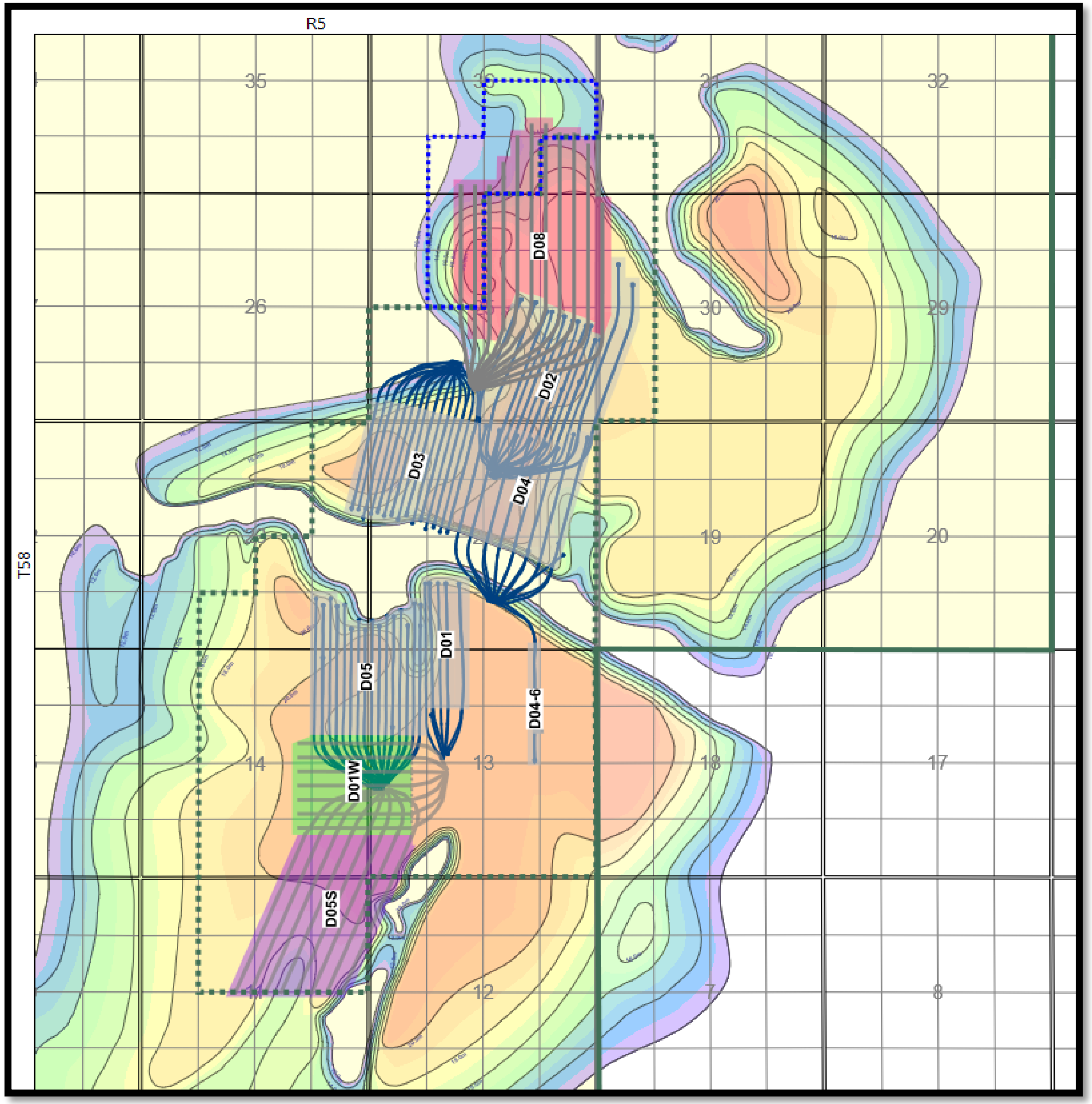

2022 Approved Development Area

Lindbergh Development Area

Lindbergh Project Area

Strathcona Lease Area

Future Development:

Future Development, D08 Pad

Future Development, D01W

Future Development, D05S

5 Year Development Plan: CPF Plot Plan

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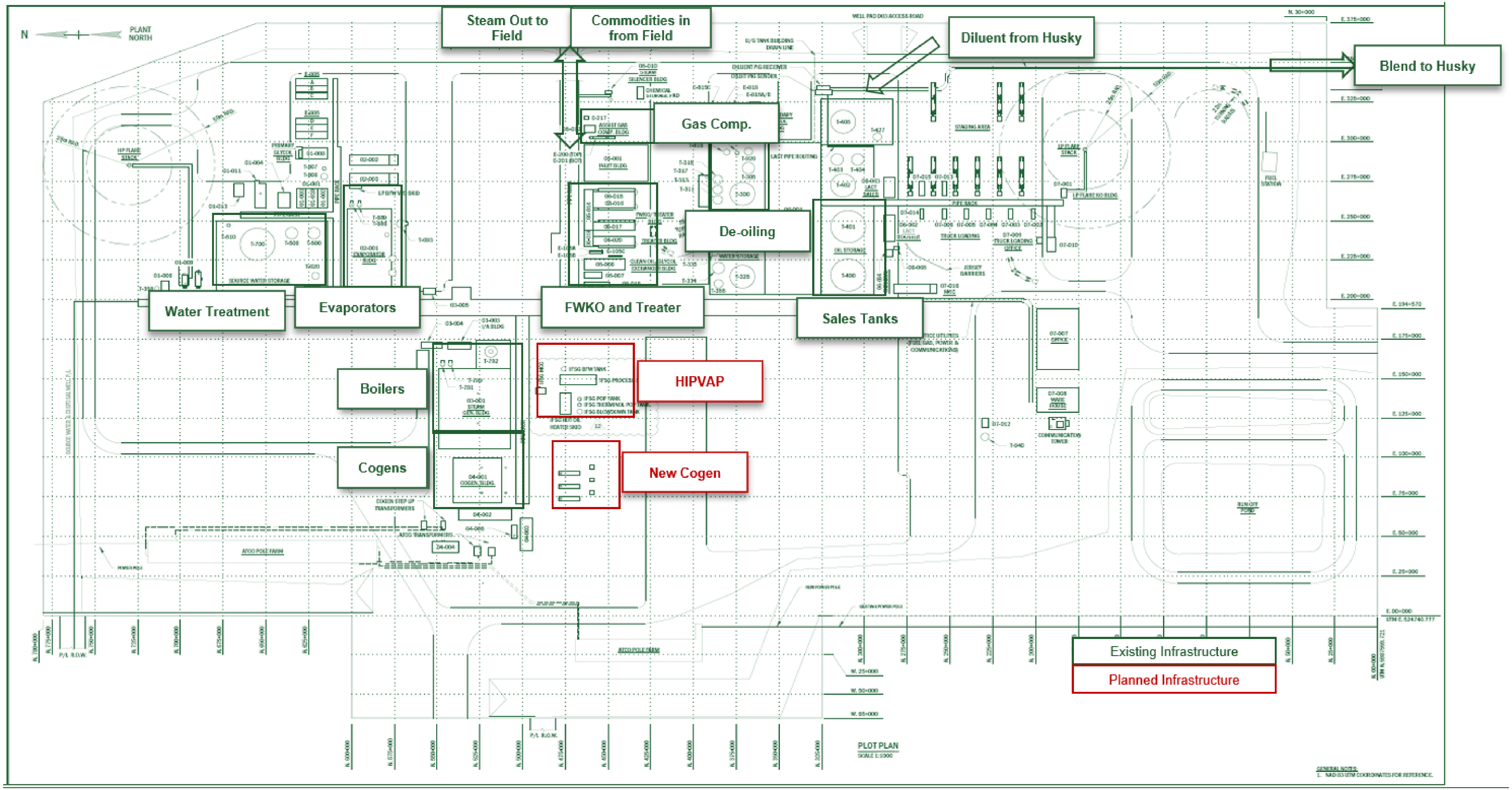

Summary of Events That Could Affect Scheme Performance

The following items will have an impact on the scheme performance and are opportunities for learning and technical innovations:

- NCG injection learnings and strategy:
  - Maintaining NCG co-injection below 2 mol% has positive impact on lowering steam to oil ration while minimizing the gas recycle rates.
- SO_2 emission limit prior to installation of SRU:
  - Increased gas production has resulted in increased SO_2 emissions,
  - Managing SO_2 production below the EPEA limit is key in maintaining bitumen production level with adjusting NCG injection targets.
- Longer Laterals:
  - Longer lateral length in WPs has resulted in lower F&D cost and performance is meeting or exceeding expectations,
  - Using ICDs and steam splitters in the longer well pairs has resulted in improved production performance and SOR, evaluations continuing.
- Steam chamber pressure management
  - Maintain chamber pressure above 2,900 kPa to avoid bottom water production and central processing facility upsets.
- Cogeneration
  - More effective use of fuel gas energy vs. traditional drum boilers and OTSG,
  - Limits exposure to power grid outages.

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