

Barristers & Solicitors  
Patent & Trade-mark Agents

McCarthyTétrault

**McCarthy Tétrault LLP**  
Suite 3300, 421-7th Avenue S.W.  
Calgary AB T2P 4K9  
Canada  
Telephone: 403 260-3500  
Facsimile: 403 260-3501  
mccarthy.ca



**D. G. Davies**  
Direct Line: 403 260-3681  
Direct Fax: 403-260-3501  
E-Mail: ddavies@mccarthy.ca

Assistant: Penny Goebel  
Direct Line: 403-260-3662  
E-Mail: pgoebel@mccarthy.ca

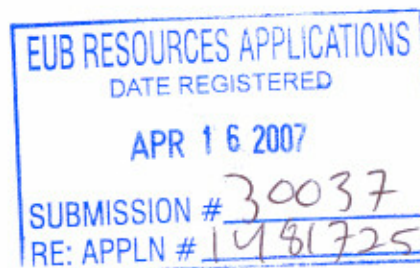
April 13, 2007

**VIA COURIER**

Alberta Energy and Utilities Board  
640 - 5 Avenue S.W.  
Calgary Alberta  
T2P 3G4

**Attention: Mr. Gary D. Perkins**

Dear Sir:



**Re: EnCana Oil And Gas Partnership (EnCana) Application No. 1394112  
Canadian Natural Resources Limited (CNRL) Application No. 1409180  
Husky Oil Operations Limited (Husky) Application No. 1481725  
Cold Lake Oil Sands Area – Clearwater Deposit**

Attached please find the information request of EnCana to Husky in relation to the input and output files submitted by Husky on April 5, 2007.

Yours very truly,

**McCarthy Tétrault LLP**

*Original signed by*

**D. G. DAVIES**

cc: Alberta Energy and Utilities Board  
Attention: Mr. Ernie Smith

Thackray Burgess  
Attention: Mr. Patrick J. McGovern

cc: Canadian Natural Resources Limited  
Attention: Mr. Jared Paddock

Husky Oil Operations Ltd.  
Attention: Ms. Susan Anderson

Borden Ladner Gervais LLP  
Attention: Mr. Randall W. Block

Imperial Oil Resources  
Attention: Ms. Cheryl L. Trudell

ALBERTA ENERGY AND UTILITIES BOARD

ENCANA OIL AND GAS PARTNERSHIP (ENCANA) APPLICATION NO. 1394112  
CANADIAN NATURAL RESOURCES LIMITED (CNRL) APPLICATION NO. 1409180  
HUSKY OIL OPERATIONS LIMITED (HUSKY) APPLICATION NO. 1481725  
COLD LAKE OIL SANDS AREA – CLEARWATER DEPOSIT

Information Request of EnCana Oil and Gas Partnership (EnCana) to  
Husky Oil Operations Limited (Husky) Respecting the Input and Output Files  
Submitted by Husky on April 5, 2007

1. **Preamble:**
- (i) A minimum producing bottomhole pressure (BHP) constraint of 2000 kPaa was applied for HWCSS well in 2D HSAGD case. EnCana has rerun Husky's HSAGD models, d17gc-2d-Dep200-tol1 and d17gc-2d-NoDep-tol1 and has changed the HWCSS producer minimum BHP from 2000 to 1000 kPaa.
  - (ii) A minimum producing bottomhole pressure (BHP) constraint of 1000 kPaa was applied for HWCSS well in 2D HWCSS case. EnCana has rerun Husky's HWCSS models, d18gc-2d-Dep200-tol and d18gc-2d-NoDep-tol and has changed the HWCSS producer minimum BHP from 1000 to 250 kPaa.
  - (iii) An operating schedule for the Husky's 2D HWCSS applied 6 cycles and 19 years only. EnCana has rerun Husky's HWCSS models, d18gc-2d-Dep200-tol and d18gc-2d-NoDep-tol and has extended the number of CSS cycles from 6 to 8. The extended CSS cycles number to 8 covers a period of 30 years.
  - (iv) The attached Table 1 and Figures 1 to 6 provide a summary of results for the Husky runs and for each of the reruns referred to in (i), (ii) and (iii) above. A CD with the input and output files is also being provided.
- Request:**
- (a) Please advise whether Husky disagrees with any of the results shown in Table 1 and Figures 1 to 6.
  - (b) If Husky does disagree with any of the results, please provide Husky's own reruns of its models with each of the BHP changes referred to in (i) and (ii) and with the extended CSS cycles referred to in (iii).

2. **Request:** Explain why a maximum liquid production rate constraint was not applied in the SAGD well in 2D HSAGD model. The maximum liquid production rate observed in the d17gc-2d-Dep200-tol1 model was above 8,000 m<sup>3</sup>/d and the average daily liquid production rate between 04/12/2015 and 09/12/2015 was above 7,400 m<sup>3</sup>/d (46,000 BBL/D). This value appears impractically high. Please provide information or reference to any SAGD wells in the Cold Lake area that were capable to produce at this rate.

**TABLE 1: SUMMARY OF RESULTS**

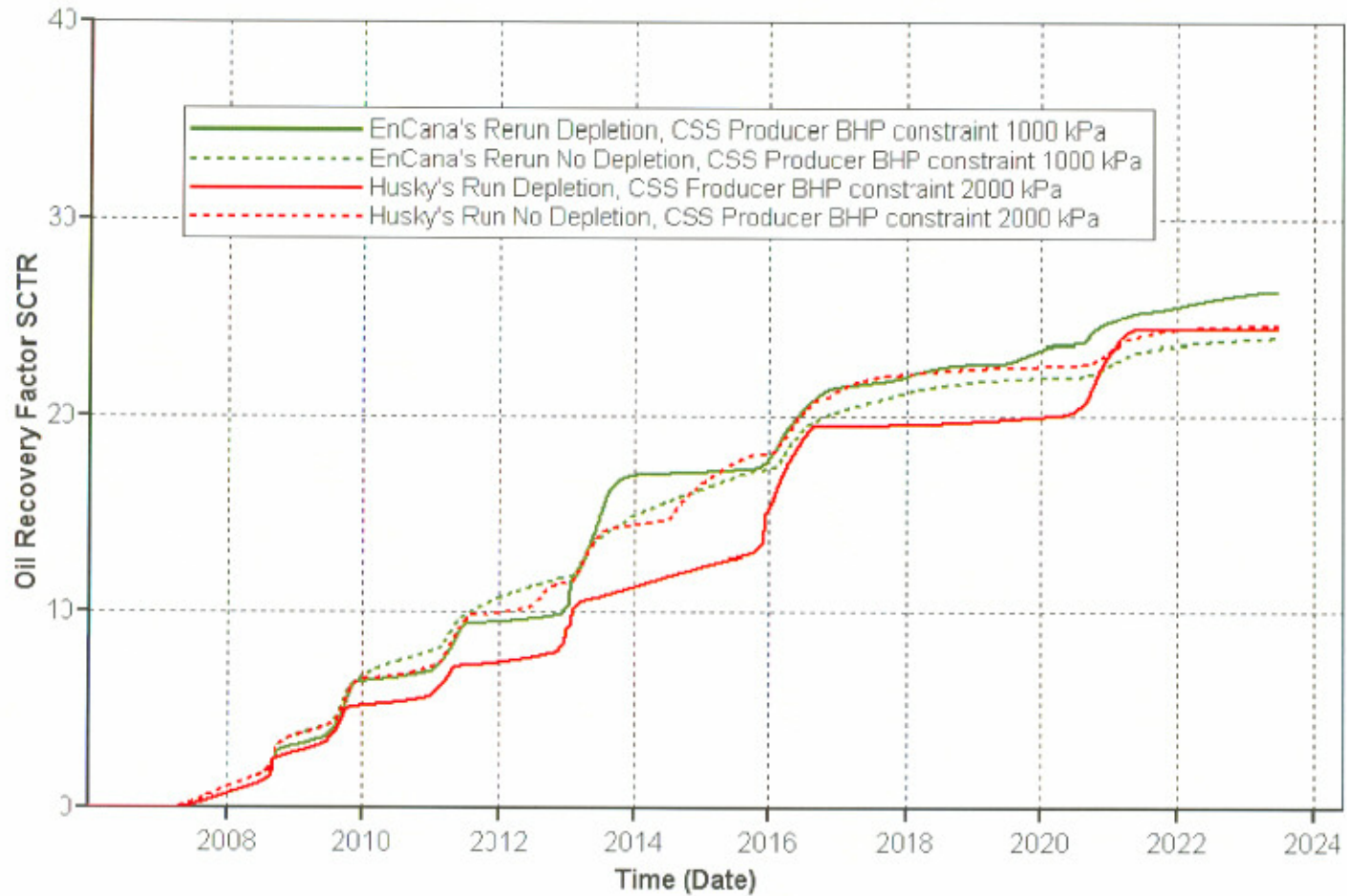
**HWCSS**

Description	Case Name	Number of CSS Cycles	Thermal Period	Oil Recovery Factor	CUM SOR	Max Material Balance Error	Material Balance Error at the end
				%OBIP	m3/m3	%	%
Husky's run (April 5, 2007 submission)	d18gc-2d-Dep200-tol	6	From 2008-7-1 to 2027-2-9	16.8	4.1	0.077	0.010
Husky's run (April 5, 2007 submission)	d18gc-2d-NoDep-tol	6	From 2008-7-1 to 2027-2-9	17.8	4.0	0.038	0.010
EnCana's rerun Husky's model Extended operating schedule to 8 cycles	d18gc-2d-Dep200-tol_extended_	8	From 2008-7-1 to 2038-7-1	22.1	4.5	0.025	0.025
EnCana's rerun Husky's model Extended operating schedule to 8 cycles	d18gc-2d-NoDep-tol_extended_;	8	From 2008-7-1 to 2038-7-1	22.1	4.6	0.001	0.001
EnCana's rerun Husky's model changed Producer BHP from 1000kPa to 250 kPa	d18gc-2d-Dep200-tol_250	6	From 2008-7-1 to 2027-2-9	19.5	3.6	0.004	0.004
EnCana's rerun Husky's model changed Producer BHP from 1000kPa to 250 kPa	d18gc-2d-NoDep-tol_250	6	From 2008-7-1 to 2027-2-9	19.4	3.7	0.003	0.003

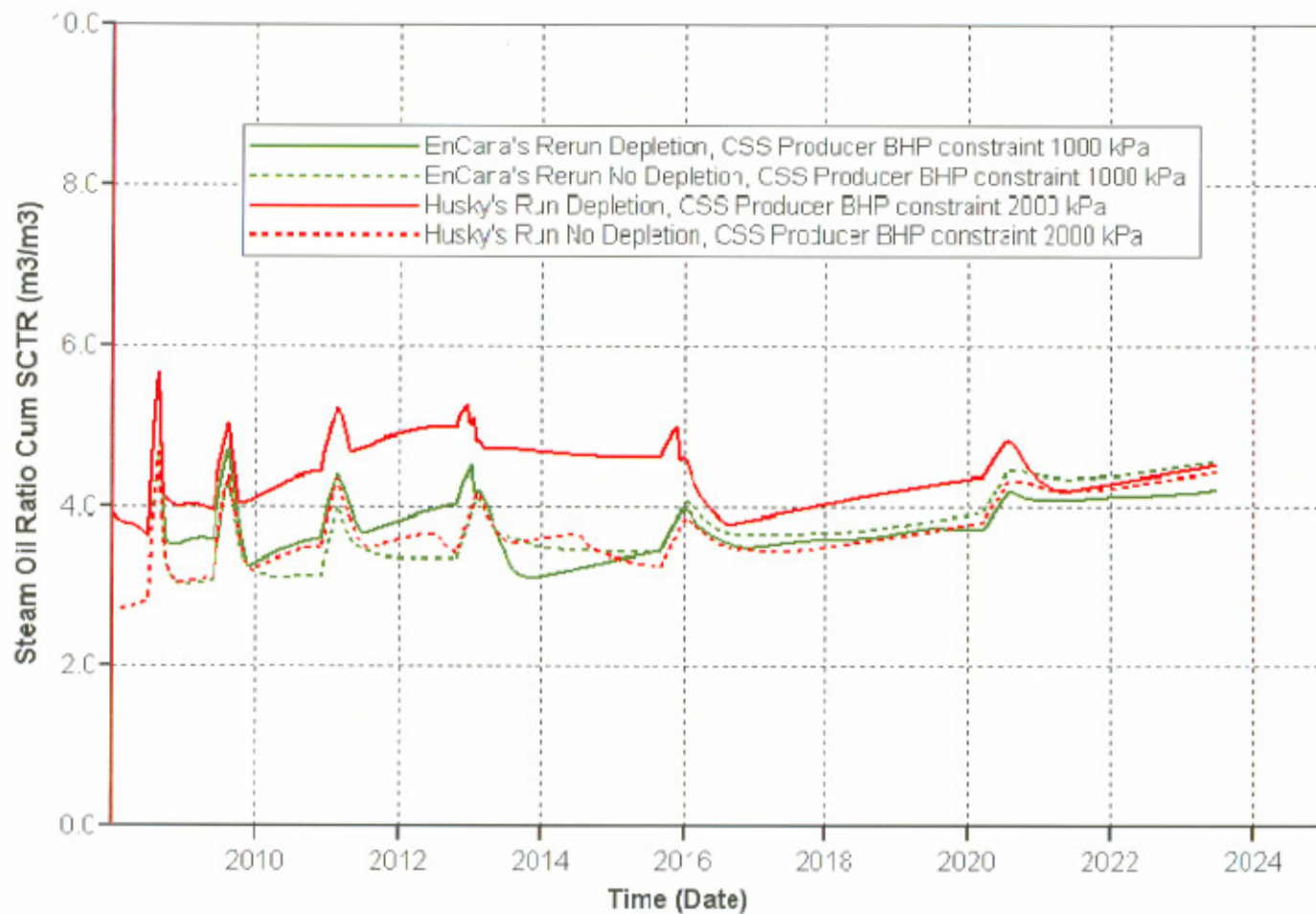
**HSAGD**

Husky's run (April 5, 2007 submission)	d17gc-2d-Dep200-tol1	6	From 2007-4-1 to 2023-7-1	24.4	4.5	0.052	0.052
Husky's run (April 5, 2007 submission)	d17gc-2d-NoDep-tol1	6	From 2007-4-1 to 2023-7-1	24.6	4.4	0.129	0.125
EnCana's rerun Husky's model changed CSS Producer BHP from 2000kPa to 1000 kPa	d17gc-2d-Dep200-tol1_1000kPa	6	From 2007-4-1 to 2023-7-1	26.4	4.2	0.001	0.001
EnCana's rerun Husky's model changed CSS Producer BHP from 2000kPa to 1000 kPa	d17gc-2d-NoDep-tol1_1000kPa	6	From 2007-4-1 to 2023-7-1	24.0	4.6	0.002	0.002

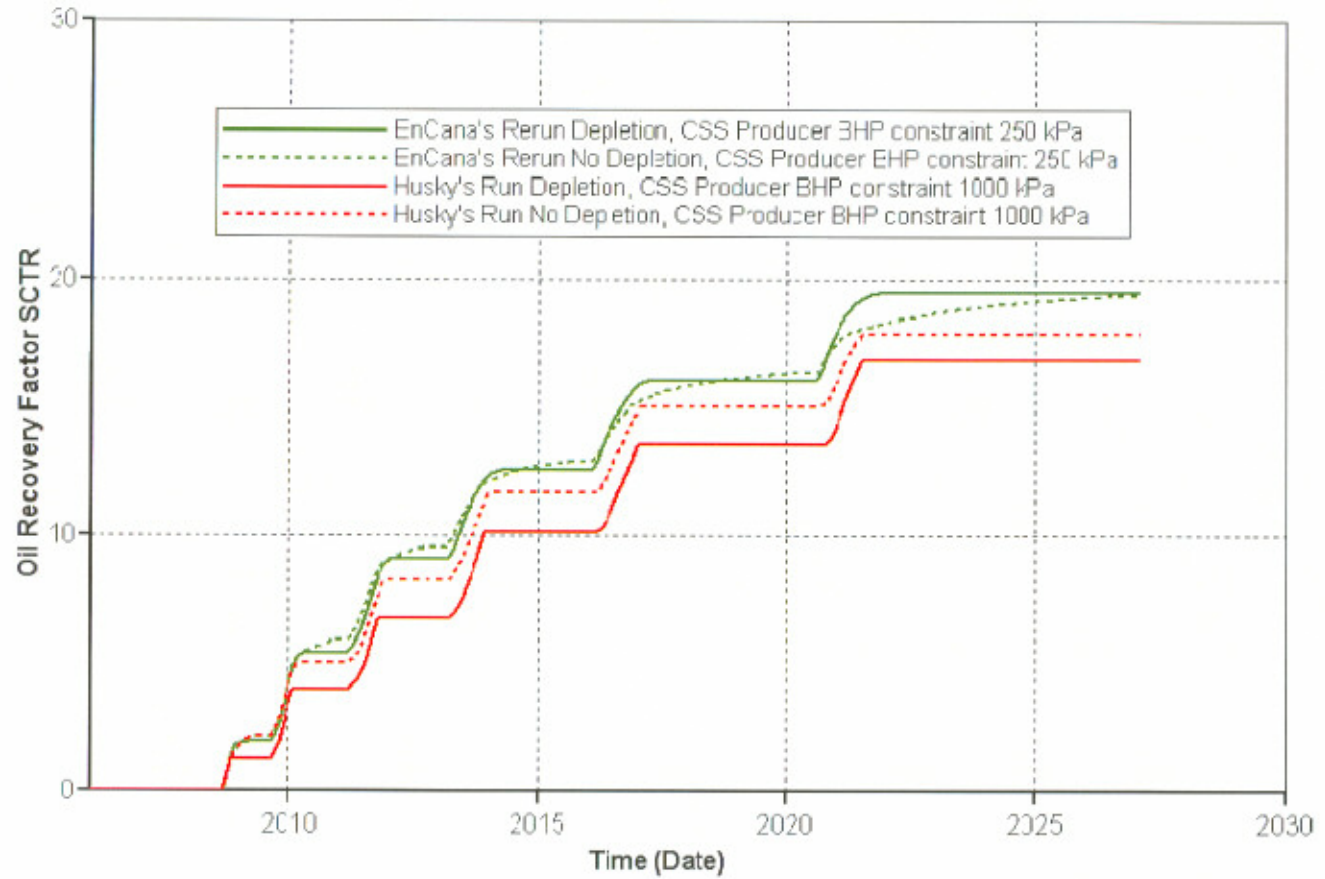
**Figure 1: Oil Recovery Fator of Husky's 2D HSAGD Runs (April 5, 2007 submission) and EnCana's Rerun of Husky's Model Altering CSS Producer BHP from 2000 to 1000 kPa (Husky's 2D HSAGD Models: d17gc-2d-Dep200-tol1 and d17gc-2d-NoDep-tol1)**



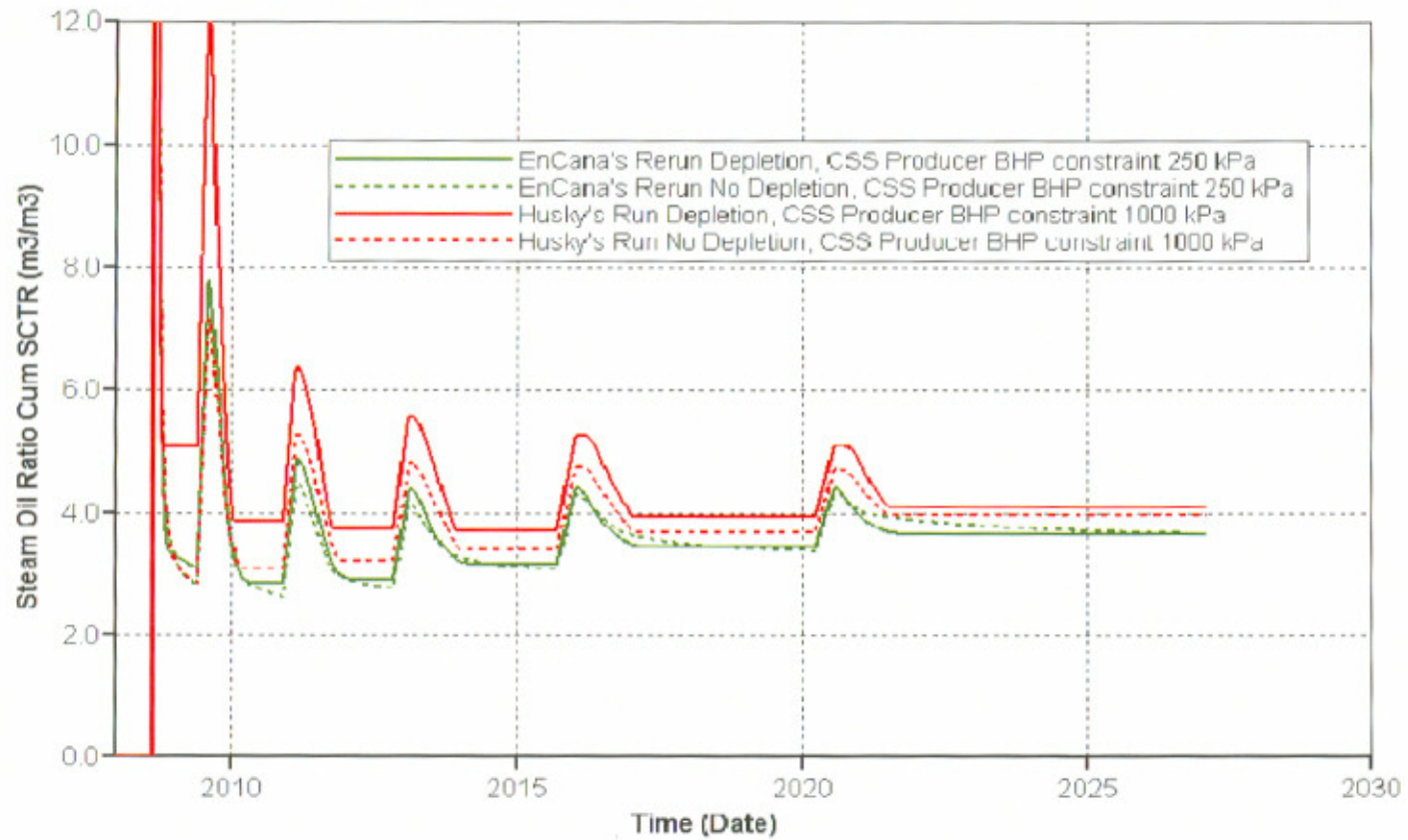
**Figure 2: Cumulative SOR of Husky's 2D HSAGD Runs (April 5, 2007 submission) and EnCana's Rerun of Husky's Model Altering CSS Producer BHP from 2000 to 1000 kPa (Husky's 2D HSAGD Models: d17gc-2d-Dep200-tol1 and d17gc-2d-NoDep-tol1)**



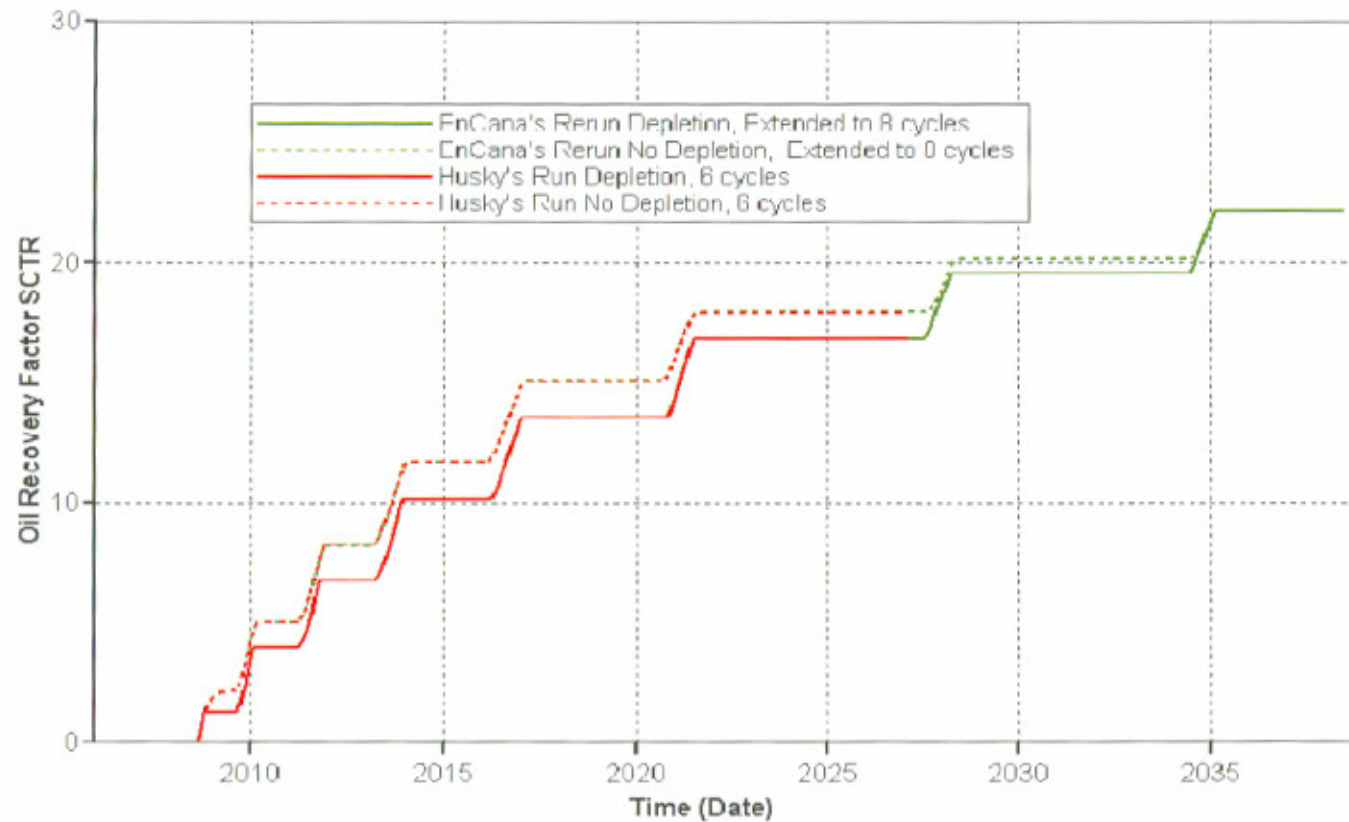
**Figure 3: Oil Recovery Fator of Husky's 2D HWCSS Runs (April 5, 2007 submission) and EnCana's Rerun of Husky's Model Altering CSS Producer BHP to 250 kPa (Husky's 2D HWCSS Models: d18gc-2d-Dep200-tol and d18gc-2d-NoDep-tol)**



**Figure 4: Cumulative SOR of Husky's 2D HWCSS Runs (April 5, 2007 submission) and EnCana's Rerun of Husky's Model Altering CSS Producer BHP to 250 kPa (Husky's 2D HWCSS Models: d18gc-2d-Dep200-tol and d18gc-2d-NoDep-tol)**



**Figure 5: Oil Recovery Fator of Husky's 2D HWCSS Runs (April 5, 2007 submission) and EnCana's Rerun of Husky's Model Extending to 8 HWCSS Cycles**  
**(Husky's 2D HWCSS Models: d18gc-2d-Dep200-tol and d18gc-2d-NoDep-tol)**



**Figure 6: Cumulative SOR of Husky's 2D HWCSS Runs (April 5, 2007 submission) and EnCana's Rerun of Husky's Model Extending to 8 HWCSS Cycles (Husky's 2D HWCSS Models: d18gc-2d-Dep200-tol and d18gc-2d-NoDep-tol)**

