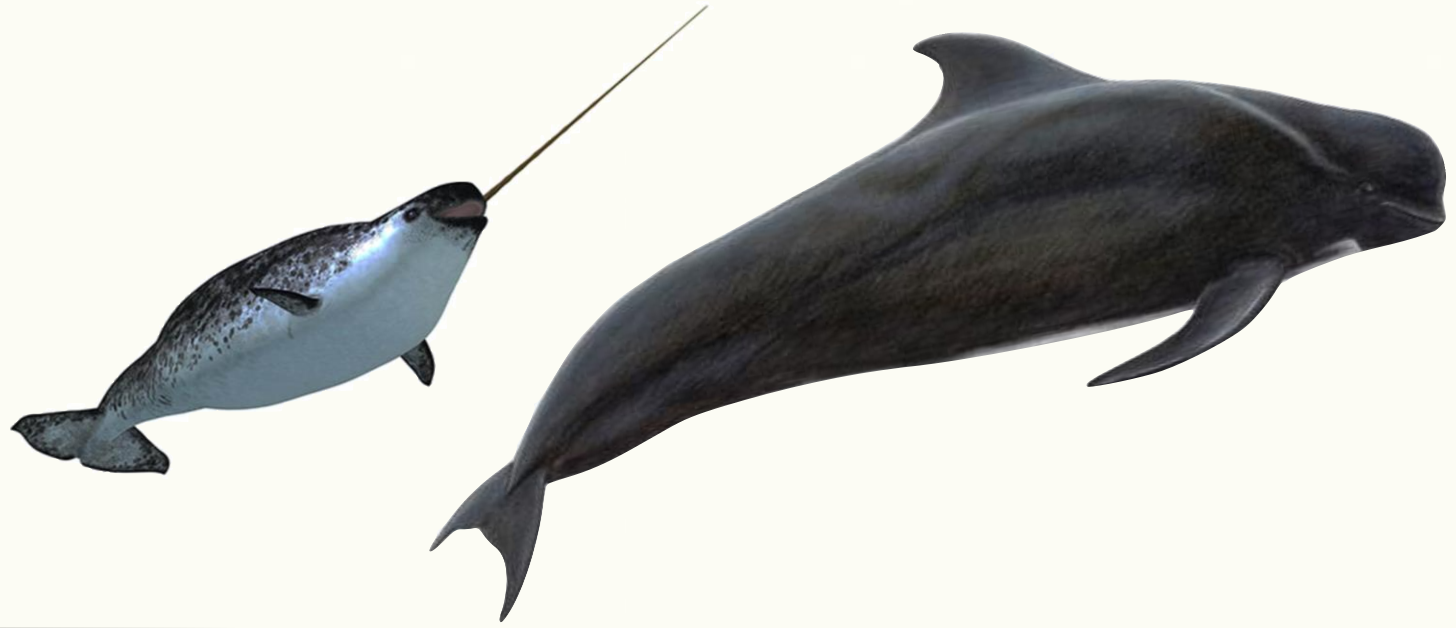
PHARIS ENERGY

SUCCEEDING WITH MARGINAL FIELDS

February 2020



PILOT FIELD SUMMARY

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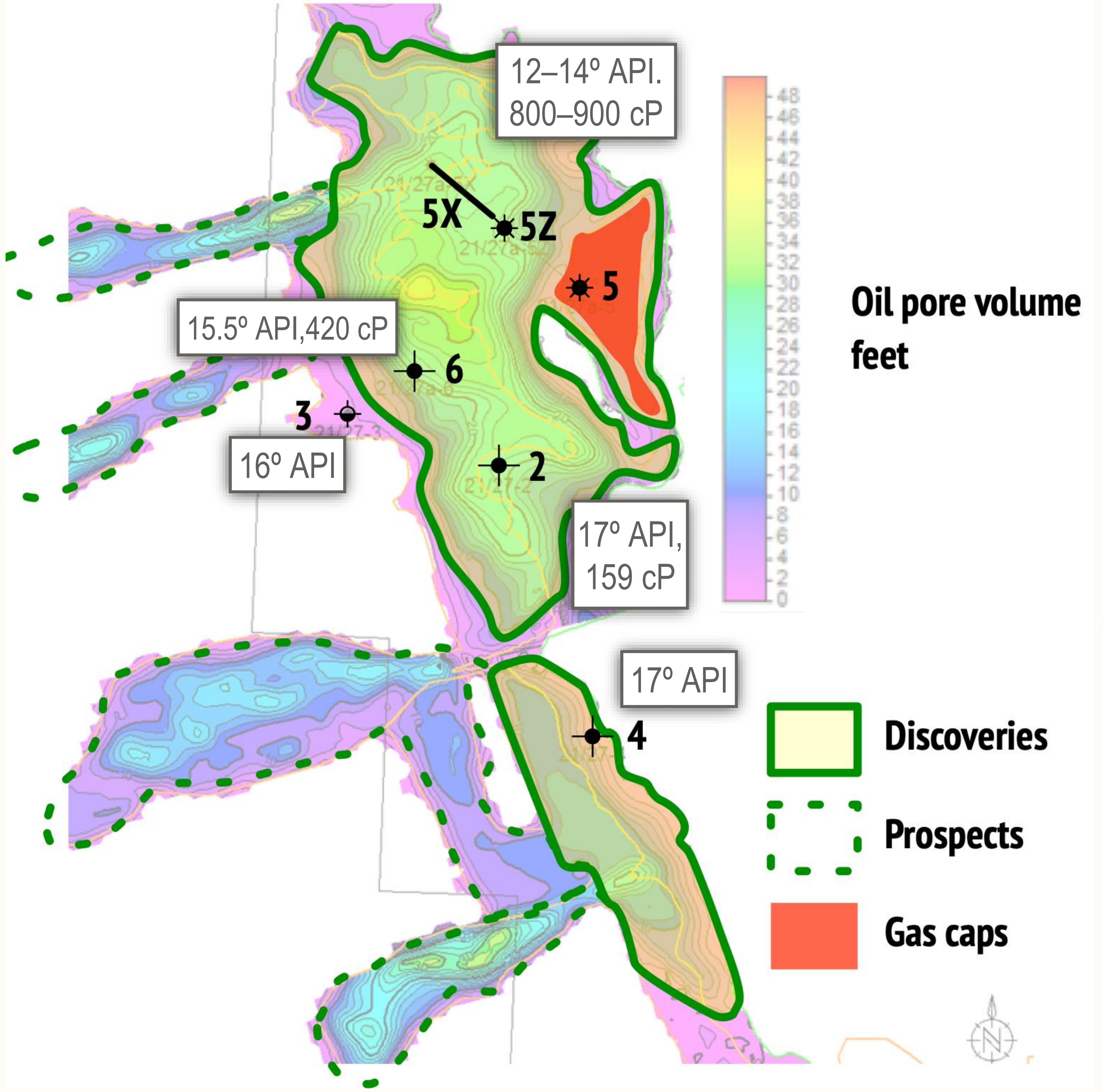
Pilot	Parameter	Units
Oil water contact	2724	feet
Oil column	65	feet
Gross sand thickness	70	feet
Net to gross ratio	95%	~
Porosity	35%	~
Water saturation	7.5%	~
Permeability	2 to 8	Darcies
Oil gravity	12º - 17º	API
Oil viscosity	160 - 1200	cP
Gas-Oil ratio	80	scf/bbl

- Pilot Main discovered by Fina in 1989, fields appraised by 5 wells, plus 2 sidetracks/horizontals, Pilot South discovered in 1990, 2 3D surveys
- Six wells were cored, three wells were tested including a relatively short horizontal well that tested at rates over 1,800 bopd despite being in the most viscous part of the field
- Oil in place (STOIIP) of 263 mmbbls, c. 60 mmbbls recoverable with a hot waterflood, 111 mmbbls recoverable with a steam flood; further 8 mmbbls in periphery



FROM STEAM TO POLYMER

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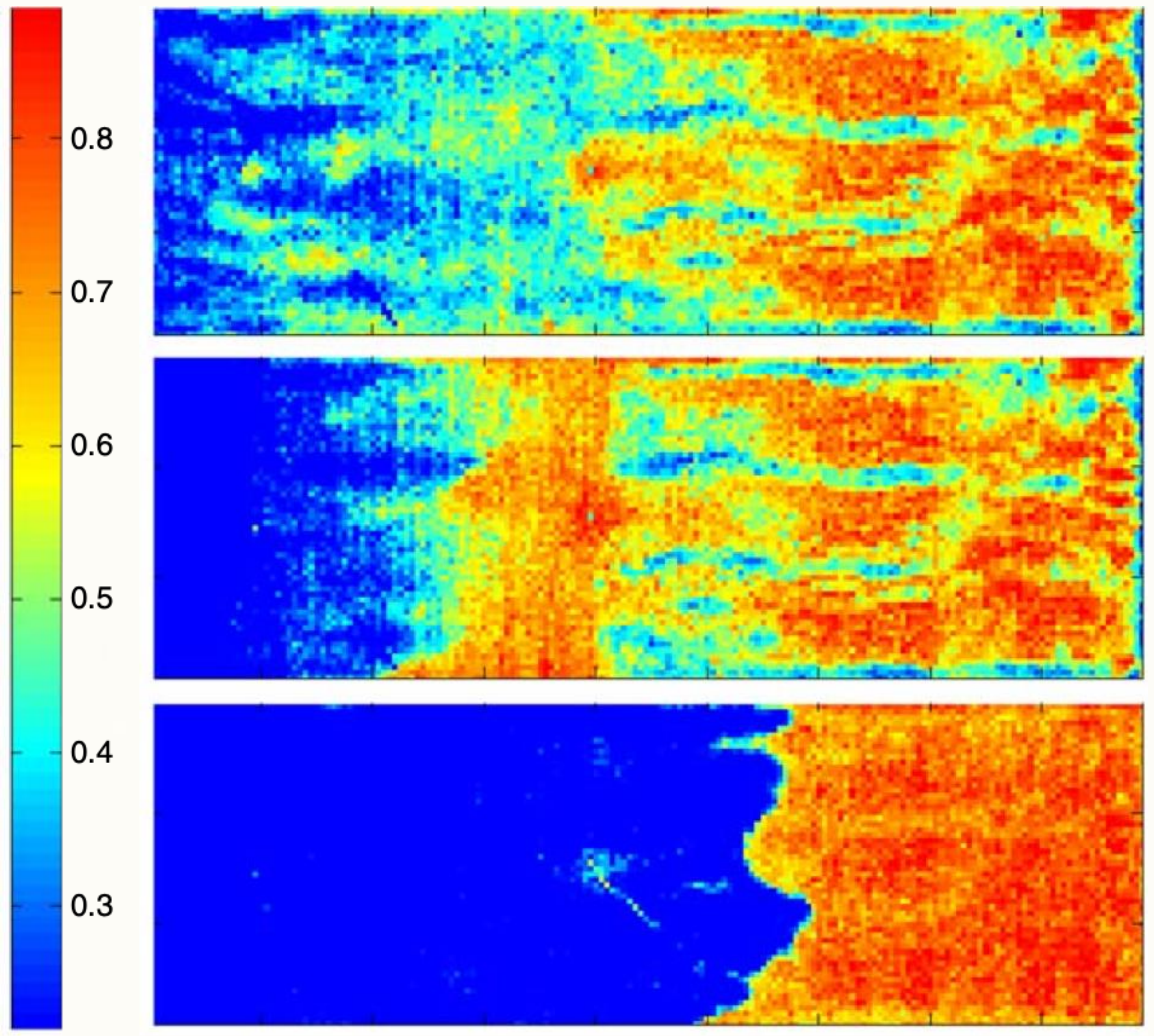
- Screening criteria have shifted considerably over the last decade from a maximum limit of 150 cP to 5,000 cP
- Polymer sweeps oil efficiently towards the producer with many fewer pore volumes of injected fluid than water
- Best response with alternating horizontal injectors and a quicker response and much better economics with tight well spacings (already in our plan)
- Better when applied early in field life, probably best when applied as a primary, rather than secondary or tertiary process (already in our plan)
- Dry trees better than subsea (already in our plan)
- Low salinity water injection has the potential to massively reduce polymer costs (already in our plan)



End of waterflood (2.7 PV)

0.15 Pore volumes of 2,000 ppm polymer

0.5 Pore volumes of 2,000 ppm polymer

Loubens et al: experiment on 2,000 cP oil; oil saturation maps during core floods

Pilot Data - Range		High Medium Low	2650	88	60	35	4000	15.8	160 409 1200	92.5	75505
Proposed by	Paper	Year	Depth (ft)	Reservoir temperature (F)	Reservoir Thickness h (ft)	Porosity (%)	Permeability K (mD)	API	Oil Viscosity (cP)	Initial Oil Saturation at Start, So (%)	Water salinity (ppm)
Taber et al	SPERE	1997	<9000	<200			>10	>15	10 - 150	>50	
Saleh et al	SPEREE	2014	550 to 9400	65 to 210		4.1 to 36.1	0.6 to 5500	12 to 48	0.3 to 5000	21 to 94	
Dickson et al	SPE 129768	2010	800 to 9400	< 170			>1000*	>15	10 to 1000	>30	
Delamaide#	SPE 171015	2014		< 176			High		<5000	>30**	Low
Saboorian-Joyhari	SPE 152206	2015	<5250	< 149		>21	>1000	>11	<5400	>50	<46000

Loubens et al, "Numerical Modeling of Unstable Waterfloods and Tertiary Polymer Floods Into Highly Viscous Oils", SPE-182638-MS, 2017

EVALUATION OF RESERVOIR RECOVERY METHODS

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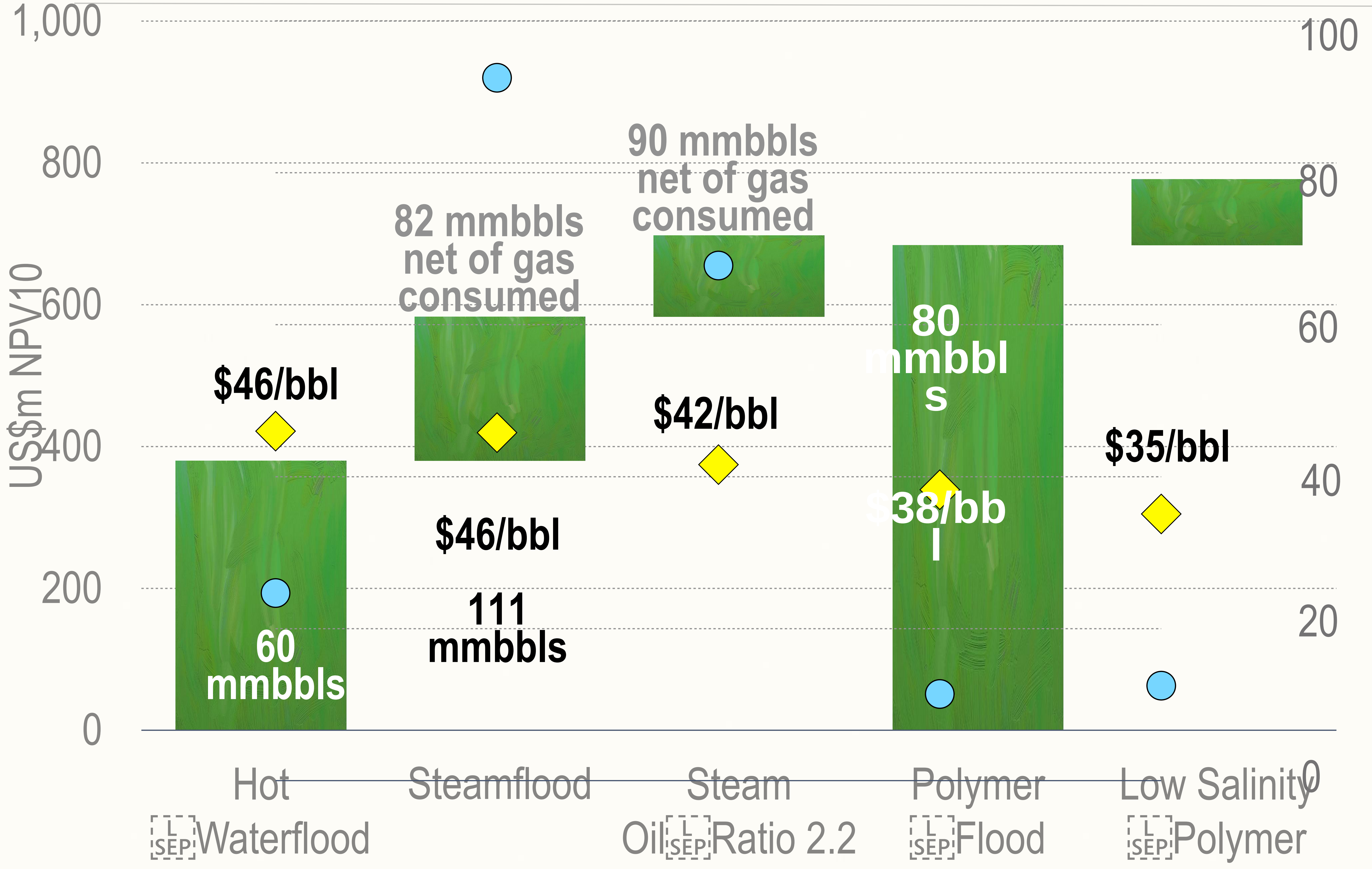

- Polymer with c.40% recovery factor and assuming 2,500ppm polymer injection matches our upside steamflood NPV_{10} and reduces breakeven to c. $38/bbl
- Use of low-salinity water could significantly reduce polymer consumption, reduces breakeven to $35/bbl; can also boost recovery factor (not yet modelled)
- CO_2 emissions per barrel substantially reduced from high energy consumption steam cases, also much lower than hot waterflood case and long-lived conventional heavy oil waterfloods

◆ NPV_{10} breakeven, Brent price $/bbl

● CO_2 emissions kg/bbl

Sproule price deck; Pilot polymer flood capital & operating costs based on audited hot waterflood case; facilities costs reduced by $43m as gas pipeline is deleted

POTENTIAL AREA PRODUCTION

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Only the core, larger discoveries and prime prospect illustrated