

Brownfields Enhancement Technologies Pte. Ltd (BET)

Brownfields Enhancement Technologies Pte. Ltd (BET) was established by a group of senior Petroleum Industry professionals with the sole focus of assisting operators extract the maximum value out of producing assets as they approach the end of their economic life.

BET focusses on the operator's business requirements to assist in extracting value and extending the economic life of the operator's mature assets. This is achieved by utilizing an operators' data and BETs proprietary modelling and simulation tools to design and deliver bespoke solutions tailored to address the specific technical and economic challenges facing the business.

In order to ensure that solutions are delivered expediently, safely and efficiently in any given jurisdiction, BET enters into collaborative arrangements with local entities that are appropriately qualified and licensed and have a proven track record of delivering services in country and has global supply agreements with leading industry service companies to provide local equipment to deliver services.

In that respect BET is proud to announce that it has signed an exclusive agreement with Neural Oilfield Services Sdn Bhd to be represented in Malaysia and Brunei.

BET's sole focus is on Brownfields

A Brownfield is defined as *"An oil or gas accumulation that has matured to a production plateau or even progressed to a stage of declining production"*. During the recent years of downturn operators have been focused on cost containment and reduction of OPEX. However, an opportunity now exists for operators to focus on maximizing value from existing producing assets.

In the Asian region the majority of production now comes from mature assets. Excellent opportunities exist to apply solutions to improve production and thus recoverable reserves from existing brownfield assets at limited or no capital expenditure thereby extending economic field life and deferring abandonment expenditures and reducing operating expenditure per barrel or BOE.

These solutions can be delivered in a shorter time frame and with a far less uncertainty than alternative investments in exploration, appraisal or the development of new assets. By delivering results in a shorter time frame the risk of adverse oil price fluctuations affecting the economics of any activities is also reduced.

Core Technologies that BET offer include:

- Immiscible Gas Stimulation (IGS)
- Small Scale Binary Polymer Flooding (SSBPF)
- Specialized Chemical Treatments (SCT)
- Reservoir Simulation and Consulting Services

BET's sole focus is to apply these technologies to maximize the economic value of an operator's mature assets. The aim is to:

- Add incremental oil economically at the lowest cost and shortest payback times
- Access additional recoverable reserves.
- Minimize OPEX cost per incremental barrel or BOE and subsequently reduce the overall OPEX cost per total barrel produced.
- Reduce the complexity of the intervention techniques that will be applied.
- Defer abandonment costs through extension of the economic life of the asset.
- Undertaking this process in a manner that is efficient, safe and environmentally responsible.

The current technological focus in the region is Immiscible Gas Stimulation (IGS).

Immiscible Gas Stimulation (IGS)

BET is pioneering the use of an immiscible gas blend (IG) to improve production in reservoirs that may be described as:

- Low energy
- Complex
- Economically marginal
- Watered out / high water cut
- Compartmentalized
- Poor recovery or bypassed oil

IGS can be carried out on a single well in a Cyclic Injection Application (CIA) or can be scaled to multi-well compartments or full field. IGS can also be used to augment water flood applications to improve sweep and access oil bypassed in initial production and subsequent water flood.

This process economically addresses many of the issues being faced as reservoirs reach the end of their economic life under current intervention cost / complexity restrictions.

- IGS can mobilize up dip oil without expensive side-tracking or short radius drilling.
- IGS can also be applied to reverse water encroachment when applied as a displacement mechanism to lower the oil water contact.
- The IGS process can be applied to most clastic or carbonate reservoirs
- IGS addresses the issue of attic oil and low recovery prevalent in stacked and limited deltaic sequences
- IGS can increase recovery in fractured and vuggy reservoirs by displacing oil trapped in blind fractures and partially drained vugs
- IGS can also be used on a large scale to address poor production that results from no, or low reservoir drive by the introduction of a secondary IG gas cap
- IGS is scalable from single well Cyclic Injection Applications (CIA) up to multi-well compartments or full field applications
- IGS can be applied without any additional costly and complex downhole or surface intervention such as CT or wireline in appropriate candidate wells
- IGS can be economically delivered to offshore assets

In **Appendix I** following several illustrations of the IGS process and equipment are provided and several example results for IGS in clastic reservoirs.

IGS Screening and Modelling

BET has developed a series of proprietary screening and modelling tools that we use to select candidate reservoirs and wells and predict the benefits of any IGS intervention program. The tools combine the Operator's G & G information, well design information and production data to screen appropriate candidates and develop a reservoir model to simulate the area of interest.

The model is refined through a process of history matching and once it accurately reflects the reservoir's past performance it is used to forward model IGS programs and resultant production profiles.

This approach is unique to BET. It is a product of our customer centric view and our focus of generating positive economic returns that extend the field life. The additional benefit of BET's screening tools are that the IGS program can be continuously improved over the project life. The modelling results can also be used to justify increases in reserves under PRMS over the subject area.

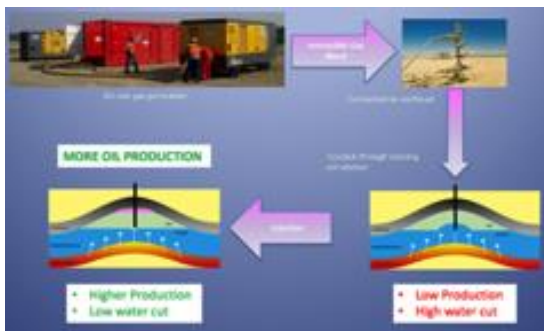
How is BET Organized and who are BET?

BET is privately held company administratively based in Singapore to service the region. We are currently active in Indonesia, India, Brunei, Malaysia, Thailand, Myanmar and Australia. We have established service partner agreements to deliver services in India, Thailand, Myanmar, Malaysia and Indonesia and have global access to IGS generation equipment that can be deployed locally.

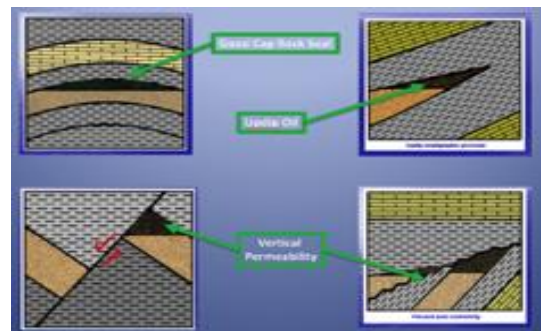
Appendix 1

1. Process & Candidate Types

Outline of Process

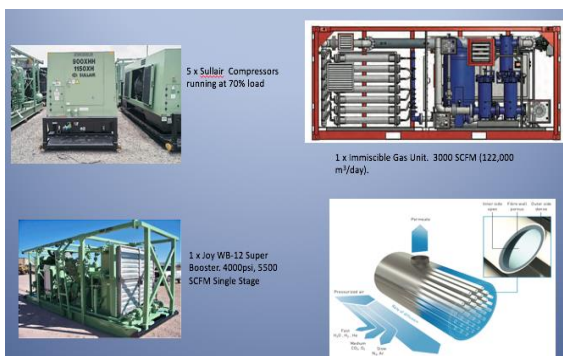


Candidate Types



2. Equipment

Spread and IG Process

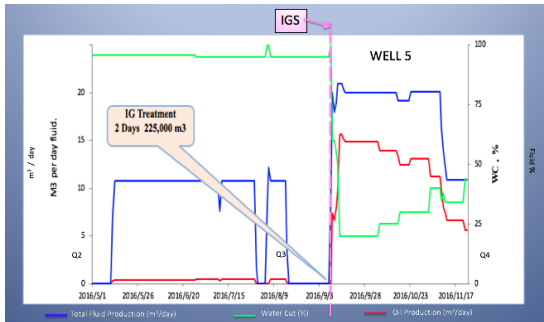


Spread on Location

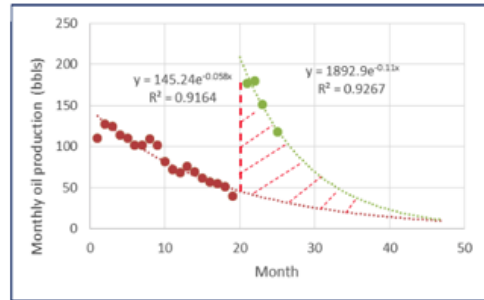


3. Sample Results Graphs

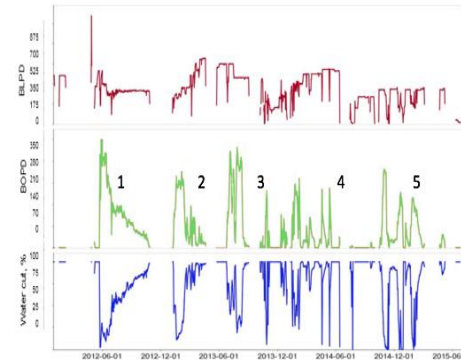
Two days IG treatment, 3 BOPD to 100 BOPD



Decline curve significantly modified with IGS



Vuggy and fractured carbonates.



Cycle	Incremental oil BBLs
1	18,163
2	9,002
3	10,174
4	8,848
5	10,465
Total Inc Oil	56,652

4. Table of Typical Results

Field wide applications 52, 33 and 19 well sets all showing significant incremental oil

Data Set Clastics. Compartmentalised reservoir.	
Wells in data set:	52
Average depth Ft:	4900
Volume IG injected M3:	273946
Days Injection:	2.3
Water Cut Reduction:	56%
Incremental oil per well BBLs:	3700
Value Incremental Oil per well US\$ @ US\$ 70 BBL	259000

Data Set Clastics well. Moderately deep and heavy oil.	
Wells in data set:	33
API of Oil:	11°
Average depth Ft:	9800
Volume IG injected M3:	316142
Days Injection:	2.6
Water Cut Reduction:	20%
Incremental oil per well BBLs:	5079
Value Incremental Oil per well US\$ @ US\$ 70 BBL	355530

Well	IG Used M3	Fluid Volume Change	Treatment Days	Avg BOPD New to Date	Avg new water cut	Op days to date	Planned effective days	Inc Oil to date
1	252,000	-9%	2	23	-71	84	170	9462
2	717,100	44%	6	72	-51	63	155	4526
3	217,100	-88%	2	26	-45	102	90	2682
4	504,100	4%	4	31	-38	104	130	3203
5	225,000	60%	2	94	-70	63	150	5918
Avg 5 wells	383,060		3	49		83	139	5158
6	361,000	-69%		53	-58	31	85	1643
7	449,000	-70%		53	-74	26	100	1382
8	407,000	-18%		23	-3	49	90	1109
9	283,000	23%		79	-68	25	140	1986
10	380,000	-19%		67	-62	29	100	1939
11	357,000	25%		57	-35	35	100	2003
12	395,000	-16%		34	-39	32	90	1099
13	322,000	32%		96	-68	24	160	2312
14	448,000	12%		62	-50	14	110	867
15	355,000	-7%		76	-62	13	120	988
16	366,000	8%		58	-62	12	130	699
17	286,000	-53%		25	-47	5	80	126
18	314,000	20%		59	-56	4	100	235
19	409,000	-54%		28	-53	6	90	167