Indago Energy Limited

Hydrocarbon Dynamics

ASX: INK

Corporate Presentation

Proposed Merger with Hydrocarbon Dynamics

March 2017

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Hydrocarbon Dynamics

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Corporate Summary

Hydrocarbon Dynamics

ASX listed - Energy focused

Board & Management	
Stephen Mitchell	Chairman
Don Beard	Non-Executive Director
Ray Shorrocks	Non-Executive Director
Nick Castellano	Proposed Exec Director
Allan Ritchie	Proposed Exec Director
Doug Hamilton	Business Development Manager

Capital Structure	
Cash:	$3.6m (31 Dec 16)
Share Price:	$0.085
Issued Cap:	107m Shares pre HCD acquisition
Market Cap:	$9.1 milllion
Debt:	$0
ASX Code:	INK

Shareholder Summary – Pre HCD acquisition	
Geoff Barnes	9.2%
Lowell Resources Fund	6.6%
Morgan Stanley Australia	5.7%
Wheelbarrow Investments	4.9%
Stephen Mitchell	4.4%
Total	**30.8%**
Top 20 Holders	52.4%
Number of Shareholders	1,332

Project Summary
Hydrocarbon Dynamics (in the course of acquisition)
- clean oil technology for the treatment of heavy oil
- used to increase oil production & pipeline flow rates/economics
Oklahoma Mississippi Lime Play - ~5,000 net acres

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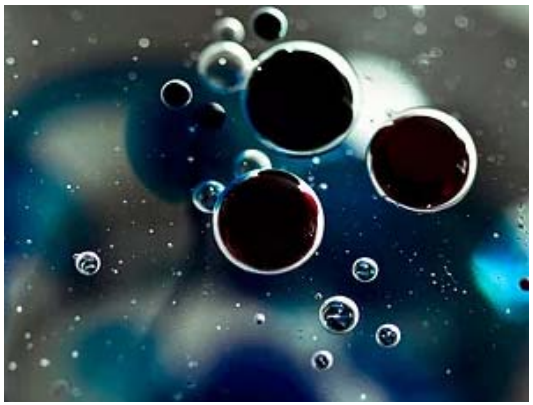
Rebuilding Initiatives During 2016

Hydrocarbon Dynamics

- New board and management
- Sale of projects with no material upside
- Change of name
- Change of capital structure
- Proposed acquisition of Hydrocarbon Dynamics (“HCD”)
  - HCD owns an exceptional technology used to improve oil flow and recovery rates
  - The technology also reduces oil operating, transportation and cleaning costs
  - Business has tremendous potential to grow via product sales and oil reserve and production growth



Capital Structure Scenarios and Terms

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Hydrocarbon Dynamics

HCD Acquisition Terms

- 30m Ordinary Shares and 33.2m options (exercisable at $0.25)
- $1m in cash for Intellectual Property and creditors
- 20m conditional ordinary shares (linked to short-term revenue growth)
- 30m Performance Rights if HCD year 1 EBITDA is > US$4m (Tranche 1)
- 50m Performance Rights if HCD year 2 EBITDA is > US$8m (Tranche 2)
- 5% net revenue royalty of HCD product sales

*Note Performance Rights are proportional to EBITDA and numbers above reflect maximum ordinary shares that may be issued.

	Shares on Issue	Options ($0.10)	Options ($0.25)
Pre HCD Acquisition	107.4m	5m	0
On Completion of HCD	**137.4m**	**5m**	**33.2m**
Conditional shares (Oct 2017)	157.4	5m	33.2m
Performance Tranche 1[1]	187.4m	5m	33.2m
Performance Tranche 2[2]	237.4m	5m	33.2m

[1] (April 2018) if HCD EBITDA >$US4m
[2] (April 2019) if HCD EBITDA >$US8m

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Opportunities in Heavy Oil Fields

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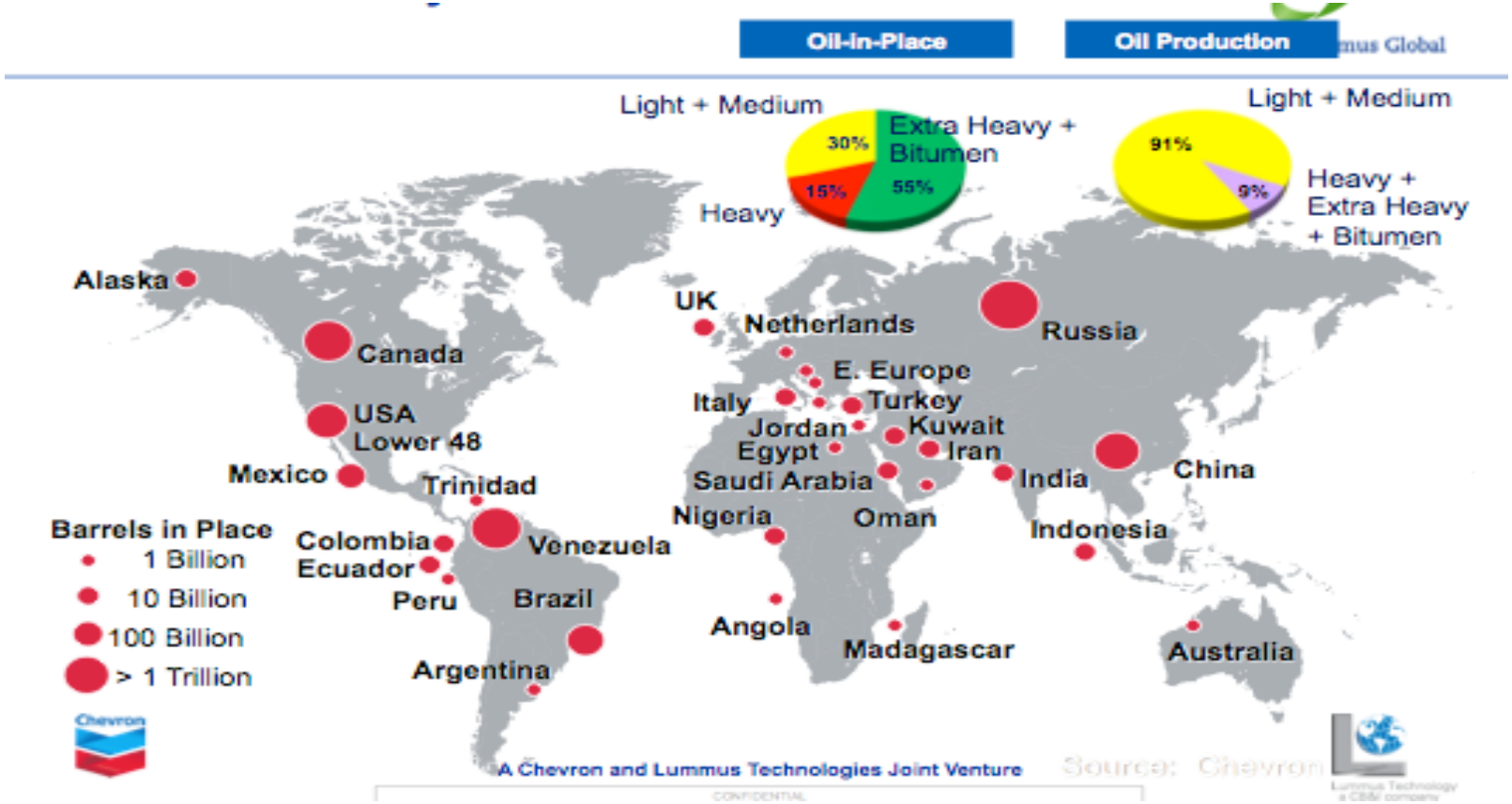
According to the US Geological Survey, the world's current heavy oil reserve estimates total approximately 1.1 trillion barrels of oil. The Western Hemisphere has about 70% of this resource's technically recoverable reserves.



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The Technology

Hydrocarbon Dynamics

HCD Multi-Flow™, is a small, specially engineered carbon-based molecule that disaggregates & reliquefies the large agglomerations of waxes and asphaltenes naturally occurring in waxy and heavy crude oils. The product:

- Lowers the pour point of paraffinic crudes
- Lowers the viscosity of heavy crude oils, allowing easy transportation
- Lowers the amount of heat required to mobilise heavy crude oils
- Lowers pipeline and production equipment corrosion rates
- Breaks oil and water emulsions, reducing BS&W levels
- Increases production rates by reliquefying paraffin in the reservoir
- It provides a clean and green, cost-effective solution to the production, transport, storage and refining of heavy oils

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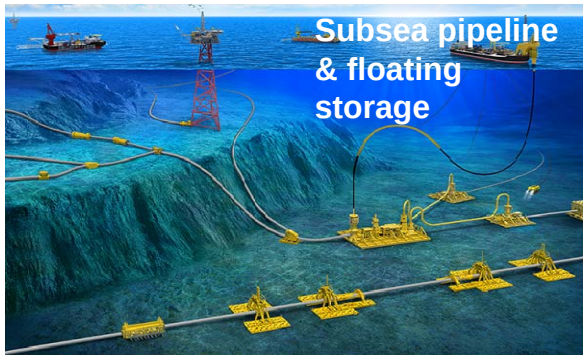
Application from Well bore to Refinery

Hydrocarbon Dynamics

HCD Multi-Flow™ has application through the entire hydrocarbon production stream



Multi-Flow
green tech molecular disaggregation

... and its environmentally friendly

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Applications and Benefits

Hydrocarbon Dynamics

Key product applications and their benefits:

- Ensures successful and economic flow in onshore/offshore pipeline and oil gathering lines that transport heavy or paraffinic crudes
- Increases oil production and recovery rates and thus economics in both on-shore and offshore wells in fields producing heavy or paraffinic crudes
- **HCD Multi-Flow™** reduces the need for costly workovers and chemical or heat treatments to remove paraffin or asphaltene deposition on production tubulars & oil flowlines
- Enables efficient clean-up, oil recovery and water & sediment separation of tank bottom sludge in oil tank batteries offshore/onshore. **HCD Tank Clean** separates oil, water & sediment without the need for human intervention in tank cleaning
- **HCD Multi-Flow™** also improves crude quality in all applications by lifting the API Specific Gravity and separating water by breaking water-in-oil emulsions, resulting in a higher price for the crude at the point of sale

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Superior Technology

Hydrocarbon Dynamics

HCD Multi-Flow™, is a more efficient product based on superior technology. It is clean, green, non-toxic and significantly cheaper than rival products:

- It is less harmful than toxic solvents (Benzene-Toluene-Xylene) for clearing blockages in pipelines & well bores caused by paraffin/asphaltene
- It is more efficient than polymer chemistries for stopping wax crystallization of the crude oil by interrupting the molecular attraction that causes wax to crystallise whereas polymers only slow down, but do not stop, this process
- It is much more cost effective than using heat treatments to keep the crude oil in a liquid (flowable) phase in cold environment conditions
- It replaces six traditional additives to treat paraffin and asphaltene with only one versatile product, making it operationally very simple and significantly less expensive for overall system treatments as well as being environmentally safe

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Non-Toxic and Environmentally Friendly

Hydrocarbon Dynamics

The safety rating of **HCD Multi-Flow™** in the HMIS is exceptional. No personal protection is necessary when handling the product and there are no health hazards.

Multi-Flow
green tech molecular disaggregation

HEALTH	0
FLAMMIBILTY	1
REACTIVITY	0
PERSONAL PROTECTION	

0 = Minimal Hazard
1 = Slight Hazard
2 = Moderate Hazard
3= Serious Hazard
4= Severe hazard





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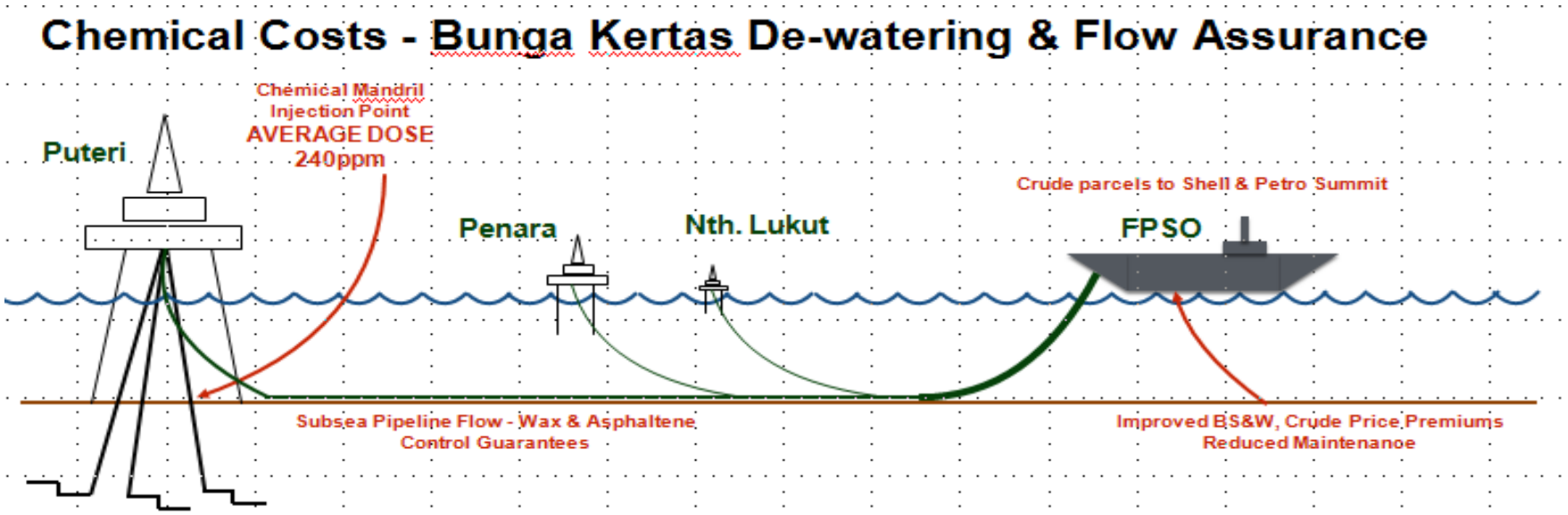
Success To Date: Puteri Platform

Hydrocarbon Dynamics

Puteri platform is part of a $2bn offshore Malaysian development owned by Petronas that included a US$400m pipeline. The field is estimated to have produced up to 17,000 bod.

Due to Paraffin and asphaltene build-up in both the well bore and the pipeline, production had reduced to ~1,000 bod before the field was then shut-in in 2009.

In 2012 the production re-commenced using HCD Multiflow and was returned to production at an estimated rate of 12,000 bod. HCD product was continuously used for 4.5 years.



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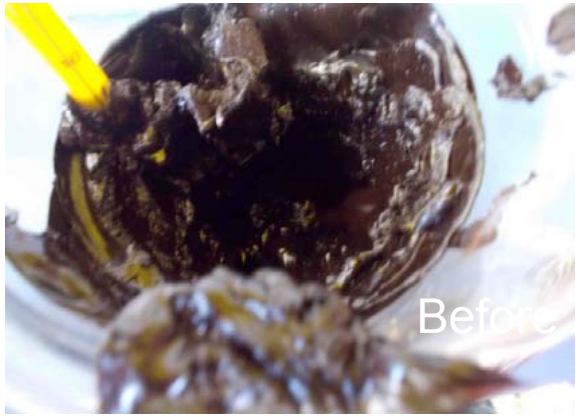
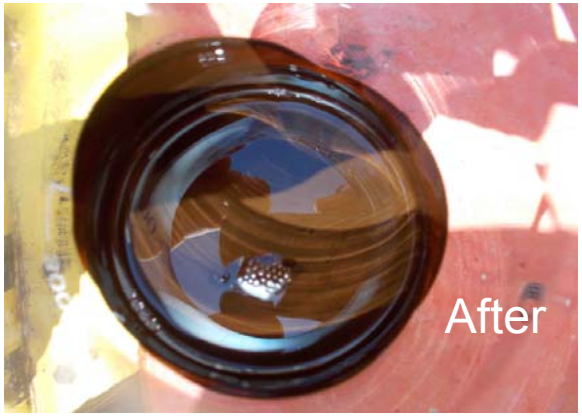
Success To Date: Puteri Platform

Hydrocarbon Dynamics





- Pour point reduced from 41^{0}C to 32^{0}C that enabled the platform to resume production and resume flow through the pipeline at ~12,000 BOPD
- HCD Multi-Flow™ solution cost average US$0.34/bbl versus competitor's solution average of US$4-7/bbl
- Facilitated restart of Puteri and hence restoration of value to the US$400M pipeline and $2bn field
- Reduction of maintenance on platform heat exchangers
- Oil discounts associated with BS&W eliminated – generating ~US$7m extra revenue /month for Petronas
- Pour point was also reduced in the neighbouring Abu Alpha Field from 36^{0}C to 14^{0}C

Successes To Date: Western Canada

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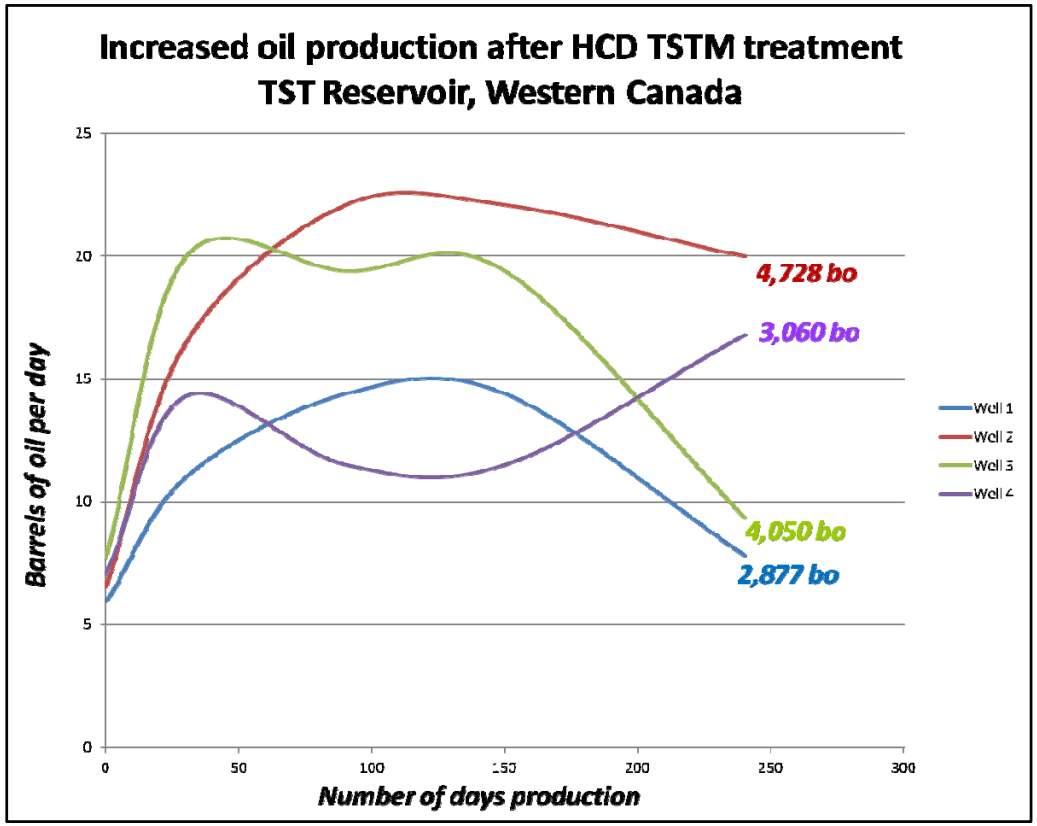
Hydrocarbon Dynamics

- HCD treatment increased daily oil production in 4 wells, increases varied from 64-240%
- The production increase was largely sustained for 240 days of monitoring after the treatment
- No asphaltene or paraffin built up in the flowlines for at least 6 months after the treatment. The flowlines normally required pigging every month



Well	Before (bopd)	After (bopd)	Increase %
1	5.9	14.4	144
2	6.5	22.1	240
3	7.7	19.4	152
4	7	11.5	64

Total barrels produced 14,715

Successes To Date: Syria, SPC Souedie Field

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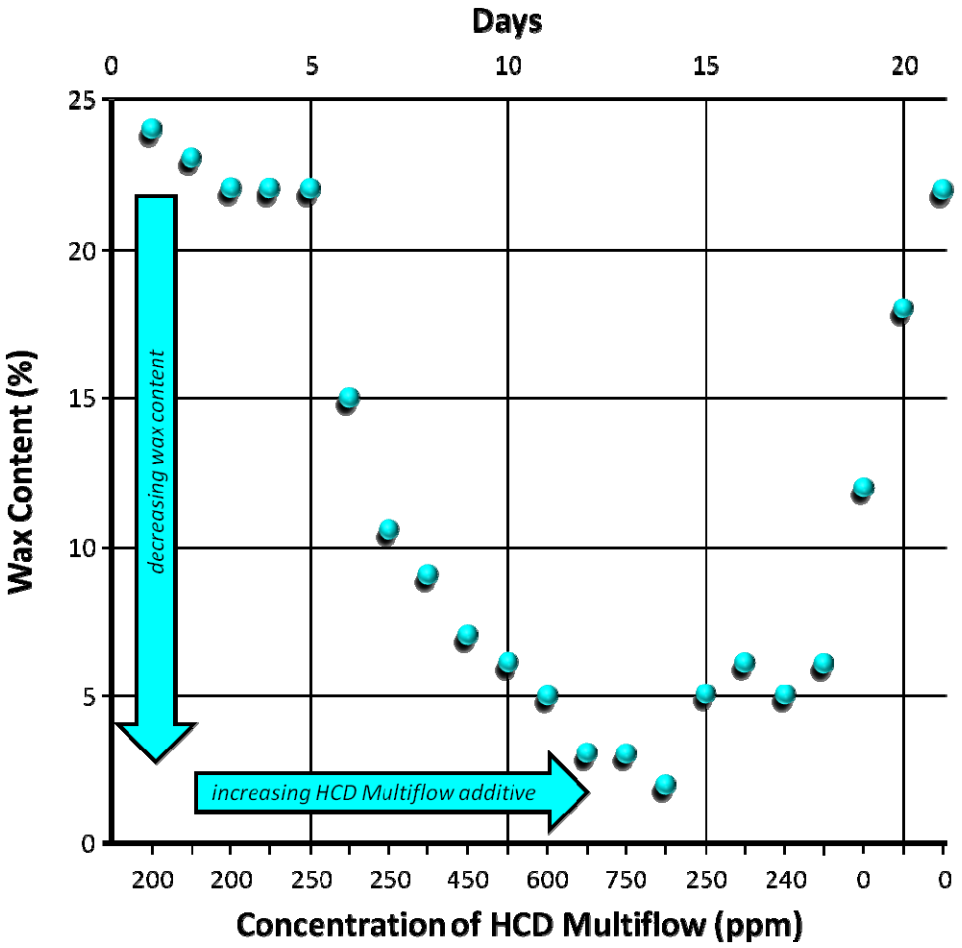
Problem:

- Cold ambient temperatures at surface and high pour point waxy & asphaltenic crudes caused gathering lines and pipeline failures in Souedie Field, Syria
- Oil production was seriously curtailed because wax/asphaltene blocked the lines in winter. The wells had to be shut-in and damaged sections of gathering lines and pipelines had to be replaced in the Spring each year

Solution & Benefits:

- HCD product was injected into gathering lines, liquefying the wax deposition and PP (by as much as 53^0C) ensuring continuous well production & crude flow
- API gravity of treated crude was uplifted from 11^0 to 15.2^0



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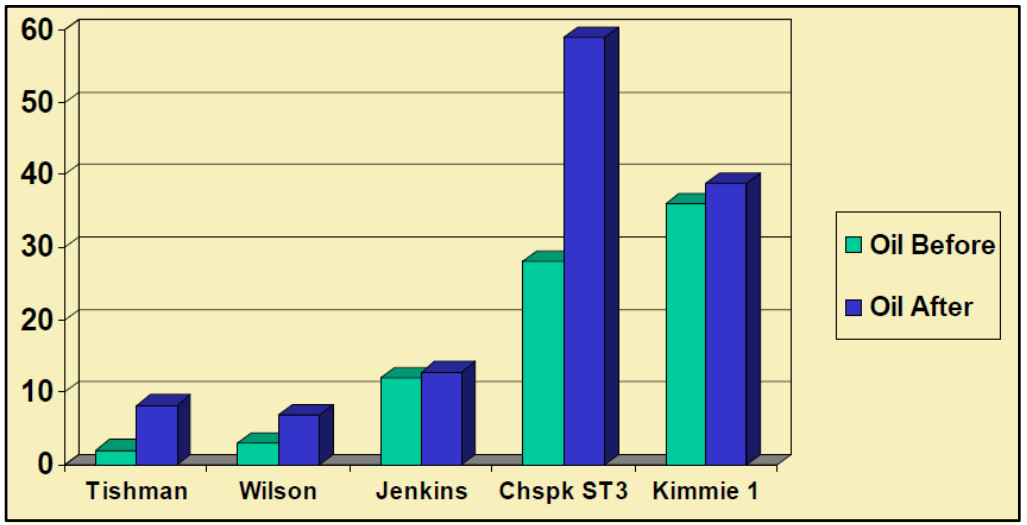
Successes To Date: New Mexico

Hydrocarbon Dynamics

- HCD EOR (Enhanced Oil Recovery) treatment increased average daily oil production in 5 wells from 6-310%
- Total average incremental barrels of oil produced from one treatment was 45 barrels of oil/day
- Increased gas production from 367 mcf/day to 502.6 mcf/day (37%)
- Substantial increase in daily revenue. At current oil ($US50) and gas ($3.3/mcf) prices the increased revenue is $US2,697 per day



Well Name	Before (bopd)	After (bopd)	Increase %	Before (mcf)	After (mcf)	Increase (%)
Tishman	2	8.2	310	0	0	no change
Wilson	3	6.8	126	5	30.8	516
Jenkins	12	12.8	6	50	74.3	48
Cheasapeake ST 3 No. 1	28	59	110	157	191.8	22
Kimmie 1	36	38.8	7	155	205.7	33
Total	81	125.6	55%	367	502.6	37%

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Trials Underway – Example 1

Hydrocarbon Dynamics

- Down-hole and pipeline injection of **HCD Multi-Flow™** is currently being tested in a major onshore oilfield that comprises ~400 wells and a 600km pipeline
- Because of wax deposition, the pipeline, which has a capacity of 175,000 BOPD, has to be heated to 65^0C, and the downhole well pumps have to be manually cleaned at surface from 2 to 4 times/month resulting in lost revenue from 5 to 7 days/well/month
- Injection of **HCD Multi-Flow™** is designed to lower the pour point of the crude delivered to the pipeline to reduce heating costs and arrest wax deposition in the wellbores
- Injection of **HCD Multi-Flow™** into two test wells completely eliminated wax deposition and after one month the pumps were still performing at 100% efficiency
- After only 2 days of continuous **HCD Multi-Flow™** injection into the pipeline heat exchanger, the temperature dropped from 65^0C to 55^0C. This represents a saving of $5/barrel as every 1^0C drop in temperature, the operator saves $0.50 per barrel
- The pipeline has a throughput capacity of 175,000 BOPD, which at a savings of $5/per barrel/day is $875,000/day or $320m/year

Opportunities for Future Applications

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The opportunities for future applications of **HCD Multi-Flow™** are enormous because the technology is directly applicable and beneficial to any area or business involved with the production, handling, storage or transport and refining of waxy or heavy crude oil.

In summary, potential applications include:

- Production in heavy and extra heavy crude oil fields
- Production in paraffinic crude oil fields
- Production in tar sands
- Treating pipelines that transport heavy or paraffinic crude oils
- Treating tanks that store heavy or paraffinic oils
- Treating refinery feedstock by reducing corrosive BS&W levels

Opportunities in Heavy and Waxy Oilfields in the USA

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Hydrocarbon Dynamics

States Containing Significant Heavy Crude Oil and Tar Sands Accumulations

Areas with significant **Heavy Oil** accumulations

Areas with significant **Tar Sand** accumulations

www.norwestcorp.com

NORWEST QUESTA ENGINEERING

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Additional Opportunities

Hydrocarbon Dynamics

- **Paraffin Oil Fields** — Caspian Sea and Kazahkstan – 85 Billion BO
  Western Siberia Basin – 120 Billion BO
  Indonsesia – 4 Billion BO
- **Tar Sands** — Athabasca Oil Sands, Canada - 1.6 Trillion BO
- **Heavy Oil** — Orinoco Heavy, Venezuela - 500 Billion BO
- **Ashphaltene Problems** — El Furrial, Venezuela - 26 Billion BO +50 TCF

New Business – Potential Impacts

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The oil field chemical market is ~$20 billion/year. HCD is relevant to 50% of this market.

- **Pipeline Applications**. 400 to 5,000 drums of Multi-flow/year. One large contract could generate revenues of up to $10m/year
- **Product Sales to Producers.** 100 drums to 6,000 drums/year. One large contract could generate revenues of up to $12m/year
- **Self Owned Projects.** Seek to own projects that generate significant reserves and production (initially in North America). Target projects with 10mmbbls recoverable
- **Incremental Production.** Contribute product to producers for share of incremental production and profits
- **Tank Cleaning & Refineries.** Large contract could generate up to $8m in revenue

Existing Newkirk Project Oklahoma

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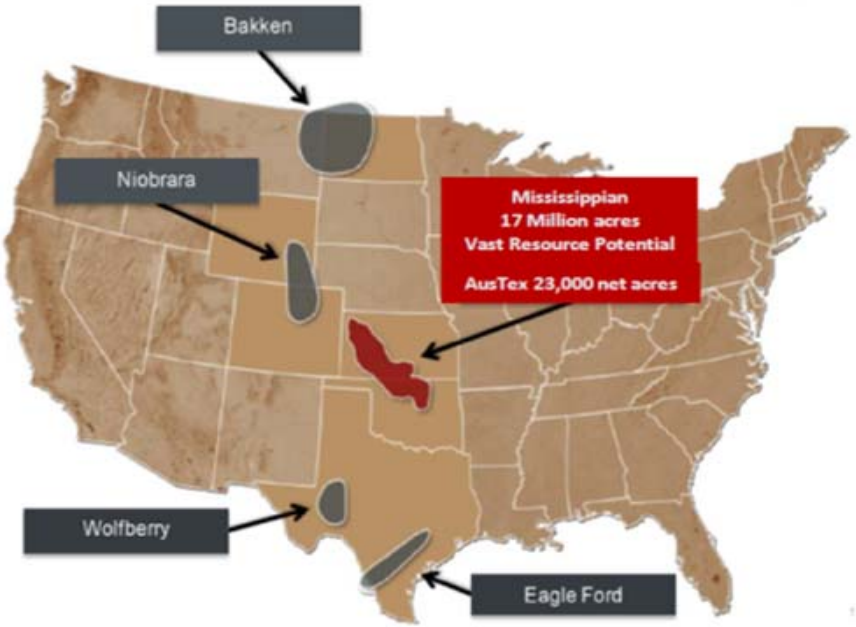
Hydrocarbon Dynamics

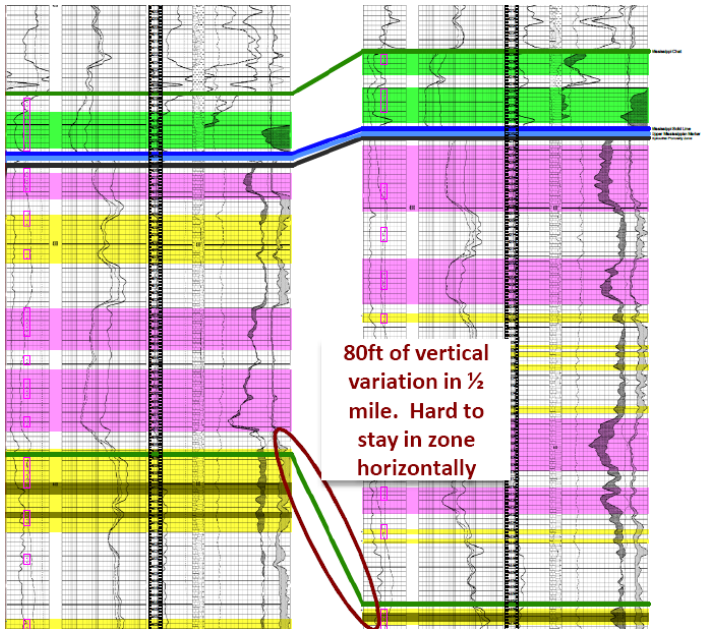
Low cost, repeatable, stacked pay environment

Project information	
Primary Target Location	Mississippi Lime Kay County, OK
Operator JV Partner	Empire Energy
Acreage	4,049 net acres
2P Reserves	5.1 million BOE (net)
Well locations	~100 (based on 40 acre spacing)

- AMI & JV allows for both parties to contribute 50% of costs to each earn 50% WI and 40.6 % NRI in each well drilled
- 80 foot of vertical variation in ½ mile – difficult to stay in zone horizontally – preference for lower risk vertical wells
- Extensive infrastructure in place plus numerous secondary targets



Source: SandRidge Energy, 2012



Existing Newkirk Project Oklahoma

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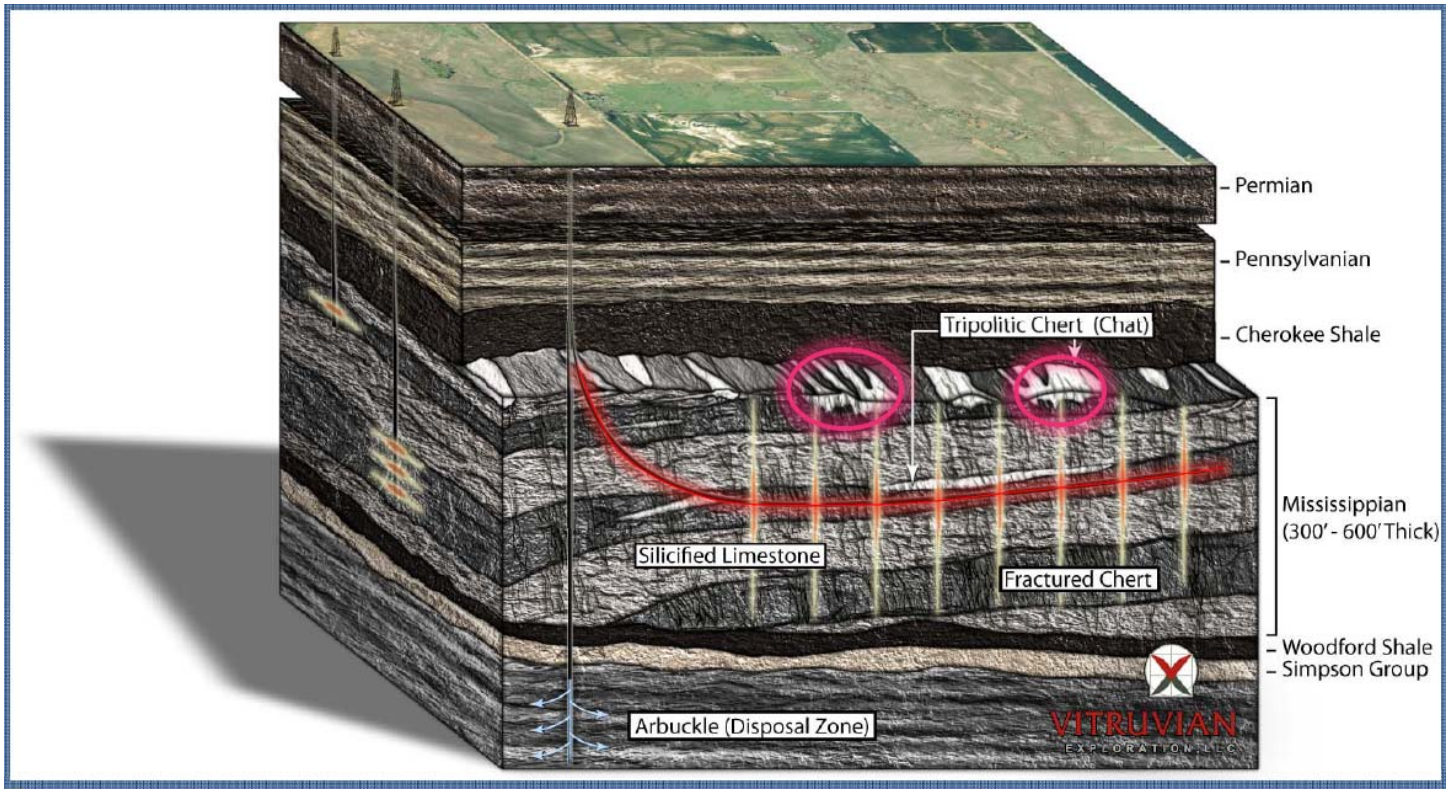
Key Attributes

- Complex geology with chats, cherts, dolomites & limestones
- Developed with fracced horizontal & vertical wells
- Mixed success - wide range of initial production rates and EUR's
- Wells produce significant water and low oil cuts – typically 10:1
- Salt water disposal wells required – linked to seismic activity



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