

# Revitalizing Mature Offshore Fields in the Caspian Sea



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#### Measurement

Where amounts are expressed on a barrel of oil equivalent ("BOE") basis, natural gas volumes have been converted to oil equivalence at six thousand cubic feet per barrel. The term BOE may be confusing, particularly if used in isolation. A BOE conversion ratio of six thousand cubic feet per barrel is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent a value equivalency at the wellhead.

#### Currency

All amounts in this presentation are in US dollars unless otherwise noted.



# Investment Highlights



## **Bahar PSA**

#### **Stable PSA structure**

- good commercial terms and no taxes
- Large unrecovered tax pools (\$240MM)
- Oil sales price linked to Brent
- Existing production/transportation infrastructure

## Significant recent reserve revision

Net P1+P2<sup>(1)</sup> 53 MMBOE \$538MM



- Immediate Bahar NKP development gas drilling up to 6 wells (83 BCF<sup>(2)</sup>)
- Positive increase in oil production in 2018+ through re-initiating Gum Deniz waterfloods (37 MMB reserves<sup>(2)</sup>)
- Opportunity to pilot Bahar waterfloods
- Offsetting well testing additional exploration potential which could provide a substantial uplift in the valuation
  - (1) GLG Reserves Report 12.31.2017 Net GNF Interest
  - (2) GLG Reserves Report 12.31.2017 Gross Bahar PSA 3P



# Azerbaijan Operating Environment



# Proven Resources<sup>(1)</sup>

Oil Fields 7 billion barrels

Gas fields **35 TCF** 

# **Contract Integrity**

- **PSA adjudicated by Azerbaijan Parliament**
- **Rule of Law**
- SOCAR involved in all aspects of the O&G industry

"There are still billions of barrels to recover and billions of dollars to invest" in Azerbaijan, said Wood Mackenzie Analyst Laura Bennie (Sept 2017).





























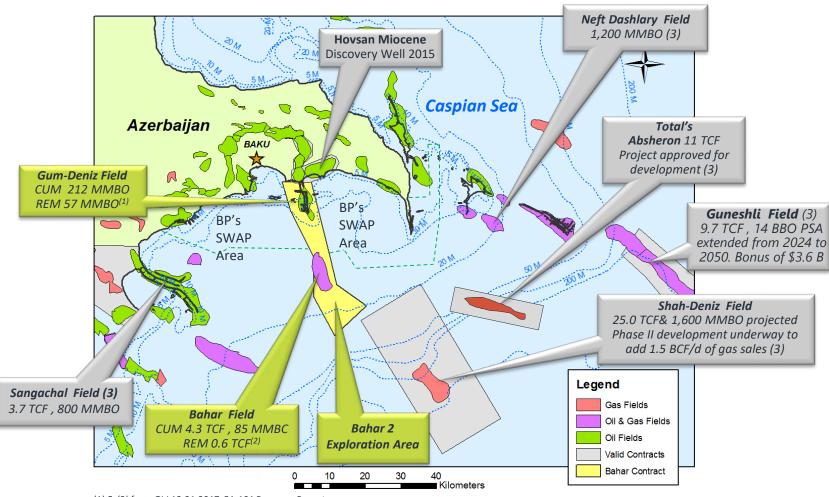
EIA Energy Information Administration 2016



# Overview: Offshore Shallow Water Deposits



"The Neighborhood of Big Oil and Gas – Billion Barrel and Multi TCF Fields"



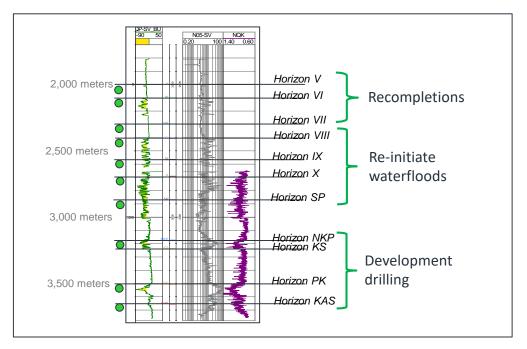
(1) & (2) from GLJ 12.31.2017 51-101 Reserves Report

(3) Sourced from Infield Systems, Eurasianet.com and Reuters for the estimates of BP's, Total's and SOCAR oil and gas fields

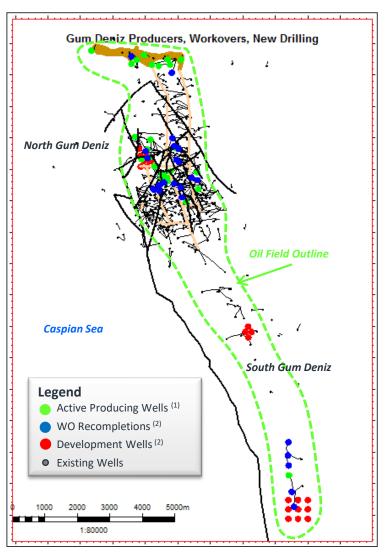
# Gum Deniz Oil Field



- Discovered in 1950's. 499 wells drilled to date.
- ~2.3+ BB OOIP
- Cumulative production 212 MMB<sup>(1)</sup>
- Average cumulative production per well of 556 MBOE.
- Peak Production of 46,400 B/d in 1964.

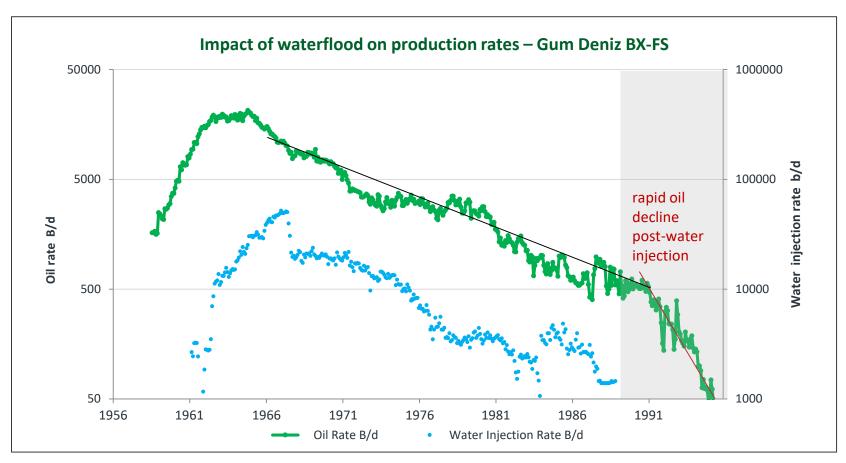


- (1) From OFM data base
- (2) GLJ 51-101 Reserves Report 12.31.2017



# Water Injection Response



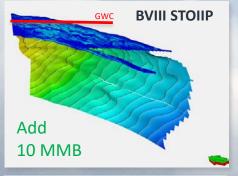


- SOCAR operated successful water floods in numerous reservoirs
- These projects were terminated prematurely leaving large remaining reserves

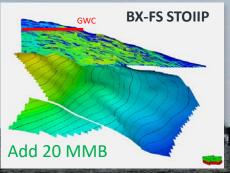
(1) From OFM data base

# Gum Deniz OOIP and Water Flood Potential<sup>(1)</sup> (2)





# Add 7 MMB



## **BVIII**

OOIP = 166 MMB

Current Recovery Factor to date = 19%

#### BIX

OOIP = 106 MMB Current Recovery Factor to date = 30%

## **BX-FS**

OOIP = 209 MMB

Current Recovery Factor to date = 37%

# **TOTAL OOIP**

= 481 MMB

Current Recovery Factor = 29%

Gross Incremental
Waterflood
Reserves
37.5 MMB



- (1) From OFM data base
- (2) from GLJ 12.31.2017 51-101 Reserves Report Gross 3P

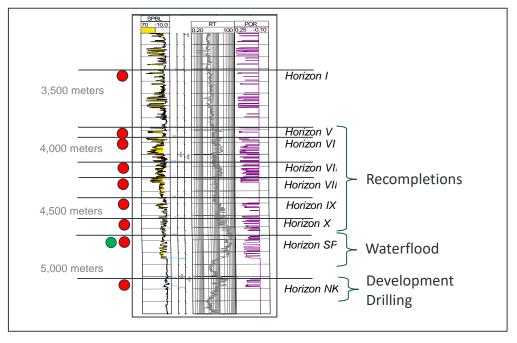


# Bahar Gas Field

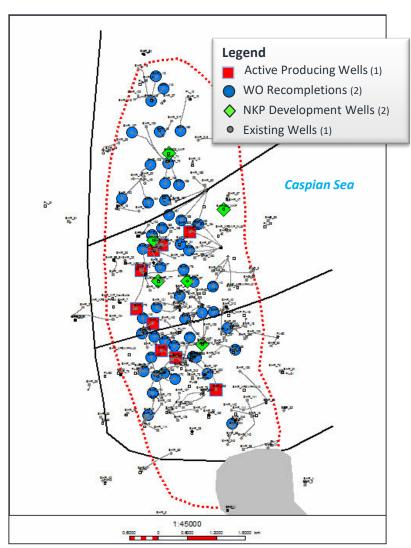


## Cumulative production of 4.3 TCF, 84.0 MMB of condensate<sup>(1)</sup>

- Initial production in 1969 with 203 wells drilled
- Peak of 591 MMscf/d & 13,900 B/d 1985
- OGIP of 6.8 TCFG in 12 stacked reservoirs Currently
   63% RF and ultimately 72% RF<sup>(2)</sup>



- (1) From OFM data base
- 2) from GLJ 12.31.2017 51-101 Reserves Report Gross 3P



# Bahar NKP Gas Drilling Opportunity<sup>(1)</sup>



## NKP original gas in place 395 BCF

- 122 BCF of gas produced (31% RF)
- Wells abandoned to accelerate production from uphole zones
- No wellbores are available due to casing damage in uphole sections

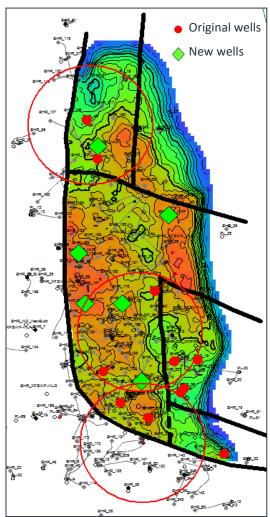
174 BCF of recoverable gas in the NKP (based on 75% ultimate recovery)

# 6+ potential development well locations with reserves of 83 BCF

 Three platforms previously refurbished by SOCAR are available for drilling.

Spud BHR-301 development well in 2018 from Platform 196 Good uphole potential remaining in the BX and BIX horizons

## **Net Gas Pay**

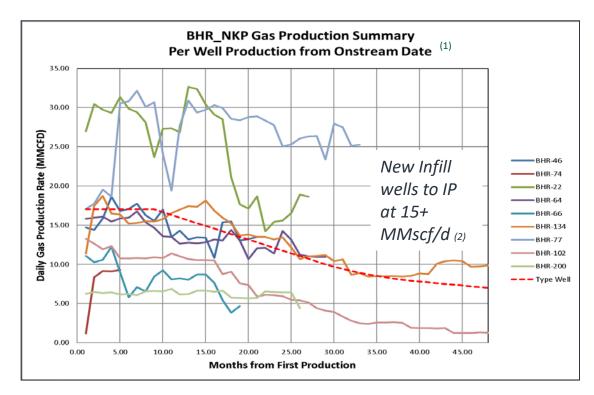


(1) from GLJ 12.31.2017 51-101 Reserves Report Gross 3P



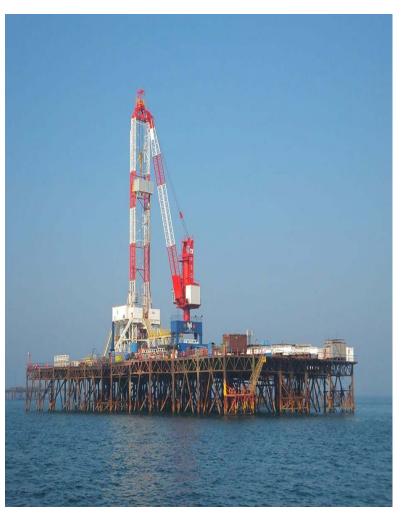
# Bahar Historical NKP Well Performance (1)







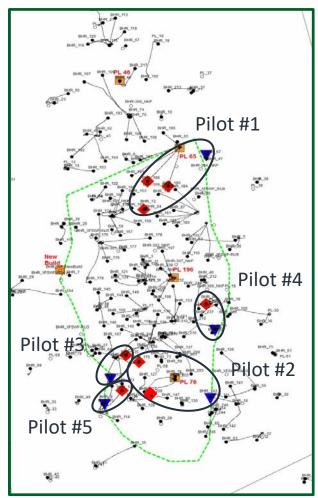
- Existing production facilities to immediately handle gas and condensate production
  - (1) From OFM data base
  - (2) From GLJ 12.31.2017 Reserves Report
  - (3) From BEOC cost estimate for BH 301 well (2018)



# Bahar FS-X Waterflood Potential



## Pilot Program (2019)



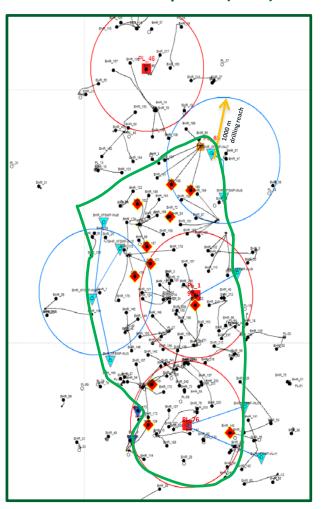
**Five Pilots** to be installed in 2019 using 11 existing wellbores, platforms and SWIMS facilities



Full Field Development with 9 downdip injectors wells (2021+), drilling platform and additional flowlines to shore

- **W**orkov
  - Workover (PRODUCER)
- Workover (INJECTOR)
- $\bigvee$
- New Drill (INJECTOR)

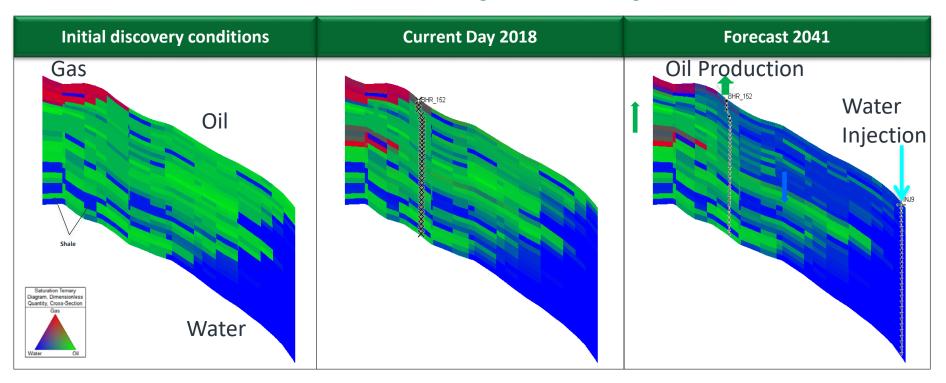
#### **Full Field Development (2021)**



# Water Injection Response



Bahar FS-X Cross-section showing saturation changes over time



Significantly improved oil sweep improvement over historical water flood with proper positioning of the water injectors downdip in water leg.

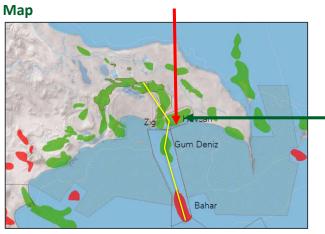
Additional Resources: Pilot program

**Field Development** 

# **Miocene Exploration Opportunities**

# **Hovsan 1870 Discovery**

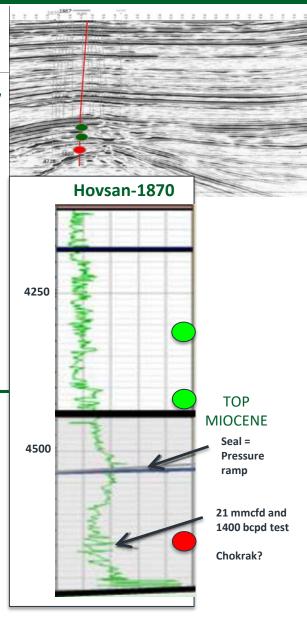
#### **AOC 2018 Exploration** well drilling Location



# **Gum Deniz Miocene Analog**

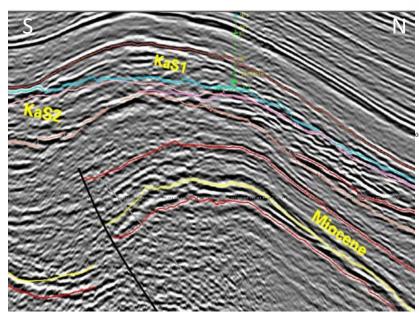
- Excitement for the play was generated by the 2015 discovery of gas-condensate in the Hovsan 1870 well drilled by AOC
- The well drilled into the Miocene and produced 21 mmcfd and 1400 bcpd at ~4700 m<sup>(1)</sup>





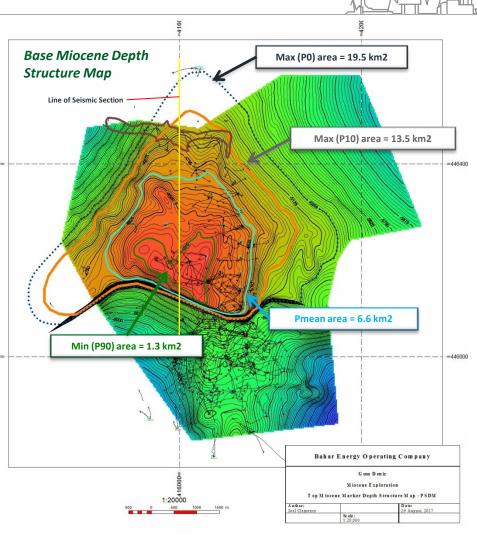
# Gum Deniz Miocene Prospect





#### **Gum Deniz Miocene PSTM Seismic**

- A large structural closure involving the entire Miocene stratigraphic thickness.
- Well imaged fold with a maximum area of almost 20 km<sup>2</sup>



Potential to test significant resources from Gum Island

# Marketing



#### OIL

- All volumes sold to SOCAR Marketing
  - pipeline shipped to Novarossiysk (or Supsa)
  - liftings every 6 to 10 days
- Realization: Brent (less 4%) in USD

#### **GAS**

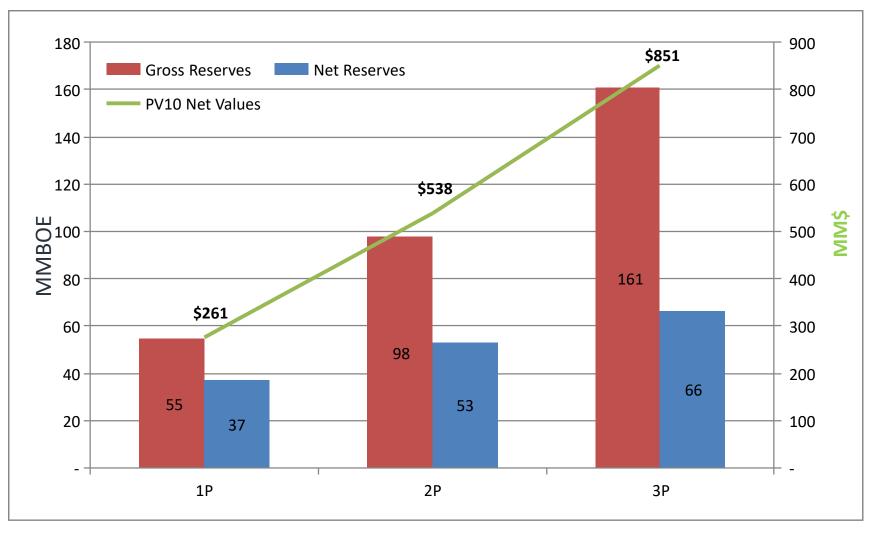
- All Non Associated Gas in PSA
- Sold to SOCAR Gas Export
- Take or Pay Contract
- Fixed Price US\$2.69/mcf





# Bahar PSA Reserves - Year End 2017





From GLJ 51-101 Reserves Report 12.31.2017

# **Going Forward**

## Maintain operating costs reductions

\$89MM reduced to ~\$22MM (\$15 per B) (1)

### **Continue Gum Deniz and Bahar workovers and recompletions**

- Capital cost reductions for platform refurbishments from \$70 MM to \$18MM for 17 platforms
- 74 intervals in 49 wells (1)

# Drill Bahar NKP development gas wells in 2018

Reserves 83 BCF (1)

#### Re-initiate Gum Deniz waterfloods in 2018

Reserves 37.5 MMB <sup>(1)</sup>

Pilot Bahar waterfloods in 2019

**Evaluating partners for deeper Miocene exploration opportunities** 



(1) GLJ 12.31.2017 Reserves Report

# **Contact Information**



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Bay of Baku is a natural harbor on the shore of the Absheron Peninsula

