Surat Gas Project
Environmental Impact Statement
30 April to 10 May 2012
Outline

• Air quality impact assessment

• Noise and vibration impact assessment

• Agriculture impact assessment
Air Quality and Noise and Vibration Impact Assessments
Emission sources and impact assessment scenarios

• Air emission sources
  – Production facilities (gas turbines exhausts, flares)
  – Well head infrastructure (gas engine exhausts)

• Noise and vibration sources
  – Production facilities (compressors, gas turbines)
  – Well head infrastructure (gas engines)
  – Vehicles, plant and equipment

• Impact assessment
  – Worst-case meteorological conditions (three regions)
  – Peak development (2020) and typical installations modelled
  – Impact assessed at sensitive receptors (houses, hospitals, etc)
Predicted ground level concentrations (NO₂)
Integrated processing facility

- Key indicators are oxides of nitrogen (NO₂) and ozone (O₃)
- No exceedences at regional level (NO₂/O₃)
- Ground level concentrations of NO₂ achieved at 175 m to 225 m
Predicted ground level concentrations (NO$_2$)
Production well

Ground level concentrations of NO$_2$ not exceeded
### Noise criteria at sensitive receptors and findings

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Short-term Noise Event</th>
<th>Medium-term Noise Event</th>
<th>Long-term Noise Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.00 am to 6.00 pm</td>
<td>Day 45 dB(A)</td>
<td>43 dB(A)</td>
<td>40 dB(A)</td>
</tr>
<tr>
<td>6.00 pm to 10.00 pm</td>
<td>Evening 40 dB(A)</td>
<td>38 dB(A)</td>
<td>35 dB(A)</td>
</tr>
<tr>
<td>10.00 pm to 6.00 am</td>
<td>Night 28 dB(A)</td>
<td>28 dB(A)</td>
<td>28 dB(A)</td>
</tr>
<tr>
<td>6.00 am to 7.00 am</td>
<td>Morning 40 dB(A)</td>
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</tr>
</tbody>
</table>

- Background noise levels 19 dB(A) to 34 dB(A)
- Production wells: unmitigated 300 m, mitigated 80 m
- Integrated processing facility: unmitigated 5 km, mitigated 1 km
- Vibration below threshold for human detection / no structural damage
Noise propagation contours (Integrated processing facility)
Agriculture impact assessment
Planning policies and legislation

• Good Quality Agricultural Land (GQAL)
  – Class A and B (cropping land)
  – Class C (grazing land)

• Strategic Cropping Land Act 2011 (enacted January 2012)
  – Trigger maps define potential SCL
  – Zonal criteria used to define SCL at property level
  – Zonal criteria include slope, rockiness, gilgai microrelief, soil depth, drainage, soil pH, chloride content and soil water storage
  – Eastern Darling Downs and Western Cropping zones
Agricultural enterprises

Intensive farming operation (feedlot) and dryland broadacre cropping

Intensively farmed land (irrigated broadacre cropping)
Impacts to agricultural enterprises

• Sensitivity intrinsic to each property
  – Unique and with individual challenges
  – Tolerance to change varies

• Magnitude of impact
  – Disruption to farming activities
  – Constraints on future development
  – Disturbance of soils / availability of water

• Significance of impact
  – Extent to which activities can be integrated
  – Success of rehabilitation
Potential impacts of CSG development

- Loss of arable land
- Crop yield (productivity)
  - Disturbance of soils
    - Inverted soil horizons, breakdown of soil structure
    - Compaction
  - Farm workability
    - Headlands, cultivation islands and controlled traffic runs
    - Irrigation infrastructure (head ditches, tail drains, booms)
    - Inconvenience of working around CSG infrastructure
Potential impacts of CSG development cont’d

• Farm management
  – Operating overheads including management of CSG activities
  – Coordination of activities (spraying and withholding periods)

• Amenity
  – Contractors and employees entering and working on properties
  – Disruption to lifestyle
  – Noise
  – Dust
  – Visual impact of CSG infrastructure
Potential impacts of CSG development cont’d

• Project development area – 8,600 km² (860,000 ha)
  – GQAL 59%
  – Potential SCL 49%
• To be developed on land to be purchased by Arrow
  – Integrated processing facilities (~223 ha per facility)
  – Central gas processing facilities (~18 ha per facility)
  – Field compression facilities (~0.50 ha per facility)
• Production wells and gathering systems
  – 2-3 % of typical 160 acre (~65 ha) production spacing during construction i.e., ~1.95 ha per 65 ha production area
Lasting (residual) impacts

The majority of impacts are temporary in nature, during construction and rehabilitation, however some may be lasting in nature:

- Changed operations (reduction of cultivated/irrigated area)
  - Installation of coal seam gas infrastructure
  - Ability to develop or modify farm plan

- Potential for diminished productivity
  - Unsuccessful rehabilitation (soil structure, surface relief)
  - Effects may not be known for some time

- Changed land use
  - Rehabilitation of production facility sites to sustainable land use e.g., grazing land
Lasting (residual) impacts cont’d

Example of unsuccessful rehabilitation

Example of successful rehabilitation
Lasting (residual) impacts cont’d
Conclusions and recommendations

• Plan development to integrate with farming practices, including:
  
  A. Design and planning objectives
     ➢ Twelve objectives aimed to design out impacts where possible
  
  B. Specific mitigation and management measures
     ➢ Accepted practice
  
  C. Rehabilitation trials
     ➢ Techniques and treatments to return land to former use/productivity
  
  D. Develop assessment method for productivity
     ➢ To measure success of rehabilitation
  
  E. Rehabilitation of soils fundamental to long-term productivity
Questions
Flexibility in production well siting (conceptual arrangement)

- More wells; shorter production period
- Less wells; longer production period
- Multiple wells per pad
Roads and traffic

- Project generated traffic
  - Consistent with predicted growth
  - Average ~100 vpd; peak 330 vpd
  - Localised impacts

- Cumulative impacts
  - Warrego Highway
  - Chinchilla – Tara Road
  - Dalby – Kogan Road
  - Kogan – Condamine Road
  - Moonie Highway
Production well footprints

- **Establishment footprint**
  - ~75 m by 75 m (~0.5 ha)

- **Operation footprint**
  - 10 m by 10 m

- **Workover footprint**
  - ~70 m by 70 m (~0.5 ha)