



GEODYNAMICS  
LIMITED

## QUARTERLY REPORT

**PERIOD ENDING 30 June 2012**

*power  
from the earth.*



# Review of the Quarter

## HIGHLIGHTS

***The Company's activities for the period have focused on drilling operations at Habanero 4, the latest geothermal well of the Innamincka Deeps Joint Venture.***

### ***FOLLOWING IS A SUMMARY OF HIGHLIGHTS FROM THE QUARTER:***

- Drilling of the Habanero 4 well continued. By the end of the quarter, the 12 ¼ inch diameter hole section was at a depth of 4,007 metres.
- Post the reporting period, the 12 ¼ inch well section was completed to a depth of 4,026 metres and cased and cemented. Logging conducted to assess the quality of the cement job of the 251 mm (9 7/8") casing determined that the cement placed in the upper section of the well had met its objectives. Additional work was necessary to ensure cement integrity at the base of the well. Drilling has continued in the final 216 mm (8 1/2") hole section reaching target depth of 4,204 m. Next steps to finalise the Habanero 4 well include logging to assess the target fracture zone, confirming cement integrity behind casing for well stimulation and installing the well completion to secure the well.
- As a result of operational delays encountered, the total cost to complete the well and associated stimulation and open flow test activities is now estimated to be approximately \$50 million, an increase of \$1.5 million or 3% compared to the maximum authorised expenditure of \$48.5 million agreed with joint venture partner, Origin Energy. Origin Energy has advised it will not contribute further to the well costs with Geodynamics now responsible for ongoing risk and cost of the well. The incremental cost to Geodynamics as a result of the increased final well cost and Origin's decision to cease further participation in the well is estimated to be approximately \$2.76 million.
- Evaluation activities at Habanero 1 concluded that minimal intervention is required to prepare the Habanero 1 well for use as the injection well during future Habanero reservoir testing.
- Geodynamics announced the sale of the jointly-owned Rig 200 to Pangaea Resources Pty Ltd for A\$21 million. Under the terms of the agreement the sale is not due to complete until 30 September 2012.

***The Company's cash position at the end of the quarter stood at \$35.1 million.***

*Cover: Rig 100 at dawn during Habanero 4 drilling  
This page: Grass on the Gibber Plain at sunset*



## Letter to Shareholders

Dear Shareholder

Steady progress has been made during the quarter at the Habanero 4 well which was spudded on 9 March and reached target depth of 4,204 m just before midnight on 22 August. Operations will now focus on completing the well. As the newest well of the Innamincka Deeps Joint Venture project, Habanero 4 is intended to be a production well which will power the commissioning and trial of our Enhanced Geothermal System through the one megawatt pilot plant atop the known reservoir at Habanero.

Habanero 4 is one of the most technically challenging wells that will be drilled in Australia this year, given its depth, the high pressure, high temperature environment and the geological formations involved. Reaching the final stages in the drilling program is a solid achievement for a well of this size and complexity, and I am proud of the well quality the team has achieved to date and our commendable safety performance during this time of significant operations.

With any major drilling program, safety is a paramount consideration in terms of employee health and lost productivity. I am pleased to report that there have been no lost time injuries, which is a credit to our drilling team and contractors. The result is a great achievement and one the Geodynamics' team will work hard to uphold.

The drilling campaign has not been without operational delays. At the start of the quarter our schedule was impacted when we encountered a hard surface layer known as "duricrust" and also as a result of operations to repair and replace surface equipment. Most recently we experienced operational delays in the reverse cementing operation for the 251 mm (9<sup>7</sup>/<sub>8</sub> inch) casing undertaken in the 311 mm (12<sup>1</sup>/<sub>4</sub> inch) diameter hole section, before resuming drilling in the final hole section.

Despite this there have been incremental improvements in operations that represent a step forward on previous campaigns. For example, extensive engineering preparation has led to increased drilling speed, enhanced bit life performance and greater reliability and continuity of drilling operations through improved drilling mud performance. These are improvements we can carry into subsequent well designs to deliver cheaper wells in future campaigns. I encourage you to read more about our progress to date in our operations update and, in particular to review details on the Australian first reverse cementing operation undertaken at Habanero 4 including how the operation differs from conventional cementing.

Regrettably the operational delays incurred throughout our drilling campaign, have seen the overall cost of completion for the Habanero 4 well increase beyond our agreed budget expenditure with our joint venture partner, Origin Energy. As a result of the well not meeting pre-agreed cost and performance milestones, Origin Energy have advised they will make no further contribution to the cost of completing the well with Geodynamics to fund further progress. Geodynamics is well funded to complete the well and carry the incremental cost of Origin's decision to cease participation within existing funding and we look forward to progressing the planned testing and demonstration program including the trial of the 1 MWe Habanero Pilot Plant later in this financial year.

During this quarter, we were pleased to advise shareholders of the sale of Rig 200, due to complete 30 September 2012, to Australian-based Company, Pangaea Resources, for a total cash consideration of A\$21 million. Last year we advised shareholders that we would seek to rebuild our cash resources through internal measures as well as reduce costs so that the business remains viable in a challenging economic environment. Securing these funds will further strengthen our balance sheet along with the sale of Rig 100, the settlement of the Habanero 3 insurance claim, the successful renegotiation of terms of the Renewable Energy Demonstration Program (REDP) funding grant and capital raising undertaken earlier this year.

With strong investor interest in the progress at Habanero 4, we are pleased to provide you with greater insight into our operations through this quarterly report. We will continue to provide update announcements as we focus on completing the remainder of our proposed well and testing program. As always, your feedback or questions are welcome.

**Geoff Ward**

Managing Director and Chief Executive Officer





# Operations Update

## *Innamincka Deeps Joint Venture Update*

### **HABANERO 4 DRILLING CONTINUES**

Drilling of the Habanero 4 well continued in the 12 ¼ inch diameter hole section and was at a depth of 4,007 metres at the end of the quarter.

Post the reporting period, the 12 ¼ inch well section was completed to a depth of 4,026 metres and cased and cemented using a reverse cementing process.

The reverse cementing operation undertaken at Habanero 4 is technically significant given the depth, volume, temperature and mud weight involved. It is the first time a reverse cementing process has been carried out in Australia, the first high pressure, high temperature operation of this type undertaken in Australasia and one of the deepest and longest continuous reverse cementing operations undertaken in the world.

The decision to undertake reverse cementing was a key recommendation arising from the Habanero 3 well failure findings and the procedure, while not commonly undertaken for conventional wells, is designed to enhance overall well safety and integrity of the Company's high pressure high temperature (HPHT) geothermal wells.

As previously reported, the Habanero 3 investigation determined the most probable cause for well failure was the combination of caustic fluids on the outside annulus of the casing combined with cyclic high temperatures during production testing resulting in a condition of caustic (stress) corrosion cracking. Our revised cementing design at Habanero 4 minimizes the presence of caustic fluids and provides a strong structure for the well before moving into the final drilling section.

Operational delay was encountered during the completion of the cementing operation, primarily due to drilling out cement encountered higher than anticipated inside the casing and as a result of additional cementing work required to ensure the well is able to withstand the higher pressure loads that will be created during stimulation.

As a result of the cumulative delay encountered, the total cost to complete the well and associated stimulation and open flow test activities is now estimated to be approximately \$50 million, an increase of \$1.5 million or 3% compared to the maximum authorised expenditure of \$48.5 million agreed with joint venture partner, Origin Energy.

In line with the agreement between the joint venture partners that the well had to achieve interim cost and technical milestones and maintain the final estimated cost of the well within the agreed budget, Origin Energy has advised it will not contribute further to the well costs. Geodynamics is now responsible for ongoing risk and cost of the well. Origin retains the right to elect to resume paying its full contribution to the well cost and return to full participation in the well at any stage. Geodynamics has no knowledge of Origin's intention with respect to this right at this time. The incremental cost to Geodynamics as a result of the increased final well cost and Origin's decision to cease further participation in the well is estimated to be approximately \$2.76 million.

At the time of writing the well had drilled through the final 216 mm (8½inch) hole section reaching target depth of 4,204 m. Geodynamics is currently preparing to complete the Habanero 4 well.

*Night shift at Habanero 4,  
moving casing.*



# Reverse Cementing

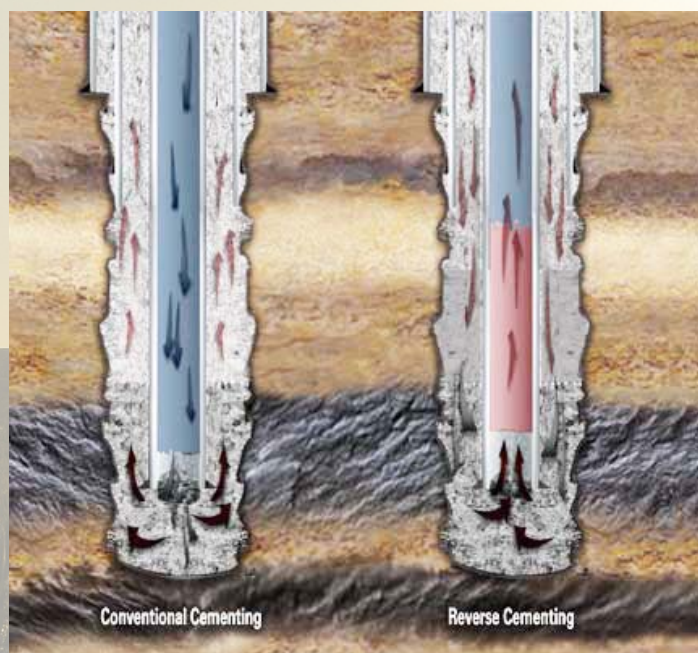
*A conventional cement job circulates cement down the inner bore of the casing and up the outside. This is known as forward circulation. A reverse circulation cement job does just the opposite.*

## **REVERSE CEMENTING AT HABANERO 4**

A reverse circulation cement job circulates the liquid cement slurry down the space between the casing string and the wellbore wall to the basement of the well with the return flow of drilling fluid traveling up the inside of the casing. The complexity of a reverse job is increased because the level to which the cement returns inside the casing cannot be measured during the operation.

In certain circumstances, a cement job performed in the reverse direction offers critical advantages over the conventional forward circulation. The Habanero 4 well for instance, has an extremely high temperature at the bottom of the well. This high temperature, approximately 240°C, requires the addition of chemical retarders to enable forward circulation. However these same additives that enable circulation through the high temperature region prevent the cement from setting in the much cooler shallow regions of the wellbore. This was determined to be a contributing factor to the casing failure at Habanero 3.

To overcome the problem cement is pumped in the reverse direction. This allows for placement with only the minimal amount of retarding chemical included in the cement. Progressively less retarder is used in the cement in the upper sections of the well, as only the first portion of the cement slurry actually sees the maximum temperature in the bottom of the well.





# Operations Update

## **WORKING SAFELY**

A pleasing achievement since commencing drilling at Habanero has been operating without any major health and safety incidents. Overall safety standards have been excellent, even improving on prior performance. In the twelve months to date, Geodynamics' company-wide total recordable injury frequency rate (TRIFR) has reduced to zero.

TRIFR is the ratio of recordable injuries per million hours worked, where the recordable injury types include those which require medical treatment or cause lost time or restricted work duties.

## **STIMULATION AND FLOW TESTING PREPARATIONS**

Preparation for the stimulation and testing of Habanero 4 has continued during the quarter. The overall program of testing and stimulation has been agreed and the reservoir testing plan has been reviewed by an external expert. Detailed operational procedures, risk assessments and safety plans for the testing and stimulation are now being finalised.

The seismic network is currently being reconfigured, adding eight extra seismic stations to improve coverage of micro-seismic activity during stimulation.

A magneto-telluric (MT) survey over Habanero was also undertaken. This survey is designed to investigate whether MT data can detect the extension of the reservoir during stimulation. The survey was run and funded by the South Australian Centre for Geothermal Energy Research (SACGER).

Preparations for surface facilities to support the stimulation and flow testing program have progressed significantly in the last quarter. Contracts have been awarded for stimulation pumping services, camp services, dam earthworks and piping construction.

The approvals process with the South Australian regulator, the Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE), is progressing well, with dam works and piping activities now approved.

A dam has been constructed and lined near Habanero 2. This dam will hold the water required for stimulation of Habanero 4 and will later be used to store brine produced from the well.

## **HABANERO 1 EVALUATION CONCLUDED**

After considerable evaluation, Geodynamics is pleased to report that the existing Habanero 1 well can be used as the injection well for closed loop flow from Habanero 4 with minimal intervention. The evaluation process included an extensive risk assessment attended by Origin Energy and DMITRE to review and consider advice from international metallurgy experts, detailed corrosion modelling, casing load analysis and wireline logs in order to ascertain the condition of the downhole components.

Plans and preparation are now underway to update the Christmas tree and remove the plug currently in place.

## **SALE OF RIG 200 ANNOUNCED**

In June, Geodynamics and Origin Energy agreed to the sale of Rig 200 to Australian-based Company, Pangaea Resources Pty Ltd, for a total cash consideration of A\$21 million.

Under the terms of the agreement the sale is not due to complete until 30 September 2012. During this period Pangaea may elect to withdraw from the sale. Pangaea has paid a deposit of A\$1 million that will be forfeited if Pangaea elect to withdraw from the sale.





# Exploration Projects

## *Innamincka Shallows Joint Venture Update*

### **REVIEW OF SHALLOWS PROGRAM**

The Innamincka Shallows exploration program was designed to assess the Hot Sedimentary Aquifer (HSA) potential of the Cooper Basin geothermal resource. Data obtained from oil and gas well campaigns within the region had indicated the tenement acreage was prospective for geothermal energy production from HSA. If sufficient permeability or flow capacity at temperatures greater than 135°C could be achieved, then the Shallows HSA project would offer an alternative pathway for potential commercial geothermal development.

The first 'shallows' geothermal exploration well, Celsius 1, was drilled in 2011. The well provided excellent temperature results, slightly higher than anticipated at 145°C but reservoir permeability was significantly below target.

Results of the well have been further evaluated and Origin Energy, as operator of the Innamincka Shallows Joint Venture, has completed a detailed review of regional seismic and well data with the objective of determining an alternative viable target locations for drilling and testing.

The results of these studies concluded that there is a low probability of encountering adequate permeability with high enough temperatures for commercial geothermal development. The joint venture has agreed that no additional exploration wells will be drilled in the immediate future.

*The local dingo observing  
the morning activities at  
Geodynamics' camp*





## Government Relations

### **LEGISLATION PASSES**

During the quarter, the Clean Energy Finance Corporation (CEFC) legislation was passed. The legislation is to set up a \$10 billion green investment bank for clean energy projects.

### **APPOINTMENT OF GEODYNAMICS' NON-EXECUTIVE DIRECTOR, ANDREW STOCK, TO CEFC BOARD**

Post the reporting period, the Federal Government confirmed the appointment of Ms Jillian Broadbent AO as the chair of the CEFC Board for a five-year term and announced the appointments of Mr Michael Carapiet, Mr Ian Moore, Ms Anna Skarbek and Geodynamics' Non-Executive Director, Mr Andrew Stock, as members of the CEFC Board each for a five-year term.

The commercially orientated CEFC will facilitate greater private sector investment in renewable energy, low-emissions technology and energy efficiency and is a key part of the Federal Government's Clean Energy Future package, working alongside the carbon price, the Renewable Energy Target and the Australian Renewable Energy Agency (ARENA) to transform our economy to cleaner energy sources.

### **APPOINTMENTS TO ARENA BOARD**

Post the reporting period, the Australian Centre for Renewable Energy program under which Geodynamics' \$90 million federal government grant is administered was consolidated within ARENA and key board appointments were announced including Greg Bourne as Chairman. Ivor Frischknecht has been appointed Chief Executive Officer of the new agency.

Established in July 2011 to support renewable energy technology innovation, ARENA aims to improve the competitive nature of these technologies in Australia and to increase the country's supply of renewable energy.

### *How to hear more about Habanero*

The Geodynamics team is excited to have reached target depth at Habanero 4 and we are proud of the excellent safety record achieved during a period of such intense activity.

If you would like to hear more about upcoming work and what's been achieved, tune into our other channels below to keep up with the latest news from Geodynamics.

#### **BOARD ROOM RADIO INVESTOR UPDATE**

**URL:** <http://www.brrmedia.com/asx/GDY/geodynamics-limited/>



Shortly we will send an invitation to listen to Geoff Ward, Managing Director and CEO, discuss the execution of Habanero 4 and the completion of the drilling campaign, as well as, outlining upcoming objectives and milestones of the project.

The audio cast will be archived on our website.

#### **FOLLOW OUR ANNOUNCEMENT TWEETS**

 [@GeodynamicsLtd](https://twitter.com/GeodynamicsLtd)

#### **ASK YOUR QUESTIONS OR SEND FEEDBACK**

We welcome shareholder inquiries at [info@geodynamics.com.au](mailto:info@geodynamics.com.au)



*Mr Geoff Ward, Managing Director and CEO*





# Investor and Public Relations

## **GEODYNAMICS' 2012 ANNUAL GENERAL MEETING**

The date and venue is now confirmed for the 2012 Annual General Meeting:

**Date:** Thursday, 29 November 2012

**Time:** 6:00pm – 8:00 pm

**Venue:** Marriott Hotel, 515 Queen Street, Brisbane, QLD 4000

This year's AGM will also be broadcast live via an interactive webcast to provide more shareholders the opportunity to participate.

An invitation to attend the meeting or participate via webcast will be mailed to shareholders during October along with the Notice of Meeting.

## **2012 ANNUAL REPORT DISTRIBUTION**

Many of our shareholders have communicated their preference to receive documents via email and to access reports online, enabling Geodynamics to make a significant saving in production costs.

With a continued move to electronic reporting and our ongoing commitment to reduce the cost of producing, printing and posting annual reports, Geodynamics will again publish this year's annual report through our website ([www.geodynamics.com.au](http://www.geodynamics.com.au)) as the default distribution method.

Shareholders who wish to opt in to receive documents electronically should register their communication options via Computershare Investor Services Pty Limited's web portal at:

[www.computershare.com.au/easyupdate/gdy](http://www.computershare.com.au/easyupdate/gdy).

You may also visit the portal to elect to receive a print copy of the report.

## Useful Terms

TERM	DEFINITION
<b><i>Duricrust</i></b>	Accumulation of silica precipitation in sands close to the surface of the Habanero area. These kind of siliceous crusts are the result of deep weathering, solution and precipitation of silica close to a former groundwater level triggered by evaporation. The duricrust forms a very hard layer.
<b><i>Magneto-telluric (MT) survey</i></b>	An electromagnetic method used to map the spatial variation of the Earth's resistivity by measuring naturally occurring electric and magnetic fields at the Earth's surface. The MT survey can pick up where the fluid is moving in the reservoir.
<b><i>Closed loop flow testing</i></b>	The system for testing the circulation of brine through the reservoir up the production well and back into the reservoir through the injection well.
<b><i>Open loop flow testing</i></b>	The system used for testing the flow of reservoir fluid (brine) from the production well.
<b><i>Stimulation</i></b>	The process of injecting high-pressure water to enlarge and extend existing fractures in the underground reservoir to improve productivity or injectivity.



**Geodynamics welcomes  
Dick Smith to site**

*The Geodynamics team was pleased to host Australian entrepreneur Dick Smith and his accompanying party recently at Habanero.*

*During his visit Dick toured site operations inspecting the 1 MWe Habanero Pilot Plant and Rig 100 that is currently drilling the Habanero 4 well.*



Left: Dick Smith, in front of Rig 100 at Habanero 4  
Background: Dick Smith descending Rig 100



# Corporate Directory

## **BOARD OF DIRECTORS**

Mr Keith Spence  
(Non-executive Chairman)

Mr Geoff Ward  
(Managing Director and CEO)

Dr Prame Chopra  
(Alternate Director for Mr Minesh Dave)

Mr Minesh Dave  
(Non Executive Director)

Mr Bob Davies  
(Non-executive Director)

Dr Jack Hamilton  
(Non-executive Director)

Mr Michel Marier  
(Non-executive Director)

Mr Andrew Stock  
(Non-executive Director)

## **JOINT COMPANY SECRETARIES**

Mr Paul Frederiks FCPA FCIS FAICD  
Mr Tim Pritchard CPA

## **PRINCIPAL AND REGISTERED OFFICE**

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## **BANKER**

Westpac Banking Corporation

## **AUDITOR**

Ernst & Young

## **SOLICITOR**

Thomsons Lawyers

## **SHARE REGISTRY**

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## **SECURITIES EXCHANGE LISTING**

Geodynamics Limited shares are listed on the  
Australian Securities Exchange, ticker: GDY