QUEENSLAND ombudsman

The Underground Coal Gasification Report



An investigation into the approval and oversight of the Kingaroy underground coal gasification project.

September 2012

Report of the Queensland Ombudsman

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Foreword

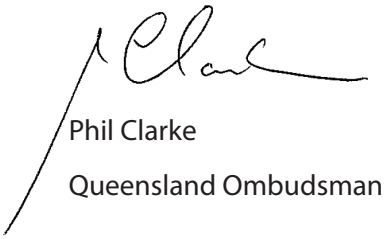
This report presents the findings of an investigation by my Office into the issuing of an environmental authority for an underground coal gasification pilot project outside Kingaroy, including the associated conditions for the project and the monitoring of that project up to 30 June 2010. The project was shut down by the then Department of Environment and Resource Management in July 2010. The shut down, together with various other aspects of the project, are the subject of ongoing litigation between the project operator and State agencies.

This report particularly focuses on the application of existing regulatory frameworks, designed to cater for familiar or standard projects, to situations where novel or emerging technologies are being piloted or trialled. It highlights the challenges faced by regulators in trying to establish sound conditions in environmental authorities for such projects, particularly where they are associated with potentially significant and/or uncertain environmental impacts. The investigation also highlights the difficulty experienced by agency officers trying to collaborate with their colleagues in other agencies, particularly to access expert advice.

In deciding to present the report to the Speaker for tabling in Parliament under s.52 of the *Ombudsman Act 2001*, I have given thorough consideration to the public interest in environmental regulation generally and to the current issues surrounding extracting gas from underground coal deposits, as well as to the release of the report in relation to the ongoing litigation. In my view, there is a significant public interest in disclosing the matters detailed in the report to allow informed public discussion and debate of the matters under consideration, rather than waiting for the finalisation of litigation (which may be a significant time away).

I consider the publication of this report will assist the agencies concerned to improve their procedures and practices and ensure that a more robust environmental regulatory framework is applied in the future for novel or emerging technologies that involve potentially significant and/or uncertain environmental impacts.

I wish to thank all of the agency staff who assisted the investigation and particularly pay tribute to my officers for their hard work and professionalism in conducting the investigation and preparing the report.



Phil Clarke

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19 September 2012

The Honourable Fiona Simpson MP
Speaker
Parliament House
George Street
BRISBANE QLD 4000

Dear Madam Speaker

In accordance with s.52 of the *Ombudsman Act 2001*, I hereby furnish to you my report, *The Underground Coal Gasification Report: An investigation into the approval and oversight of the Kingaroy underground coal gasification project*.

Yours faithfully

Phil Clarke
Queensland Ombudsman

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Dictionary

Assessing officer	The EPA officer who processed and advised on the application for an environmental authority in relation to the Kingaroy project.
Assessment report	A report completed by the EPA assessing officer recommending the conditions for the environmental authority.
CAC	Coordinated Assessment Committee of the EPA and its successor department.
CSG	Coal seam gas.
DEEDI	The former Department of Employment, Economic Development and Innovation. DEEDI was responsible for granting MDLs and mining leases between March 2009 and April 2012, taking over these functions from the former DME. DEEDI was replaced by the DNRM in April 2012.
DEHP	The Department of Environment and Heritage Protection. DEHP was created in April 2012 with similar environmental functions to its predecessor, DERM. Prior to March 2009, DERM's functions were exercised by the EPA. These departments are responsible for administering the EP Act.
DERM	The Department of Environment and Resource Management. DERM was formed in March 2009 out of the former EPA, and was succeeded in April 2012 by the DEHP. These departments are responsible for administering the EP Act.
DME	The Department of Mines and Energy. The DME was responsible for granting MDLs and mining leases prior to March 2009. It was succeeded by DEEDI and then the DNRM.
DNRM	The Department of Natural Resources and Mines. The DNRM was created in April 2012 and is responsible for granting mineral development licences and mining leases. Its predecessor departments include DEEDI and DME.
EIS	Environmental Impact Statement.
EIS guideline	The guideline developed by the EPA to guide decisions on whether an application for an environmental authority requires an EIS.
EIS requirement decision	A decision made by an EPA officer about whether an application for an environmental authority requires an EIS.
EIS trigger checklist	A template checklist to assist the CAC to make an EIS requirement decision.
EMP	Environmental Management Plan.
Environmental authority	An authority issued for a mining activity under Chapter 5 of the EP Act.
EPA	The Environmental Protection Agency. The EPA was responsible for administering the EP Act prior to March 2009, when it was replaced by DERM.
EP Act	*Environmental Protection Act 1994 (Qld)*.
Hydrogeological report	A report prepared by the project operator under the conditions of the environmental authority for the Kingaroy project.
ISP	The Independent Scientific Panel appointed by the former government to advise on UCG policy.

ISP Report	A report released by the ISP on 24 January 2011 titled *Summary of considerations and recommendations on the Environmental Evaluations of Cougar Energy*.
Kingaroy project	A UCG project operated near Kingaroy, Queensland, by the project operator.
MDL	A mineral development licence issued under Part 6 of the MR Act.
MR Act	*Mineral Resources Act 1989 (Qld)*.
P&G Act	*Petroleum and Gas (Production and Safety) Act 2004 (Qld)*.
P&G Unit	The Petroleum and Gas Unit of DERM.
PFL	A Petroleum Facility Licence under Part 3 of the P&G Act.
Project operator	Cougar Energy Limited.
Report to the CAC	A report prepared by an EPA officer about the application for an environmental authority by the project operator in relation to the Kingaroy project, and sent to the CAC.
UCG	Underground coal gasification. The process of converting coal to a gas at the site of the underground coal seam.

Introduction

Underground coal gasification (UCG) is a process of converting coal to a gas at the site of the underground coal seam. In 2010, there were three UCG projects operating in Queensland: one near Chinchilla, one near Dalby, and the newest project operated by Cougar Energy (project operator) near Kingaroy (Kingaroy project). The investigation was an autopsy-style review of a specific portion of this last project: that is, the approval and oversight of the project by the relevant departments.

In January 2011, the Independent Scientific Panel (ISP), a panel of experts appointed to advise the former government on UCG policy, released a report in relation to the environmental evaluations of the Kingaroy project (ISP report). The ISP report called into question a number of aspects of the project, including the sufficiency of baseline data collection and the adequacy of groundwater monitoring.

In response to the ISP report and media reports, I commenced the investigation into the administrative actions of the relevant agencies in approving and monitoring the Kingaroy project.

The investigation considered the administrative actions of the Department of Environment and Heritage Protection (DEHP) (formerly the Department of Environment and Resource Management (DERM) and the Environmental Protection Agency (EPA)) and the Department of Natural Resources and Mines (DNRM) (formerly the Department of Employment, Economic Development and Innovation (DEEDI) and the Department of Mines and Energy (DME)). These agencies were involved in approving the Kingaroy project, including issuing the relevant approvals, as well as monitoring compliance by the project operator.

Questions have been raised over the suitability of the Kingaroy site for a UCG pilot project. It was the ISP's view that

> ... the location of the [project operator] trial in the Kingaroy region was not optimal. The local hydrogeology indicates considerable underground complexity and potential for preferential flow of groundwater. This information was contained in the consultant's report that was available to [the project operator] (and therefore potentially to government) at the time of approval. It is unclear why the trial was not located in a more simple hydrogeological setting, which was available not too distant from the existing site. The complexity of the aquifers and strata surrounding the test chamber are not competent to contain potential, and as it turns out actual, fluid flows potentially containing contaminants.[1]

The decision to locate a UCG project on the Kingaroy site was also commented on unfavourably by at least two DEHP officers during this investigation. However, the question of site suitability is a matter of expert opinion and was not considered in this investigation.

The investigation focused only on the administrative actions of the relevant departments in approving the Kingaroy project, issuing the relevant environmental authority and monitoring the project up to the point at which the project operator notified DERM on 30 June 2010 of groundwater contamination. After this notification, DERM's role moved into a different phase: that of responding to a contamination event and considering any breaches of the conditions of the environmental authority attached to the project.

The events after 30 June 2010 were not considered in the investigation and are not discussed in my report. These events are currently the subject of litigation.[2]

I do not have jurisdiction over private companies such as the project operator. Accordingly, the investigation and this report focus only on the administrative actions of the relevant departments. I have not considered the adequacy, lawfulness or legitimacy of any actions

1 *Summary of considerations and recommendations on the Environmental Evaluations of Cougar Energy,* 24 January 2011, p.7.
2 I have made non-publication orders under the *Ombudsman Act 2001* in relation to material prepared for the purposes of the investigation.

taken by the project operator and nothing in my report should be taken as reflecting adversely on this company.

The investigation included an in-depth review of DEHP and DNRM documents relating to the Kingaroy project. Investigators also conducted interviews with current and former DEHP and DNRM officers, as well as scientific experts.

Ombudsman jurisdiction

The Ombudsman is an officer of the Queensland Parliament empowered to investigate complaints about the administrative actions of Queensland public sector agencies.

As Queensland Government departments are 'agencies' for the purposes of the *Ombudsman Act 2001,*[3] it follows that I may investigate the administrative actions of:

- DEHP (formerly DERM)
- DNRM (formerly within DEEDI).

Under the Ombudsman Act,[4] I have authority to:

- investigate the administrative actions of agencies on complaint or on my own initiative
- make recommendations to an agency being investigated about ways of rectifying the effects of its maladministration and improving its practices and procedures
- consider the administrative practices of agencies generally and make recommendations, or provide information or other assistance to improve practices and procedures.

The Ombudsman Act outlines the matters on which the Ombudsman may form an opinion before making a recommendation to the principal officer of an agency.[5] These include whether the administrative actions investigated are unlawful, unreasonable, unjust or otherwise wrong.[6]

Although the Ombudsman is not bound by the rules of evidence,[7] the question of the sufficiency of information to support an opinion of the Ombudsman requires some assessment of weight and reliability.

The standard of proof applicable in civil proceedings is proof on the balance of probabilities. This essentially means that, to prove an allegation, the evidence must establish that it is more probable than not that the allegation is true.

Although the civil standard of proof does not strictly apply in administrative decision-making (including the forming of opinions by the Ombudsman), it provides useful guidance.[8]

"Unreasonableness" in the context of an Ombudsman investigation

It is important to note that, in expressing an opinion under the Ombudsman Act that a department's administrative actions or decisions are "unreasonable", I am applying the meaning of the word in the context of the Ombudsman Act. In this context, "unreasonable" bears its popular or dictionary meaning, not the far narrower "Wednesbury" test of unreasonableness, which involves a consideration of whether an agency's actions or decisions were so unreasonable that no reasonable person could have taken them or made them.[9]

3 Section 8(1), Ombudsman Act.
4 Section 12, Ombudsman Act.
5 Sections 49 and 50, Ombudsman Act.
6 Section 49(2), Ombudsman Act.
7 Section 25(2), Ombudsman Act.
8 See *Minister for Immigration and Ethnic Affairs v Wu Shan Liang* (1996) 185 CLR 259 at 282. See also the discussion in R. Creyke, and J. McMillan, *Control of Government Action – Text, cases and commentary, 2nd edition*, LexisNexis Butterworths, Australia, 2009, at 12.2.20.
9 See *Re Hospital Benefit Fund of Western Australia Inc* (1992) 28 ALD 25 at 42 for a discussion of statutory unreasonableness.

Publication of report

There are presently three court actions ongoing in relation to the Kingaroy project. I have carefully considered whether to publish my report in light of the ongoing court proceedings.

As noted above, I have limited my discussion to the events that occurred before 30 June 2010. This avoids discussion of matters directly relevant to the issues presently before the various courts.

In reaching the decision to publish my report, I have considered the strong public interest in the issues addressed in my report. The public has a clear interest in novel or emerging technologies being effectively regulated.

Many of the issues raised in my report may well have application beyond the regulation of UCG. Therefore, my analysis contributes to the public discussion of the environmental regulation of UCG and other novel or emerging technologies.

Having carefully considered this issue, I have determined that the public interest in publishing my report outweighs the arguments in favour of not publishing my report. I have therefore decided to table my final report in the Parliament.

Chapter 1 – Underground coal gasification in Queensland

What is underground coal gasification?

UCG is a process of converting coal to a gas at the site of the underground coal seam. During this process, wells are drilled into the coal seam. Oxygen or air is then introduced to burn the coal underground, and the resulting gases are transported to the surface for processing or transport.[10]

The UCG process provides access to coal without the need to mine it and process it through a surface gasification plant. The UCG process has been described as follows:

> In the UCG process, injection wells are drilled into an unmined coal seam, and either air or oxygen is injected into the cavity. Water is also needed and may be pumped from the surface or may come from the surrounding rock. The coal face is ignited, and at high temperatures and high pressures, this combustion generates hydrogen, carbon monoxide, carbon dioxide, and minimal amounts of methane and hydrogen sulphide. These products flow to the surface through one or more production wells.[11]

Both the UCG process and the coal seam gas (CSG) process produce gas from coal seams through wells drilled into the coal seam. However, while UCG converts the coal to gas through a process of partial combustion, CSG extracts methane gas which is naturally occurring within the coal seam by reducing the groundwater pressure.[12]

The use of UCG technology in Australia is in its infancy. The first UCG project in Australia commenced in 1999 and there have been a total of three trial projects in Australia, all based in Queensland. However, none involves commercial scale operations. Commercial scale UCG sites for power generation have been operating in the former Soviet Union for over 40 years.[13]

Summary of responsibilities of different agencies

In Queensland, two separate government departments currently have responsibility for approving and regulating UCG projects.

The current and former incarnations of the departments at the relevant times are shown in the following table:

Area of regulation	December 2007 (lodgment of application)	March 2010 (commencement of gasification)	September 2012 (date of this report)
Environmental regulator	EPA	DERM	DEHP
Mining regulator	DME	DEEDI	DNRM
Water regulator	DNRW	DERM	DNRM

DEHP is responsible for administering the *Environmental Protection Act 1994* (EP Act). DEHP was created in April 2012 with similar environmental functions as its predecessor, DERM. DERM was formed on 26 March 2009 as a result of the amalgamation of the former Department of Natural Resources and Water (DNRW) and the former EPA. The DEHP and its predecessors were responsible for monitoring the UCG pilot projects, and in particular the environmental impacts of their activities on land, groundwater, air quality and local communities in accordance with the EP Act.

DNRM was also created in April 2012 following the change in government. The new DNRM administers a range of Acts relating to the mining, petroleum and gas industries, including

10 Lawrence Livermore National Laboratory, *Best Practices in Underground Coal Gasification*, page 13 (draft version).
11 Lawrence Livermore National Laboratory, 2007, Fire in the Hole, *Science and Technology Review*, pp. 13-18 viewed on 4 April 2012, https://www.llnl.gov/str/April07/pdfs/04_07.2.pdf.
12 Department of Environment and Resource Management, Cougar Energy UCG incident – update (7 July 2011) viewed on 4 April 2012, http://www.derm.qld.gov.au/environmental_management/ucg/q-and-a.html.
13 L.Walker, 1999, Underground Coal Gasification: A Clean Coal Technology Ready for Development, *The Australian Coal Revie*w, viewed on 4 April 2012, http://www.cougarenergy.com.au/pdf/AustCoalReviewPaperOct1999.pdf.

the *Mineral Resources Act 1989* (MR Act), *Petroleum Act 1923* and *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act). It is responsible for granting mineral development licences (MDL) and mining leases. Its predecessor, DEEDI fulfilled these functions from March 2009. Prior to the creation of DEEDI in March 2009, the former DME fulfilled these roles.

Within this report, agencies will be referred to by the name they operated under at the relevant time. For events prior to March 2009, the EPA, DNRW and DME will be used as appropriate. For events between March 2009 and May 2012, DERM and DEEDI will be used. For events after that time, DEHP and DNRM will be used.

UCG projects in Queensland

Three pilot UCG projects have been approved in Queensland.

One project began operating near Chinchilla in 1999 and now includes a gas to liquid plant for processing the gas produced by the UCG process.

A second project was operating approximately 50 km west of Dalby. This project commenced operations in 2008 and included an onsite power station which is used to supply electricity to the local power grid. This project ceased operation in March 2012.

Neither of these projects was considered in the investigation.

The third project, operated by Cougar Energy near Kingaroy, is the subject of this report. An environmental authority was granted by the EPA on 30 April 2008 and the underground gasification commenced in March 2010.

In February 2009, the government released its *Underground Coal Gasification Policy* stating that, while the three pilot UCG projects already underway in Queensland would be allowed to continue, during the pilot phase of the three projects there would be no further UCG pilot projects allowed on "public interest" grounds. These grounds were not specified.

The policy of the current government in relation to UCG has not been considered in this report.

The Kingaroy project

The Kingaroy project is located on Mineral Development Licence number 385 within the former Shire of Kingaroy (now part of the South Burnett Regional Council). The project is operated by the project operator on private farming land. The Kingaroy project was intended to convert approximately 20,000 tonnes of coal to gas over a period of two to three years.

The site of the Kingaroy project is approximately 10 km south-east of the Kingaroy township.

According to DERM records at the time, the land surrounding and within the MDL was predominantly used for rural agricultural activities, including cropping and grazing. DERM understood that many of the farms in the area used groundwater for stock watering and in some cases for drinking water.

Key events within the Kingaroy project timeline were as follows:

Date	Event
22 August 2007	Preliminary meeting between the project operator and officers of the regional EPA office
5 November 2007	Pre-lodgement meeting between EPA officers, the project operator and their consultants
6 December 2007	The project operator lodges an application for a MDL with the DME
7 December 2007	DME officers forward a copy of the application for the environmental authority to the EPA

18 December 2007	The EPA's Coordinated Assessment Committee determines that no EIS process will be required
30 April 2008	The environmental authority is issued by the EPA
26 March 2009	The EPA and the DNRW are amalgamated to form DERM, while the DME is merged into the new DEEDI
Between 4 December 2009 and 26 April 2010	Responsibility for the project oversight is transferred from the regional DERM office to the DERM Petroleum and Gas Unit in Brisbane
12 March 2010	DERM receives the project operator's Groundwater Assessment and Impact Study report
15 March 2010	Underground coal was ignited and the underground coal gasification process commenced
20 March 2010	The gasification was shut down by the project operator due to blockages in both the injection well and the production well and did not recommence
30 June 2010	The project operator advised DERM that benzene had been detected at a level of 2 parts per billion (ppb) in groundwater samples taken on 11 and 27 May 2010
April 2012	Machinery of government changes result in DERM's environmental functions being given to the DEHP, and the former DEEDI's functions for mining regulation and the former DERM's responsibilities for water being given to the new DNRM.

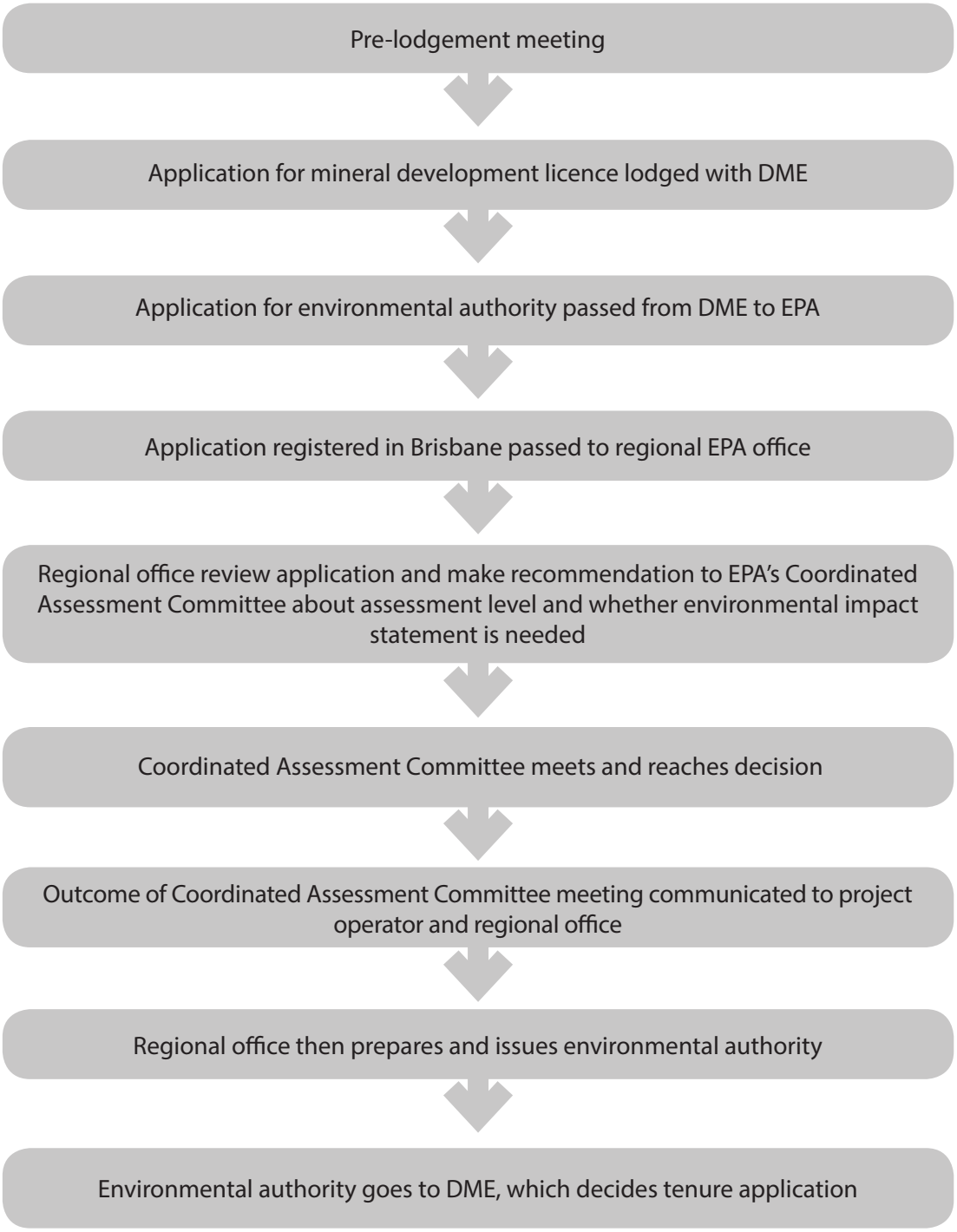
After 30 June 2010, DERM's oversight of the project moved into a different stage as it responded to alleged breaches of the environmental authority. On 17 July 2010, DERM issued a notice to the project operator requiring the operator to conduct or commission an environmental evaluation. As at the date of this report, there is ongoing litigation between DEHP and the project operator about various matters relating to the Kingaroy project.

Chapter 2 – The application for the environmental authority

The process of applying for an environmental authority is set out in the EP Act. Chapter 5 of the EP Act contains the provisions in relation to environmental authorities for mining activities, including activities under a MDL. Chapter 5A of the EP Act relates to petroleum and gas activities.

The initial work involved in establishing a UCG project involves exploration for coal which is converted to gas as part of the project. Coal is a mineral and therefore exploration and development of coal falls under Chapter 5 of the EP Act.

The basic process in relation to environmental authorities for mining activities under Chapter 5 at the time of the Kingaroy project was:



The application for the environmental authority

On 6 December 2007, the project operator lodged an application for an MDL under Part 6 of the MR Act with the former DME. The following day, DME forwarded a copy of the application for an environmental authority and relevant documents to the EPA.

From the EPA's perspective, UCG was a novel technology in Queensland. Although the language used by the project operator differs somewhat, it is clear that EPA officers considered the Kingaroy project to be a pilot or trial. The fact that it was a novel technology had some bearing on the adequacy of steps taken by the EPA to process the application.

The assessment level decision

The first step in processing an application for an environmental authority is for a decision to be made regarding the level of assessment required (the assessment level decision). In December 2007, there were two possible assessment levels for projects involving MDLs:

- standard applications
- non-standard applications.

If a project was considered to involve a non-standard application then a second decision was necessary as to whether an Environmental Impact Statement (EIS) was required (referred to by EPA officers as the EIS requirement decision).

In December 2007, assessment level decisions about MDLs were made by the EPA's Coordinated Assessment Committee (CAC), a body created to ensure consistency of decision-making across the various regional EPA offices in Queensland. The members of the CAC were usually a number of senior EPA officers. However, at that time, the CAC consisted of only one EPA officer.

The EPA assessing officer was required to complete a template report to provide information about the possible environmental impacts of the proposed project to the members of the CAC to ensure they were suitably informed when making their decisions (report to the CAC).

In the case of the Kingaroy project, the assessing officer recommended that the project be classified as Non-Standard (Level 1, non-code compliant environmental authority) with no EIS required. This recommendation was adopted by the CAC.

As will be discussed below, in circumstances where the report to the CAC highlighted areas of potentially high or unknown environmental impact, I have concerns about both the decision not to require an EIS and also the adequacy of the EPA's policy on the circumstances in which an EIS is required.

In this case, in addition to completing a template report, the EPA assessing officer also prepared another template document called an EIS trigger checklist to assist the CAC in making the EIS requirement decision. Relevantly, the template checklist contained a paragraph stating:

> If no criteria are triggered, this does not provide an exemption from having to prepare an EIS if the administrating authority or EPA Minister considers that there may be a significant environmental impact, or there is a high level of uncertainty about the possible impacts, or there is a high level of public interest in the proposal.

Therefore, pursuant to the EIS trigger checklist, an EIS may be required for any projects that the EPA or the responsible Minister considered had a significant or uncertain environmental impact or high level of public interest.[14]

14 Notwithstanding this, no DEHP officer spoken to as part of the investigation was aware of any departmental process which would have alerted the responsible Minister to the existence of this project to enable them to make a decision to require an EIS.

However, the EIS trigger checklist went on to state that "for exploration permits or mineral development licences, the current policy is not to require an EIS." These two separate provisions in the EIS trigger checklist do leave a question in relation to potential MDL activity that may have a significant or uncertain environmental impact.

A further document relevant to the consideration of this matter is the then EPA Guideline 4 "Deciding the level of impact assessment for the mining industry" (EIS guideline). It stated:

> Projects with the potential for relatively high environmental impact and/or a high level of uncertainty regarding the possible environmental impacts and/or a high level of public interest and/or State or national significance, will be required to prepare an EIS under the EP Act.

However, the EIS guideline also stated:

> It should be noted that the trigger criteria have been developed for mining leases only and do not apply to exploration permits or mineral development licences. It is the current policy of the EPA not to require an EIS for exploration. No triggers have been developed specifically for mineral development licences. An EIS would only be required for a mineral development licence application under the EP Act if a preliminary assessment as described in the previous paragraph indicated that there was a high probability of a significant impact on a matter of State or national significance.

In the circumstances, the EIS guideline does not add any clarity to the issue. In fact, I am concerned that it further complicates matters in that the EIS guideline moves from a list of up to four criteria that may warrant an EIS (mentioned in the first extract) to only referring to one criteria, namely State or national significance (in the second extract). Further, there exists an inconsistency between the EIS guideline, which does allow for an EIS for MDLs (albeit in very limited circumstances), and the EIS trigger checklist, which does not.

As noted above, the assessing officer recommended that the project be classified as Non-Standard (Level 1, non-code compliant environmental authority) with no EIS required. This recommendation was adopted by the CAC.

I consider that the report to the CAC raises questions about the potential environmental impact of the project, or at the very least uncertainty about the possible impacts. I note in particular that the report stated:

> The proposed activity is not common. As such, there are some unknowns regarding potential impacts of the project, and there is limited information to support theory, demonstrate that the process works well in practice, and to enable the proponent to accurately predict impacts.

Further, the report to the CAC also indicated an expected high-level of impact on:

- water quality
- water discharges
- hydrology
- groundwater
- liquid waste
- land erosion/stability
- land rehabilitation
- subsequent land use.

A medium-level of impact was identified for:

- air pollution
- compatibility with surrounding uses/activities
- community views and neighbours' opinions.

An unknown level of impact was identified for "contaminated land".

Despite the template form requiring details of any identified impacts, no information was provided in respect of the above listed impacts.

The report to the CAC also noted that "there may be some community concern regarding the proposal". However, I note that it would have been difficult for the CAC to assess whether there was a "high level of public interest" in the project under the EIS guideline, because at that time there was no public knowledge of the proposal.

No further information was included in the report to the CAC about the expected environmental impact of the project. The absence of such detailed further information created a risk that the decision would be made on inappropriate or incorrect assumptions.

Having regard to the matters detailed above, I have a number of concerns in relation to the assessment level decision.

Firstly, I am concerned that the procedural framework does not sufficiently provide for MDL activities that have a potentially significant or highly uncertain environmental impact. I have concerns about the policy expressed in the EIS guideline of only requiring an EIS for an MDL where there is a high probability of a significant impact on a matter of state or national significance. I consider that in certain circumstances this test is simply too high and does not adequately account for a MDL, albeit one of a small scale, that has the potential to have significant environmental impact or where its impacts are sufficiently uncertain. This in my view is particularly relevant for situations involving novel or emerging technologies, or those previously unused in Australia, where there is an unknown risk or high risk of environmental impact. In my view, the policy is inadequate to provide environmental protection in such situations.

Secondly, I am concerned in relation to the lack of clarity in the existing procedural framework concerning MDLs and EISs. I have identified above inconsistencies between the EIS trigger checklist and the EIS guideline. I consider that these inconsistencies make it difficult for assessing officers and decision-makers to understand what is required, particularly in a case of a novel or emerging technology. The lack of an appropriate checklist or other guidance that could be used in assessing the Kingaroy project exposed a weakness in the EPA's decision-making processes.

Finally, while I stopped short of finding that an EIS should have been obtained, I do have some concerns in relation to how the assessing officer and the CAC had confidence in reaching the view that no EIS was required. While the problems that I have discussed above are likely to have contributed to this situation, it is not clear that sufficient consideration in this case was given to:

- the expected high level of impact on a range of environmental values
- the uncertainty about the nature and extent of possible impacts on the environment
- the expected community concern with the project.

In my view, the assessment did not adequately consider the intersection between the use of a novel or emerging technology and the lack of knowledge about environmental impacts.

Agency response

In response to my proposed report, the Director-General of DEHP submitted that:

> …in the context of mining activity, MDLs are small-scale projects and are designed to allow mining at the pilot scale to check the commercial viability of the mineral. It is unlikely that they would be of a scale that would trigger an EIS.

In response to the Director-General's submissions, I note that while the scale of the activity may be one relevant consideration, environmental impact may nevertheless be significant in a small one-off project. The UCG process undertaken at Kingaroy

(which involved the underground burning of coal and the generation of contaminants) is something quite different, for example, to a standard low impact expository mineral sampling exercise. I remain of the view that the scale of the project (or the pilot nature of it) should not be the sole determining factor for an EIS where potentially significant and/or uncertain environmental impacts are associated with a pilot activity.

The Director-General also submitted that the decision to permit a limited number of UCG operations on a pilot basis was a decision of the then Queensland Cabinet and that Cabinet put in place arrangements to inform it and the agencies involved including by commissioning the ISP. The Director-General also correctly noted that Cabinet decisions cannot be the subject of an Ombudsman investigation.

The investigation does not in any way seek to question a decision of Cabinet. I note that the events surrounding the assessment level decision in relation to the Kingaroy project occurred in late 2007, more than 12 months prior to the announcement of the Queensland government's Underground Coal Gasification Policy which resulted from a Cabinet decision. This policy, dated 18 February 2009, imposed limitations on future UCG operations in Queensland, but did not play a part in providing initial permission or conditions for any of Queensland's three UCG operations to commence. In fact, two of the three projects had already commenced operations and the third, the Kingaroy project, had already been issued an environmental authority (in 2008). The UCG policy confirmed that those existing projects could continue. It is instead the EPA's assessment process that is the subject of the investigation.

The Director-General also submitted that an EIS would not have altered the outcome of this project, and that:

> It is not correct to suggest that only a complete EIS process provides a full and adequate assessment of the environmental risks of any given project. While an EIS process provides an opportunity for public comment, it does not necessarily provide a more thorough examination of a project's scientifically achievable merit.

In response, I note that I have not found that an EIS would have altered the ultimate outcome of this matter. My concern relates to the adequacy of the assessment. An EIS provides a process for considering the environmental impacts of a project, as well as community input. While there may well be other methods of conducting an assessment to a similar level of scrutiny, no such methods were adopted in relation to the Kingaroy project. In my view, it is essential that there is an appropriate method available that allows for the scrutiny of potentially significant and/or uncertain environmental impacts associated with a pilot activity, or for novel or emerging technologies.

Having regard to the above, I form the following opinions and make the following recommendations:

Opinion 1

In the case of the Kingaroy project, the department's policies and procedures failed to adequately provide guidance in relation to the appropriate assessment level for novel or emerging technologies with potentially significant or highly uncertain environmental impacts, particularly in the area of MDLs.

Opinion 2

The inconsistency between the EIS trigger checklist and the EIS guideline meant that it was not clear whether an EIS could be required in relation to an MDL that identified areas of significant impact or unknown risks.

Opinion 3

The default position that EISs are not required for MDLs despite identified areas of significant impact or unknown risks, was unreasonable within the meaning of s.49(2)(b) of the *Ombudsman Act 2001*.

Recommendation 1

The Director-General of DEHP amend the department's EIS trigger checklist and the EIS guideline to ensure that its policy position is clear on whether an EIS could be required in relation to an MDL that identified areas of significant impact or unknown risks.

Recommendation 2

The Director-General of DEHP review the department's policy to ensure that the position in relation to MDLs is consistent with the position in relation to other applications: that is, that areas of significant impact or unknown risks for MDL applications can be taken into account in determining whether an EIS is required.

Recommendation 3

The Director-General of DEHP develop specific and detailed material to guide officers in responding to applications for novel or emerging technologies.

The Coordinated Assessment Committee

During the investigation, DEHP officers advised that the future of the CAC is unclear.

Prior to the CAC's creation, decisions were made by regional offices responsible for assessing the applications. The CAC was created to ensure consistency in decision-making between different EPA officers.

DEHP officers have reported that the operation of the CAC is under review due to the departure of the experienced officers who used to form the CAC. One officer reported to the investigators, "all the experts we used to rely on aren't there anymore". At the time of conducting interviews with agency officers, a single officer was responsible for making the decisions previously made by the CAC.

Queensland residents and businesses looking to operate in Queensland have a reasonable expectation that DEHP will make consistent decisions regardless of which office is responsible for the decision.

As a matter of good public administration, an agency should ensure that there are adequate measures in place to ensure consistent decision-making. This can be achieved through a central decision-making body such as the CAC or by other processes such as detailed guidelines to guide decisions.

Agency response

In response to my proposed report, the Director-General of DEHP supported the continuation of the CAC, with increased regional representation on a rotational basis.

I form the following opinion and make the following recommendation:

Opinion 4

There should be a process in place to achieve consistency in decision-making in relation to assessment level decisions between different regional offices, whether through the use of the CAC or another approach.

Recommendation 4

The Director-General of DEHP ensure there is an adequate process to achieve consistency in decision-making in relation to assessment level decisions between different regional offices.

Chapter 3 – The development of the environmental authority

On 19 December 2007, the project operator was advised that the application for an environmental authority would be assessed as a Non-Standard application but an EIS would not be required for the application. The EPA assessing officer then began the process of developing the conditions for the environmental authority, which had to be issued to the project operator before it could commence the UCG process.

In issuing the environmental authority, the EPA was required to assess any potential or actual environmental impacts associated with the project and develop and impose conditions to prevent or minimise any environmental impact.

Once an environmental authority is issued, the conditions of that authority are binding.

In my view, it is essential that appropriate and adequate conditions are imposed in environmental authorities, particularly for novel or emerging technologies. As the effects and risks of novel or emerging technologies may not be clear at the time of application (when the conditions are established), in my view this requires the department to develop conditions that facilitate comprehensive monitoring to ensure that environmental effects are identified at the earliest possible time.

Agency response

In response to my proposed report, the Director-General of DEHP noted that officers must exercise their power within the terms of the relevant statutory provision.

I agree with that statement.

However, I also note that a pilot project is an opportunity for the regulator to learn about the environmental effects of a novel or emerging technology, and how best to regulate those effects. This can only be done by having a comprehensive monitoring program in place, and through placing appropriate conditions on the project to facilitate this monitoring.

I form the following opinion:

Opinion 5

As the effects and risks of novel or emerging technologies may not be clear at the time of application, DEHP officers should take care to draft adequate and appropriate environmental conditions that facilitate comprehensive monitoring.

EPA officers used a number of sources to draft conditions.

As a starting point, the Environmental Management Plan (EMP) submitted by the project operator included proposed environmental authority conditions.

In addition, the EPA had a number of standard conditions available on its electronic database to assist officers who were preparing environmental authority conditions. However, during the investigation concerns were raised that these standard conditions had not been reviewed recently and were unsatisfactory, resulting in individual officers having to rewrite the standard conditions on an ad-hoc basis. One regional manager stated his office was working to develop its own set of standard conditions because of inadequacies with those on the electronic database.

It was suggested to investigators that greater consistency and better conditions could be achieved by ensuring the standard conditions were periodically reviewed and updated in consultation with agency officers state-wide. I agree with this view. This practice will increase the likelihood that consistent conditions will be placed on projects initiated in different regions. It is difficult to see why projects approved in one region should be the

subject of more stringent conditions than those approved in another region if all other things are equal. It is far more desirable to have a single set of standard conditions across the state. This appears to be the approach intended by the EPA (and now DEHP) by maintaining standard conditions on its electronic database and it would be unfortunate if this approach lapsed because the database conditions were not maintained.

In my view, DEHP should ensure that all standard conditions are reviewed at least annually. Such a review process will also give DEHP officers confidence in the conditions, and remove any perceived need for individual officers or regions to draft their own standard conditions. Accompanying guidelines could also set out the limits for application of the standard conditions.

Agency response

In relation to my proposed report, the Director-General of DEHP noted that the department is currently engaged in various projects relating to model conditions. He also stated that:

> Nevertheless, standardised conditions would be of limited benefit to novel or emerging technologies for the reasons stated above. Moreover, the accumulated knowledge necessary to guide the development of standardised conditions does not yet exist. Standardised conditions, of their nature, would not deal with those parts of that technology which give rise to their novelty. For example, the three UCG pilot sites in Queensland use very different technologies and synthetic gas is used differently at each site resulting in either: a gas to liquids plant; or power generation; or flaring of the gas. Therefore, site-specific assessment is essential in order to accommodate differences in technology even within the same industry.

The Director-General noted that the department has in recent years undertaken work to develop model conditions for common activities. However, he noted that these conditions will have little application for novel or emerging technologies.

In response, I note that my proposed recommendation was not limited to novel or emerging technologies. The discussion above refers to conditions generally, as this was an issue raised with investigators by DEHP officers.

I also note that, for projects where it is difficult to use standard conditions, this should provide an indication to the department of which projects require more comprehensive monitoring. As noted above, in my view novel or emerging technologies warrant a more proactive monitoring process.

The Director-General also noted that its current Greentape Reduction Project would place emphasis on the streamlining, integration and coordination of regulatory requirements, including creating standard conditions for a range of projects.

In relation to the timing of reviews, the Director-General stated:

> [T]he timing of the suggested review is not achievable. Model conditions often require (consistent with Government's obligation to consult) extensive negotiations with stakeholder and industry groups to ensure strong, proportionate and reasonable regulation. A six-month review cycle would mean that model conditions were continually being reviewed, and at the expense of the Department's other tasks and obligations. The Department will continue to update and review conditions as required and as competing priorities permit.

My proposed recommendation set out an initial six monthly review timeframe and an ongoing 12 monthly review cycle. However, I also note that a review does not mean that every condition needs to be rewritten. What is required is an assessment of the condition's ongoing suitability in light of current best practice. This could be done through an internal review, unless significant change was required.

Having said this, I have amended my recommendation so that a specific review

timetable is not included. However, this places the obligation on the Director-General to allocate sufficient resources to ensure that this review continues to be conducted on a regular basis.

In the circumstances, I form the following opinion and make the following recommendation:

Opinion 6

Well-drafted, appropriate conditions, subject to regular review, would assist in achieving greater consistency and improved quality in environmental authorities issued across Queensland.

Recommendation 5

The Director-General of DEHP should:

(a) conduct a review of the department's standard conditions for environmental authorities as soon as possible to ensure they are consistent with known best practice

(b) institute a process for a regular review of these conditions by experienced assessing officers and legal advisers to ensure that they remain consistent with current best practice

(c) develop guidance for the department's officers on how to apply the standard conditions to novel or emerging technologies, including the limits of such standard conditions.

Access to expertise

The development of each environmental authority may require consideration of a range of possible impacts on the environment to develop the appropriate conditions. For example, on a single environmental authority, knowledge may be required concerning noise pollution, airborne contaminants, stormwater management, land subsidence, and dam construction.[15] In order to properly set conditions, an understanding of the particular activity to be regulated is required.

It is unreasonable to expect that individual assessing officers will have sufficient knowledge and expertise to adequately draft conditions covering all possible impacts on the environment for all possible environmentally relevant activities without access to expert advice. It is essential that officers drafting environmental authorities have access to expertise. Such advice may be sourced from within the department, if suitable experts exist, from the broader public sector, or from the private sector.

In early 2008, at the time the Kingaroy project environmental authority was issued, the EPA was using a project team approach to assessing applications for environmental authorities. The usual process was for the assessing officer as the designated project manager to work with the project director to identify the particular areas of expertise required to prepare the conditions. The officers then contacted internal experts who had the necessary expertise to join the project team.

Both the assessing officer and project director recalled difficulties in their attempts to form a team for the development of conditions for the Kingaroy project. These difficulties related both to locating officers who had the appropriate expertise and having these officers join the project team given their other responsibilities. Particular difficulties were noted in locating groundwater expertise within the EPA.

15 The definition of environmentally relevant activities which an EPA officer may be assigned to deal with can be found at s.18 of the EP Act.

Other DEHP officers generally reported difficulties in identifying internal expertise and problems associated with relying on personal networks in the absence of any departmental list of expertise.

In addition, during this investigation several officers noted the recent significant loss of expertise from within DEHP, with experienced officers retiring or leaving the public sector for positions in the mining, petroleum and gas industries. According to senior DEHP officers, it is difficult for the public sector to compete with the private sector in terms of attracting and retaining expertise.

The departure of experienced staff should be a matter of concern for DEHP. For a regulatory agency whose officers need significant experience to engage in regulatory activity to achieve agency goals, the loss of expert staff has significant ramifications.

DEHP managers described a number of strategies that are currently being used to overcome the difficulties associated with the departure of experienced officers, including consultants hired on a standing offer basis, scholarships for university students and the use of external consultants. This will be an ongoing issue for DEHP to grapple with.

However, it is essential that the environmental regulator have in place a method for identifying and accessing expertise, whether internal or external to the department. It would be unreasonable to expect DEHP officers, particularly those in regional offices, to rely on personal networks to know where to source relevant expertise.

Agency response

In response to my proposed report, the Director-General rejected the contention that agency officers rely only on their personal networks to access internal expertise. He stated:

> Where an assessment officer does not know how to access expert advice, they are encouraged in first instance to speak to their immediate supervisor who is reasonably expected to be able to identify (or seeks means of identifying) the appropriate source of expertise in the Department as a number of business units have advertised and instituted 'request for service' processes to better promote and manage access to expertise. Previous experience with a "roster of experts" approach has resulted in officers placing themselves onto a centralised list, but that process became unmanageable due to the need to verify the qualifications of staff and address disputes arising from addition to, or omissions from, the list.

The Director-General also noted that the department is presently considering the consolidation of internal expertise as part of the Machinery of Government changes (for example, some scientific staff formerly of DEHP have been transferred to a newly-created Department of Science, Information Technology, Innovation and the Arts (DSITIA)). The new DSITIA would provide centralised access to expertise to assist with the department's regulatory functions. However, he acknowledged that arrangements for accessing this knowledge are yet to be put in place.

In my view, it is incumbent on the Director-General, as head of the department, to ensure that officers have access to the necessary expertise. This may include enabling access to experts in other government agencies, and ensuring that this access is readily available to officers when needed. A Memorandum of Understanding may be required to facilitate this access.

The Director-General also submitted that officers sometimes call on external expertise, and that it is sometimes more convenient and cost-effective to do so. He also noted that departmental access to experts is compounded by the increasing movement of experienced and highly-skilled staff towards the private sector to perform similar roles for higher levels of remuneration. He stated:

Methods for attracting and retaining staff in the current economic climate are being considered and implemented across government.

While I appreciate the difficulty associated with a loss of expertise to the private sector, in my view it does not absolve the Director-General from the responsibility to provide his officers with access to expertise, however this is done. If sufficient expertise is unable to be retained internally, then this expertise will have to be accessed through alternative arrangements with external persons as required.

On the basis of the above discussion, I form the following opinions and make the following recommendation:

Opinion 7

Assessing officers should not be expected to rely on personal networks to access expertise for advice on conditions for environmental authorities.

Opinion 8

As head of the environmental regulator, it is the Director-General's responsibility to ensure that expertise is available to officers when assessing applications for environmental authorities. If such expertise is not available within the department, it must be sought from across the broader public sector or the private sector.

Opinion 9

The Director-General should continue to address the issue of developing and retaining expertise in key areas.

Recommendation 6

The Director-General of DEHP establish a mechanism to ensure that officers have access to the necessary expertise to properly assess applications for environmental authorities.

Once appropriate expertise is located, the method by which that expertise is accessed must be adequate and appropriate for the situation.

DEHP officers reported that there are presently no guidelines as to how officers should seek expertise from other work units or from outside the department.

It is clear from evidence on the Kingaroy project file and interviews with DEHP officers that an informal process of emailed requests for comment or review was used in 2008. Officers from one work unit explained that more recently they have been using formal work request forms to obtain specialist advice from other work units, however this procedure is not in place across the entire department.

I am concerned that an informal method of requesting expert advice may result in uncertainty.

The following example from the Kingaroy project illustrates my concerns.

The issue of groundwater contamination was identified by the EPA as a key potential environmental impact from the very start of the process of assessing the application for an environmental authority.

The project operator submitted a draft EMP in around November 2007 which was reviewed by EPA officers. An email dated 12 November 2007 from an EPA officer to the project operator (to provide feedback on the draft EMP) noted:

> Groundwater:
>
> -To date the EM Plan has not been reviewed by someone within the EPA who has skills and experience relevant to groundwater. However, as flagged during the pre-design meeting, the EPA will expect detailed groundwater information to be submitted with the application (which will be reviewed by an appropriate person) to demonstrate that the proposal will not adversely affect groundwater quality and where applicable, the users of this groundwater.
>
> Geology:
>
> As per groundwater. A detailed description of the geology of the site will need to be provided with the application.

On 1 April 2008, the assessing officer received an email from another EPA officer providing feedback on the draft conditions and asking if officers from the then DNRW had reviewed the draft conditions relating to groundwater. The email stated that "groundwater contamination seems to be one of the main environmental issues". At this stage the assessing officer had not been able to locate any groundwater expert.

That same day the assessing officer contacted an officer at the nearest DNRW office in Bundaberg and arranged to send a request for advice through to that office. During the investigation, the Bundaberg DNRW officers were asked about their expertise in relation to the groundwater concerns relevant to the Kingaroy project. They explained that their knowledge and expertise was in relation to planning, management and monitoring of groundwater, rather than groundwater hydrogeology or the movement of contaminants in groundwater: they were groundwater managers, not groundwater scientists.

EPA officers appeared to be operating under the view that the DNRW officers were "groundwater experts". However, the investigation found no evidence that the EPA staff had asked DNRW staff if they had expertise in the specific area in which the advice was sought (that is, groundwater science).

On 2 April 2008, the assessing officer emailed DNRW seeking advice on groundwater issues. The email noted that the project operator was still drilling to determine where the UCG plant would be within the tenure area. It also stated "this is quite a new process in Australia and as such there are a fair few unknowns re the process and potential impacts. The EPA has particular concerns regarding what impacts the proposal may have on groundwater." A copy of an incomplete assessment report and draft conditions for an environmental authority were provided, as well as the EMP.

In her email the EPA assessing officer stated that she would greatly appreciate the DNRW officer's input regarding the proposed conditions, the groundwater resources in the area and whether he had concerns regarding the potential impacts of the proposed activities on the groundwater.

Both DNRW officers recalled reviewing the EMP and identifying concerns regarding the information it contained.

However, the senior DNRW officer did not recall commenting on any specific environmental authority conditions. He was not sure what assistance the DNRW officers could have been in reviewing the draft conditions as they had no experience in the process of setting or reviewing conditions, nor with the UCG process.

It appears there was a lack of a common understanding between the relevant EPA and DNRW officers regarding the expertise of the DNRW officers and the extent of the advice being sought by the EPA officers.

The EPA officers believed they were obtaining crucial advice on the proposed environmental authority conditions from groundwater experts, and used the word "conditions" in that context. However, DNRW officers were providing comments not in relation to the adequacy of the environmental authority conditions, but the actual conditions of the groundwater and the description of these conditions in the EMP.

This example demonstrates the pitfalls in the use of an informal review process to obtain expert advice on conditions. This approach appears to still be used by DEHP. In my view, an informal review process is inadequate for projects involving novel or emerging technologies or for unusual projects where significant drafting of new conditions may be required. In such situations, I am of the view that a better approach would be to require a more formalised, supported decision model, where more than one officer is involved in decision-making about the conditions of a project. The CAC model may achieve this goal if it is in place. However, I note that at the time of the investigation, the CAC consisted of a single officer.

What is important is the access to expert opinion and the necessary breadth of opinion. Obviously, for common projects with standard conditions, less expertise will be required. Conversely, for novel or emerging technologies with conditions necessary to address high or unknown risks, greater access to experts and more shared decision-making should be utilised.

In my view, the informal method of requesting assistance during the Kingaroy project resulted in unclear communication between officers in relation to draft conditions, leaving uncertainty as to whether the draft conditions had been fully reviewed and amended for the particular project. What is required is procedures to guide DEHP officers on how to seek expertise from other officers within the department or those external to the department, including an assessment of their specific field of expertise and a careful consideration of the scope of any advice received.

Agency response

In response to my proposed report, the Director-General of DEHP submitted:

> Different officers will often have different views and approaches to matters such as those identified. Likewise, different fields of expertise have their own limitations and boundaries.
>
> So far as knowledge of contaminant migration is concerned, this is a notoriously difficult field and one about which, especially where groundwater is concerned, even the most experienced and qualified experts often differ. Movement of groundwater contaminants is a very specialised field.
>
> The Department has, since the issues the subject of the Proposed Report arose, employed an officer with a PhD in underground transport contamination to assist with this aspect of UCG regulation.
>
> A lack of clear communication is unlikely to have had an impact on the outcome in the situation with which the Proposed Report is concerned. The incident related to infrastructure failure, rather than insufficiency of the groundwater monitoring network, which did, in the result, detect the contaminant movement in the groundwater in a timely manner.
>
> There was, therefore, no failure to address relevant matters and no unreasonableness.

The Director-General also submitted:

> The lack of understanding between staff may have impacted upon the development of conditions. Although more prescriptive groundwater conditions might have been imposed, that is unlikely to have altered the result in this situation. The incident arose from infrastructure failure, rather than any insufficiency of the groundwater monitoring network, which did (it should be noted) detect the contaminant movement in the groundwater in a timely manner.

I disagree with this view. The Director-General's contention (that there was no failure to address relevant matters and no unreasonableness because the ultimate problem with the Kingaroy project was infrastructure failure) simply misses the point. My concerns are with the method of determining conditions, particularly for novel or emerging technologies with potentially high or uncertain risks. The explanation that the project failed due to infrastructure failure does not excuse an inadequate assessment and conditioning process.

My concern is that no one with expertise in groundwater science had input into the setting of the conditions for the environmental authority in a situation where several agency officers, including the officer responsible for conducting the assessment and preparing the conditions, believed it was necessary to obtain that input.

I note that the department has already moved to address a lack of expertise by employing a groundwater contamination expert.

The Director-General noted that the present system includes the assessing officer producing a report and a delegate reviewing this report and making a decision.

Whether this is sufficient may depend on the complexity of the project, the access to expert advice and the experience of the officers involved. The department should have a process in place for greater access to experts and more shared decision-making where the nature of the project demands greater oversight.

Finally, the Director-General stated that:

> Access to the advice alluded to in the proposed recommendation was arranged by Cabinet. It appointed an Independent Scientific Panel to provide advice on UCG and its feasibility (technical and otherwise) in Queensland. That panel provided advice (including to Cabinet).

Cabinet's decision to appoint a scientific expert panel was detailed in the UCG policy published in February 2009, and the panel was appointed in September 2009. Again, I note that my concerns relate to the process of obtaining expert advice during the period prior to the granting of the environmental authority in 2008.

In light of this discussion, I form the following opinions and make the following recommendation:

Opinion 10

The method by which expert advice was sought on the Kingaroy project was flawed in that there was no common understanding between the relevant EPA and DNRW officers as to:

- the expertise of the DNRW officers
- the advice required by the EPA officers
- the responsibility of the DNRW officers in providing assistance to the EPA officers.

The failure to address these matters constituted administrative action that was unreasonable within the meaning of s.49(2)(b) of the *Ombudsman Act 2001*.

Opinion 11

The lack of common understanding between the relevant EPA and DNRW officers about the nature and scope of the advice being sought meant that EPA officers did not have adequate expert advice about conditions placed on the environmental authority for the management of groundwater impacts.

Opinion 12

A supported decision model should be required for projects involving novel or emerging technologies or for unusual projects where significant drafting of new conditions may be required.

Recommendation 7

The Director-General of DEHP develop a written guideline for officers who require access to expert advice when preparing environmental authorities. This guideline should include instructions for officers on how to:

(a) ascertain the exact nature of the person's expertise

(b) specify the advice required

(c) direct a request to provide that advice

(d) review the advice to ensure that the scope of the advice is as requested.

Chapter 4 – The assessment report and the environmental authority

Assessment report

The assessment report was a structured report prepared by the assessing officer to support the recommendation that an environmental authority be approved subject to listed conditions.

The assessment report was completed by the assessing officer on 30 April 2008. On the first page of the report there was a section which identified some particular concerns.

> **1. Issues**
>
> The proposed activity of underground coal gasification (UCG) is not common. As such, there are some unknowns regarding potential impacts of the project, and there is limited information to support theory, demonstrate that the process works well in practice, and to enable the proponent to accurately predict impacts.
>
> Some of the particular concerns identified relate to:
>
> - The potential for groundwater contamination during and after the UCG, resulting from contact with residual tars that are left underground by the process.
> - Potential for odorous air emissions from the liquid waste, uncertainty in predicting the concentration of odorous compounds (phenols) in the evaporation pond, and dispersion of these and other contaminants to air.
> - Closure/shut down of the UCG and confidence that the combustion of coal underground has ceased.
> - Concerns that, if there is a problem, the process cannot be shut down immediately. While the proponent states that they can extinguish the combustion by closing the injection well and shutting off oxygen supply, they acknowledge that coal may continue to combust for several weeks after this.
>
> The proponent is relying on some information collected for trials in Uzbekistan and Russia, and intends to collect information from the proposed pilot UCG plant to assist with environmental management and any future application for full-scale underground coal gasification.
>
> Linc Energy established (in ~2003) a pilot underground coal gasification project near Chinchilla, Qld. Cougar Energy does not have access to all of the data obtained during this trial, and my understanding is that the EPA does not have a lot of information regarding the outcomes of this trial.

Recognition of possible community concern

Within the assessment report there was recognition of possible community concern in relation to the proposed UCG facility:

> **COMMUNITY**
>
> - Members of the local community may be impacted by, or have concerns relating to, the proposed UCG facility. As mentioned earlier in this report, there are six residences within the MDL. While conditions will be applied to mitigate impacts, there is some potential for nuisance issues (odour, noise) to arise. These may be most appropriately handled by the proponent initially (and then the EPA if not resolved). Residents may also have other concerns. For example, as many of the farms in the area use groundwater for stock watering and in some cases drinking water, they may have concerns regarding effects of the UCG facility on groundwater.

The following page of the assessment report stated:

> There is no formal public notification process required prior to determining this application. The EPA has not been approached by any members of the community with specific concerns regarding this project.

It is not clear what weight was placed on this lack of community concern. However, given that there was no formal public notification required or undertaken prior to the determination of the application for an environmental authority, and therefore no method by which the community would necessarily be aware of the proposal, it would be unreasonable if a lack of any approach by members of the community with specific concerns regarding the project was considered as a positive factor in favour of the project.

Agency response

In response to my proposed report, the Director-General of DEHP stated:

> The Proposed Recommendation makes an assumption about the weight placed upon a factor relevant to the decision-making process.
>
> There is no evidence here to suggest that community concern or an alleged lack of it was a determining factor in either granting or refusing an application. The fact that Cabinet itself made the decision about trialling UCG activities in Queensland on the limited and qualified basis it did suggests that there was, at the very least, a strong public and community interest in such activities being carefully controlled.
>
> The fact a decision-maker might note that there were no public enquiries in relation to an issue does not mean that this factor was given any particular weight. It might simply be a fact. That fact will often be relevant to a decision. The weight to be placed upon it is a matter which (administrative law requires) remain within the discretion of the decision-maker, except in limited circumstances.

My opinion and recommendation are not only related to this specific project, but are a broader statement about the assessment process generally and the extent of any weight which may be placed on a perceived lack of community concern.

There are significant benefits in the decision-maker clearly stating in the reasons for their decision the weight that was placed on the various factors. By simply noting a fact and not explaining the weight placed on it, a decision-maker leaves themselves open to allegations that they have considered irrelevant factors or have incorrectly weighed factors in reaching their decision.

My concern is that the Director-General ensure that where no formal public notification process exists, the lack of any community concern about a project is not a factor that can be assigned any significant weight in making a decision to issue an environmental authority.

I form the following opinion and make the following recommendation:

Opinion 13

In the absence of formal public notification about an application for an environmental authority, it would be unreasonable if a lack of community concern was considered a positive factor in favour of a project.

Recommendation 8

The Director-General of DEHP should ensure that the department's processes to assess applications for environmental authorities do not consider a lack of community concern about a proposed project as a relevant factor in determining the approval of a project or the environmental authority conditions to be applied, in situations where there has not been any formal public notification process.

Issues with the environmental authority

DEHP officers repeatedly expressed the view to investigators that the environmental authority was of a high standard.

However, my review of the conditions of the environmental authority identified several areas of concern, particularly focusing on the conditions relating to the protection of groundwater.

Condition C10-1

Condition C10-1 stated:

> (C10-1) Before commencing underground coal gasification, a suitably qualified person must conduct sufficient hydrogeological investigations and studies to confirm that the selected site is suitable for the proposed use, and prepare and submit a report to the administering authority summarising the findings. This investigation must include:
>
> - The collection of baseline data regarding groundwater quality, volume and connectivity with surrounding aquifers;
> - Investigation of hydraulic pressures of groundwater within and surrounding the coal seam;
> - Confirmation that the layers surrounding the coal seam are sufficiently impermeable to prevent contaminants from migrating beyond the void left by the gasified coal; and
> - Consideration of existing bores located within the vicinity of the site, and a risk assessment of potential impacts on any existing bores within the vicinity of the underground coal gasification.

Condition C10-1 required a suitably qualified person to prepare and submit a hydrogeological report to the administering authority before the project operator commenced the UCG process.

While a desktop hydrogeology report was initially submitted with the EMP, the EPA assessing officer required further work on hydrogeology to be completed before the UCG process commenced.

The assessing officer expressed the view to investigators that the hydrogeological report required by condition C10-1 would be submitted to the EPA in sufficient time for it to be reviewed and any issues or problems addressed before the UCG process began. Her colleagues also expressed the view that the hydrogeological report needed to be assessed and reviewed by EPA officers.

However, condition C10-1 only required that the hydrogeological report be submitted before the gasification commenced. There was no requirement about the length of time prior to the gasification that the report should be submitted.

One senior DEHP officer commented to investigators that the department "...wouldn't want to receive [the hydrogeological report] two days before [the project operator] wanted to start the burn". Unfortunately, that is precisely what occurred.

The hydrogeological report, titled *Groundwater Assessment and Impact Study*, was received by the department on Friday 12 March 2010. Three days later, on Monday 15 March 2010 (the next business day), coal at the bottom of the Well P1 was ignited by the project operator and the UCG process commenced.

At the time the UCG process commenced, no departmental officer with hydrogeology expertise had reviewed the hydrogeological report. It was subsequently reviewed internally and a response highlighting concerns and queries sent to the departmental project officer on 31 March 2010, over two weeks after gasification had commenced. However, it took a further five weeks for the concerns to be forwarded to the project operator. By this time, the UCG process had already been shut down by the project operator.

The importance of reviewing the hydrogeological report before gasification commenced seems clear. Had the hydrogeological report raised significant concerns about groundwater impacts, then the department would have been able to prevent gasification commencing. I note that the ISP made the following comments relevant to the hydrogeology of the site:

> The ISP's view is that the location of the [project operator] trial in the Kingaroy region was not optimal. The local hydrogeology indicates considerable underground complexity and potential for preferential flow of groundwater. This information was contained in the consultant's report that was available to [the project operator] (and therefore potentially to government) at the time of approval. It is unclear why the trial was not located in a more simple hydrogeological setting, which was available not too distant from the existing site. The complexity of the aquifers and strata surrounding the test chamber are not competent to contain potential, and as it turns out actual, fluid flows potentially containing contaminants.[16]

There were obviously some concerns or issues requiring clarification, because departmental emails show that concerns about the contents of the hydrogeological report were still not fully addressed to the department's satisfaction in August 2010, five months later.

I note also that in early November 2007 at a pre-lodgement meeting between the project operator, their consultants and five departmental officers, the project operator advised that a baseline study of groundwater quality would be conducted before the project commenced and contaminants that might be generated by the UCG process included phenols, BTEX (benzene, toluene, ethyl benzene and xylene), and PAH (polycyclic aromatic hydrocarbons). At this meeting, a senior departmental officer queried whether the project operator would be monitoring other groundwater (to ensure that contaminants did not escape beyond the project area). Therefore, it is clear that departmental officers were aware of the potential for groundwater contamination beyond the project area as early as November 2007.

With the benefit of hindsight, several senior DEHP officers believed the hydrogeological report should have been required prior to the environmental authority being issued. This would have permitted the complex report of almost 400 pages to be thoroughly reviewed by an expert in groundwater modelling, as such expertise was not present within the project team at the time.

When asked about how long they believed it would have taken for departmental officers to review the hydrogeological report submitted in purported compliance with condition C10-1, DEHP officers advised investigators that, given other workloads, it would require approximately one month to review such a report, including the groundwater modelling. Any queries about the report's contents would then have to be referred back to the consultant who prepared the report, giving a total time to review the report and engage in discussion with the consultant of up to three months.

16 *Summary of considerations and recommendations on the Environmental Evaluations of Cougar Energy,* 24 January 2011, p.7.

Given that it was intended that the hydrogeological report would be reviewed by departmental officers and any concerns addressed prior to the commencement of the gasification process, in my view condition C10-1 was inadequate because it failed to place adequate time limits on the project operator in relation to the provision of the hydrogeological report to enable the department to review the report before gasification commenced.

Agency response

In response to my proposed report, the Director-General submitted:

> This assertion is incorrect. Condition C10-1, read (as it must be with Condition C10-3) makes it clear that groundwater investigation required by C10-1 is a necessary component of the groundwater monitoring program which was required two months before gasification commences.

The Director-General's assertion that the groundwater monitoring program (C10-3) was to be provided to the department two months before the gasification commenced is not supported by a plain reading of the project conditions, nor by the admissions of DEHP officers at interview. In fact, if the Director-General's interpretation was supported, the department would have failed to monitor and enforce the condition because neither the hydrogeological report nor the groundwater monitoring program were provided until one business day before the gasification commenced.

It was the clearly stated view of departmental officers at interview that the hydrogeological report required by condition C10-1 should have been reviewed by the department prior to the gasification commencing. That the report, of almost 400 pages, was not received until one working day prior to the gasification commencing clearly indicates a weakness in the department's processes.

Even if the Director-General's view regarding the linkage between the hydrogeological report (C10-1) and the groundwater monitoring program (C10-3, discussed below) is correct, there was no requirement within condition C10-3 as to when (or whether) this program should be provided to the department. Condition C10-3 merely required that a groundwater monitoring program be prepared two months before gasification commenced.

Therefore, the project operator could satisfy the conditions by preparing the groundwater monitoring program the requisite two months prior, but not providing anything to the department until the hydrogeological report (C10-1) was provided "before commencing underground coal gasification." This is in fact what occurred: the hydrogeological report (C10-1) was provided to the department one business day before gasification commenced, with the groundwater monitoring program (C10-3) attached.

The Director-General stated that condition C10-1 was not inadequate, and nor was the department's conduct unreasonable, because performance-based conditioning encourages innovation.

The Director-General also stated that:

> Even if gasification had not been permitted until the groundwater report was reviewed, the outcome would not have changed. The incident concerned infrastructure failure, not insufficiency of the groundwater monitoring network. That network did in fact detect the contaminant movement in the groundwater in a timely manner.

I disagree with the Director-General's assertion that the condition was not inadequate, for the reasons outlined in this section.

Further, the assertion that operations ceased due to an infrastructure failure does not validate the department's processes in conditioning and regulating the project.

I form the following opinion:

Opinion 14

Condition C10-1 was inadequate in that it failed to place adequate time limits on the project operator in relation to the provision of the hydrogeological report.

Condition C10-3

Condition C10-3 provided details of what had to be included in the groundwater monitoring program. The purpose of this condition was to enable the department to assess what impact the UCG process was having on the groundwater in the project area.

(C10-3) At least two months prior to commencement of underground coal gasification a groundwater monitoring program must be developed and implemented for the site. The program must:

(a) be developed by a person possessing appropriate qualifications and experience in hydrogeology and groundwater monitoring program design, to be able to competently make recommendations about these matters;

(b) include a sufficient number of "bore(s) of compliance" in locations that will provide early detection of contamination from potential sources of impact (including the underground gasifier); and

(c) provide the following:

(i) representative groundwater samples from the aquifer(s); and

(ii) sufficient sampling to characterise background groundwater quality and levels within the immediate vicinity of the underground coal gasification plant prior to the plant being established; and

(iii) sufficient spatial and temporal replication of samples to make valid conclusions about the presence or absence of contamination or other impact on groundwater down gradient of any potential source of contamination including groundwater passing the relevant bore(s) of compliance; and

(iv) contaminant trigger levels for the detection of contaminant migration from the underground coal gasification or likely material failure of the waste water containment system(s); and

(v) sufficient monitoring of groundwater pressure within the coal seam being gasified and adjacent aquifers to ensure that groundwater pressure within the cavity is maintained such that groundwater does not migrate from areas where the gasification is occurring.

(d) be constructed and sampled in accordance with the requirements of Australian Standard "AS5667.11:1998 "Water Quality Sampling: Guidance on Sampling Groundwaters"; and

(e) be installed, sampled and maintained by a suitably trained and experienced person; and

(f) be reviewed annually by a person possessing appropriate qualifications and experience in hydrogeology and groundwater monitoring.

I am not satisfied that this condition was adequate. DEHP officers with experience in monitoring groundwater levels suggested to investigators that at least 12 months of groundwater monitoring should have been completed prior to the commencement of the underground gasification. In fact, the ANZECC guidelines[17] specify that a minimum of two years of groundwater monitoring has to be undertaken to sufficiently define baseline values for water levels and water quality.[18] This would have allowed for water level information to be obtained that gave some indication of pre-existing variations in the area.

It is noteworthy that while the assessing officer expected there to be discussions between the department and the project operator concerning the groundwater monitoring program, there was in fact no requirement for the groundwater monitoring program to be submitted to the department. The requirement was simply that a program be developed and implemented by the project operator.

These conditions are very different from those relating to air emissions monitoring (conditions B5-1 and B5-3), which required the project operator to submit a draft Air Emissions Sampling and Analysis Program, have due regard to any comment made by the regulator and then submit a finalised program at least three months prior to the commencement of the UCG process. The conditions relating to air emissions monitoring appear to be much more likely to achieve the department's desired outcome than those imposed in relation to groundwater.

I also note that the ISP report commented that:

- there was a lack of sufficient base line information
- more systematic monitoring should have been required and undertaken at the outset
- the "acquisition of better data beforehand would have revealed the complexities of the hydrological situation at Kingaroy before the burn".[19]

The ISP recommended improved groundwater monitoring, stating that:

> A critical factor concerning environmental monitoring, to assist in regulatory and operational control, is the implementation of a comprehensive monitoring scheme to establish background levels of the water chemistry and soil properties. This factor relates to the issue faced by the three companies that have run UCG trials, which is the lack of initial regulatory oversight and structure within which to operate.[20]

In light of this, I am of the view that condition C10-3 was inadequate to achieve the department's purpose of ensuring that it could monitor groundwater impacts.

Agency response

In response to my proposed report, the Director-General of DEHP submitted that while more baseline data would have assisted the assessment process, it would be impractical to expect two years' worth of baseline data.

He also noted that the Kingaroy project was a small-scale pilot project designed to assess whether the industry was viable, within parameters established by Cabinet.

I note that the Director-General accepted that more baseline data would have assisted the assessment process. I have not expressed a view on how much baseline data should have been required, as this is a matter best left to experts. However, condition C10-3 did not specify any level of baseline data required. It is on this basis that I have concluded the condition was inadequate.

17 Australian and New Zealand Environment and Conservation Council, *Australian and New Zealand Environment Guidelines for Fresh and Marine Water Quality*, Paper No 4, Volume 1, October 2000.

18 Golder & Associates, *Groundwater Assessment and Impact Study – Cougar Energy – Pilot Underground Coal Gasification Project*, 2010, p. 73.

19 *Summary of considerations and recommendations on the Environmental Evaluations of Cougar Energy*, 24 January 2011, pp.4-5.

20 *Summary of considerations and recommendations on the Environmental Evaluations of Cougar Energy*, 24 January 2011, p.9.

Further to my previous comments about the timing of the Cabinet decision relative to the setting of the conditions, I note that the parameters set by Cabinet, to which the Director-General refers, included a requirement for 'stringent monitoring' of the projects. The UCG policy stated that the department "will comprehensively monitor the conduct of each UCG trial project, in particular the environmental impacts of UCG activities on adjacent land, groundwater, air quality and rural communities."

The Director-General also implied that C10-3 did require a report to be provided to the department.

I repeat my view above that a plain reading of condition C10-3 shows no requirement that a groundwater monitoring program be submitted to the department.

I form the following opinion:

Opinion 15

Condition C10-3 was inadequate to achieve the department's purpose of ensuring that it could monitor groundwater impacts as it did not specify a baseline data requirement and did not require a draft monitoring program to be submitted for review and comment by the EPA.

Condition C10-4

Condition C10-4 stated:

> (C10-4) As a minimum, groundwater quality must be monitored for the parameters and at the frequency stipulated in Schedule C – Table 2.

Schedule C – Table 2 Groundwater Quality Characteristics to be monitored and monitoring frequency

Quality characteristic	Units	Monitoring frequency
Total Dissolved Salts	mg/L	Monthly
pH	pH units	Monthly
Sulphate	mg/L	Monthly
Fluoride	mg/L	Monthly
Cadmium	mg/L	Monthly
Arsenic	mg/L	Monthly
Lead	mg/L	Monthly
Zinc	mg/L	Monthly
Phenois	mg/L	Monthly
Total Petroleum Hydrocarbons	mg/L	Monthly
Benzene	mg/L	Monthly
Toluene	mg/L	Monthly
Xylene	mg/L	Monthly
Total Polycyclic Aromatic Hydrocarbons (PAH)	mg/L	Monthly
Benzene (a) pyrene	mg/L	Monthly

The environmental authority contained no maximum levels for contaminants within the groundwater. Instead the monitoring program referred to in condition C10-3 was required

to be developed by "a person possessing appropriate qualifications and experience in hydrogeology and groundwater monitoring program design" who would provide the contaminant trigger levels. This had the effect of allowing the project operator's expert advisor to set limits on the "safe" levels of contaminants in the groundwater, particularly as there was no requirement within the environmental authority for the monitoring program to be supplied to the department for review.

Agency response

In response to my proposed report, the Director-General of DEHP advised that DEHP would review the efficacy of this type of conditioning as part of its model condition process. However, he also noted that the condition C10-3 required trigger levels to be developed by a person with appropriate qualifications and experience in hydrogeology and groundwater monitoring program design.

While I note the requirement that the project operator use someone of sufficient expertise to set the trigger levels, I remain of the view that this type of condition is inadequate in a situation where:

- ***the department was faced with a novel or emerging technology***
- ***there were unknown but potentially high impacts expected on groundwater***
- ***local residents used nearby groundwater bores for livestock and possibly drinking water***
- ***there was no mechanism by which the department could review and comment on the appropriateness of the trigger levels before gasification commenced.***

I also note that Schedule B Table 3 within condition B6-6 of the environmental authority sets maximum allowable concentrations for air contaminants. I can see no reason why a similar approach could not have been adopted for groundwater, with trigger levels set by the department or at the least an approach that provided for the department to have oversight of trigger levels set by an expert.

I form the following opinion:

Opinion 16

Condition C10-4 was inadequate in that it permitted the project operator's expert advisor to set limits on the "safe" levels of contaminants in the groundwater, without any oversight by the department.

Condition F3-1

Condition F3-1 stated:

> **Shut down and decommissioning of the underground coal gasification facility**
>
> (F3-1) At least six months prior to cessation of the underground coal gasification trial the environmental authority holder must submit to the administering authority a shut down procedure for the underground coal gasification pilot plant. This procedure must:
>
> - detail steps that will be taken to cease combustion /gasification of coal underground;
> - detail tests that will be completed during and following the shutdown process to confirm that combustion and/or pyrolysis of coal has ceased; and
> - ensure that on shutdown the cavity is flushed using proven processes to ensure removal of residual pollutants.

(F3-2) In finalising the shut down procedure, the environmental authority holder must have due regard to any comments made by the administering authority.

(F3-3) The procedure detailed in Condition (F3-1) must be implemented immediately on cessation of the underground coal gasification trial or if otherwise requested by the administering authority.

This condition required the project operator to submit a shutdown procedure for the UCG pilot plant "at least six months prior to cessation of the underground coal gasification trial" and spelt out what was required to be included in the shutdown procedure.

The assessing officer explained that it was intended that the shutdown procedure would be reviewed by departmental officers and discussed with the project operator.

In contrast to condition C10-1, this condition provided a specific timeframe in which it was intended that the department would be able to review and comment on the project operator's planned shutdown procedure. However, it was based on an expectation that the project would run according to plan: that is, it would run for two to three years.

No shutdown procedure had been submitted to the department when the UCG gasification commenced on 15 March 2010. Therefore, when the project operator shut down the plant on 20 March 2010, this was not in accordance with any planned shutdown procedure approved by the department.

As this was a pilot or trial project of a novel or emerging technology, it would not be unreasonable to expect that the UCG process might need to be shut down before the full two to three year program was completed.

The assessing officer agreed at interview that the department could have required a shutdown procedure to be prepared and submitted to the department six months before the gasification commenced. Amendments could have been made to the shutdown procedure as the project progressed if required. This would have ensured that from the first day that the UCG process commenced there was an approved shutdown procedure ready to be applied when needed.

In my view, condition F3-1 was inadequate in that it failed to require the shutdown procedures to have been prepared prior to the commencement of the UCG process, thereby not allowing for any contingent events, such as an early shut down of the operation.

Agency response

In response to my proposed report, the Director-General of DEHP submitted that the offence provisions of the EP Act and general environmental duties meant that this condition was not inadequate.

He also stated that:

> As a novel and emerging technology, it is difficult to prescribe shut-down procedures ahead of time and without at least some operational experience. Whilst there might be arguments about how, with the benefit of hindsight, the condition might have been improved, that condition, when considered in light of the statutory framework, was adequate.

While I understand that it may be difficult to fully set out the shutdown procedures for a novel or emerging technology without operational experience, the effect of condition F3-1 as written meant that the project operator was not required to have an approved process to deal with a shutdown in other than the last six months of operation. This expectation that the project would continue without problems for the life of the proposed project may well have been an optimistic expectation for a novel or emerging technology.

The effect of this condition was that when the shutdown occurred after less than one week, there were no shutdown procedures approved by the department that could

have been applied.

A better approach would have been to require shutdown procedures to be produced before gasification commenced, which could then be refined as required during the life of the project.

I form the following opinion:

Opinion 17

Condition F3-1 as written was limited in its ability to deal with a shutdown other than in the last six months of project operation. This approach was unreasonable for a novel or emerging technology.

The conditions generally

In my view, the inadequacies with the conditions in the environmental authority for the Kingaroy project led to the UCG process commencing with insufficient oversight from the environmental regulator, particularly as:

- the major groundwater report had not been reviewed
- insufficient baseline groundwater data had been obtained
- the contaminant trigger levels had not been checked
- the department had not been able to comment on any shutdown procedure.

There may well have been other inadequate conditions included in the environmental authority that I did not specifically investigate. For example, despite the conditions relating to air emissions monitoring (conditions B5-1 and B5-3), investigators were informed that the gasification commenced without the air emission sampling program being finalised. The final air emissions sampling program was submitted to the department on 13 August 2010 and the department was awaiting clarification of aspects of the program two months later: seven months after the gasification had first commenced.

Nevertheless, on the basis of the investigation I am satisfied that the department's actions in issuing the environmental authority with inadequate conditions were unreasonable.

Agency response

In response to my proposed report, the Director-General of DEHP stated that the events post-30 June 2010 demonstrated the department's effectiveness in detecting non-compliance and taking swift action to stop ongoing and unacceptable environmental impacts.

He further stated that the proposed recommendation accorded with the department's current practice.

I note that my conclusion about the reasonableness of the department's actions in issuing the environmental authority was formed on the basis of opinions 14 to 17. As these opinions have been formed, I disagree with the Director-General that the department's actions were reasonable overall.

I further note that my discussion relates to the conditioning of the environmental authority, and that any issues of taking action for non-compliance after 30 June 2010 did not form the basis of my conclusion.

On the basis of my discussion in this entire chapter, I form the following opinion and make the following recommendation:

Opinion 18

The department's actions in issuing the environmental authority with inadequate conditions constituted administrative action that was unreasonable within the meaning of s.49(2)(b) of the *Ombudsman Act 2001*.

Recommendation 9

The Director-General of DEHP provide guidance and training to officers to ensure that, in respect of the granting of environmental authorities:

(a) conditions are appropriately drafted and tailored to the desired outcome

(b) the standard conditions are used where they are adequate to achieve the stated purpose, recognising the potential limitations on the application of standard conditions to novel or emerging technologies

(c) advice is sought from experts where necessary on the appropriate conditions for projects involving novel or emerging technologies or high or unknown environmental impacts

(d) conditions enable the department to monitor projects as required by the level of risk of environmental impacts

(e) appropriate timeframes are placed on conditions to ensure that compliance can be assessed as necessary during a project.

Chapter 5 - Notification

The EP Act contains requirements for the public notification of applications for environmental authorities in relation to some projects. For instance, Chapter 3 of the EP Act contains provisions for a public notification process in relation to projects requiring an EIS. The EP Act also requires applications for a level 1 environmental authority in relation to Chapter 5A activities[21] to include a public notification process.

The reasons for having a public notification process are best explained by the department itself in the guideline in relation to public notice requirements for level 1 Chapter 5A activities:

> The public notice process allows the public to have access to information about, and the opportunity to make submissions to the administering authority on, application for or amendment of level 1 environmental authorities (chapter 5A activities).
>
> Public notification is carried out by the applicant and promotes community awareness and understanding of the implications of the application. It allows the public –
>
> (a) To obtain details of applications by taking extracts or making copies of the application;
>
> (b) To make submissions about the application to the administering authority; and
>
> (c) The right of review and appeal regarding the administering authority's decisions on applications about which they have made a submission.[22]

The Kingaroy project fell under Chapter 5 of the EP Act, rather than under Chapter 5A, and therefore there were no specific public notification requirements under the EP Act for this project, and none was carried out.

In addition, departmental officers did not place any requirements on the project operator to notify potentially affected persons.

Although DERM officers agreed to a request to hold a public meeting in August 2009 to brief local residents about the project, this occurred after the approvals were issued and therefore there was no opportunity for potentially affected persons to register any concerns about the project proceeding.

DEHP officers explained at interview that MDLs are usually issued for mining projects where it is intended that mineral samples will be taken and testing done to confirm the viability of a larger scale mining operation, for which a mining lease would then be obtained. The relatively small scale of these mineral development projects and their use of known technologies would usually result in them being classified as not being high risk and as a result no public notification process would occur.

However, I note that in this case the MDL was for the use of a novel or emerging technology. Further, the report to the CAC recorded an expected high level of impact in a significant number of areas including water quality, water discharges, hydrology, groundwater, land erosion/stability, land rehabilitation and subsequent land use. A medium level of impact was expected on other areas such as air pollution, compatibility with surrounding uses/ activities, community views and neighbours' opinions. Although I did not reach the view that the failure to require an EIS in these circumstances was unreasonable because of the department's policy at the time, I am of the view that the department's policy in relation to novel or emerging technologies was not appropriate.

Similarly, I am unable to reconcile these expected impacts with the decision not to notify persons potentially affected by the Kingaroy project.

21 Chapter 5A activities include petroleum and gas activities, geothermal activities and greenhouse gas storage activities.

22 Department of Environment and Resource Management, Guideline – *Public notice requirements and submissions about applications for environmental authorities for level 1 chapter 5A activities* , 11 May 2011, p. 2.

Accountability and transparency in public administration is vitally important in a modern democratic society. Transparency in relation to the risk of environmental harm requires that potentially affected persons be fully informed as to the risk of environmental harm and the potential effects of an activity on their lives.

In my view, the default position should be that notification of potentially affected persons should occur whenever there is a significant risk that property or livelihood (such as farming) may be negatively affected by an activity.

As a matter of natural justice, this would allow potentially affected persons to make submissions about such projects where a decision may adversely affect their rights, property or legitimate expectations.

In my view, the extent of the notification should be based on the amount of information necessary for potentially affected persons to ascertain the nature and likelihood of the risks associated with the activity so that they can make any representations they believe necessary to protect their interests.

This is particularly the case where projects propose the use of a novel or emerging technology or are likely to involve a medium or high level of environmental impact or unknown level of risk, and where potentially affected persons will not be able to find out about the project through other reliable means and therefore would be unable to raise any concerns during the approval process.

Agency response

In response to my proposed report, the Director-General stated that it is not practicable for all resource activities to be publically notified, and that this would impose excessive and onerous regulatory burdens, often with little benefit. He noted that resource legislation already contains landholder notification or consultation requirements.

The Director-General further stated:

> It is important to engage landholders in the EA decision-making process where the environmental impacts of a project directly affect them. This is best achieved at the application/allocation of the mining lease rather than after the resource allocation has been approved. Existing opportunities within the EP Act for community involvement are sufficient and appropriately balance these considerations.

The Director-General also stated that public notification is an existing requirement under legislation in some circumstances.

I accept that, as a general proposition, public notification for all projects may be excessive. However, I consider it is reasonable to provide limited notification to potentially affected persons where there are high or unknown risks associated with the project and it involves the use of a novel or emerging technology.

While notification is required under legislation in some instances, this does not prevent the department from requiring the project operator to identify potentially affected persons and notify them of the application and project proposal. I disagree with the Director-General's assertion that the engagement with potentially affected persons should occur at the time of a mining lease allocation rather than when a MDL is approved. In the Kingaroy project, the activity with the unknown or high risks began after the MDL was granted.

The Director-General agreed to undertake a review of the current policies on notification, including consideration of a default position of public notification for novel or emerging technologies.

I remain of the view that, for novel or emerging technologies with high or unknown risks of environmental impacts, there is a clear case for the notification of potentially affected persons at the time of application and assessment.

This notification may require the department or the project operator to define an 'area of impact' in order to determine who to notify of the project proposal. This is likely to be easier in relation to some impacts, such as air or noise, and may be more difficult in relation to groundwater movements or aquifers. However, in my view it is a key step in the assessment process, regardless of whether it is difficult to undertake.

In my view, the obligation to notify should apply regardless of whether the project is a pilot project or not. The obligation to notify hinges on the expected environmental impacts, rather than the nature of the project itself. The obligation to notify should exist unless the regulator is able to determine that the expected environmental impacts will be low.

In relation to the Kingaroy project, I acknowledge that I am applying this analysis with the benefit of hindsight. However, I consider that this analysis is valid as it is based on the department's own project documentation, such as the report to the CAC which states that the project was expected to have unknown and high environmental impacts despite being at the pilot stage. I see this project as an example of the circumstances requiring the development of general principles in the future.

My conclusions here are consistent with my views above that novel or emerging technologies should be able to trigger the requirement for an EIS process where they involve high or unknown risks. As the EIS process includes notification requirements, notification of potentially affected persons could occur under the EIS process. However, even if an activity does not require an EIS, in my view notification should still occur where there are unknown or high risks. This notification could occur either under amendments to the relevant legislation or through amendments to departmental policy.

I form the following opinion and make the following recommendation:

Opinion 19

Persons who may be impacted by high or unknown environmental risks are entitled to be notified at the time of the project application and assessment. The extent of the information made available should be based on the amount of information necessary for potentially affected persons to ascertain the nature and likelihood of the risks associated with the activity so that they can make any representations they believe necessary to protect their interests.

Recommendation 10

The Director-General of DEHP ensure the department adopts a position of notification of potentially affected persons for all projects proposing the use of a novel or emerging technology and for projects assessed as involving medium and high level environmental impacts or unknown risks.

Public access to information

In addition to the issue of notification of potentially affected persons during the approval process for the Kingaroy project, the issue of public access to information after the project had been authorised to proceed also merits consideration.

After the environmental authority was approved, a local landholder raised concerns about the proposed activity and its effect on the groundwater. Despite his land being within the boundary of the MDL, he was required to pay a fee to obtain a copy of the environmental authority to see the conditions of operation and monitoring requirements established to ensure that environmental impacts from the proposed activity were managed.

It is apparent from letters submitted to departmental officers and the relevant Minister that local residents were keenly interested in the project that had been authorised to commence on or near their properties. As already discussed, I am of the view that persons have a right to information about matters affecting or potentially affecting their rights or interests.

Providing the public with access to environmental authorities would have the dual benefits of enabling community monitoring of compliance with specific environmental authority conditions as well as decreasing the likelihood of complaints about activities which are authorised under the environmental authority.

Other records that in my view should be made available to the public include the EMP submitted by the project operator and the assessment report prepared by the assessing officer.

Agency response

In response to the proposed report, the Director-General noted that the EP Act requires a range of documents that must be made available to the public on request. It also permits the department to charge a fee for doing so, although this fee is often waived when the request comes from a member of the community affected by the project.

The Director-General advised that the department is moving towards making documents proactively available on its website, as is already occurring with level 1 Chapter 5A activities. He also advised that the department encourages companies to make such documents available on their own websites.

Finally, the Director-General noted that the community can obtain such documents under the Right to Information framework.

The availability of documents under Right to Information laws does not have any bearing on my proposed opinion or recommendation, as my concern is that people should not have to resort to these laws (with corresponding fees and delay) to obtain copies of documents directly relevant to their interests.

I am encouraged to hear that the department is moving towards proactive disclosure. However, there is no timeframe for when this disclosure will occur. I therefore maintain my opinion and recommendation, with some amendments, to ensure certainty in when information will be made available. When such a blanket policy of disclosure is put in place, then my recommendation may no longer be necessary.

I form the following opinion and make the following recommendation:

Opinion 20

Copies of relevant project documents including environmental authorities, assessment reports and environmental management plans about approved projects should be made freely available to the public.

Recommendation 11

The Director-General of DEHP ensure copies of relevant project documents including environmental authorities, assessment reports and environmental management plans are freely available to the public.

Chapter 6 – Financial assurance

Under the EP Act, the EPA as the administering authority was able to require a financial assurance to be lodged with it by the project operator. The purpose of the financial assurance is:

> "to ensure that the government holds sufficient money to cover any costs that it may incur to achieve compliance with an environmental authority (mining activities) should the holder be unable to meet the conditions or fail to rehabilitate or restore the environment."[23]

The current DEHP guideline makes it clear that the financial assurance is intended to be available in the event that a project operator prematurely ceases operations or becomes bankrupt and the administering authority is required to arrange for the rehabilitation of the project site.

DEHP was unable to provide a copy of the EPA guideline applicable at the relevant time.

Under s.189 of the EP Act, project operators are required to propose a financial assurance amount as part of the EMP provided to the department. The Kingaroy project operators proposed a financial assurance amount of approximately $465,000.

I am advised that the current guidelines for calculating financial assurances were designed for mining projects that had very different expected environmental impacts and rehabilitation processes to UCG projects.

There was internal discussion within the department about the amount of the financial assurance.

The EPA project director reported to colleagues in an email dated 23 October 2008 that:

> Assessment of the environmental authority application highlighted potential risks associated with closure of an underground combustion process. Information obtained from the applicant indicates that, while combustion can be ceased relatively easily, by capping air injection wells, the pyrolysis of coal underground will continue for a period (possibly a couple of months), producing gas and tars. The decommissioning process needs to be managed to flush residual contaminants from the underground cavity to minimise the risk of groundwater contamination. Information provided by the applicant indicates that this 'decommissioning' process could cost up to $1.5M.
>
> As groundwater contamination is a risk, ongoing groundwater monitoring would be required. The duration of monitoring is unknown as it would be dependent on results.
>
> …
>
> [The project operator] has proposed a total [financial assurance] of $464,950. If a determination was made that we needed to incorporate decommissioning costs of $1.5M, indications from the applicant are that the trial would be economically unviable.

Departmental officers also considered the amount of financial assurances placed on the other two Queensland UCG projects. Internal advice provided to the EPA project director by a senior officer was that the proposed financial assurance amount may be reasonable on the basis of the scale of the proposed UCG facility and comparison with the financial assurance held for another UCG project. The amount was considered likely to be sufficient to cover groundwater monitoring costs, particularly given the small amount of surface rehabilitation required.

Ultimately an amount of $599,306 was agreed upon for the financial assurance. This was significantly less than the $1.5 million figure referred to by EPA officers in their analysis, and there was no evidence of any further consideration of whether this amount would be sufficient to cover the decommissioning of the project.

23 Department of Environment and Resource Management, Guideline - *Calculating financial assurance for mining projects*, 29 March 2011, p.2.

While the analysis undertaken by the department appears to have balanced a number of factors, including the level of financial assurances received in relation to the two other UCG projects, it is concerning that the full decommissioning costs (as advised to the department) were not included and do not appear to have been further clarified.

In my view, the amount of financial assurance required should have been calculated on the basis of the full decommissioning costs. By requiring only a portion of the advised decommissioning costs as financial assurance, the department may have exposed taxpayers to meeting the cost of decommissioning the project if the project operator was to walk away.

Given the significant risks associated with this project, which were identified in the report to the CAC and the assessment report, in my view, the department's decision not to include the full costs of decommissioning or clarify the information received from the project operator is of significant concern.

In this regard, I note again the references to "unknowns regarding potential impacts of the project" and limited information being available to "support theory, demonstrate that the process works well in practice, and to enable the proponent to accurately predict impacts" that were contained in the assessment report.

I am also concerned that one factor raised in the decision-making process was that the project operator would consider the trial economically unviable if the decommissioning costs of $1.5 million were included in the financial assurance amount. The department's role as environmental regulator is to protect the environment and ensure that if the government is required to incur costs in rehabilitating land disturbed by mining projects, there is sufficient money available to cover those costs. It is not the role of the environmental regulator to purposefully set an amount of financial assurance that fits within the budget or financial projections of the project operator.

Agency response

In response to my proposed report, the Director-General of DEHP noted that s.364 of the EP Act required the department to consider three factors when assessing the requirement for a financial assurance: the degree of risk of environmental harm, the likelihood of restoration or rehabilitation being required, and the environmental record of the applicant.

He further stated that the departmental guideline was followed by officers when calculating the financial assurance.

It is not clear which guideline the Director-General is referring to, as the department was unable to provide a copy of the guideline applicable at the relevant time.

The Director-General also stated:

> The Department does not understand how the suggested figure of $1.5M has been calculated and cannot therefore comment upon it.

The figure of $1.5 million in decommissioning costs was taken from the department's own records. It appears to have been provided by the project operator. Correspondence between departmental officers discussing the amount to be required as a financial assurance does not show any evidence that officers queried this amount or the relevant calculations with the project operator at the time. If departmental officers were unsure of how this amount was calculated, they were obliged to seek further advice from the project operator.

The Director-General also stated that the department is currently undertaking a review of the financial assurance calculation process. He also noted that the current financial assurance guideline, which is relevant to a number of industries, provides

information about when they are required, how they are to be calculated, the review process and when they may be discharged.

I form the following opinions and make the following recommendation:

Opinion 21

The department's failure to clarify or incorporate the quoted decommissioning costs of $1.5 million into the financial assurance amount calculations potentially exposed Queensland taxpayers to meeting the decommissioning costs of the project.

Opinion 22

An environmental financial assurance should be primarily focused on providing adequate protection for the environment, and should not be concerned with the financial viability of the project.

Recommendation 12

The Director-General of DEHP review the guideline to ensure that adequate written guidance is provided to all officers involved in calculating or approving environmental financial assurance amounts, including:

(a) the factors which may be taken into account in setting the amount of the assurance, and

(b) the basis on which the appropriate amount of an assurance is to be calculated.

Chapter 7 – Oversight and monitoring of novel or emerging technologies involving high or unknown risks of environmental harm

After the conditions of an environmental authority have been determined by the DEHP, it is responsible for monitoring the environmental impact of the project activities. As the environmental regulator, DEHP has a responsibility to ensure compliance with its conditions and must therefore have an adequate process in place to encourage and monitor compliance.

DEHP's oversight system includes scope for planned inspections and audits as well as reactive compliance inspections in response to notifications or allegations of environmental harm. However, DEHP officers reported the department has insufficient resources to proactively monitor or ensure compliance with the conditions of all issued environmental authorities in Queensland.

For this reason, there is substantial reliance on complaints made by third parties and on the project operator self-reporting breaches and submitting monitoring data in line with any conditions in the environmental authority.

I do not intend to discuss this oversight model in relation to environmental harm generally. My concerns lie specifically with the appropriateness of reactive monitoring for novel or emerging technologies that involve high or unknown risks of environmental harm.

In my view, the standard approach to compliance of relying on self-reporting of breaches of environmental authority conditions may be insufficient in such circumstances, and both greater oversight and more stringent conditions are warranted.

I am also unaware of any standard process by which holders of environmental authorities are required to give assurances that any preconditions to project commencement have been met. Similarly, DEHP is not required to confirm or acknowledge that environmental preconditions have been complied with before an activity can commence. It may not be unreasonable to require company officers to specifically advise the DEHP of compliance with certain conditions prior to certain milestones being reached, both to assist the DEHP to carry out its regulatory functions, and also because the publication of these results would enhance community confidence that projects were as safe as possible.

Greater oversight of such projects will allow the DEHP to not only ensure that environmental harm is minimised, but also to learn about how best to regulate such projects in the future.

Agency response

In response to my proposed report, the Director-General of DEHP submitted that it was impossible for the department to audit all individuals and entities within its regulatory function. He noted that the DEHP undertakes at least 690 proactive compliance audits each year under its Annual Compliance Plan, and allocates its resources according to the risk posed by projects. He also stated that:

> The Department seeks to foster sustainable development and part of this process requires environmental authority holders to take some responsibility for managing their environmental risks.

While I acknowledge the DEHP's approach to compliance, this preferred approach does not absolve the department from responsibility as the regulator to adequately monitor compliance, particularly in relation to novel or emerging technologies with high or unknown risks.

The Director-General's previous comments about novel or emerging technologies being unsuited to standard conditions support my view that such situations should be a trigger for a risk-based assessment leading to greater monitoring and proactive compliance auditing.

The Director-General also submitted that the department's Compliance Strategy and Annual Compliance Plan provided, in the case of UCG, the following scope for industry compliance:

- assess disturbance to land, water management and releases, dam management including hazard assessment and reporting, and rehabilitation of completed activities
- conduct proactive inspections of the three UCG sites, including inspections where sampling of groundwater is conducted
- ensure that recommendations from the ISP (appointed by Cabinet) are implemented across the UCG sites.

He also noted that executive officers of corporations have an obligation under s.493 of the EP Act to ensure compliance with the EP Act.

The Director-General stated that the DEHP:

- has a documented and well-publicised approach to compliance
- undertakes compliance inspections having balanced factors such as project risk and competing duties (e.g. compliance monitoring or assessment)
- has recently refined its compliance planning and added an intelligence and information unit to further inform its compliance priorities by science and available information, and
- continues to work to developing a consistent regional approach to compliance planning.

Finally, the Director-General stated that the department is investigating the possibility of requiring executive officers to indicate that environmental preconditions have been met prior to the commencement of a project. The annual return process already achieves this in part.

I acknowledge the Director-General's comments in relation to the department's approach to compliance generally. While I accept that the general approach is appropriate in many circumstances, in my view the nature of novel or emerging technologies, when associated with high or unknown risks of environmental harm, warrants a greater level of oversight and monitoring by the regulator.

I form the following opinion and make the following recommendation:

Opinion 23

Projects involving novel or emerging technologies that have high or unknown risks warrant greater oversight and compliance monitoring.

Recommendation 13

The Director-General of DEHP review the department's approach to monitoring compliance with environmental authorities for novel or emerging technologies involving high or unknown risks of environmental harm to ensure that:

(a) it carries out comprehensive oversight of such projects

(b) the penalties for failing to comply with conditions are adequate to encourage compliance

(c) it has an adequate process for proactively auditing compliance with environmental authority conditions

(d) it is assured or has determined that environmental preconditions have been met prior to the commencement of a project.

Transfer of Kingaroy project file

In late 2009, a decision was made to transfer the three UCG project files from the regional branches of DERM to the Petroleum and Gas Unit (P&G Unit) of DERM in Brisbane. The P&G Unit was already responsible for the administration of the environmental aspects of other petroleum and gas projects state-wide. It was also responsible for the environmental administration of Petroleum Facilities Licences (PFL) which had been issued in relation to the other two UCG projects.

The transfer of responsibility for the project management of the files meant that the P&G Unit would be responsible for responding to complaints, checking on compliance with the environmental authority, and responding to queries or contact from the project operator.

A significant reason for the transfer was a desire to achieve greater consistency in how UCG projects were managed. In my view, this was a positive step. However, I have concerns about the process by which the transfer of the Kingaroy project file occurred.

When interviewed, an experienced senior officer within the P&G Unit advised that he expected a discussion about the file would have occurred between the officers involved in the transfer in addition to the physical delivery of the file. He also thought a written summary of the current position would have been desirable. He would expect the P&G Unit officer who received the file to familiarise themselves with the environmental authority conditions and arrange a site visit to introduce themselves to the project operator.

From a review of the relevant records and interviews with DEHP officers, it is clear that, in relation to the transfer of the Kingaroy project file:

- the paper file was delivered in early December 2009 and the electronic file was delivered in mid-January 2010
- regional officers considered that the responsibility for managing the Kingaroy project had passed to the P&G Unit in December 2009 when the paper file was transferred
- P&G Unit officers believed the transfer in fact occurred in April 2010
- the project operator was advised in April 2010 that a transfer of the administration of the project file would occur and take effect from Monday 26 April 2010.

This suggests to me that for a period of up to three months, there was a lack of clarity among DERM officers about who was responsible for the Kingaroy project file. This is reflected in a lack of work completed on the file during this time. In fact, the P&G Unit officer who was responsible for the project admitted that he had never read the full environmental authority.

It seems to me that this period of time leading up to the commencement of the UCG process called for proactive liaison with the project operator regarding the planned start date, the whereabouts of the air emission sampling program and the major groundwater study which were required by the conditions of the environmental authority.

Agency response

In response to the proposed report, the Director-General of DEHP noted that the process for file handovers is managed at officer-level. He stated that this enabled the process to be adapted to the particular requirements of the situation and to occur quickly without unnecessary paperwork or protocol. He acknowledged that in the present situation the process did not work as well as it ought to, and said that the department would explore how to guide officers in the handover of open files on a case by case basis, to be developed and managed by the business unit.

The Director-General's response acknowledges the failings in process that occurred in this instance. In my view, it is not acceptable that the department does not have guidelines, expectations or standards for the transfer of control of regulatory activities. This is an important process and a critical part of the successful performance of the department's regulatory functions, and should not be determined at the time of transfer. I consider that it is particularly important to have agreed, standard processes in situations where there are imminent milestones due in the project, or where there are high or unknown risk activities.

I form the following opinion and make the following recommendation:

Opinion 24

DERM's actions in transferring the Kingaroy project file to the Brisbane P&G Unit were unreasonable, in that:

(a) the timing of the transfer was unclear which resulted in a period of confusion as to who had responsibility for the project

(b) written advice of the file transfer was not provided to the project operator, DEEDI and other interested parties as soon as the transfer occurred.

This constituted administrative action that was unreasonable within the meaning of s.49(2)(b) of the *Ombudsman Act 2001*.

Recommendation 14

The Director-General of DEHP should develop and implement a written procedure for the transfer of open files relating to environmental authorities between work units or offices which includes a requirement for written advice to all interested parties at the earliest possible time and a written summary of the current position to accompany the transferred file.

Chapter 8 – Well construction and petroleum facilities licence

DNRM was created by machinery of government changes in April 2012.

DNRM is responsible for granting tenure to entities applying to undertake mining or petroleum and gas projects. This system of tenure, separate to land tenure which is the system for land ownership, enables the State of Queensland to give an entitlement to enter land and conduct activities relating to mining or petroleum and gas exploration and extraction. There is a range of different levels of tenure which may be available for different projects. For example, under the MR Act, DNRM can grant a prospecting permit, exploration permit, MDL, mining claim or mining lease.

The exploration and mineral development processes for UCG projects are initially in relation to coal despite the UCG process producing a petroleum product according to the definition in s.10(c) of the P&G Act. This is because the gasification product does not exist until the underground burning of the coal commences. As a result, tenures for wells that will eventually be used for the extraction of a petroleum product are dealt with under the MR Act. Similarly, DNRM has advised that "safety and health considerations" initially fall within the *Coal Mining Safety and Health Act 1999*.

Well construction standards

As part of the investigation, DEHP was asked about any identified deficiencies in the regulatory oversight of the Kingaroy project. According to DEHP:

> One notable gap in the regulation of UCG activities however, is that there is no minimum standard for the design and construction of the UCG production well (bore). [DNRM] would be the appropriate agency to develop and deliver a minimum construction standard for this purpose. Brief discussions with the three UCG operators has revealed that they have constructed their UCG production wells using technology applied to other similar activities such as geothermal, where wells are required to be constructed to withstand both heat and pressure. Accordingly the EA's for [the Kingaroy project operator] and the other operators are silent on the requirements for production well construction.

The UCG process requires two bores: an injection bore through which air or oxygen is added, and a production bore where the gas is brought to the surface. The production bore is subject to high temperature and high pressures.

No formal standards have been issued for well design and construction for UCG wells. The existing *Code of Practice for Constructing and Abandoning Coal Seam Gas Wells in Queensland* (the Code of Practice) was issued by DEEDI for coal seam gas wells only.

The Code of Practice noted broad requirements for the construction and abandonment of petroleum wells were stipulated within the *Petroleum Act 1923*, P&G Act and the Petroleum and Gas (Production and Safety) Regulation 2004 (P&G Regulation). These statutes also reference some international standards in regard to well equipment and construction.

Although the definition of "petroleum well"[24] in the P&G Act could perhaps be expected to include a well drilled for UCG projects, DNRM advised investigators that the obligation to comply with the broad requirements referred to above is tenure-specific; that is, it does not apply to holders of MDLs.

When asked about the current requirements for the construction and abandonment of wells used in UCG projects in Queensland, DNRM advised that:

> There are no documented requirements specific for well construction and abandonment for UCG in Qld. However if compliance with the Code of Practice for construction and abandonment of CSG wells could be achieved, then it may be considered appropriate to follow that Code.

24 *Petroleum and Gas (Production and Safety) Act 2004*, Schedule 2 Dictionary.

It is clear from reports produced by the project operator that the casing around the production well failed during the six days that the UCG process was in operation. The ISP report stated that:

> Pressure and temperature have been proposed as explanation for the compromise to the bore casing at a point where, during construction, a join was made. Water and gas then escaped through the compromised infrastructure and were detected in bores down the gradient of groundwater flows … [The] situation is, therefore, more concerning than [other environmental incidents involving UCG projects in Queensland], with at least a casing breach of the bores … having released contaminated waters into the groundwater.[25]

DNRM is aware that there are no specific requirements for UCG well construction under the MR Act. I am not convinced that it would be reasonable for DNRM to continue to grant MDL tenures involving UCG projects without any obligations being imposed on project operators in relation to well design and construction standards.

Agency response

In response to my proposed report, the Acting Director-General of DNRM acknowledged that there are currently no specific regulatory requirements for well construction and abandonment for UCG wells. However, he stated that:

> …under the general safety management plan requirements of the Petroleum and Gas (Production and Safety) Act 2004 all equipment must be fit for purpose and adequately maintained. Risk management obligations for operating plant (including wells) require that the operator of the well must ensure all adequate controls are in place to reduce risk. Compliance with the Code of Practice for construction and abandonment of CSG wells could be considered as part of that process.
>
> The development of a separate Code for UCG wells is supported because of the specific issue and risks associated with those wells. However the wording of the proposed recommendation could be better expressed as the universal application of the current Coal Seam Gas (CSG) Code is not necessarily appropriate for all petroleum wells. Conventional petroleum wells (as opposed to CSG wells) and UCG wells each have their own issues that would need to be addressed separately.

The Acting Director-General advised that steps are being taken by DNRM officers to prepare standards, and that no MDLs for UCG will be granted until requirements or standards are in place for the construction, operation and abandonment of UCG wells.

The Acting Director-General of DNRM suggested a more detailed recommendation including specific reference to some of the UCG specific issues known to his department.

I agree with his assertions that the obligations should be consistent with those in the current regulations including the current Code of Practice for CSG wells, but should also address UCG-specific issues such as temperature, abrasion and corrosion. They should also be specific to the well type and situation such as wells drilled for exploration, monitoring, air injection, ignition wells and production wells.

I form the following opinion and make the following recommendation:

Opinion 25

It would not be reasonable for DNRM to continue to grant MDL tenures involving UCG projects without obligations being imposed on project operators to meet minimum requirements or standards in relation to well design and construction.

25 *Summary of considerations and recommendations on the Environmental Evaluations of Cougar Energy*, 24 January 2011, p.6.

Recommendation 15

The Director-General of DNRM ensure that adequate obligations in relation to construction and abandoning of UCG wells are developed and implemented as the minimum standard applying to all UCG projects in Queensland regardless of the tenure type on which the projects operate.

Petroleum facilities licence

The investigation identified repeated discussions and email exchanges over two and a half years from November 2007 to June 2010 between DEEDI and DERM officers about whether the project operator's planned use of the petroleum product would require a PFL to be obtained. A PFL must be obtained under the P&G Act in order to operate a petroleum facility.[26] The main question being considered by the department at the time was the limits on what a UCG project operator could do with the petroleum product after it had been brought above ground before they would need to obtain a PFL. DNRM and DEHP officers at interview gave different responses to this question.

A DEHP P&G Unit officer believed the current position was that any UCG project that brought gas to the surface would require a PFL to cover the above ground piping and whatever was done with the gas from that point onwards. A DNRM officer stated that he understood that there was no blanket rule that all UCG projects needed a PFL. A PFL was only required if a significant facility was being constructed to process the gas and that no PFL would be required if the gas was being flared.

There was no common understanding between the departments as to whether a PFL was required for the Kingaroy project. From records examined it is apparent there was a significant lack of clarity regarding the stage at which the operators of the Kingaroy project required a PFL.

Agency response

The Acting Director-General of DNRM advised that steps were currently being taken by officers to address this recommendation.

The Director-General of DEHP did not respond to this proposed opinion or recommendation.

I form the following opinion and make the following recommendation:

Opinion 26

The failure of DNRM and DEHP to resolve the issue of the PFL constituted administrative action that was unreasonable within the meaning of s.49(2)(b) of the *Ombudsman Act 2001*.

Recommendation 16

The Directors-General of DNRM and DEHP resolve the issue of the circumstances under which a PFL is required for UCG processes within three months of the date of this report.

26 A petroleum facility is defined in section 17 of the P&G Act as a facility for the distillation, processing, refining, storage or transport of petroleum. A reference to a petroleum facility includes: a storage depot, a meter station, a petroleum processing plant, an oil refinery, an LPG separation plant or another facility declared under a regulation used, or to be used, for petroleum production, processing, storage or transport.

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