

**STANDING COMMITTEE ON
ENVIRONMENT AND PUBLIC AFFAIRS**

**INQUIRY INTO THE IMPLICATIONS FOR WESTERN AUSTRALIA OF
HYDRAULIC FRACTURING FOR UNCONVENTIONAL GAS**

**TRANSCRIPT OF EVIDENCE
TAKEN AT PERTH
FRIDAY, 7 FEBRUARY 2014**

SESSION TWO

Members

**Hon Simon O'Brien (Chairman)
Hon Stephen Dawson (Deputy Chairman)
Hon Brian Ellis
Hon Paul Brown
Hon Samantha Rowe**

Hearing commenced at 11.36 am**Mr TADAS BAGDON****Executive Director, Policy and Innovation, Department of Water, sworn and examined:****Mr NIGEL MANTLE****Manager, Water Source Protection Planning, Department of Water, sworn and examined:****Mr SCOTT MACAULAY****Senior Hydrogeologist, Department of Water, sworn and examined:**

The CHAIRMAN: On behalf of the committee I would like to welcome witnesses to this hearing. Before we begin, I must ask each of you to take the oath or affirmation.

[Witnesses took the oath or affirmation.]

The CHAIRMAN: Gentlemen, you would have signed a document entitled “Information for Witnesses”. Have you each read and understood that document?

The Witnesses: Yes.

The CHAIRMAN: These proceedings are being recorded by Hansard. A transcript of your evidence will be provided to you. To assist the committee and Hansard, I ask you to quote the full title of any document that you refer to during the course of this hearing for the record. Also, we have been asked to get back a little from the microphones to avoid feedback. I remind you that your transcript will become a matter for the public record. If, for some reason, you wish to make a confidential statement during today’s proceedings, you should request that the evidence be taken in closed session. If the committee grants your request, any public and media in attendance will be excluded from the hearing. Please note that until such time as the transcript of your public evidence is finalised, it should not be made public. I advise you that publication or disclosure of the uncorrected transcript of evidence may constitute a contempt of Parliament and may mean that material published or disclosed is not subject to parliamentary privilege.

Can I ask now: would you like to make an opening statement?

Mr Bagdon: We were not intending to make an opening statement as we believe that the detail provided in our submission clearly outlines the role that the Department of Water has in the whole process and the processes and procedures that we are applying to acquit our responsibilities.

The CHAIRMAN: If we turn now to the submission from the Department of Water dated October 2013. Firstly, I want to say that I wish that all submissions we received from government departments were this simple, clear, concise and informative. There is no trace of anything Humphrey Appleby-like about it. I compliment you on that and thank you.

A point of clarification, though: on the top of page 5 under section 2.3 there is discussion about regulation pursuant to the Rights in Water and Irrigation Act 1914. Is there an abbreviation for that, the RIWI act?

[11.40 am]

Mr Bagdon: The RIWI act, yes.

The CHAIRMAN: The point of possible ambiguity that I want you to clarify is: as I understand it, Perth and the Canning Basin are proclaimed groundwater areas.

Mr Bagdon: Yes.

The CHAIRMAN: And therefore your department is the agency empowered to licence and permit, or not permit, certain activities which occur there; is that the case?

Mr Bagdon: That is the case. We licence the take of water from declared water resources, so we do not regulate what happens around those water resources but, rather, we regulate the management of the water resource itself. If someone wants to take water out of one of those water resources, we licence the construction of the wells and we licence the conditions under which they may actually abstract water from that resource.

The CHAIRMAN: This is the point of ambiguity: I understand from your submission that all wells and bores in proclaimed groundwater areas have to be licensed.

Mr Bagdon: That is wells for the taking of water. The wells used for petroleum exploration and subsequently fracking are not the taking of water. They pass through the aquifer; they do not actually take water from the aquifer. If, for purposes of drilling, they wish to take water, we would be involved in the assessment and licensing of that take but not of a well for petroleum exploration.

The CHAIRMAN: If a hydraulic fracturing operation were to enter into a locality and bring their own water with them—in a very, very large container—you would not have an involvement; is that correct?

Mr Bagdon: We would not have a direct regulatory involvement in terms of the use of the water. We may have an advisory involvement in terms of the disposal of that water if it were seen to be having a potential impact on the water resource itself.

The CHAIRMAN: If, however, the hydraulic fracturing company was to be extracting groundwater from the locality for the purpose of injecting it for the fracking process, would you be involved in licensing that?

Mr Bagdon: We would be involved in the licensing of the taking of the water from the water resource. If the reinjection of water was outside of that water resource—in other words below the water resource in terms of the geological formation—no, we would not be involved necessarily in regulating that injection but we would certainly wish to know about potential impacts on the water resource if that were an issue. This is where we have the arrangements with the organisations that are involved in the regulation of that for referrals or for the passing of information so that we are aware of what is going on and are able to provide appropriate advice to those organisations.

The CHAIRMAN: At an earlier hearing a distinction was made between groundwater which is sourced for human consumption and how that has to be preserved at certain standards. Reference was also made to other groundwater resources and how they are regulated. What sort of standards do you apply? Do you apply different standards to the different resources and what are they?

Mr Bagdon: We apply different levels of regulatory intervention, so that for the protection of public drinking water sources we declare public drinking water source areas. We have a process whereby we classify the risks associated with that. We provide advice to regulatory agencies about whether we would approve or not approve any applications for certain kinds of undertakings within those areas.

Mr Mantle: If I could add, there is a suite of national guidelines of the appropriate water quality criteria under the national water quality management strategy. There is a document for appropriate drinking water quality, irrigated agricultural water quality and marine and aquatic systems quality. There is a range of national guidelines available for water quality.

The CHAIRMAN: I am just trying to get a handle on a proclaimed groundwater area. Would the Jandakot water mound or the Gngangara water mound, for example, be a proclaimed groundwater area?

Mr Bagdon: Yes. The majority of groundwater sources in the state are proclaimed. There is only a small band width of underground water which is not particularly useful and not particularly used

which we have not declared. But the majority of groundwater that is usable or being used in the state is declared and proclaimed.

The CHAIRMAN: How much of the state, perhaps by reference to the percentage of ground area, would be proclaimed groundwater area?

Mr Bagdon: It would have to be close to 90 per cent I would imagine.

The CHAIRMAN: So the vast majority of the state is a declared groundwater area?

Mr Bagdon: Yes, it is, basically. There are some areas where there is nobody living, there is no water. I can provide a map which shows where we have actually proclaimed those areas.

The CHAIRMAN: If someone wanted to drill for shale gas under the Jandakot water mound, clearly that is a valuable water resource for human consumption. Does the Department of Water, one, have to give permission for that to happen or, two, have power of veto?

Mr Bagdon: We would certainly advise that we would not approve of that kind of activity over a significant public drinking water source. No, we do not have the power of veto.

Mr Mantle: If I could add to that: Jandakot is proclaimed for two purposes. One is the allocation proclamation for the groundwater controlled for quantity, but it is also proclaimed under the Metropolitan Water Supply, Sewerage, and Drainage Act as a proclaimed public drinking water source area to prevent contamination of the area. So it is proclaimed for two purposes.

The CHAIRMAN: In the second sense that you have just pointed out, that would be the way that we would protect against inappropriate development whether it is residences, mining operations or whatever?

Mr Bagdon: Yes, correct.

The CHAIRMAN: In that way, say, the Jandakot and Gnangara mounds would not be subject to drilling for gas?

Mr Bagdon: The process would be that we have a system whereby we have declared those areas. We advise on the suitability of certain kinds of activities. Those sorts of activities would be deemed to be completely incompatible and therefore we would advise against approval, be it by the Department of Planning or any other organisation—Department of Mines and Petroleum—against those kinds of activities being approved.

The CHAIRMAN: In practical, realistic terms, is that advice inevitably observed by the other agencies?

Mr Bagdon: I am not aware of any instances where it was not observed but I am not aware of all of the instances where that advice has been provided because it has been done over a fairly long period of time.

The CHAIRMAN: It occurs to me that there is an absolute requirement for us to protect our water for consumption, for obvious reasons that I do not think I need to go into.

Mr Bagdon: Yes, we take that very seriously.

The CHAIRMAN: But for everyone's health and wellbeing and so on. There are other activities, apart from residential, and there are plenty of people outside the Perth metropolitan area that also need their drinking water protected. How is that achieved? Are there similar provisions?

Mr Bagdon: There are similar provisions. We use the same process across the state.

The CHAIRMAN: Then again there are other requirements for consumption of water, for example by livestock, for use in other agriculture and water cultural pursuits. Is it the case that the standards are not quite as stringent for those non-human type of activities?

[11.50 am]

Mr Bagdon: We have a risk-based planning system which incorporates the concept of fit for purpose as well, so we would look at what is the resource, what is the quality of the water of that resource, how can it be effectively used and we do a planning process which is quite comprehensive and includes all the appropriate science, and we make assessments on what water is available to be used and the conditions under which it can be used. However, we do not regulate that people have to use it for a particular purpose only. We advise of the quality of the water. If someone wishes to use that water, we have guidelines that we publish which recommend the quality of water for different purposes, but for drinking water there are other regulatory processes like the Department of Health's processes, which ensure that the quality of water used for those purposes complies with all the appropriate standards. In terms of water used for other purposes, we do have certain guidelines and regulations and assessment regulations, but it does not cover every single use.

The CHAIRMAN: I just wanted to return to that initial point to make sure that I have got it absolutely clear, then, that virtually all of the state is a groundwater area.

Mr Bagdon: Usable groundwater areas in the state are proclaimed.

Mr Mantle: And surface water.

The CHAIRMAN: And whenever somebody wants to drill a well to extract water, they have to obtain —

Mr Bagdon: Appropriate authorisations.

The CHAIRMAN: — appropriation authorisation and licensing from yourself.

Mr Bagdon: Yes.

The CHAIRMAN: Is that the same or would that be the same for someone seeking to obtain water for fracking purposes?

Mr Bagdon: Yes. We assess all applications for the taking of water. It is based on the capacity of the resource to sustain the taking of that water, not whether it is purpose A or purpose B. So it is about the management of the water resource rather than the specific use being entertained for that water.

The CHAIRMAN: So the area of use of water that falls outside your complete control and falls to others—perhaps the Department of Mines and Petroleum—is actually about the reinjection of water or fluids into the ground.

Mr Bagdon: Into the ground as distinct from into a declared aquifer. If they were injecting into the aquifer, then we would be involved through our regulatory processes.

Hon BRIAN ELLIS: On the same subject, it seems a fine line there. You do not need a licence to put the well down for the fracking operation from you.

Mr Bagdon: Not from us.

Hon BRIAN ELLIS: No, not from you I mean. What happens if there is an accident and they strike water and the well fills up with water? Where do you come in then?

Mr Bagdon: If it was from a declared aquifer, then we would become involved.

Hon BRIAN ELLIS: In what way, because the well is already there?

Mr Bagdon: We would be assessing the impact on other users and the resource, and we might have to say that that well needs to be capped if it is having a detrimental impact on that actual resource. But, again, I would not expect that to occur.

Hon STEPHEN DAWSON: I just wanted to ask what sort of compliance activity the department would take in relation to a licence that is granted to take water for fracking operations.

Mr Bagdon: It would be very similar to the compliance activities we would take for any licence in the sense that we would monitor the take and we would ensure that they were complying with any conditions that we put onto that licence.

Hon STEPHEN DAWSON: And if they were not complying with those conditions?

Mr Bagdon: We have a compliance regime whereby, first of all, we go through a series of steps and if those steps all fail, then we would seek prosecution.

Hon STEPHEN DAWSON: The other question, Chair, I had related to wastewater discharge and disposal. We are all aware that significant amounts of water are used in fracking operations. What policies do you have in place around wastewater discharge and disposal and, in fact, do they apply to fracking operations?

Mr Bagdon: We have guidelines related to the discharge of water and so on, but if you are getting down to the point of contamination, then the environmental laws cover that aspect of it. We only deal with the discharge of water that was taken from an aquifer. We also refer to the environmental protection agency and others under their regulations if there is any possibility of pollution or contamination and so on. So, there is a mix of interactions that do occur governing that kind of issue.

Hon STEPHEN DAWSON: Am I right in thinking that you are going through some sort of review at the moment in relation to updating regulations around wastewater disposal and discharge?

Mr Bagdon: We are undertaking a number of steps. We have regulations that cover, say, people who produce wastewater in terms of water services provision—so, sewerage management and so on. In terms of mining, we also have guidelines and regulations covering the discharge of dewatering for mining, but if someone has water that they use for a process—be it a factory, be it a farm, be it a mining operation—and they are discharging that water into the environment, that is under the environmental laws.

Mr Mantle: If I could add, though, that is one of the activities in our submission that we have highlighted is incompatible within the public drinking water source area. So, if we referred advice about fracking activity in a public drinking water source area, then we would also refer to the fact that discharges to ground and wastewater treatment would be an incompatible activity within the public drinking water source area.

Mr Bagdon: And in other areas we would be providing advice about the potential impact of that discharge on any water sources and therefore any conditions that we believe or any treatment that would need to be undertaken to mitigate against any impact.

The CHAIRMAN: I will follow on from that about the protection of public drinking water source areas. Is there a map available which might show us —

Mr Bagdon: Yes, we can provide one.

The CHAIRMAN: If you could provide by supplementary information a map to show the public drinking water source areas in the state, thank you. Is there the likelihood, do you think, of conflict in the future between the public drinking water source areas and your responsibility to protect those from incompatible uses and an expanding gas industry seeking to operate in those areas?

Mr Bagdon: There is the potential, yes.

The CHAIRMAN: How would that resolve itself?

Mr Bagdon: We are working closely with not only the Department of Mines and Petroleum, but other agencies like the Department of Environment Regulation and the EPA, to ensure that the approval processes have the appropriate levels of assessment, that anything that needs to be referred to us is referred to us and that we have systems whereby we can exchange information, particularly scientific information, readily. So we are working on those processes. Some of those are formalised

already; some of them will be formalised in the near future, whereby we will make sure that, first of all, we have adequate input into the development of any regulations, guidelines or whatever and, secondly, that the processes by which assessment are done are clearly defined in terms of the input from the Department of Water and how those processes are actually managed, both into and out of the department and internally within the department.

[12 noon]

The CHAIRMAN: So in both of those areas—firstly, the broad policy construction areas and, secondly, the operational areas—are you satisfied with the degree of input that the Department of Water is able to have with other agencies where the decision makers are elsewhere?

Mr Bagdon: Yes. We have a very good collaborative relationship with the Department of Mines and Petroleum, the Department of Planning, the EPA and the Department of Environment Regulation. As I said, some of those processes are already formalised, whereby with referrals, say, for mining activities, there is an agreement between ourselves and the Department of Mines and Petroleum about how that will occur, the time lines and processes and so on and the criteria for referral, and we are in the process of doing something similar for petroleum activities as well. Similarly, we have similar arrangements with other agencies to do that and, in other cases, we have formalised arrangements with the Department of Planning relating to the protection of public drinking water supply areas. So we are quite proactive in that area and, to date, we cannot say that we have been not given the opportunity or ignored in any way.

The CHAIRMAN: That is good.

Hon SAMANTHA ROWE: Does the Department of Water have a position on gas fracking in Western Australia and any adverse impacts that there may be on our groundwater?

Mr Bagdon: Our position is related to our specific responsibilities. The position on fracking is a government policy position which is managed through the Department of Mines and Petroleum. That is a given. In relation to the potential impacts on water, yes, we have various positions about the protection of public drinking water and we also have other internal positions about how we go about assessing and evaluating and providing advice, but they are simply about a risk-management approach, assessing the risk adequately, how we go about doing that, what criteria we use and then how we provide that advice to the regulatory agencies involved.

Hon SAMANTHA ROWE: But do you think there are any risks to our groundwater if we go ahead with gas fracking in Western Australia?

Mr Bagdon: There are risks with any activity. There are risks with mining. There are risks with any manner of farming. There are risks everywhere.

Hon SAMANTHA ROWE: But given your position at the Department of Water —

Mr Bagdon: Our position is to understand those risks and to make sure that they are adequately assessed and managed and, where they are unacceptable, that the appropriate decisions are made to refuse that activity.

The CHAIRMAN: Have there been questions addressed along the lines of how much pollution of our groundwater is acceptable, or has there been any attempt to identify a level of tolerance?

Mr Bagdon: There are various water quality management guidelines and standards. There are national ones; there are various ones around the state. We have water quality plans in various locations. So, yes, but there is not a set of universal against all potential contaminant type of activity. We have plans that say we would like to maintain the water quality within a certain regime, be that salinity or anything else, and we have management plans or we have arrangements with other agencies, because water quality is influenced by a whole range of different activities over which we have actually no control. So we have no direct control over land use planning decisions, farming activities, other kinds of mining activities, and all sorts of activities. We provide advice and

we develop guidelines and water quality notes and other information like that, which we make available through the normal processes to the other agencies.

Hon PAUL BROWN: Can you tell me what are the likely compliance conditions that you would put on a fracking operation that would be taking water?

Mr Bagdon: It would not be a standardised type of thing. It is simply about what is the risk to the resource. In other words, is the resource close to fully allocated; has it got plenty of capacity for that water? We would assess the volume of water and the take regime in terms of how quickly they take water and so on. We would be looking at that and putting some conditions around that to make sure that they did not withdraw water too quickly and cause problems like salinity and flows or whatever. We would be putting conditions in terms of how they treat the water after it has been used and in terms of its potential impact on the water resource itself and we would be looking to manage the volumes in terms of some sort of measurement capacity. That would be the broad spectrum, but it would get down to what are the particular issues around that area, how close are other users, what are the environmental situations around there, are there any protected areas that need to be preserved with water levels or whatever. We would take all of those issues into account and we would apply conditions to suit that particular location in terms of the water resource and the environment around it and the other users.

Hon PAUL BROWN: I have just one more double-barrel question, so others can ask more questions. Firstly, is there a volume trigger for any of your licences; and, secondly, as part of those conditions, have you done baseline studies on the water quality? If there are issues with either contamination during the taking or re-injection, would we have a baseline study in relation to that body of water?

Mr Bagdon: We do investigations and we have reasonably good knowledge of most groundwater sources, so there is more or less a baseline there. Do we do specific baseline studies for things like fracking? To date we have not, no. We would work with DMP—again, they have released those draft regulations, which require baseline monitoring—so we would provide advice on the guidelines around what the appropriate baseline monitoring measure would be.

Hon PAUL BROWN: Is there a volume trigger whenever you go for a licence?

Mr Bagdon: It depends on what you mean by a volume trigger. We do an assessment of the resource, including how much water is there and who are the users around that area, and then we assess whether the proposed take of that water is manageable within the capacity of the resource to sustainably supply that volume as well as the potential impact on users in the surrounding area or in terms of any flows or levels that need to be maintained for the environment. All of those things are assessed. Yes, there are triggers. We would not let certain things happen, so we would put conditions on the licence to maintain within a certain management regime; in other words, to protect the environment or other users, or to sustainably manage the resource. There would be a volume limit on how much they could take out, because if they took more than that out, the resource would not be sustainable. Similarly, if they wanted to withdraw at a very rapid rate, which would cause a drawdown of the aquifer that may have an impact on surrounding users, there would be conditions around those sorts of things. We assess all of those issues. As part of our submission, one of the attachments lists all the things we consider when assessing a licence application and putting any conditions on that licence. It is quite a comprehensive list.

Hon PAUL BROWN: I have just one last question. We have heard previous testimony today of the likelihood that in the future in the midwest basin there could be 25 000 fracked wells and in the Kimberley up to 100 000 fracked wells. If the industry figures are to be believed in relation to how much water is being used per well, which is somewhere between I think 11 million and 20 million litres per single well, do we actually have the water resources for the taking to be able to use in this industry?

Mr Bagdon: On the expectation that there would be a significant amount of reusable water on the site, there would be an incentive—we would be seeking to ensure there is some sort of incentive for people to re-use water as much as possible—so that if they were not drilling and using water for their purposes, they would be re-using a fair amount of water. Taking all those issues into account, there possibly is, but again we would need to do the assessment at the time based on the number of wells and our understanding of the capacity of the system to sustain that amount of water being taken. Again, a lot of that take is limited in time; they are not going to be there in perpetuity as it is a take for a certain period of time. We would look at the resilience of the resource to be able to sustain that short-term take, but the long-term sustainability of that resource would be a governing thing.

Hon PAUL BROWN: I have been trying to do the calculations in my head for 25 000 wells in the midwest with a potential to use 20 million litres per well. I may be way wrong here, but I think we are looking in the vicinity of 200 trillion or more litres of water just for that one industry.

[12.10 pm]

Mr Bagdon: Again, it is difficult to say now. If you are just doing sheer volumes on a grand scale, it is a matter of concern and there would need to be very good management of that whole process. As I said, there would then be an incentive, particularly if there is a financial reward at the end of the thing, for those people to have a significant water re-use program so that you would get a high level of usage out of any initial water that is taken.

Hon BRIAN ELLIS: Just on that, all that water would not necessarily have to be potable water.

Mr Bagdon: No, it could be saline or hyper saline; there are all sorts. They would then need to assess how much treatment they would need to do before they could use that water themselves.

Hon BRIAN ELLIS: I have just the one question, which I would like you to clarify. You were involved, were you not, with the Department of Mines and Petroleum in putting your advice towards the new standards that have just been announced this last week? Are you totally satisfied then about the standards that have come out from that process?

Mr Bagdon: We have provided a certain amount of input to them, which helped them to frame what they have done. We have not gone through the actual final document in detail. That is what we will do now, and we will be providing our input into those and advice to the department as a submitter.

Hon BRIAN ELLIS: So the document that came out just recently is just a draft at this stage?

Mr Bagdon: That is a draft.

Hon BRIAN ELLIS: And you are going to have your input?

Mr Bagdon: Yes.

Hon STEPHEN DAWSON: Chair, I wanted to explore further the issue of compliance and breaches et cetera. On page 6 of your submission, paragraph 2.7 “Penalties”, states that if a party is found to be in breach of the licence, you will initiate enforcement action et cetera. I wonder if you can give me a sense of what the potential financial penalties are and how regular an occurrence it is that you might actually cancel someone’s licence for significant breaches.

Mr Bagdon: There have not been a lot of instances of that occurring, because —

Hon STEPHEN DAWSON: There have not been lots of instances of breaches?

Mr Bagdon: There have been breaches of licence conditions. We have a tiered approach in which, first of all, once we become aware of a breach, we advise the person that they have been in breach and we seek for them to stop doing it or remediate or have a process. It depends on how serious it is.

Hon STEPHEN DAWSON: Do you have timelines or a policy on timelines?

Mr Bagdon: There is compliance and enforcement, but off the top of my head I could not tell you the exact timelines. It is a little flexible in terms of just how serious it is, where it is located and if it is having an impact on other people. A range of issues would be taken into account. We go through an information and education process. We then put some harder conditions on them, and then if all of that fails, we would prosecute.

Hon STEPHEN DAWSON: Can you provide by way of supplementary any of those guidelines?

Mr Bagdon: We can provide that, yes.

Hon STEPHEN DAWSON: Also, I am keen to understand the penalties for the upper reach as well. If somebody is a regular transgressor, what types of penalties are there?

Mr Bagdon: The current act that defines those, dates to 1914. It has been amended from time to time, but in many cases the penalties have not risen commensurate with modern systems. We are in the process of reform; we have put out discussion papers and we are soon to enter into the process of seeking approval to revise legislation. That revised legislation will include an increased penalty regime.

Hon STEPHEN DAWSON: I will move on. Under the Rights in Water and Irrigation Act 1914 and the new regulations in 2000, has the department alone got the final decision to refuse or grant a licence? Can the minister override that? Also, perhaps you can let us know whether the department ever seeks advice from other agencies, be they departments or external organisations, when it makes a decision on granting a licence to take water?

Mr Bagdon: Yes, we would, but it would be very dependent on the specific location and what was surrounding that location. For example, if there was a nationally declared wetland next to where someone wanted to stick a bore, we would seek advice on the implications and tolerance levels and so on. We would probably have a lot of that information ourselves but we would certainly seek to make sure that it was correct. There are instances in which we would potentially seek other agencies, but by and large we are delegated by the minister to undertake the licensing function. It is the minister's act, and we are delegated under that act to undertake certain activities on behalf of the minister.

Hon STEPHEN DAWSON: If the department refused a licence to somebody, could the minister then decide, given it is the minister's act, to overrule your decision?

Mr Bagdon: Technically, yes, but there are processes, through SAT and other areas, in which people have the right of appeal, so it is highly unlikely that it would ever get to that situation.

Hon STEPHEN DAWSON: That was my next question: who could they appeal to? So SAT is the appeal body.

Mr Bagdon: SAT is the appeal body, yes.

Hon PAUL BROWN: Chair, I will follow up on that. The granting of a licence for taking water does not indicate where that water is going to be used, does it? They can actually take water from over there —

Mr Bagdon: No; a licence is specific to a particular location of extraction.

Hon PAUL BROWN: So if they take water out of that location and they want to put it in a tanker and take it to a wellhead or a hydraulic fracturing location —

Mr Bagdon: They can do that if it is from their actual extraction point.

Hon PAUL BROWN: So they get the licence to take the water, but it does not actually tell them where—if they want to use that water in a process over there —

Mr Bagdon: They can then put it in a pipeline and send it down the road to a plot they have got and put it through the irrigation system or into a factory or the cement plant—whatever it happens to be. We are managing the resource and the extraction point, not the specific methodology of any use.

Hon PAUL BROWN: If they want a licence for here and that licence does not permit the taking of water from that location, they can seek a licence for somewhere else, and if it is commercially viable they can transport that water to that location and you do not have any input into where they use that water?

Mr Bagdon: There would be no need for us to have an input on that.

Hon PAUL BROWN: I just wanted to clarify that, that is all.

The CHAIRMAN: Much of the discussion about fracking that tends to occur in Western Australia is about preserving the integrity of the groundwater from contamination. We have also discussed the quantities of water that would be required to be pressure-fed into the wells to frack them. I have a couple of questions about those processes. The potential for contaminants from the fracking fluid to enter one of your aquifers has been identified, potentially through, for example, a leak in a well at the point where it passes through an aquifer. You would obviously be aware of that.

Mr Bagdon: We have areas of concern in which we are providing input. One is what happens on the surface, because spills and other activities on the surface could contaminate a groundwater source. So we are concerned about what happens on the surface, how things come in and out, how they are stored and accidents that might happen, such as spills or whatever. That is one area of concern and we provide advice on the indications of those sorts of things. We have concerns about well integrity, obviously, so we provide advice to DMP on that. The latest draft regulations that have come out deal with well integrity, so we will be looking at those very carefully and providing input into those draft regulations about managing well integrity. The third area we have an interest in is what happens underground: what are the propagation of the cracks, how safe are they, how far away are they from an aquifer and so on, how well that is known, and what are the monitoring assessment programs being used. We have an interest in all of those areas and we regularly converse with DMP about those and we will be providing our inputs on those. We will also be formalising referral and advisory procedures relating to those issues.

[12.20 pm]

The CHAIRMAN: You have just anticipated answers to about four of my next questions, so you really saved a bit of time for us all there. Thank you for that. I am glad to have confirmed that they are all areas of concern to you that you are monitoring and having input to. One of the questions that was inspired by your submission is, and this also a matter of concern: What happens after the fracking process and what is the legacy that may occur either immediately after a well is closed or indeed 30 or 50 years down the track; and is there a possibility of contaminants finding their way into water sources that need to be protected after that? Have you got any comments you could make there?

Mr Bagdon: We would simply be looking at what the potential risks are of that and what measures could be taken to minimise those risks or avoid them. There are limitations in terms of current technologies and information, but we would be using the best possible information we have to provide advice to the Department of Mines and Petroleum who are the lead regulatory agency on that issue. We do not control that issue itself.

The CHAIRMAN: You have observed that because of cost considerations and the prohibitive cost considerations that recycling water used for fracking means it is not a good final solution. You have commented that in the course of further fracking operations the water recovered could be re-used and in that sense recycled. But you get to an ultimate point where the water that has been used for fracking and then recovered back up the well has to be disposed of, and at that point recycling, as I

understand it, is not a cost-effective option and other means of disposal would have to be resorted to. Can you comment on that, whether I have got that correct?

Mr Bagdon: Yes; it is a possibility. Again, it would all be driven by what the availability of water is in the area where the operation is concerned, what the profitability of a particular well is and whether it is worth their while to put in a water treatment system. It could be a reverse-osmosis treatment package that would treat the water. They would then still have to comply with all the regulations to do with the disposal of any waste from that treatment facility. There are lots of options and it would really come down to the financial dynamics of it. It is possible to purify water to very high standards; there is a cost attached to it. If there is no water available and their only option is to recycle water or to obtain recycled water from some other source, they would have to weigh up whether that is a viable proposition for them. We would be managing the water resource to the extent that once we believed the water was fully allocated we would not be issuing any further licences.

The CHAIRMAN: In terms of the water used in fracking operations that remains in the ground, going beyond the point where fracking occurs and large amounts of water are introduced under very great pressure as part of that process, what happens when that is finished, when the well is no longer producing? How much of that water would remain in shale rock; and would it still be under pressure thereafter thereby posing the risk of that water finding its way through a fault or a leaking gas well into the future?

Mr Bagdon: I defer to the hydrogeologist on that question. Look, there would be immense pressure at those depths and yes there would be some water, but it would depend a lot on the individual geology and what the rock is, how permeable it is, what the fracture systems are and so on.

Mr Macaulay: I think that more or less covers it. It would vary enormously from case to case how much water actually remained there at the end of the productive cycle of the well, which could well be decades. Most of that pressure would tend to dissipate. The most likely pathway for that water to get back up to our aquifers, as we are referring them here, would be to go back to the earlier risk that has been flagged a couple a times now—would be potential failure somewhere along the well casing. Speaking as a geologist I think it is unlikely that it would move out.

The CHAIRMAN: Would that residual water, after the well has been decommissioned, still be under pressure, though, so there is a force at work that might at some future time keep that water in danger of leaking through a leak in the well as it deteriorates over time as it surely must?

Mr Macaulay: I honestly cannot answer that question without going back and doing a bit more homework.

Hon STEPHEN DAWSON: Mr Bagdon, you told us there is no licensing instrument under the RIWI act to regulate the injection of water and fluids into the ground for hydraulic fracturing activities and they are regulated under the Petroleum and Geothermal Energy Resources Act, which is a DMP act. Some might see that as the fox in charge of the henhouse. You also told us that the legislation is old, from 1914, and that you might be looking at updating legislation. If you did update the legislation, would you seek to include in any new legislation an ability for your department to regulate the injection of fluids or water?

Mr Bagdon: We will be updating the injection into aquifers; we will not be seeking to regulate injection into the ground outside of aquifers. The Department of Mines and Petroleum is the lead agency. It is the regulator on that issue. If you have two agencies with overlapping legislation that is attempting to achieve something through different mechanisms and objectives, you could probably have just as big a problem of things getting overlooked and not done as you have in terms of any perception that the Department of Mines and Petroleum is not doing its job. Our position is that we will work within the current framework. We will provide the best quality advice that we can

relating to how that would be regulated and have the expectation that the Department of Mines and Petroleum would fulfil its legislative duty.

Hon STEPHEN DAWSON: One final question: Is the way things happen now the best way? If you could have the choice of whether this is regulated by the PGERA or the RIWI act, what would be the best place?

Mr Bagdon: Our role is the management of the water resource. If there is no impact or minimal impact on that water resource, there is no requirement for the Department of Water to be managing that activity. There are other activities that could have an impact on water resources and we manage them through the EPA, the Department of Environment Regulation or the Department of Planning. There are all sorts of activities that might impact; we cannot manage all of those and nor should we. We are a water resource manager. Where it would be a significant issue to water resource, we would want to be actively involved or directly legislating it. Where it involves activities that have minimal risk, in many cases, or the managed risk through someone else's legislation, we would work through that mechanism.

Hon PAUL BROWN: One final one from me. This problem probably goes to Mr Macaulay the hydrogeologist. Following from the Chair's question before about the water being left in the wells once production is finished, being that we currently in the Gngangara mound have a wastewater recharge facility where near-clean water goes here, migrates to another point and is taken out, in one of these fractured wells, if at depth over time the well was to fail and water was to be released from that and there were contaminants or naturally occurring radioactive materials, as the water migrates from the well into the strata and then to another water body, is there a likelihood that there would also be a filtering process as well as with our recharge facility in Gngangara where it is cleaned up as it moves slowly through soil structure?

Mr Macaulay: It varies from contaminant to contaminant, obviously, and the length of time taken for things to dissipate as they move through natural formations, but yes, it would gradually happen, over time, be it decades or centuries, depending on the contaminant.

The CHAIRMAN: Mr Bagdon, Mr Mantle and Mr Macaulay, I think we are just about at the conclusion of this hearing for now. I once again thank you very much for your submissions and for also giving us the benefit of your advice today. I note there are a couple of matters that require supplementary information that you will be providing by way of the maps and the other material Mr Dawson asked for, and we look forward to receiving that and we will possibly seek your advice again in the future. For now, I bid you good day and thank you very much.

Mr Bagdon: Thank you for the opportunity and I will pass on your comments about the submission to all those involved; they will be very grateful to hear it.

Hearing concluded at 12.31 pm
