

AUGUST/SEPTEMBER 2017

The following is a monthly update for the Narrabri Community Consultative Committee (CCC) regarding activities undertaken by the NSW Environment Protection Authority (EPA) relating to PEL 238, PAL 2 and PPL 3 (Narrabri Gas Project).

It includes activities relating to the regulation of Environment Protection Licence (EPL) 20350 and the EPA's functions conducted under the NSW Gas Plan.

Attachments to this month's update:

- Running Log – Old Investigations of PEL 238 Outcomes
- Inspections undertaken by EPA - August 2017
- Inspections undertaken by EPA - September 2017
- EPA Site Inspection Map - August 2017
- Feature Article – An overview of the gas well decommissioning process

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EPA ACTION ITEMS SINCE LAST NCCC

No new issues.

INVESTIGATIONS

Background

On 19 February 2013 the EPA became responsible for investigating environmental incidents that occur during coal seam gas activities under the provisions of the *Protection of the Environment Operations Act 1997* (POEO) and issuing Environment Protection Licences (EPL) for coal seam gas activities.

On 1 July 2015 the EPA commenced a new role as the lead regulator for compliance with, and enforcement of, conditions of approval for gas activities in NSW. This includes regulating consent conditions and activity approvals issued by other agencies (excluding work health and safety). In carrying out this role the EPA works with the relevant experts and NSW Government agencies.

Gas activities must comply with a broad range of regulatory controls, including Acts, regulations, codes of practice, titles, approvals and other controls.

The prioritisation of investigations is determined using a risk assessment for investigations that considers the level of environmental impact and the likelihood of environmental harm occurring.

Current Investigations

The EPA is liaising with Crown Lands and Water on a matter raised with the EPA relating to approvals required by Santos for the irrigation activity at the Narrabri Gas Field. Multiple approvals and licences are currently in place for the irrigation activity including an Environment Protection Licence. The results from the initial round of monitoring, as required by the Environment Protection Licence, has been submitted to the EPA. The EPA has reviewed the data and confirmed that the irrigation water meets the monitoring requirements of this Licence.

Running Log – Old Investigations PEL 238 and PAL 2 Outcomes

Incident	Outcome
<p>June 2017 <u>Bohena 13C and Bohena South 2C (PAL 2)</u> The EPA undertook a review of Bohena 13C and Bohena South 2C following the submission of ESF2 rehabilitation relinquishment documents from Santos. The EPA undertook unaccompanied inspections of the sites, and followed up on some matters with Santos regarding the rehabilitation status of the sites. A community call to the EPA Environment Line was also lodged with regards to Bohena 13C.</p>	<p>EPA officers re-inspected both sites. No environmental harm was identified from the inspections, with the matters finalised and no further action considered necessary. The EPA also sent a response letter to the complainant advising the outcome and finalisation of the matter at Bohena 13C.</p>
<p>February 2017 <u>Groundwater pH levels at Dewhurst 14C (EPL 20350)</u> The EPA investigated data from groundwater monitoring bore, Dewhurst 14C, following an Environment Line call on 17 February 2017 that raised concern about data published on the Santos Water Portal, showing alkaline results (pH>9.5) for water samples collected from monitoring well Dewhurst 14C.</p>	<p>An EPA investigation showed the findings indicated the alkaline pH reported for Dewhurst 14C was the result of local geological and groundwater conditions, and that there was no evidence that the groundwater chemistry in Dewhurst 14C had been modified because of water pollution. The investigation has been finalised, with no issues identified.</p>
<p>February 2017 <u>Tintsville Flare Incident (PEL 238)</u> On 24 February 2017, the EPA were notified by Santos of an incident relating to unauthorised access to Wilga Park, resulting in damage to the Tintsville Flare.</p>	<p>Investigation confirmed that the gas pipe had not been ruptured and there was no environmental harm. The EPA has concluded its investigation.</p>
<p>December 2016 <u>Leewood Northern Sediment Dam</u> EPA Officers Investigated Leewood Northern Sediment Dam following an Environment Line call alleging an overflow incident from Leewood Ponds Water Treatment Facility.</p>	<p>Incident was investigated and samples taken, with lab results confirming no BTEX present and the materials classed as organic; dried sun bleached algae; and a naturally occurring protozoa. Investigation finalised, with no issues identified.</p>
<p>November 2016 <u>Bohena Creek</u> Report alleging that Bohena Creek was impacted by the Bibblewindi Water Treatment Plant and gas wells.</p>	<p>EPA officers visited the area of Bohena Creek that the reporter referenced. There was no evidence that environmental harm has occurred.</p>

<p>September 2016 <u>Leewood (PAL002)</u> Report alleging Leewood produced water dams were overflowing.</p>	<p>The EPA officers visited the site and all ponds were observed to be operating with adequate freeboard. There was no evidence of any overflow or spill from the ponds.</p>
<p>September 2016 <u>Bohena 2</u> Report alleging Santos were using produced water from Leewood for watering program at Bohena 2 salinity site.</p>	<p>Environment Line complaint alleging Santos were using produced water from Leewood for the watering program at Bohena 2 salinity site following a Namoi Waste truck seen leaving Leewood and heading to Bohena 2 salinity site. EPA Officers attended the site, investigated and took water samples. Lab results indicate that the source of water is not consistent with produced water. The EPA sent a response letter to complainant advising this.</p>
<p>April 2016 <u>Bohena Creek Road</u> Methanol Drum on road.</p>	<p>Santos staff located a 44 gallon drum labelled 'Methanol' dumped on Bohena Creek Road near the Leewood Water Treatment Facility. Police and HAZMAT attended and secured the item. The drum was not on the Santos site, nor related to its activities as per media Tweet by the EPA.</p>
<p>March 2016 <u>Leewood Pond</u> Alleged leaking.</p>	<p>EPA officer inspected storage ponds and met with Santos staff. No evidence that produced water was leaking. No further action was required.</p>
<p>March 2016 <u>Bohena Creek Road</u> Report that a vent had been left open, unattended and emitting methane gas.</p>	<p>Santos has approval to vent gas from high and low point vents along the water gathering lines for safety and operational purposes – this is performed manually by a field operator. Santos has amended the manual venting operating procedure. The procedure clearly notes that a high point vent is not operated without an operator present.</p>
<p>March 2016 <u>Santos Pilliga</u> Report received that there was a 'foamy residue' left along Beehive Road. The complainant returned to the site some days later with a Geiger counter and recorded a reading allegedly linked to the high and low point vents.</p>	<p>An EPA Officer spoke to the complainant who advised that the location they took the Geiger counter reading was a few kilometres away from the area of concern and there was no evidence to support the initial claim. No further action required.</p>
<p>March 2016 <u>Leewood Water Treatment Facility</u> Report alleging a truck was spraying produced water between the internal fence and the property boundary fence for dust mitigation.</p>	<p>An EPA Officer viewed available data confirming raw water from an on-site bore was used for dust suppression at the time of the allegation. The EPA supports dust suppression which is a requirement of the Santos EPL. No further action required as at 15 March 2016.</p>
<p>February 2016 <u>Santos Pilliga</u> Report of 35,000 litre spill at unmanned Santos facility.</p>	<p>Investigations proved minor water run off with no environmental or health risks. Media release: Water Run-off From Leewood Water Treatment Facility in Narrabri Cleaned Up</p>
<p>January 2016 <u>Leewood Water Treatment Facility</u> Alleged discharge of sediment laden water.</p>	<p>The rainwater discharge followed heavy rain. Santos undertook immediate works to prevent further discharge from the site installing coir mats and construction of bunding. The EPA inspected site and determined no environmental harm had occurred and that no regulatory action was required.</p>
<p>January 2016 <u>Santos Pilliga</u> Report a 'foamy caramel coloured' material on the roadside near operation site.</p>	<p>The EPA inspected the site and collected samples. Analysis determined it was a natural event, likely due to the decomposition of organic material. No further action was required.</p>

September 2015 <u>Bohena Creek</u> Piezometer located in creek.	No regulatory action required.
January 2015 <u>Santos Dewhurst Southern</u> Water flow line.	No breach of EPL 20350 identified. Santos varied operational practices for high point vents following negotiations with the EPA. Media release: No environmental harm but improvements needed
February 2014 <u>Namoi Waste</u> Storage of Santos drilling mud onsite.	6 May 2014 The EPA issued Namoi Waste Corp with a Penalty Notice for breach of s145 of the POEO Act. Note - The Penalty Notice issued was not related to the original complaint regarding waste from coal seam gas, rather other waste material identified during the course of the investigation. Media release: EPA issues Naracor and Namoi Wastecorp with penalty notices for unlawful waste transport and storage
March 2013 <u>Biblewindi Water Treatment Facility</u> Pond liner failure.	11 Feb 2014 The EPA issued a Penalty Notice for s120 Pollution of Waters. A Pollution Reduction Program (PRP) was added to EPL 20350 (Environment Protection Licence) requiring the development of a Remediation and Monitoring Plan and the implementation of this plan.
March 2013 <u>Tintsville Ponds</u> Detection of elevated levels salinity and metals.	Insufficient evidence to determine if the changes detected in groundwater were the result of leaks from the Tintsville ponds or were from natural factors. A PRP was added to EPL 20350. Media release: No environmental harm but improvements needed

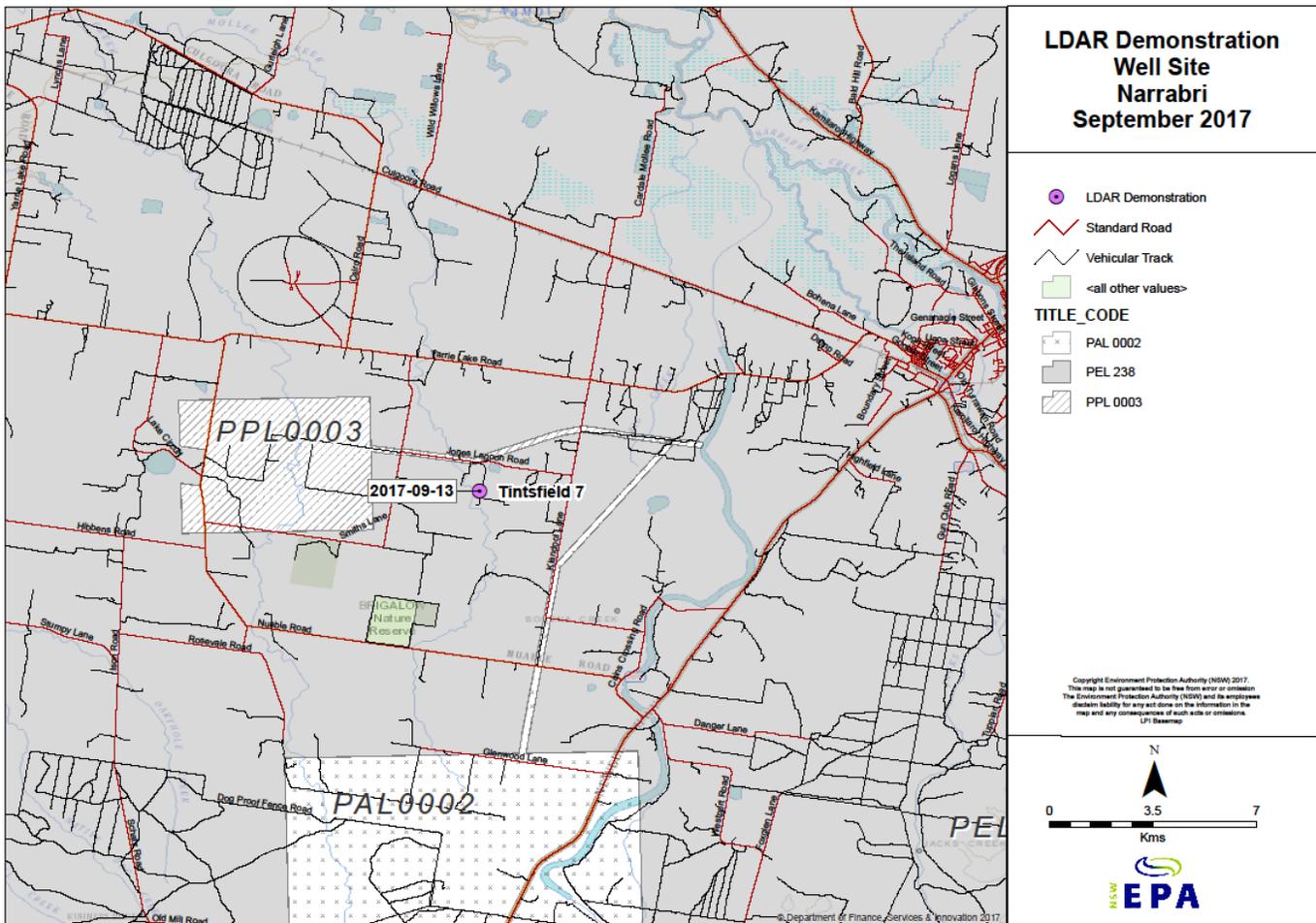
Inspections undertaken by the EPA – August 2017

Inspections					
Site ID	Date Inspected	Reasons	Action/Outcome	Site Status	Statutory Document
Leewood irrigation pivot	16/08/2017	Observation	Ongoing monitoring	Active	PAL 2
Leewood irrigation pivot	23/08/2017	Meeting and observation	Discussions ongoing	Active	PAL 2

Inspections undertaken by the EPA – September 2017

Inspections					
Site ID	Date Inspected	Reasons	Action/Outcome	Site Status	Statutory Document
Tintsville Pilot	15/09/2017	LDAR meeting	LDAR demonstration	Active	PPL 3/PEL 238

EPA site inspections undertaken at Narrabri during September 2017



An overview of the gas well decommissioning process

Coal seam gas (CSG) well decommissioning is also known as plug and abandon (P&A) or abandonment and is undertaken when it has been determined that a gas well is no longer needed. The [NSW Code of Practice for Coal Seam Gas Well Integrity 2012](#) stipulates best practice principles for well decommissioning, along with mandatory requirements and good industry practice guidelines. [The Chief Scientist and Engineer's Initial Report into CSG](#), July 2013, provides more information about the science of CSG wells including decommissioning.

The process of decommissioning, or P&A, a CSG well involves removing the surface infrastructure, then a staged filling of the well with a series of cement 'plugs' which will isolate formations, or rock layers, from each other preventing any movement of water or gas along the well. There are numerous steps involved with checks and measures to ensure the plugging of the well is successful. This article presents an overview of the main steps involved.

Preparing for the decommissioning

During gas extraction, scaling can build-up along the inside of the casing. This is not dissimilar to hardwater build-up in your household plumbing. It is standard practice to use a scraping tool to remove this scaling during production life. Scale removal prior to decommissioning contributes to a better bond between the cement and the steel casing.

Each well to be plugged is filled with cement that has been prepared specifically for that well. The considerations given to any individual batch of cement include compatibility with rock type and groundwater chemistry, pressures, temperatures and operating conditions. The cement composition is lab tested prior to the P&A and the results are submitted to the government.

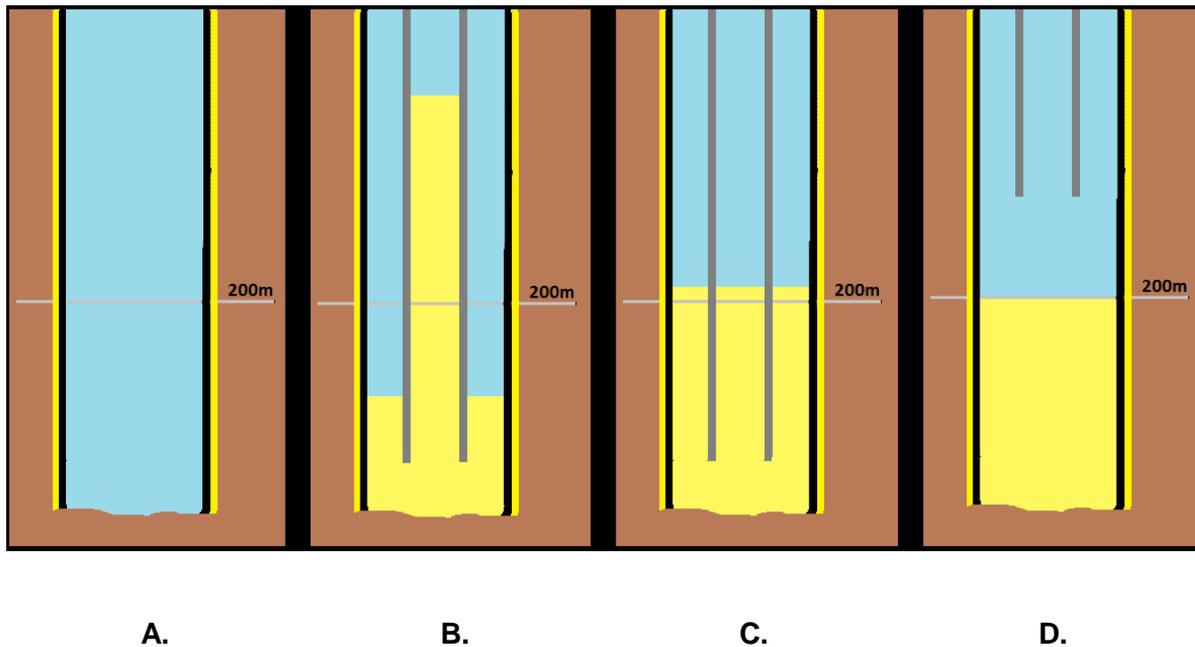
Installing the plugs

A specialised cement rig is used to mix and pump the cement. Cement is pumped via a tube to the bottom of the well. The tube is lowered to a few meters from the bottom and the cement is pumped in at 200 metre maximum intervals. At this point, pumping stops, the tube is pulled up out of the well, and the cement is left to set. This is typically for a period of six hours. Each 200-metre cement plug is tagged after it has set. Tagging involves lowering a pipe into the well until it touches - or 'tags' - the top of the cement. The length of the lowered pipe is noted thus enabling the depth of the cement from ground level to be calculated. Tagging has the dual purpose of measuring the depth of the top of the plug and confirming the cement has set.

To make sure the cement seals any perforations that had been created in the well casing, once the cement level is above the perforations, it undergoes a pressure test to 500psi above the natural pressure level at the depth of the perforations. After pressure testing confirms suitable sealing, the remaining cement can be pumped into the well in as required.

As the cement fills the gas well it displaces any water present, pushing it further up the hole. The water that is displaced by the cement is treated as produced water and is subject to produced water regulations.

Many factors determine the time it takes to plug and abandon a CSG well including the depth of the well, the time cement plugs take to set, well-specific factors and restrictions relating to operating hours. This procedure is followed for each cement plug.



The above four diagrams represent a cross-section of CSG well during the plugging process.

- A.** The black lines depict the well casing. The yellow lines depict cement used during the well construction phase.
- B.** The grey lines in the centre of the well casing show the tube used to pump in the cement, which is shown in yellow.
- C.** This diagram shows the cement pumping tube in position having pumped cement to a maximum depth of 200 metres. The cement is seen slightly raised by the presence of the tube.
- D.** This shows cement in the well to a depth of 200 metres. The tube has been raised out of the still wet cement.

Cut and cap

Once the gas well has been filled with cement and the cement has set, the top of the last plug and the steel well casing are cut off 1.5m below ground level and a well-head marker (a steel plate) is secured to the top of the plug. A 'bubble test' is conducted for safety reasons, to make sure no gas is present before the cutting commences. Some details on the marker will include the well ID and the date of plugging. Once the soil has been replaced on top of a decommissioned well the rehabilitation phase commences.

The Division of Resources and Geoscience and the EPA oversee every step of the decommissioning process and will not sign off a decommissioned well until satisfied that the community and environment are protected. In line with international best practice, engineering principles and sealing requirements ensure environmentally sound and safe isolation of the well and once a well has been decommissioned, it is deemed very low risk.

CONTACT US

Want to know more about what the EPA does? Want to understand a process used by the gas industry in a bit more detail? ...

...Tell us what you would like discussed in a Feature Article!

The feature article in this newsletter each month is an opportunity for the EPA to provide additional information and address any questions you have. Your feedback is key to ensuring we are providing the sort of information the community would like to see, and so, we would like to hear from you all.

Previous editions of this newsletter have included articles on 'who we are and what we do', groundwater quality monitoring, specific EPA projects and decommissioning and rehabilitation of gas well sites – these examples may give you an idea of a question you would like to ask.

Please send us any activities, processes, questions or information you would like to see in a feature article to gas.reg@epa.nsw.gov.au.

We look forward to hearing from you!

Every effort has been made to ensure that the information in this document is accurate at the time of publication. However, as appropriate, readers should obtain independent advice before making any decision based on this information.

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