

KEY THEMES FROM SUBMISSIONS

Proposed new statutory function: Geotechnical engineer – underground coal mines

Overview

On behalf of the Mining and Petroleum Competence Board (the board), the NSW Resources Regulator invited comment from stakeholders on the discussion paper for a possible new statutory function of geotechnical engineer in underground coal mines.

The consultation period closed on 19 October 2019.

Questions

Stakeholders were asked to comment on the following questions:

1. Is a new statutory function for geotechnical engineering warranted?
2. If the function is warranted, what qualifications and experience are appropriate?
3. If the function is warranted, should it be a key statutory function?
4. Do you have any comments of a general nature?

Submissions received

The Regulator received 13 submissions (eight from individuals and five from organisations).

Table 1 (page 2) shows a list of submissions and stakeholder responses to questions 1 and 3.

KEY THEMES FROM SUBMISSIONS

Proposed new statutory function: Geotechnical engineer – underground coal mines

Table 1 List of submissions and responses to questions 1 and 3

| NO. | SUBMISSION | 1. IS A GEOTECHNICAL ENGINEER STATUTORY FUNCTION WARRANTED? | 3. IF YES, SHOULD IT BE A <u>KEY</u> STATUTORY FUNCTION |
|-----|---|---|---|
| 1 | Name redacted - Individual submission | Yes | No |
| 2 | Name redacted - Individual submission | Yes | Did not comment |
| 3 | Greg Shields – Individual submission | No | - |
| 4 | Name redacted - Individual submission | Yes | Yes |
| 5 | Name redacted – Individual submission | Yes | No |
| 6 | Name redacted – organisation submission | Yes | Yes |
| 7 | Glencore Coal Assets Australia (Glencore) | No | - |
| 8 | Professors Ismet Canbulat and Bruce Hebblewhite, UNSW-individual submission | Yes | *Yes |
| 9 | NSW Minerals Council | No | - |
| 10 | Mine Managers’ Association of Australia (MMAA) | No | - |
| 11 | Name redacted – Individual submission | Yes | Yes |
| 12 | Emeritus Professor Jim Galvin (Professor Galvin) - Individual submission | No | - |
| 13 | Collieries’ Staff and Officials Association (CSOA) | Yes | No |

*Submission 8 said geotechnical engineer should be treated the same way as a ventilation officer which is a key statutory function.

Key themes from submissions

1. Is a new statutory function for geotechnical engineering warranted?

Support for the proposed function

As shown in Table 1 (page 2), eight of the 13 submissions support the proposed function. The reasons for their support are summarised below:

- **Advantages to having an onsite geotechnical engineer:** Individual submission 4 believes the advantages of having an onsite geotechnical engineer include a deeper understanding of specific challenges at an individual mine; input into daily planning; ensuring data is collected/used properly; and the recognition of early warning signs.
- **Minimising strata failure-related incidents:**
 - Organisation submission 6 believes it would help minimise incidents and reduce the likelihood of geotechnical engineers being made redundant in downturns.
 - Individual submission 5 believes it would ensure a standard for qualifications to perform this function and hopefully improve outcomes.
- **Elevation of status of the profession:**
 - Organisation submission 6 believes it would give geotechnical engineers more weight to not give in to pressure from managers to alter designs.
 - CSOA advised elevating it to a statutory function may help ease tension between production demands and geotechnical recommendations, obligating other roles a duty to more fully consider and include geotechnical recommendations.
- **Reliance on geotechnical engineering advice:** Individual submission 11 advised not all mine managers are experienced in geomechanics and not all rely on a geotechnical engineer for advice.
- **Performance of role:** Individual submission 1 believes persons in this role should have greater knowledge, commitment and competence than they currently do.

Opposition to the proposed function

As shown in Table 1 (page 2), five submissions oppose the proposed function. The reasons for this are summarised below:

Existing legislative framework

Greg Shields, Glencore, the NSW Minerals Council and the MMAA believe the existing legislative framework for managing geotechnical matters in underground coal mines is appropriate. For example, Glencore engages external experts to advise and assist in undertaking the Principal Hazard Management Plan risk assessment for strata failure.

Glencore, the NSW Minerals Council, and the MMAA believe there is already appropriate statutory responsibility for geotechnical matters with these matters primarily falling under the responsibility of the Mining Engineering Manager. The MMAA believe splitting responsibilities with the Mining Engineering Manager and a Geotechnical Engineer is problematic and fraught with risk.

Advice for geotechnical engineers

The following submissions believe industry already receives sound geotechnical engineering advice:

- The NSW Minerals Council believe different expert perspectives provide valuable input on different geotechnical situations to supplement on-site geotechnical expertise. Mine operators engage appropriate geotechnical engineers either through direct employment or through consultants.
- Glencore advised that externally sourced expertise and internal geotechnical capability provides an appropriate level of robust advice to underground coal mines.
- The MMAA believe geotechnical specialists used by industry have extensive knowledge and experience, service multiple sites, have international networks, often work in tunnelling, hard-rock and construction and bring a much broader knowledge base to play.

No demonstrated need, limit collaboration, and regulatory burden

Other reasons for opposing the proposed position are:

- **Evidence of improvements:**
 - The NSW Minerals council argue there is no logical basis to infer it would result in any improvement or would have improved the outcome regarding the major investigations identified in the discussion paper.

- Professor Galvin does not believe it will deliver the anticipated benefits.
- Glencore advised underground mine safety performance regarding geotechnical engineering matters and historical incidents due to strata failure do not demonstrate a need for the proposed function.
- **Different perspectives/collaborative approach**
 - Glencore believes being reliant on a single geotechnical engineer could lead to inadequate consideration of geotechnical issues due to the inherent degree of uncertainty in most geotechnical situations.
 - Professor Galvin advised an unintended consequence of creating the function could be discouraging or impeding access to the range of specialists and consultants from across many disciplines who currently contribute to managing risks.
- **Regulatory burden and complexity:** Glencore, MMAA, NSW Minerals Council and Professor Galvin commented about the increased complexity and regulatory burden from introducing the proposed function.

2. If the function is warranted, what qualifications and experience are appropriate?

Qualifications

Note: References below to ‘alternate qualifications’ are a reference to the second option on page 6 of the discussion paper: *“a degree in either geology, geophysics or mining engineering with a one-year postgraduate qualification in geomechanics or geotechnical engineering...”*

Four-year geotechnical engineering degree may not be available

Individual submission 1 and Glencore advised a four-year geotechnical engineering undergraduate degree may not be available in Australia. Individual submission 1 advised civil engineering students can major in geotechnical engineering but this field is vastly different to what’s required of an underground geotechnical engineer.

CSOA advised until recently a standalone four-year geotechnical engineering degree was not taught. Most geotechnical engineering was taught as part of another engineering degree or as a Master of Engineering Science in Geotechnical Engineering and Engineering Geology.

Professor Galvin advised geotechnical engineering is not a distinct, standalone discipline. It is a core component of mining/civil engineering degrees and has rarely been offered as a standalone degree.

Four-year geotechnical engineering degree may not be suitable

Professor Galvin advised:

- some practitioners don't have a geotechnical engineering qualification.
- many are not engineers but may hold postgraduate qualifications in geotechnical engineering, usually building on graduate degrees in other aspects of earth science.

Individual submission 5 believes a geotechnical engineering degree may not be relevant unless combined with the right experience and a graduate diploma in strata control.

CSOA advised less than 10 per cent of their members doing coal mine geotechnical work hold a four-year geotechnical engineering degree; and many of their staff with a geotechnical engineering degree are not employed as a standalone resource at a mine (they are spread over various mines).

Support for civil engineering, mining engineering and engineering geology

The following submissions support including the following as eligible qualifications:

- **Civil engineering:** Individual submission 1, Professors Canbulat and Hebblewhite, Organisation submission 6 and Individual submission 11 all support civil engineering as an eligible qualification. Individual submission 1 suggests it is the most suitable as it teaches foundations of strength, stress and structures and has strong ties to geology and rocks.
- **Mining engineering:** Individual submission 5 believes mining engineering is highly relevant as it includes solid mechanics, fluid mechanics (and rheology), mine geomechanics and geotechnical engineering. Individual submission 1, Individual submission 4, Organisation submission 6, Individual submission 11, and Professors Canbulat and Hebblewhite support including it as an alternate qualification.
- **Engineering geology:** Organisation submission 6 supports including engineering geology as an alternate qualification due to its principles in soil and rock mechanics.

Alternative qualifications (particularly UNSW's strata control grad diploma)

The following comments relate to support for the proposed alternate qualifications:

- Individual submission 4, Individual submission 5, Individual submission 11 and Organisation submission 6 support UNSW's graduate diploma in strata control as an appropriate postgraduate qualification.
- Individual submission 5 believes a geology background would be suitable combined with the right experience and UNSW's graduate diploma of strata control.
- CSOA advised the majority of its members in geotechnical work hold a geology, geophysics or mining engineering degree, supplemented by postgraduate qualifications including UNSW's strata control diploma (CSOA has queried if the UNSW course counts as eligible one-year postgraduate qualification).

Concerns raised by Glencore around the proposed qualifications

Glencore advised the proposed qualifications/experience are overly stringent and may be problematic for persons with overseas qualifications given European undergraduate programs are often three years.

They believe the proposed qualifications are likely to result in a shortage of geotechnical engineering capability in NSW with a significant number of experienced engineers unlikely to meet them.

Experience

Support for three years' experience

Individual submission 1, Individual submission 4 and Professors Canbulat and Hebblewhite support three years' experience. However, Individual submission 1 suggests it should also include consulting to underground coal mines; and Professors Canbulat and Hebblewhite believe a number of competent, highly qualified geotechnical engineering consultants may not have three years' underground coal mine experience and those with hard rock underground experience should not need it to qualify.

Support for five years' experience

Organisation submission 6 and Individual submission 11 support five years' experience working in an underground coal mine as a geotechnical engineer. Organisation submission 6 advised this is based on the Registered Professional Engineers Queensland (RPEQ) process for geotechnical engineers (mining) which appears a responsible time to gather experience and see various conditions.

3. If the function is warranted, should it be a key statutory function?

As outlined in Table 1 (page 2), of the eight submissions in support of the proposed function, four believe it should be a key statutory function; three oppose it being a key statutory function; and one did not comment.

Support for it being a key statutory function

Reasons why it should be a key statutory function

A summary of reasons in support of it being a key statutory function are provided below:

- Individual submission 4 advised that geological and geotechnical characteristics are more variable than other parameters at a mine therefore a deeper understanding of specifics is needed. Making it a key statutory function would not prevent mines using geotechnical advice across different sites, collaborating or seeking external advice.
- Organisation submission 6 advised:
 - One person should solely be responsible and be on site. There may be two or more geotechnical engineers employed on site due to the complex geotechnical environment and therefore one person should be nominated.
 - The role of a geotechnical engineer is quite similar to that of the ventilation officer which is currently a key statutory function.
 - It would alleviate the work load of the mining engineering manager and give confidence to the underground workforce as this person would be on site regularly inspecting underground roadways and communicating to the workforce.
- Professors Canbulat and Hebblewhite believe it should be treated the same way as the role of ventilation officer and Individual submission 11 believes it should be a key statutory function as it is dealing with a principal hazard.

Opposition to it being a key statutory function

It should just be a statutory function (not a key statutory function)

Individual submission 1, Individual submission 5 and CSOA support it being a statutory function but not a key statutory function. Individual submission 1 believes it is suitable for multiple people to hold the ticket at a site or one person to hold it over several sites.

Operational difficulties where the position could not be filled

Glencore believes making it a key statutory function may lead to operational difficulties where the position could not be filled. They consider it unlikely there would be sufficient persons with the proposed qualifications and experience for each underground coal mine in NSW fill the position.

4. Do you have any comments of a general nature?

The following is a summary of the general comments from the submissions:

- **Benefit to mines and industry through professional development training:** Individual submission 2 believes the proposed function will benefit mines and industry through more frequent training and conferences which will engage geologists.
- **Time is required to train more geotechnical engineers before implementing function:** Professors Canbulat and Hebblewhite support the proposed function but advise time is required for industry to train more geotechnical engineers before it is introduced.
- **Description of geotechnical engineering role in discussion paper is inaccurate:** (Professors Canbulat and Hebblewhite and Glencore).
- **Opposition to CFMMEU's view that mines not receiving sound advice:** Professors Canbulat and Hebblewhite believe many competent experts provide sound and robust advice.
- **Requirement to have registered or chartered engineering status:**
 - Professor Galvin suggests an alternative approach is to require persons who influence geotechnical engineering practice in underground coal mines to have registered or chartered engineering status with a nominated profession organisation.
 - Professors Canbulat and Hebblewhite believe in addition to the qualification/experience requirements, a requirement should be registration with a relevant professional organisation to ensure continuing professional development.

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