

Glennies Creek Part 3A Application - Longwall Panels 10-17 Middle Liddell Seam

Response to Submissions

Glennies Creek Coal Management

February 2008

0047481.Final

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Approved by:	<i>Mike Shelly</i>
Position:	Partner
Signed:	
Date:	<i>21 February, 2008</i>

Environmental Resources Management Australia Pty Ltd Quality System

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Integra Coal Operations Pty Ltd (ICO) has applied to mine Longwalls 10 to 17 within the Middle Liddell seam at its Glennies Creek Colliery (GCC). The application applies to approximately 600ha wholly within CL382, and specifically the proposed Longwalls 10 to 17 and associated first workings in the Middle Liddell seam, including mains and gateroad development. The existing mains or access ways, conveyors and handling facilities established to enable the mining of Longwalls 1 to 9, will continue to be used to provide underground access for employees and materials to the Project Area, and for the transportation of coal extracted within the Project Area to the mine portal area in ML1437.

The proposal includes first workings and secondary extraction of up to 15.58 Mt of run of mine coal (ROM) over approximately five years at an annualised rate of up to 4.5Mt. Mining within the Project Area requires only minimal surface infrastructure (gas drainage boreholes) and will not involve an increase in production rate or variation to mining methods.

GCC is located in the Hunter Valley Coalfield of the Sydney Basin, approximately 12km north-west of Singleton, within the Singleton Local Government Area. The majority of surface land within the Project Area is owned by subsidiaries of the mining company Xstrata, including Glendell Tenements Pty Ltd, Savage Minerals Ltd & Enex Foydel Ltd, Enex Ravensworth Pty Ltd and Xstrata Mount Owen (XMO). The operating Mount Owen Mine, Ravensworth East Mine and the approved but yet to be commenced Glendell Mine (all currently owned by Xstrata) are in the vicinity of the Project Area.

Following public exhibition of the Environmental Assessment over the period from 4 October to 5 November 2007 inclusive, submissions were received from the following Government instrumentalities:

- Roads and Traffic Authority;
- Department of Environment and Climate Change;
- Department of Lands;
- Department of Primary Industries;
- Heritage Council of New South Wales;
- Mine Subsidence Board; and
- Department of Water and Energy (formerly the Department of Natural Resources).

Two community submissions were also received.

Responses to all submissions are presented in the following sections. A revised Statement of Commitments which reflects the relevant aspects of the responses is included as *Annex A*.

2.1 ROADS AND TRAFFIC AUTHORITY

The Roads and Traffic Authority had no objections or requirements.

2.2 DEPARTMENT OF ENVIRONMENT AND CLIMATE CHANGE (DECC)

2.2.1 Noise Impact Assessment

The Department's letter recommended certain conditions of approval and identified a number of broader environmental issues. With regard to noise impacts, DECC questioned gas extraction plant modelling results and recommended that the noise limits in DA 06-0057 be applied to the as yet undefined locations of the gas extraction plants.

Condition 7 within Schedule 3 of the Glennies Creek Surface Facilities Project Approval (application 06-0057) specifies the noise impact assessment criteria for that project. The condition from the consent is reproduced below.

7. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria presented in Table 1 at any residence on privately owned land.

Table 1: Noise impact assessment criteria dB(A) L_{Aeq} (15min)

Location	Day/Evening/Night
Mordey, Lambkin, Donellan, Hardy, Noble	38
Watling, Oxford, G. Hall, Proctor, Richards, Burgess	39
Egan, Payne, Moore	36

Notes:

- (a) The noise criteria do not apply to residences within the Zone of Affection for the Camberwell coal mine (Dulwich and Tisdell), or to properties where the Proponent and the affected landowner have reached a negotiated agreement in regard to noise, and a copy of the agreement has been forwarded to the Director- General and DEC.
- (b) Noise from the project is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance with the L_{Aeq} (15min) noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- (c) The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - temperature inversion conditions of up to 3°C/100m.

It is envisaged that up to two extraction plants would be operational at any one time in addition to the free venting gas drainage boreholes that do not generate noise. When mining is completed in an individual panel, when gas flows decline to a level where free drainage is an acceptable method of goaf gas reduction, or when operational needs dictate, the gas extraction plants would be relocated to the next operational panel. Integra Coal is satisfied that it can meet the DECC proposed condition of approval, and is agreeable to its inclusion.

2.2.2

Aboriginal Heritage Assessment

DECC notes that the effective survey coverage was 0.24% of the study area. The EA noted that this effective coverage was due to the limited archaeological visibility and exposure across the total survey area. The total area surveyed, however, was a significantly larger portion of the site, totalling approximately 23% of the Project Area, or 37.7 hectares. This survey included areas of flat land, slopes, crests, alluvial flats, creeklines and drainage lines. The survey area included the full extent of the Bettys Creek banks within the Project Area, as this is an area widely recognised as having a higher likelihood of culturally significant sites than other areas further from the creek. This survey demonstrates a thorough and widespread search of the Project Area, with the effective coverage being limited due to unavoidable environmental factors.

The survey results, as outlined in the Cultural Heritage assessment, are consistent with the results of previous surveys in the locality, namely that although Aboriginal sites/objects are present across all landforms, their densities are considerably lower away from Bettys Creek and its tributaries. This consistency with previous studies and the predictive model that was produced in the Cultural Heritage Assessment, attests to the validity of the survey methodology.

The DECC noted that a single letter attached to the EA Cultural Heritage Assessment was the only evidence of consultation with Aboriginal Community Groups. A comprehensive Aboriginal consultation process was undertaken as a part of the LW 10 – 17 Subsidence Management Plan, which was conducted prior to the preparation of the Environmental Assessment. The consultation process, which was undertaken in accordance with the Department of Environment and Conservation (2004) Interim Community Consultation Guidelines, culminated in a field survey within the LW 10-17 Project Area on the 14th February 2006. The registration sheet for this field work and additional notes regarding consultation are attached as *Annex B*.

Stages in the consultation process leading up to fieldwork are presented in Table 2.1.

Table 2.1 *Summary of Aboriginal Consultation Process (LW 10 – 17 SMP)*

Task	Date
Letters distributed to 26 Aboriginal interest groups, regarding registrations of interest for involvement in the project	18/10/2005
Public Notice (Invitation to Register Interest) sent to Newcastle Herald	18/10/2005
Registrations of interest received from seven Aboriginal Interest groups	18/10/2005 – 02/11/2005
Methodology for fieldwork distributed to registered groups	16/12/2005
Communication regarding fieldwork participation	16/12/2005 – 14/02/2005
Fieldwork conducted	14/02/2005
Draft Cultural Heritage Assessment distributed	11/05/2006

The letter reproduced in the EA was the only response received following the distribution of the Draft Cultural Heritage Assessment to relevant Aboriginal groups.

In regards to the DECC comments on consultation involving an assessment of significance of identified objects, the fieldwork was used as the primary opportunity for such issues to be discussed, whilst in the context of the site. As noted in the EA Cultural Heritage assessment, no specific comments were made by the Aboriginal representatives during fieldwork that highlighted areas or sites as being of particular cultural value.

In relation to borehole locations and the mitigation measures provided for cultural heritage impacts, the EA outlined that wherever possible, boreholes would not be installed within known archaeological sites. It was also stated that should borehole installation within these areas be unavoidable, consultation with the DECC and local Aboriginal community representatives would be conducted prior to any works being undertaken.

Subsurface testing by the Australian Museum Business Services (1997) found that 97% of artefacts were found within 30 metres of Bettys Creek. Given the recognised higher likelihood of artefact presence along Bettys Creek, ICO commits to having an Aboriginal community representative present prior to the installation of any boreholes with 30 metres either side of the Bettys Creek. This representative will be availed the clear opportunity to indicate the cultural value for the local Aboriginal community of the location in question.

Detailing the location of all boreholes to be installed over the life of the project prior to project approval is not possible as this is dependent on further investigations into mine gas levels and operational experience in the adjacent mined panels. The aforementioned mitigation measures will be used to ensure minimal impacts from gas drainage borehole installations on cultural heritage.

On consideration of the approval conditions recommended by DECC, the following changes are requested.

Condition 1 of those relating to Aboriginal cultural heritage refers to the need for a survey should any Aboriginal objects or sites be found on the proposed development site. In full the suggested condition reads:

- 1 If Aboriginal objects or sites are found on the proposed development site then the proponent must undertake surveys to determine the cultural heritage values of the site, and report how those values may be impacted by the development and provide appropriate avoidance, mitigation or compensatory measures. These additional surveys will require consultation with the relevant Aboriginal stakeholders. Results of this consultation should be reflected in the avoidance, mitigation and/or compensatory measures identified. In carrying out any additional assessment the proponent should refer to the following guidelines:
 - Interim Community Consultation Requirements for Applicants, available at: http://www3.environment.nsw.gov.au/PDFs/interim_consultation_guidelines.pdf
 - Aboriginal Cultural Heritage Standards and Guidelines Kit, available at: http://www3.environment.nsw.gov.au/PDFs/aborioinal_heritage_guidelines_kit_final.pdf

Given that the Project Area as defined in the EA approximates 600ha of which less than 1ha would be disturbed for the installation of the proposed gas drainage boreholes, such a requirement is totally inappropriate. Furthermore, as this survey has already been performed as part of the EA/SMP preparation; that unless such a survey were undertaken under improved visibility condition (something which is unlikely in the foreseeable future in view of the breaking of the drought) the likelihood of identifying additional sites/objects would be minimal, and given the very small scale of surface disturbance proposed, it is requested that this recommended condition of approval be deleted in its entirety.

Condition 2 of those relating to Aboriginal cultural heritage reads as follows.

2. The location of boreholes must be determined in consultation with all relevant Aboriginal stakeholders prior to commencement of works. The placement of each borehole location should involve, as a minimum, surface inspection by a suitably qualified archaeologist and at least one representative from the local Aboriginal community for the presence of Aboriginal cultural heritage material. Borehole location will be sited to avoid or minimize impacts to the Aboriginal cultural heritage values of the study area. Where boreholes or associated works cannot be relocated to avoid impacts to cultural values, mitigation, management and/or compensatory measures will be identified to reflect the views and opinions of the relevant Aboriginal stakeholders.

Although Condition 2 is generally acceptable, the reference to location of boreholes prior to the commencement of works should be deleted for the reasons provided above. Additionally, minor amendments to the proposed wording as shown in bold below are considered more appropriate in view of the site predictive model, the Project Area survey findings and the cultural heritage survey findings in the Hunter Valley in general:

*The location of boreholes **within 30 metres either side of Bettys Creek** must be determined in consultation with relevant Aboriginal stakeholders prior to installation. The placement of **these borehole locations** should involve, as a minimum, surface inspection.....*

2.2.3

Methane Management

DECC supports the intention to reticulate mine gas to the Envirogen facility as a means to reduce greenhouse gas emissions.

DECC's proposed condition O5.1 is as follows.

05 Gas reticulation

05.1 The emission of methane must be minimised to the maximum extent achievable through the application of best-practice

DECC's proposed condition O5.1 is not in keeping with the proposal as gas reticulation is not part of this project application. Furthermore, although ICO is strongly supportive of the use of the mine gas for power generation purposes and has an agreement in place with Envirogen (Oakley) Pty Ltd (an unrelated Company) that enables them to access mine gas from the underground workings, the installation and operation of the Envirogen facility and the associated pipework/infrastructure are the subject of a separate development consent issued to that Company by Singleton Shire Council. Similarly, negotiation of access agreements with the private landowners to enable the installation of the pipework/infrastructure and subsequent development consents or modifications to the existing consent to enable them to access the gas drainage boreholes over Longwalls 10 – 17 (and extensive areas of Longwalls 8 and 9) are the responsibility of that Company. Accordingly, the suggested DECC condition is neither relevant nor appropriate.

Notwithstanding the above, the emission of methane will be minimised in accordance with the statement of commitments in the Environmental Assessment (ERM 2007).

2.3

DEPARTMENT OF LANDS

The Department of Lands submission notes that there are unidentified Crown roads on the Project Area. Staff from ERM and the Department of Lands have previously discussed this issue and have noted that *Figure 2.2* of the EA indicates Crown Roads, albeit without specific keying to indicate their status.

In general terms, subsidence will cause predictable deformation of the ground surface so that improvements such as roads may develop dips. There has been no cracking observed to date at GCC. Forest Road is lightly trafficked and the Subsidence Management Plan currently lodged with the DPI details proposed subsidence management procedures. Subsidence observed in earlier mining sequences shows that Crown road closures will not be required and ICO does not expect that any formed or unformed Crown roads will become untrafficable as a result of mine induced subsidence.

It is also noted that Xstrata Mount Owen has an approval for open cut mining and overburden dumping that will cut numerous Crown Roads in the area above Glennies Creek application area.

ICO commits to restoring to previous condition any Crown road damaged by mine subsidence or associated activities where these roads will not be subject to further disturbance by Xstrata. This is reflected in the revised Statement of Commitments in *Annex A*.

2.4

DEPARTMENT OF PRIMARY INDUSTRIES

The submission from the DPI - Minerals Resources Division requested that any surface water management improvements or rehabilitation works associated with remediation of Bettys Creek and the Bettys Creek diversion constructed by Xstrata should be completed to the satisfaction of their Director - Environmental Sustainability. The submission further noted that rehabilitation and environmental monitoring reporting should be captured in the Mining, Rehabilitation and Environmental Management Plan Process and that discussions should be commenced with the Department regarding amending the current MOP to capture the planned mining in Longwalls 10-17. Both of these requirements are acceptable to Integra Coal, and although currently required as a condition of the various mining tenements, they have been incorporated in the revised Statement of Commitments.

2.5

HERITAGE COUNCIL OF NEW SOUTH WALES

The Heritage Council submission summarised the non-indigenous heritage issues on the site and noted that recommendations in the EA for further assessment for sites RE31, MOH2 and MOH3 are unnecessary as the sites are approved for removal. The revised Statement of Commitments reflects this advice.

2.6

MINE SUBSIDENCE BOARD

The Mine Subsidence Board had no objection to the proposal and noted that the Board's approval should be sought for the erection of improvements at the appropriate time.

Integra Coal commits to abiding by this requirement as per the revised Statement of Commitments.

2.7

DEPARTMENT OF WATER AND ENERGY

2.7.1

Groundwater

The Department of Water and Energy (DWE) submission identified the following matters relating to groundwater:

- A need to verify annual deep groundwater abstraction from the GCC underground workings and to demonstrate adherence to its groundwater extraction licence. ICO has an existing monitoring/metering system in place to quantify the volume of water pumped into and out of the workings. This system will be maintained over the life of the mine.
- A need to extend groundwater monitoring to determine the extent of longwall mining/subsidence-induced depressurisation, pressure head loss and loss of saturated thickness in the Bettys Creek alluvium. This will be achieved through the installation of appropriately positioned piezometers external to areas which are likely to be disturbed or damaged during or by operations at the Glendell Colliery.
- A requirement for ICO to provide verification that there is no connective loss of groundwater from the Bettys Creek alluvium. This will be achieved through the installation of the piezometers as described above.
- A requirement for verification of groundwater modelling outcomes for each longwall. ICO considers that re-running the model after each longwall is not necessary and would not provide any meaningful information. ICO considers that this should only be undertaken if there is a significant excessive drawdown departure from predicted model trends, and the trend is due to subsidence effects (as opposed to other influences such as mining associated with the various Xstrata operations/activities in the vicinity). Rather, ICO contend that monitoring should be conducted in the same manner as is currently employed, and that if a significant departure from modelled trends occurs, then the cause should be identified with the procedure for verification to be developed in compliance with the Groundwater Management Plan (GWMP) approved as conditioned on licence 20BL169862.

Except as noted, ICO confirms acceptance of all recommendations with respect to groundwater and has incorporated those recommendations in the revised Statement of Commitments.

2.7.2

Bettys Creek

The DWE submission identified the following matters relating to Bettys Creek:

- The need for a commitment to repair any subsidence induced damage to the Bettys Creek diversion channel.
- The requirement for channel monitoring and response measures to be formalised in a Monitoring and Response Plan.
- Various specific monitoring requirements.
- Specific requirements for remedial actions.

Although ICO confirms its acceptance of the majority of the content of the submission which pertains to Bettys Creek and has reflected those recommendations in the revised Statement of Commitments, the following issues/aspects are either considered to be unwarranted/excessive or of major concern due to their possible practical or legal implications. In each case, suggested alternatives are presented and incorporated in the revised Statement of Commitments:

1. ICO accepts that it has an obligation to monitor the Bettys Creek diversion and maintain and replace any element which is destabilized as a result of subsidence, but contends that prior to subsidence, responsibility lies wholly with Xstrata Mount Owen, ie the Company that received approval for and installed the diversion. However, acceptance of this obligation is conditional upon verification that the diversion is geotechnically and geomorphologically stable and not eroding sediment downstream of the diversion prior to subsidence. Any diversion remediation works required prior to any subsidence influence from GCC, and maintenance of those works until stability is achieved, is the responsibility of XMO. To this end, ICO considers that prior to the initiation of subsidence in the diversion, an independent condition survey and report should be commissioned and signed off by the DWE to establish a baseline against which subsequent changes can be measured.
2. Consistent with the above obligation, ICO concurs with DWE that a programme for monitoring stream channel cross-sections and channel form should be formalised in a Management Plan. The Plan would establish a mechanism to regularly identify changes in bed slope, actual and/or potential bed and bank scour and breakout points which occur as a result of subsidence. The Plan would also form a basis for responding, ie designing and undertaking appropriate remediation works, if necessary, to rectify subsidence-induced instability. ICO also agrees that the

programme should be submitted to DWE for assessment, but considers that its responsibility with respect to undertaking those programmes should not commence until the area is undermined and subsidence occurs, not as suggested, ie “throughout mine life”, particularly as undermining of the Bettys Creek diversion is not scheduled to commence until late 2011. It should also be recognised that as the form of subsidence is unlikely to be uniform and, based on prior experience with Longwalls 1 to 8 the magnitude of subsidence is likely to be less than predicted, the response component of the Plan should be limited to the identification of triggers for investigation and remediation work design and implementation. The specification of works required should be determined on a case by case basis in accordance with sound engineering practice.

While ICO agrees with and supports the overall outcome as envisaged by DWE, ICO considers that the DWE requirement for the Management Plan to be incorporated into the detailed diversion plan and management plan for Licence 20SL061386 (a licence which is held by ICO’s commercial competitor, Hunter Valley Coal Corporation, to enable the extension of the Mt Owen Mine) is not only legally flawed but would also cause difficulties in both the operation and regulation of site works and monitoring.

ICO recommends that DWE issue separate licences or directions to each operator which clearly identify ICO’s responsibility for subsidence effects, and HVCC’s responsibility for the long term diversion stability, with HVCC’s responsibility based on the pre-subsidence survey (as suggested in Item 1 above) and subsequent monitoring. Any dispute as to responsibility would be determined by a mutually agreed and suitably qualified independent arbitrator. Such an approach would also aid DWE’s enforcement capability.

3. While ICO generally supports the adoption of the measures identified within the monitoring portion of the management plan as identified in the DWE submission, the following issues/aspects are considered to be unwarranted/excessive, or have legal implications with respect to responsibility:

- **Dot Point 3.** The matter of 100m cross-sectional survey spacing was noted in the Department’s comments of 27 August 2007 in response to their review of the EA’s adequacy for exhibition (and repeated in their submission on the EA dated 28 November) and was a subject discussed extensively at a meeting with DWE on 14 September 2007. In this meeting, ICO expressed the opinion that such spacing was considered to be substantially more intensive than required to accurately and closely observe potential changes to stream morphology. A 200m spacing was suggested as more than adequate to provide robust data for comparative purposes, an opinion which reportedly was accepted by DWE.

The downstream limit of the proposed monitoring as expressed in the DWE submission, ie “down to the approved water management structure on the Glendell Tenements lease area (for the diversion of Bettys Creek for

the Glendell Coal project)”, is also considered to be excessive. It imposes liabilities on ICO for activities or impacts on the Creek as a consequence of the construction of the levee to the north of the diversion, as identified in the Environmental Assessment for Modification of Glendell Mine Operations (August 2007). The downstream extent of monitoring should be set to exclude ICO from any liability or responsibility in the Glendell operational area which is downstream, or outside of the GCC 20mm subsidence zone.

4. As with Item 3 above, while ICO generally supports the recommendations as to the inclusions within the remediation portion of the management plan as identified in the DWE submission, it considers the following issues/ aspects to be inappropriate:

- **Dot Point 1.** This recommendation requires ICO to provide “evidence of a management agreement between Xstrata Mt Owen Operations and Integra Coal to maintain the diversion works during the currency of the licence [presumably licence 20 SL061386].” While ICO can commit to consulting with Xstrata with regard to the maintenance of diversionary works as specified and as required, it cannot force Xstrata into the formulation of, or becoming a signatory to, such an agreement. Furthermore, as XMO and ICO are commercial competitors, any project approval condition which makes ICO’s activities reliant on XMO in any way, as would be the case in the event of the adoption of the DWE recommendation, would place XMO at a commercial advantage and, as such, would be totally unacceptable to ICO.

- **Dot Point 2.** As identified in Item 2 above, given that the form of subsidence is unlikely to be uniform as suggested by the modelling and, based on prior experience with Longwalls 1 to 8 is likely to be of a magnitude less than predicted, the remediation component of the Plan should, at most, be limited to the identification of options for energy slope and scour prevention along the length of the subsided portion of Bettys Creek. This should be on the basis of hydrologic and geomorphic theory, with the actual selection and justification of any chosen scour prevention or remediation structure/treatment, and the timing for implementation, determined on the basis of the monitoring outcomes. In this way, the remediation measure(s) implemented would be appropriate for the actual area and nature of the instability.

Community Submissions

Two community objections were lodged on the basis that the application would, if approved:

- increase road traffic;
- result in increased dust; and
- result in additional noise impacts.

The proposal seeks approval for an extension of existing approved operations into Longwalls 10 – 17, and does not require nor seek approval for a change in the approved method of mining or internal coal handling and transportation. Similarly, no approvals are being sought for any activity which would result in the generation of traffic levels which are significantly different from those currently or previously experienced in association with mining activities at the Glennies Creek Colliery. Localised minor changes in traffic may occur in association with the progressive installation, operation and decommissioning of the gas drainage boreholes as mining progresses through Longwalls 10 to 17. However, any increases would be minimal in number, and during the installation and decommissioning phases, be of short duration only.

As there will not be a change in production levels, and as the operation is an underground mine, there will be no change in dust emissions.

With the exception of the progression of gas drainage borehole installation and, potentially, the progressive relocation of the gas extraction plants, the proposed extension of underground mining into Longwalls 10 – 17 will not change the noise environment. Noise emissions from the gas drainage boreholes will satisfy the existing noise limits applicable to the Colliery as discussed in *Section 2.2.1* above.

Annex A

Revised Statement of Commitments

Table 3.1 Statement of Commitments

Desired Outcome	Existing or Proposed Actions	Timing
Environmental Management		
Obtain and/or comply with all conditional requirements in all approvals, licences and leases.	Comply with all commitments recorded in <i>Table 3.1</i> .	Ongoing
	Comply with all conditional requirements included in the: <ul style="list-style-type: none"> • Planning Approval; • Environment Protection Licence; • Mining Leases; • SMP or s138 Approvals; and • any other approvals. 	Ongoing
Conduct all operations in accordance with all relevant documentation.	Undertake all activities in accordance with any current Mining Operations Plan, environmental procedures, safety management plan or site-specific documentation.	Ongoing
Operating Hours		
All construction activities to be undertaken within the approved operating hours.	Vegetation clearing/soil removal - 7:00am to 6:00pm/7 days Construction activities- 7:00am to 10:00pm/7days Construction materials delivery - 7:00am to 10:00pm/7 days Gas drainage borehole construction – 7.00am to 10.00pm Monday to Saturday and 8.00am to 10.00pm on Sundays.	As required
All operational activities to be undertaken within the approved	Coal conveying and stockpiling - 24 hours/7 days Use of surface amenities/workshops and offices - 24 hour/7 days	Ongoing

Desired Outcome	Existing or Proposed Actions	Timing
operating hours.		
Stakeholder Consultation		
Undertake ongoing stakeholder consultation during the mining of Longwalls 10 to 17.	Monthly notification to key stakeholders of mining progress (formal and informal).	Monthly during operation
	Regular meetings with stakeholders.	To be determined by the progress of subsidence and actual and predicted impacts.
	Free call environment hotline.	Ongoing
	Community Complaints Register maintained.	Ongoing
Subsidence		
Ensure minimal subsidence impacts over the Project Area.	Existing and proposed monitoring lines will be resurveyed at the completion of each longwall, particularly Monitoring Lines B, G, H and far field effects.	Within three months of the completion of each longwall
	A summary of subsidence monitoring results and accompanying analyses will be reported to the Principal Subsidence Engineer.	Within four months of the completion of each longwall panel.
	Monitoring results and analyses will also be included within the mine's Annual Environmental Management Report (AEMR).	Annual
Ensure minimal subsidence impacts on natural features.	Monitoring of subsidence impacts on Bettys Creek and surface drainage in accordance with the Longwalls 10 to 17 Subsidence Management Plans.	Ongoing

Desired Outcome	Existing or Proposed Actions	Timing
Ensure minimal subsidence impacts on public utilities.	Monitoring of subsidence impacts on Forest Road, electricity transmission lines and Telstra cable in accordance with the Longwalls 10 to 17 Forest Road, electricity transmission lines and Telstra cable Subsidence Management Plans. ICO will restore any Crown road damaged by mine subsidence or associated activities to their pre-subsidence condition where these roads will not be subject to further disturbance by Xstrata.	Ongoing As required
Ensure minimal subsidence impacts on farm infrastructure.	Monitoring of subsidence impacts on farm fences, gates and dams in accordance with the relevant Longwalls 10 to 17 farm fence and farm dam Subsidence Management Plans.	Ongoing
Ensure minimal subsidence impacts on archaeology.	Monitoring of subsidence impacts on recorded archaeological sites in accordance with the Longwalls 10 to 17 Cultural Heritage Subsidence Management Plan.	Ongoing
Ensure minimal subsidence impacts on other mine infrastructure.	Monitoring of subsidence impacts and/or provision of relevant data on the Xstrata owned infrastructure overlying the Project Area.	Ongoing
Proper approval of improvements	ICO will liaise with the Mine Subsidence Board and gain the Board's approval for the erection of improvements on the land to be subsided.	As required
Ecology		
Minimise impact to native flora and fauna.	Minimise area of vegetation disturbance during the installation of the gas drainage boreholes.	Activity period
	Pre-clearance inspections of locations for the boreholes during the summer flowering period of <i>Bothriochloa biloba</i> to avoid impacting directly on any individual plants.	Prior to installation of boreholes
Cultural Heritage		

Desired Outcome	Existing or Proposed Actions	Timing
Minimise impact to recorded Aboriginal heritage sites.	All recorded sites will be identified on the plan used to define borehole locations, will be clearly identified in the field and protected from the impacts of any gas drainage borehole drilling or subsidence remediation works that may occur. Should these impacts be unavoidable, consultation will be undertaken with the Department of Environment and Conservation and the local Aboriginal community.	Ongoing
	Should gas drainage borehole drilling or subsidence remediation work be necessary within 30m of Bettys Creek, the Aboriginal community will be consulted regarding any proposed works and may wish to take the opportunity to salvage any artefacts.	As required
Hydrology		
Monitor changes in Bettys Creek due to weather variations, XMO/Xstrata operations and subsidence.	A monitoring and response plan will be prepared for Bettys Creek to ensure stability is maintained in the watercourse through mine life and for a defined timeframe of the post-mine life period. Cross-sections across Bettys Creek will be established approximately 200m apart to allow the measurement of any valley closure	Prior to mining Longwall 10
	Long surveys will be conducted (including both generalised bed slope gradients and localised changes in bed slope) along Bettys and Main Creeks from the nearest stable bed control point upstream of the cumulative subsidence envelope, to an identified control point defining the closest downstream stable bed control, for both pre- and post- diversion situations	
	Long survey (including the above information requirements) from the identified downstream control point to defined end of system controls	
	Identification of all existing structures which lie within the inundation zone identified for Bettys Creek, with inundation depths across each structure, as revised from the surface hydrology modelling for the SCT subsidence assessment report (Statement of Environmental Effects Appendix B).	

Desired Outcome	Existing or Proposed Actions	Timing
	Comparison with previously established floodplain cross sections on at least three chainages across the Bettys Creek floodplain, which are currently, or will be, affected by mining subsidence, to establish the change in floodplain inundation and drainage characteristics resulting from the diversion	
	Volumes and velocities of discharge along Bettys Creek downstream of the offtake and inlet points for both pre- and post- diversion conditions of the creek systems, with assessment of bed sediment basement composition and potential activation depths for a range of flows once the diversion is installed	
	Energy relationships along the current and post-subsidence profile of Bettys Creek, including stress relationships under a range of flow conditions, and explanation of, and justification for, variables used (Mannings or Chezy coefficient, Froude and/or Shields parameters), and afflux of structures which are placed on line within the system , and justification for, variables used (Mannings or Chezy coefficient, Froude and/or Shields parameters), and afflux of structures which are placed on line within the system	
	A detailed monitoring program will assess whether rapid changes in channel or floodplain form occur due to subsidence that may require remediation following storm events.	Ongoing
	Water level loggers will be installed and sediment deposition monitoring will be conducted in Bettys Creek at the Mt Owen Rail Spur bridge and downstream of Longwall Panel 10, outside the 20mm subsidence area, to monitor changes in the creek due to weather variations, XMO/Xstrata operations and subsidence impacts.	Ongoing
If adverse effects on Bettys Creek due to subsidence are observed, the creek and/or diversion will be rehabilitated to an appropriate standard.	In the event of subsidence impacts, the natural creek, HVCC's Bettys Creek diversion channel and floodplain will be rehabilitated to a similar state as existed prior to subsidence. This may include, but is not limited to, draining ponded areas, re-establishing drainage paths or diverting surface water flows from areas of potential ponding. Any installed remedial works will be maintained as appropriate for a period of no less than five years.	As required

Desired Outcome	Existing or Proposed Actions	Timing
Ensure minimal subsidence impacts to farm dams.	Restore any dam that is damaged by subsidence or has its storage capacity reduced by more than 10 percent to a condition similar to the dam's pre-subsidence condition. Should water be lost from a dam to the extent that livestock are impacted, an alternative water supply will be provided by GCCM.	As required
Ensure minimal subsidence impacts to surface water regimes.	Should water begin to pond in an area, GCCM will carry out earthworks to allow the water to drain away as requested by the relevant landowner. Prepare and implement a Bettys Creek monitoring and management plan to the satisfaction of the Department of Water and Energy prior to subsiding Bettys Creek.	As required Prior to subsiding Bettys Creek.
Ensure minimal subsidence impacts to groundwater.	Detailed ground deformation modelling and assessment of its effects on groundwater will be undertaken prior to mining Longwall 10 using Dr Winton Gale's FLAC code. Following the quantification of any impacts, appropriate management and mitigation measures will be developed if required. Annual verification of actual seepage volumes into the ICO underground and changes in bore water levels versus predictions. Obtain all necessary licenses and comply with licence conditions. Verification of geomechanical model predictions for each longwall including reassessment of modelled groundwater predictions should verification analysis vary significantly from predictions. These procedures will be developed in compliance with the Groundwater Management Plan required by licence 20BL169862. The plan and licence conditions will be audited at completion of longwall mining.	Modelling to be undertaken prior the Longwall 10. Monitoring will be ongoing.

Desired Outcome	Existing or Proposed Actions	Timing
Conduct all operations in accordance with the existing surface water management plan.	The existing on-site mine water management system, including mine water storage, clean and dirty water separation, clean water release and runoff control will continue. On going monitoring will be used to refine the current water balance estimates.	Ongoing
	All monitoring results will be reported in the AEMR and distributed to the relevant government agencies.	Annually
Noise		
Ensure minimal noise disturbance during installation of gas drainage boreholes and general operational activities.	Undertake routine noise monitoring as identified in the various approvals and licences for Glennies Creek Colliery. Comply with Condition 7 of Schedule 3 of the Glennies Creek Surface Facilities Project Approval (application 06-0057) with regard to noise impact from the installation of and operation of gas extraction plants and gas wells.	Ongoing
	The results of these monitoring programs will be presented in the Annual Environmental Management Reports (AEMR).	Annually
Air Quality and Greenhouse Gas		
Ensure that greenhouse gas generation is minimised for this project.	An inventory of emissions and sinks will be developed and maintained.	Ongoing

Desired Outcome	Existing or Proposed Actions	Timing
	Greenhouse awareness training will be held at induction to make employees aware of the science of global warming and detailed efforts to minimise emissions.	As required
	Energy audits will be held when practicable to ensure that the mine is using best practice techniques to minimise energy use and is operating at optimum energy levels.	As required
	Consider electrical efficiency in assessments of new mobile and fixed equipment.	Ongoing
	Existing dust and greenhouse mitigation and monitoring programs will be continued throughout the life of the project.	Ongoing
	Ensure soil is moist before stripping (gas drainage boreholes).	As required during installation of gas drainage boreholes
	Considerate diesel efficiency in assessments of new mobile and fixed equipment	Ongoing
	Regular maintenance and servicing of machinery and equipment ensuring equipment will be maintained to retain high levels of energy efficiency	Ongoing
	To the extent practicable, assisting Envirogen in the utilization of methane from gas drainage boreholes	Following plant commissioning
	Emissions and abatement strategies will be reported annually	Ongoing

Annex B

Aboriginal Consultation

POSTED

18/10/05

18 October, 2005

Wandiyali Aboriginal Corporation
PO Box 386
Wallsend NSW 2287



Our Reference: 0038321L06AG.DOC

To Whom It May Concern,

**RE: GLENNIES CREEK SUBSIDENCE MANAGEMENT PLAN FOR
PROPOSED LONGWALL PANELS 10-17**

Environmental Resources Management Australia Pty Ltd has been commissioned to conduct an Indigenous Cultural Heritage Assessment for the Subsidence Management Plan (SMP) for the proposed longwall panels 10-17 at Glennies Creek Mine.

Should you wish to be consulted regarding this project, please register in writing **by no later than the 3rd of November 2005** to:

Environmental Resources Management
PO Box 71
Thornton NSW 2322

Yours sincerely,
for Environmental Resources Management Pty Ltd

Nicola Roche
Archaeologist

18 October, 2005

POSTED

18/10/05

Wonnarua Tribal Council Incorporated
PO Box 184
Singleton NSW 2330



Our Reference: 0038321L06AG.DOC

To Whom It May Concern,

**RE: GLENNIES CREEK SUBSIDENCE MANAGEMENT PLAN FOR
PROPOSED LONGWALL PANELS 10-17**

Environmental Resources Management Australia Pty Ltd has been commissioned to conduct an Indigenous Cultural Heritage Assessment for the Subsidence Management Plan (SMP) for the proposed longwall panels 10-17 at Glennies Creek Mine.

Should you wish to be consulted regarding this project, please register in writing **by no later than the 3rd of November 2005** to:

Environmental Resources Management
PO Box 71
Thornton NSW 2322

Yours sincerely,
for Environmental Resources Management Pty Ltd

Nicola Roche
Archaeologist

18 October, 2005

POSTED

18/10/05

Mr Barry McTaggart
Wanaruah Local Aboriginal Land Council
17-19 Maitland St
MUSWELLBROOK NSW 2330



Our Reference: 0038321L02WLALC

Dear Barry,

**RE: GLENNIES CREEK SUBSIDENCE MANAGEMENT PLAN FOR PROPOSED
LONGWALL PANELS 10-17**

In accordance with the DEC Interim Community Consultation Requirements for Applicants, I am contacting you in order to obtain assistance in identifying Aboriginal stakeholder groups or persons interested in the above project.

The project involves the preparation of a Subsidence Management Plan (SMP) to ensure that appropriate subsidence management procedures are in place for the mining of longwall panels 10-17 at Glennies Creek Mine.

Could you please provide the contact details for any Aboriginal stakeholder groups/individuals that may be interested in being consulted regarding this project. Should you wish to discuss this matter, please do not hesitate to contact me on 02 4964 2150.

Yours faithfully,
for Environmental Resources Management Australia Pty Ltd

Nicola Roche
Archaeologist

Facsimile
message

53 Bonville Avenue,
Thornton NSW 2322
AUSTRALIA

PO Box 71,
Thornton NSW 2322
AUSTRALIA

www.erm.com

sophie.mallick@erm.com

Telephone: 61 2 49642150

Facsimile: 61 2 49642152

To Newcastle Herald

Fax Number 02 4979 5088

From Sophie Mallick

Ref/Job Number int

Subject Public Notice

Date 18 October 2005

Page 1 of 2



ERM

Attached, please find a copy of a Public Notice, which Environmental Resources Management Australia Pty Ltd (ERM) would like to place in the Newcastle Herald on Wednesday 19th October, 2005.

Company Name: Environmental Resources Management Australia Pty Ltd (ERM)

Address: PO Box 71, THORNTON NSW 2322

Contact: Sophie Mallick

Contact Number: (02) 4964 2150

Run Date: Wednesday 19th October, 2005 in the Newcastle Herald - Public Notices section

If you have any queries please do not hesitate to call me on (02) 4964 2150.

Many Thanks,



Sophie Mallick

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Environmental Resources Management Australia Pty Ltd A.C.N. 002 773 248

Aboriginal Cultural Heritage Assessment – Invitation to Register Interest

Glennies Creek Coal Management Pty Ltd intends to prepare a Subsidence Management Plan (SMP) for the proposed longwall panels 10-17 at Glennies Creek Mine. On behalf of Glennies Creek Coal Management, Environmental Resources Management Australia Pty Ltd (ERM) will undertake an assessment of Aboriginal cultural heritage in relation to the SMP.

ERM seek registrations of interest from the Aboriginal community. If you, or a group you represent, wish to be consulted about this project please register your interest by contacting Nicola Roche at ERM in writing by Thursday the 3rd of November 2005.

Nicola Roche
Archaeologist
Environmental Resources Management Australia Pty Ltd
PO Box 71
Thornton NSW 2322
Fax: 4964 2152
Phone: 4964 2150



**YARRAWALK
SEARCHING FOR OUR CULTURE & HERITAGE**

**PO Box 906 MUSWELLBROOK
NSW AUSTRALIA 2333
02 65410445 \ 0422175839 Fax 02
65410445**

Yarrowalk@bigpond.com

19th October 2005

ATT: Nicola Roche

**Re: GLENNIES CREEK SUBSIDENCE MANAGEMENT PLAN FOR PROPOSED
LONGWALL PANELS 10-17.**

Dear Nicola,

As per your fax dated the 18th October 2005 , Please be advise that YARRAWALK is seeking to be involved in any and all consultation meeting and field work, we would also like to state Yarrowalk is a made up of ONLY a membership that can prove Wanaruah DESCENDANCY via a genealogy report that has been compiled by the NSW Native Title Services.

We would be more then happy to meet with yourself and your client if you like to discuss this we would also be more then happy to supply you with a copy of the report so you can see just whom is traditional owner of this area. This would be supplied on a need to know basis and we would hope that you would not allow it to be seen or used out side any dealings with Yarrowalk.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Scott Franks', written over a circular stamp or seal.

**Scott Franks
Managing director**



Giwirr Consultants Pty Ltd

Rodney Matthews
8 Fitzgerald ave
Muswellbrook N.S.W 2133

PH: 65410506
Fax: 65410751
Mobile: 0421434590
ABN: 90505477543

24th October 2005

Attention; Nicola Roche

Reference: Glennies Creek Subsidence Management Plan For Proposed Longwall
Panels 10 - 17

Dear Nicola

It has been brought to my attention that you will be conducting an Indigenous Cultural Heritage assessment for the proposed project in mention Giwirr Consultants wishes to be consulted regarding this project.

Regards,

Rodney Matthews
Manager
Giwirr

Environmental Resources Management Australia	
Referred to:	0038321
Date Received	24 OCT 2005
Checked By: NR	Date 24.10.05

16 December, 2005

Ungooroo Aboriginal Corporation ,
Graham Ward
PO Box 3095
Singleton NSW 2330

Our Reference: 0038321L07.DOC

POSTED

16/12/05

Dear Graham,

**RE: ABORIGINAL HERITAGE ASSESSMENT AT GLENNIES CREEK -
FURTHER INFORMATION AND PROPOSED PROJECT
METHODOLOGY**

Thank you for your correspondence regarding the cultural heritage assessment for the subsidence management plan for the proposed longwall mining of panels 10-17 at Glennies Creek Colliery. Your group has been registered as an interested party and will be consulted with in relation to the project.

As outlined briefly in previous correspondence, Glennies Creek Coal Management Pty Ltd (GCCM) propose to mine longwall panels 10-17 at Glennies Creek Colliery, Glennies Creek, Hunter Valley, NSW. It is predicted that subsidence will occur as a result of the underground mining operations and therefore Environmental Resources Management Pty Ltd (ERM) has been commissioned by GCCM to conduct a Cultural Heritage Assessment of the subsidence area above panels 10-17.

As shown in *Figure 1*, the study area consists of the possible subsidence zone above longwall panels 10-17. However, the majority of this has been the subject of previous archaeological assessments by Umwelt and ERM.

This letter briefly outlines the proposed assessment process, presents a proposed survey methodology and invites submissions commenting on this methodology and any other aspects of the assessment or consultation process.

1. THE ASSESSMENT PROCESS

A cultural heritage assessment report will be prepared by ERM and will involve an archaeological and Aboriginal assessment of the area that may be impacted by subsidence (the study area). The archaeological assessment will involve a site inspection, the methodology for which is outlined below.

2. PROPOSED SURVEY METHODOLOGY

As part of the study area has previously been the subject of archaeological assessments, these areas will be not be reassessed during the course of the present project. The remaining area (hereafter referred to as the survey area) will be subjected to detailed physical inspection.

A team of two archaeologists and representatives from the local Aboriginal community will inspect the survey area by walking a number of transects, focussing on areas of exposure and greater visibility. The number of transects will be determined in the field based on vegetation coverage and landforms. During the field survey, an examination of landforms and locales within the survey area with the potential to contain subsurface deposits will also be undertaken. All Aboriginal objects, sites and potential archaeological deposits will be recorded and photographed during the survey.

3. TIMEFRAMES

The consultation process will follow the interim guidelines for Aboriginal consultation recently issued by the Department of Environment and Conservation (DEC). These guidelines allow a period of 21 days for submissions commenting on the proposed field methodology and any other aspect of the assessment or consultation process.

We propose to undertake the one day field investigation in mid January 2005 however should you provide feedback prior to this date, the fieldwork can be conducted at an earlier date. A number of field workers will be selected by GCCM to be involved in the field investigations following DEC guidelines.

Should you wish to be further consulted regarding the project, please provide comment (in writing) regarding the proposed methodology and your ongoing interest in the project. The closing date for submissions will be the **9th of January 2005**.

Additionally could you please provide a resume highlighting your skills and experience in the following areas:

- ☐ field identification and survey techniques (including confirmation of physical ability to undertake fieldwork);
- ☐ cultural knowledge; and
- ☐ ability to assist in communicating the results of the survey back to the stakeholders for the assessment of cultural values and significance and returning advise on their response to the proponent.

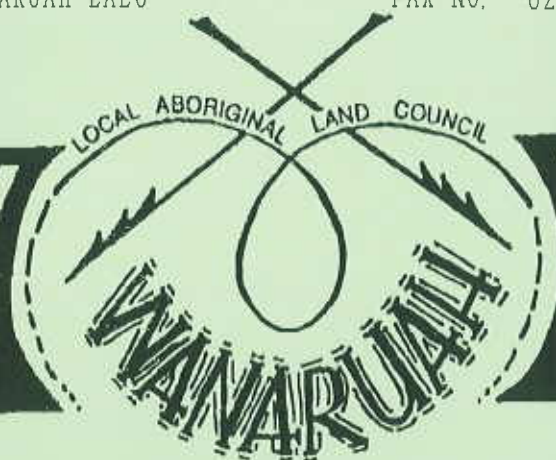
The information provided will assist in the selection of Aboriginal representatives to participate in the field investigation.

A draft assessment report will be prepared on the cultural and archaeological significance of the study area and any sites or areas of considered to have cultural value. This draft report will be made available for comment by parties who have registered an interest in the process. Feedback from all parties will be incorporated into a final report.

If you have any questions regarding any of these matters please do not hesitate to contact me on 4964 2150.

Yours sincerely,
for Environmental Resources Management Australia Pty Ltd

Nicola Roche
Archaeologist



P.O. BOX 127
19 MAITLAND STREET,
MUSWELLBROOK 2333
ABN 33 251 730 169

PH: (02) 6543 1283

(02) 6543 1962

FAX: (02) 6542 5377

EMAIL: wanaruah@hunterlink.net.au

Nicola Roche
ERM
P.O.Box 71
Thornton 2322

21st December 2005

Fax.49642152

Subject:Glennies Creek Colliery –Longwall panels 10-17.

Dear Nicola,

Thank you for your letter dated 16th December 2005 pertaining to the subject matter.

Wanaruah Local Aboriginal Land Council is most concerned about any works that may impact on the culture and heritage of Aboriginal people.

Council agrees in principal with your methodology ,however as the only constituted body in the Upper Hunter representing the Aboriginal people Council would like to be included in any assessments on a paid basis.

Attached is a brief resume of Councils qualified assessors and insurance details.

Yours Faithfully

Barry McFaggart

Environmental Res		Environment Australia
Referred to:	0038321	
Date Received	20 DEC 2005	
Checked By:	NR	Date 20.12.05

Facsimile
message

53 Bonville Avenue,
Thornton NSW 2322
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www.erm.com

nicola.roche@erm.com

Telephone: 61 2 49642150

Facsimile: 61 2 49642152

To Christine
Hunter Valley Cultural
Consultants
Fax Number 6542 5548
From Nicola Roche
Ref/Job Number 0038321
Subject Glennies Creek SMP survey
Date 16 January 2006



Page 1 of 7

Dear Christine,

As discussed, we have scheduled the field survey for the Glennies Creek SMP for the 31st of January, starting at 8am. I will send another fax through early next week to confirm a location at which to meet.

The day will involve a brief site induction which all people going on site will be required to complete. Please note that the Glennies Creek Coal Management workplace health and safety standards and other workplace standards will be adhered to during the survey.

Standard personal protective equipment will be required including appropriate safety boots, hard hat and high visibility clothing. As we will be on site all day, please ensure that your fieldworker brings adequate food and water for the day.

Should you have any queries about the work, please do not hesitate to give me a call on 4964 2150.

Cheers

Nic

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Environmental Resources Management Australia Pty Ltd A.C.N. 002 773 248

Facsimile
message

53 Bonville Avenue,
Thornton NSW 2322
AUSTRALIA

To Barry
Wanaruah Local Aboriginal Land
Council

PO Box 71,
Thornton NSW 2322
AUSTRALIA

www.erm.com

Fax Number 6542 5377

nicola.roche@erm.com

From Nicola Roche

Telephone: 61 2 49642150

Facsimile: 61 2 49642152

Ref/Job Number 0038321

Subject Glennies Creek SMP survey

Date 6 February 2006



Page 1 of 4

Dear Barry,

As discussed, we have reorganised the field work and induction for the Glennies Creek SMP. Based on our conversation, Barry French will be conducting the fieldwork on behalf of Wanaruah Local Aboriginal Land Council.

The safety induction will be held at Mt Owen Mine on Monday the 13th of February. We will be meeting at the site office at 7.45am and the induction will take approximately three hours. **Please note that Barry French must have completed the induction to participate in the survey.** I have attached some paperwork that needs to be completed and returned by 5pm today (Monday 6th Feb). This includes a letter of competency that states that your representative will be undertaking an archaeological survey and that lists their experience and says that they are competent to complete the work. **If any of this paperwork is missing or not returned, we can't do the induction.**

The survey will be conducted on Tuesday the 14th of February starting at 8am and meeting at the Glennies Creek mine site office. Standard personal protective equipment will be required during the survey including appropriate safety boots, hard hat and high visibility clothing. As we will be on site all day, please ensure that your fieldworker brings adequate food and water for the day.

Following completion of the field work, invoices should be addressed to ERM as follows:

ERM Australia Pty Ltd
PO Box 71
Thornton NSW 2322

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The invoice should also clearly state your company name, ABN and the job reference number 0038321. Please note that, in accordance with the attached sub-contractors agreement, payment will not be issued until 14 days after ERM have received payment from our client. We will do all we can to speed the process up but please be aware of this condition. Should you have any queries regarding invoicing, please contact Sophie Mallick on 4964 2150.

Should you have any queries about the work, please do not hesitate to give me a call on 4964 2150.

Cheers

Nic

GLENNIES CK SURVEY 14/02/06

NAME	GROUP	SIGNATURE
Samantha Ward	Ungooroo	S. Ward
BARRY FRANCH	W.A.A.N.E	B. Franch
GORDON GRIFFITHS	W.C.H.	G. Griffiths
TREVOR ARCHBOLD	H.V.C.C.	T. Archbold
JOHN MATTHEWS	ANTC	J. Matthews
MARGARET MATTHEWS	ANTC	M. MATTHEWS
Michele Stair	Gwiirr	M. Stair
Thomas Franks	Yurrawalk	T. Franks

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