



09 April 2021

Stephen O'Donoghue  
Director Resource Assessments  
NSW Department of Planning, Industry and Environment  
12 Darcy Street  
Parramatta NSW 2124  
Email: [REDACTED]

Dear Stephen,

**Tahmoor South Project (SSD 8445): Response to NSW Independent Planning Commission regarding Scope 1 greenhouse gas emissions**

**1. Introduction**

This letter provides a response to the request for further information from the NSW Independent Planning Commission, relating to Scope 1 greenhouse gas emissions (GHGE) predicted for the Tahmoor South Project (the Project). The Commission requested information on the following:

1. *Whether there are further abatement measures that the Applicant could take to further reduce the predicted Scope 1 GHGE of the Project below 19,310,249 t CO<sub>2</sub>-e.*
2. *If the Panel was minded to grant development consent to the Project subject to conditions that:*
  - a. *Impose a target for Scope 1 GHGE less than that presently estimated by the Applicant and*
  - b. *Having the Applicant implement measures to address actual Scope 1 GHGE of the Project in excess of that target (including possibility of offsets), at what amount of Scope 1 GHGE does the Applicant consider that target could feasibly and reasonably be set.*

*The Panel would also welcome any other relevant information the Department or the Applicant is minded to provide regarding the predicted Scope 1 GHGE of the Project.*

Further information relevant to Scope 1 GHGE is presented below, followed by responses to questions 1 and 2.

**2. Scope 1 emissions and other relevant information**

It is acknowledged that Tahmoor mine is a relatively gassy mine, with a total of 19.31 million tonnes carbon dioxide equivalent (Mt CO<sub>2</sub>-e) Scope 1 GHGE predicted over the life of the Project. This figure is reached after Tahmoor Coal uses a combination of proven, industry best practice abatement measures to reduce GHGE (gas capture, flaring and power generation). However, it should also be acknowledged that the Project is a carefully considered and vital part of the transition to GREENSTEEL production, which SIMEC GFG is actively committed to, to achieve net-zero GHGE from the business by 2030. The life of the Project is relatively short, at around 10 years to 2032, and is consistent with the latest research and anticipated timing of the transition away from coal-based steel production. During this time, the Project will enable the supply of high-quality coking coal while low carbon steel producing technology is emerging over the next decade or so.

It is also relevant to note that in its recent development application, Dendrobium Mine sought approval for a similar quantum of total Scope 1 GHGE to Tahmoor South, of between 17 Mt CO<sub>2</sub>-e (if

flares were installed) to 22 Mt CO<sub>2</sub>-e (if flaring was not employed). In relation to the predicted Scope 1 GHGE for Dendrobium, the Commission found that:

...on balance, and when weighed against clause 14(1)(c) and clause 14(2) of the Mining SEPP, the relevant climate change policy framework, the objects of the EP&A Act, ESD principles and the socio-economic benefits of the Project, the impacts associated with the GHGE of the Project would be capable of being appropriately addressed if consent were to be granted to the present Application. [*Statement of Reasons for Decision*, paragraph 306]

It is also noted that while the development application for Dendrobium was refused by the Commission, the Commission determined on other grounds to refuse the application, not GHGE. The Commission was satisfied that the Project could be conditioned to require abatement measures such as flaring of methane, which would address the objectives of the *NSW Climate Change Policy Framework (CCPF)*. As re-iterated in the response below to question 1 from the Commission, Tahmoor mine has been capturing and flaring fugitive methane emissions for almost 10 years and will continue to do so. It has also been generating power by converting methane into electricity for approximately 20 years.

### Relevant policy considerations

The NSW Government released its CCPF in 2016, which commits NSW to achieving net-zero emissions by 2050. The CCPF does not however set emission reduction targets for individual sectors, or developments. In the *Statement of Reasons for Decision for the Vickery Extension Project*, which was approved in August 2020, the Commission stated that:

The Commission notes that the CCPF does not set prescriptive emission reduction targets and sets policy directions for government action [paragraph 215]

Further to the CCPF, in 2020 the NSW Government released the *Net Zero Plan Stage 1: 2020-2030* (Net Zero Plan), which sets the net zero priorities for this decade, as follows:

- Drive uptake of emission reduction technologies;
- Empower consumers and businesses to make sustainable choices;
- Accelerate research, development and demonstration of low emissions technologies; and
- Ensure the NSW Government leads by example.

In relation to coal, the Net Zero Plan acknowledges that:

Mining will continue to be an important part of the economy into the future and it is important that the State's action on climate change does not undermine those businesses and the jobs and the communities they support.

The Net Zero Plan also commits the NSW Government to investing in a coal innovation program, aimed at reducing fugitive emissions from coal mining. As described in Tahmoor Coal's submission to the IPC (dated February 2021), SIMEC GFG is actively investing in low emissions technology, consistent with this priority of the Net Zero Plan, with its commitment to developing GREENSTEEL technology. Work is well underway to convert the Whyalla steelworks to a world leading GREENSTEEL facility.

The NSW Government also released the *Strategic Statement on Coal Exploration and Mining in NSW* (the Statement) in June 2020. This Statement provides a clear and consistent policy framework for coal exploration and mining in NSW that supports investment certainty as the coal mining sector responds to global demand. Notably, the Statement does not include a cap or policy objective on Scope 1 GHGE other than to state (with reference to reducing the impacts of coal mining) that the NSW government will work to:

reduce the greenhouse gas emissions directly associated with coal mining in NSW (fugitive emissions) (page 9)

The Tahmoor South Project, via its current measures to minimise Scope 1 GHGE meets this policy objective. Further, by committing to the proposed conditions outlined further below in Section 6 of this response, Tahmoor Coal will ensure that it continues to meet this requirement throughout the life of the project.

A further policy objective in the Statement is:

monitor security of supply for domestic coal users during the transition to low carbon energy sources, including domestic users of coking coal (page 9)

Tahmoor Coal plays a critical role in doing this for the BlueScope steelworks.

The Statement also makes it clear that the NSW Government seeks to:

recognise existing industry investment by continuing to consider responsible applications to extend the life of current coal mines.

Again, the Tahmoor South Project meets this policy objective.

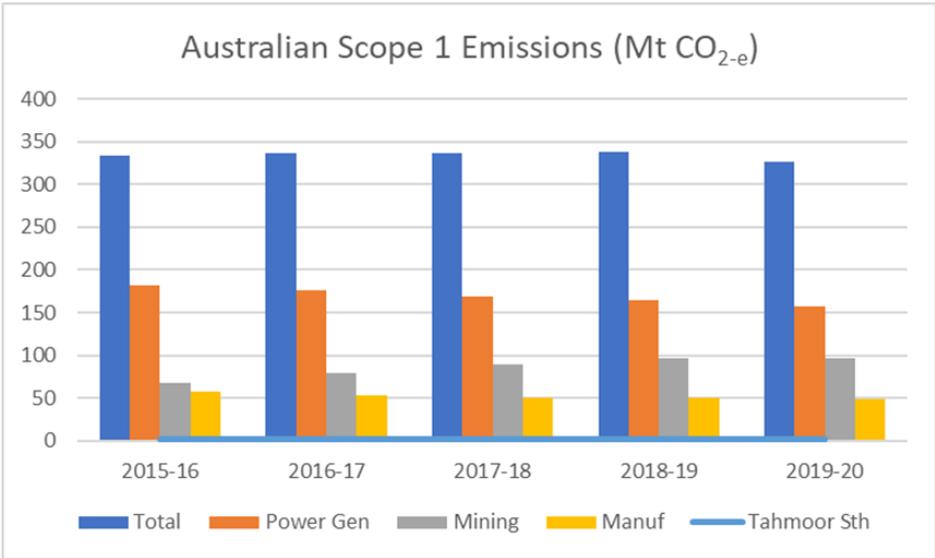
The Statement is the NSW Government’s most current and up to date policy statement on coal mining and should be taken into account when considering the application of other older merit-based decisions that addressed Scope 1 GHGE. It should be recognised that it does not:

- provide any support for the refusal of a project on the basis of Scope 1 GHGE, there being no NSW policy document that would do that; and
- provide a cap on Scope 1 GHGE or place a limit on Scope 1 GHGE from any particular mine.

**Scope 1 emissions in context**

Based on data published by the Australian Clean Energy Regulator, (National Greenhouse and Energy Reporting (NGER) data highlights) the scale of the predicted annual average Scope 1 GHGE from the Project is 0.49% of the total 327 Mt CO<sub>2</sub>-e Scope 1 annual emissions in Australia in 2019-20.

The following graph provides a summary of NGER data showing sector contributions to total Scope 1 GHGE from 2015-16 to 2019-20, and the predicted Project emissions, for contextual purposes. It can be seen that GHG emissions from the Project are insignificant with regard to the scale of emissions across Australia.



**Australian Scope 1 GHG Emissions**

It is also noted that a graph was provided in the GHG assessment for the Tahmoor South Project (ERM, 2020) illustrating the estimated GHG intensity of the Project compared with other underground coal mines. Upon further review of the information presented, it is relevant to note that this data was derived from a 1999 report (as was noted by ERM (2020)). This data is over 20 years old, and therefore is not an up-to-date reflection of Tahmoor mine in context with other mines.

The table below provides a comparison of the Project’s predicted GHGE that is comparable with other coal mines in NSW.

**Table 1 – Comparable Scope 1 GHGE with other NSW coal mines**

Mine	Status	Mine Life	Scope 1 (t CO <sub>2</sub> -e)
Bulga Coal Mine Optimisation	Approved 01/12/2014	2035	19,160,000
Integra Underground Mine	Approved 26/11/2010	2035	18,190,274
Bulga Underground Mine	Approved 23/02/2004	2031	37,356,650
Mandalong Mine Extension	Approved 12/10/2015	2040	34,000,000*
Dendrobium	Refused (not on GHGE grounds)	2048	17,000,000-22,000,000

\*estimated based on average Scope 1 GHGE/year

As shown, there are a number of other mines in NSW approved to emit a total Scope 1 GHGE comparable to, or greater than, that proposed for Tahmoor South.

### 3. Question 1 - further abatement measures

#### Current commitment to GHGE abatement

Firstly, and as noted above, it is important to clarify that Tahmoor mine currently operates a series of GHG abatement measures which will continue to be employed for the Project. These abatement measures comprise a flaring system, in which methane extracted from the coal seam is flared, and a power generation plant, in which methane extracted from the mine is used to generate power. The use of these abatement measures will reduce the total Scope 1 GHGE from 26.69 Mt CO<sub>2</sub>-e over the life of the Project if these measures were not in place, to 19.31 Mt CO<sub>2</sub>-e with these measure in place. This is a reduction of 26.8% and will be achieved through proven measures that are currently in place at Tahmoor mine.

#### Other abatement measures

Throughout the development of the Project, Tahmoor Coal has considered and investigated several other options to abate Scope 1 GHGE, as outlined below.

#### Ventilation air methane plant

All underground coal mines use systems to ventilate the mine to enable safe working conditions. These systems move fresh air from the mine surface underground to flush out fugitive methane emissions. Therefore, ventilation air from the mine has low concentrations of methane (known as ventilation air

methane (VAM)) typically less than 1% but generally lower than 0.5%. At Tahmoor mine, VAM is approximately 0.3% to 0.4% methane.

There are currently no VAM plants in operation at a commercial scale in underground coal mines in Australia. VAM technologies are energy intensive, and their use therefore increases Scope 2 GHGE. There is also a potential significant safety hazard associated with an ignition propagating into the mine with the implementation of this technology.

The *Low Emissions Technology Roadmap* report produced by CSIRO in 2017 considered technologies for the abatement of VAM, finding that technologies currently in development “*could potentially be deployed at scale by 2030*”, and that with sufficient focus on research and development, technologies for VAM abatement could feasibly be rolled out to underground coal mines by 2027.

In relation to the Project, the total cost of implementing a VAM plant would be in the order of \$100+ million over the life of the project, which is not currently economically viable.

Tahmoor Coal acknowledges that the NSW Government’s Net Zero Plan commits the government to investing in a coal innovation program as noted above, aimed at reducing fugitive emissions from coal mining. Tahmoor Coal will therefore regularly review the development and availability of such technologies, and the potential viability for implementation at Tahmoor mine.

### In-seam gas drainage

Tahmoor Coal currently employs in-seam gas drainage to extract methane from the coal seam prior to mining. This technique is also employed to capture gas released during the extraction process. Extracted and captured gas is then flared or used in the power generation plant, and is accounted for in the projected total Scope 1 GHGE from the Project.

The current in-seam gas drainage systems maximise the amount of gas pre-drained or captured from the coal seam, to reduce gas levels to below the safe operating threshold. The inherent pressurisation of the gas in the seam assists with the gas drainage process. Once gas is extracted to below the safe operating threshold limit, the seam is depressurised, resulting in diminishing returns from additional gas drainage. Further to this, gas in these depressurised areas of the coal seam in the roof and the floor of the underground workings would therefore be highly unlikely to enter the ventilation air.

Consequently, a significant increase of in-seam gas drainage would be required to achieve a small reduction in Scope 1 GHGE.

While currently optimal, Tahmoor Coal will continue to investigate the feasibility of employing additional technology to increase in-seam gas capture over the life of the Project. This will include preparing a study within two years of the development consent being granted, to determine if there are reasonable and feasible additional in-seam gas drainage measures that can be implemented.

### Surface to In-seam

Surface to in-seam (STIS) drilling involves the drilling of boreholes from the surface into the coal seam to extract methane prior to mining. In the case of the Project, the coal seam being mined, the Bulli Seam, is between 373 and 430 metres below surface level. This system is employed where access underground is limited and cannot be covered with in-seam drainage from the underground workings.

Numerous gas extraction sites would be required to provide a beneficial outcome from STIS drainage. A substantial amount of surface area is required at each drill site to accommodate the necessary gas drainage surface infrastructure, which includes the drill rig and associated infrastructure, water management facilities, an extraction plant, gas flaring facilities and/or power generation equipment. Depending on the design of the STIS extraction network, a drill rig and associated infrastructure may be required every 500 metres (m) along the longwalls. Again, depending on the design of the STIS extraction network, a series of gas pipelines may also need to be installed connecting drill sites and extraction plants and gas flaring facilities and/or power generation equipment.

The Project area is characterised by the residential areas, semi-rural and agricultural areas of the townships of Tahmoor, Buxton and Bargo. Areas not subject to residential or rural land uses are predominantly undeveloped areas with some containing a critically endangered ecological community (Shale Sandstone Transition Forest (SSTF)). Property sizes are generally small and land ownership is predominantly private. Any STIS extraction network would require access to multiple properties held in private ownership and would require disturbance to existing land uses and possibly clearance of some SSTF.

The development of a STIS extraction network for the Project would require development consent and approval under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and possibly the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In terms of the EP&A Act, the network would likely be deemed to be State significant development (SSD) and therefore require a new SSD application or an application to modify the Project, if granted. The application would require the preparation of an environmental impact statement (EIS).

Like coal mining, the application for a STIS extraction network would be subject to the provisions of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (the Mining SEPP). This SEPP was amended in October 2013 by introducing exclusion zones for the commercial extraction of coal seam gas in NSW. These exclusion zones include land zoned residential, zoned rural village and land identified as future residential growth area. It also includes land within a 2 kilometre (km) buffer around these lands.

In the case of the Project, the townships of Tahmoor, Buxton and Bargo are predominantly zoned residential and there are some areas surrounding Tahmoor and Bargo identified as a future residential growth area. Inclusion of a 2 km buffer around these lands covers a large area of the Project area. The exclusion zones were included within the SEPP, in part, to avoid land use conflicts between coal seam gas production and residential land uses.

It is noted that the exclusion zones are for the production of coal seam gas for commercial purposes and does not include removal of coal seam gas in the course of mining. However, the exclusion zones highlight the potential conflict between coal seam gas development and residential land uses. It also highlights the complexities in obtaining a SSD development consent for a STIS extraction network for the Project.

Based on the infrastructure required, the land use of the Project area and the approval process required, STIS drilling is not considered viable for the Project.

#### Sealing of areas of the mine

Tahmoor Coal incorporates sealing of unused areas of the mine as a part of its operating practice, to reduce fugitive GHGE coming from these unused underground areas.

The access points for each longwall are sealed off utilising 120 pounds per square inch (psi) seals at the completion of mining and prior to the commencement of the next longwall. This is industry best practice.

Sealing will continue to be reviewed throughout the life of the mine, to make further improvements where possible.

#### **Commitment to ongoing investigation and continual improvement**

Tahmoor Coal acknowledges that while further abatement measures are not currently viable to implement for the Project as described above, GHGE abatement and low emissions technologies are continually and rapidly evolving. Tahmoor Coal is therefore committed to regularly reviewing available GHGE abatement measures to determine if there are any reasonable and feasible measures that can be implemented to further reduce GHGE from the Project (refer to Section 6) over its life.

#### 4. Question 2a – Greenhouse gas emission reduction target

In addition to the proposed framework for development consent conditions outlined below in Section 6, GFG has executed a Power Purchase Agreement for 15 MW capacity from the Molong Solar Farm to offset GHGE, providing 48,000 MWh per year of electricity. This is anticipated to offset the approximate daytime power requirements at Tahmoor Coal in conjunction with the power generation plant. In terms of CO<sub>2</sub>-e, the Molong Solar Farm would offset approximately 300,000 t CO<sub>2</sub>-e, based on the forecast carbon intensity of the NSW grid over the 10-year Project life.

The purchase of electricity from the Molong Solar Farm would therefore effectively reduce the total Scope 1 and 2 GHGE of the Project from 20,549,599 t CO<sub>2</sub>-e to 20,249,599 t CO<sub>2</sub>-e.

To respond further to question 2 from the Commission, Tahmoor Coal refers to the Australian Government's commitment to reduce GHGE by 26 to 28% below 2005 levels by 2030, as stated in the Federal Government's publication *Australia's 2030 Emission Reduction Target* (2015). This target was reaffirmed in the Australian Government's *Nationally Determined Contribution Communication 2020* under the Paris Agreement, in accordance with UNFCCC decision 1/CP.21 (December 2020). This is an absolute economy-wide emissions reduction to be implemented as an emissions budget covering the period 2021-2030, as published in the *Australia's emissions projections 2020* (Australian Government Department of Industry, Science, Energy and Resources, December 2020).

The Australian Government's latest emissions projections, published in December 2020, states that Australia is on track to meet its 2030 target of 26 to 28% below 2005 levels. Emissions from coal production are accounted for in these projections, with the report acknowledging emissions from coal mining are projected to increase to 2030, associated with the projected increases in Australia's energy exports, as forecast by the International Energy Agency (IEA). It also acknowledges that metallurgical coal production is projected to increase to meet demand for global steel production in this period.

The December 2020 projections show a small increase in fugitive emission from coal mining to 2030, mainly due to increased production of metallurgical coal from underground mines over this period. There are no coal mining industry specific reduction factors required for Australia to meet its international obligations and commitments.

Therefore, Tahmoor Coal considers that it would be inappropriate to propose further GHGE reduction targets for the Project, as this approach would be contrary to the Australian Government published position on GHGE. Further, the total GHGE for which approval is sought accounts for the maximum reasonable and feasible GHG abatement at Tahmoor mine (capture, flaring and power generation). Notwithstanding, Tahmoor is committed to regularly review available emission reduction technologies, and to partly offset the GHGE from the Project through the purchase of power from the Molong Solar Farm, as described below.

Furthermore, the approach to GHGE and low emissions technology adopted by SIMEC GFG is entirely consistent with the Federal Government policy on GHG reductions, as well as the NSW CCPF and Net Zero Plan, of which the development and uptake of low emissions technology is a core part and a key priority over the next decade to 2030. SIMEC GFG is playing a significant role in developing GREENSTEEL technology which will ultimately contribute greatly to global and Australian improvements in GHG emissions.

It is also important to note that significant amendments have been made to the Project from what was originally presented in the Environmental Impact Statement (submitted in 2018). The original project sought approval for the extraction of 48 Mt of Run of Mine (ROM) coal over the life of the mine. Changes to the mine plan to remove three longwalls (LW109, LW107B and LW108B), as well as reducing the proposed extraction height and width to reduce the potential subsidence impacts, has reduced the total amount of ROM coal to be extracted over the life of the mine by 16 Mt to 32 Mt. The total predicted GHG emissions over the life of the Project have therefore also significantly reduced (by approximately 30%) as a direct result of the amended mine plan and associated lower total ROM coal production.

## 5. Question 2b – measures to address emissions in excess of greenhouse gas emission target (offsets)

If there are exceedances of the forecast Scope 1 and 2 GHG emissions (based on a 3-year rolling average), Tahmoor Coal will investigate mechanisms to address the exceedances (for example through offsets), to the satisfaction of the Planning Secretary. These measures could include the purchase of carbon credits or the planting of trees, noting that 300,000 t CO<sub>2</sub>-e will already be offset through the power purchase agreement that GFG has entered into with the Molong Solar Farm.

## 6. Proposed development consent conditions

Tahmoor Coal commits to the below proposed conditions being imposed on the development consent for the Project, if granted:

- *Further abatement of GHG emissions*
  - *Within two years of the development consent being granted (and each third year after that), the applicant will commission and prepare a study to determine if there are any reasonable and feasible measures that can be implemented to further reduce the abated Scope 1 and 2 GHG emissions from Tahmoor Mine.*
  - *The report will be prepared to the satisfaction of the Planning Secretary.*
  - *If the study finds there are reasonable and feasible measures, they will be implemented in a timeframe determined in consultation, and to the satisfaction of, the Planning Secretary.*
- *GHG emissions forecast*
  - *The applicant must ensure that Tahmoor Mine does not exceed the Scope 1 and 2 GHG emissions in the following table, based on a 3 year rolling average.*
  - *The applicant must monitor and report actual GHG emissions to the Planning Secretary compared to forecast emissions.*
  - *If there are exceedances of the forecast Scope 1 and 2 GHG emissions (based on a 3 year rolling average), the applicant must explore a mechanism to address the exceedances to the satisfaction of the Planning Secretary.*

**Table 2 Predicted Scope 1 and 2 GHGE for the Project**

Year	Scope 1 GHGE (t CO <sub>2</sub> -e) (flaring and power generation occurring)	Scope 2 GHGE (t CO <sub>2</sub> -e)	Total Scope 1 + Scope 2 GHGE (t CO <sub>2</sub> -e)
2021	230,041	14,764	244,805
2022	1,003,246	64,389	1,067,635
2023	1,636,849	105,054	1,741,903
2024	2,054,557	131,863	2,186,420
2025	1,843,089	118,291	1,961,380
2026	2,065,327	132,555	2,197,882
2027	2,070,977	132,917	2,203,894
2028	2,301,721	147,727	2,449,448
2029	1,859,357	119,335	1,978,692
2030	2,016,949	129,450	2,146,399
2031	1,761,824	113,076	1,874,900
2032	466,314	29,928	496,242
<b>Total</b>	<b>19,310,249</b>	<b>1,239,350</b>	<b>20,549,599</b>
<b>Annual average</b>	<b>1,609,187</b>	<b>103,279</b>	<b>1,712,466</b>

## 7. Conclusion

Tahmoor Mine has been actively capturing and abating its fugitive methane emissions through flaring and power generation for many years and remains committed to continuing this abatement throughout the life of the Project. Further, Tahmoor Coal will regularly review available low emission and GHG abatement technologies, to ensure that any new reasonable and feasible measures to further reduce GHGE from the Project are identified over the life of the Project. In addition, Tahmoor Coal has committed to offsetting some of its predicted GHGE through a purchase agreement with a 15 MW capacity solar farm which will offset the daytime power requirements of Tahmoor mine.

The Project will enable the continuation of a brownfield mine and employment of around 400 full time equivalent employees. It will play a crucial role in meeting the well-established domestic demand for coking coal over the next decade including in the Illawarra region at BlueScope steelworks (particularly with the recent refusal of the Dendrobium mine extension), as well as international steel plants, as the steel industry transitions to alternative low emission technologies.

The Australian Government has committed to a reduction of GHGE by 26 to 28% below 2005 levels by 2030. It should be noted that GHGE from coal production are accounted for in these projections, with emissions from coal mining projected to increase to 2030 to meet energy and steelmaking demands. The latest estimates indicate that Australia is on track to achieve these targets.

The Australian Government's policy position on GHGE from mining is matched by the NSW Government's policy position. While the NSW Government has committed to achieving net-zero GHGE by 2050, it acknowledges that mining will be an important part of the State's economy into the future and action in relation to climate change should not compromise those mines and the communities they support.

Should you have any queries regarding this letter, please do not hesitate to contact Zina Ainsworth, Environment and Community Manager, at [REDACTED] or Charlie Wheatley, Project Director, at [REDACTED].

Yours sincerely,



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Tahmoor Coal