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Great Western Highway Upgrade Blackheath to Little Hartley – EIS Submission PO Box 334 PARKES NSW 2870

1 March 2023

Great Western Highway Upgrade: Blackheath to Little Hartley EIS (SSI-22004371)

The Blue Mountains Conservation Society (the Society) is a community-based volunteer organisation with 900 members. Our mission is to help protect, conserve and advocate for the natural environment of the Greater Blue Mountains. In fulfilling its mission, the Society advocates for the protection of the Greater Blue Mountains World Heritage Area (WHA).

The Blackheath to Little Hartley twin tunnels project (the project) is a multi-billion dollar project to build an eleven-kilometre tunnel system under Blackheath down to Little Hartley, roughly following the Great Western Highway (GWH) corridor. This corridor is a ridge line adjoining or near to the world heritage Blue Mountains National Park.

The Society is particularly concerned about the environmental impacts that the project might have on the adjacent Blue Mountains National Park, part of the WHA. There is a significant risk of impact on aquifers supplying groundwater to groundwater-dependent ecosystems and their dependent species along both sides of the proposed tunnel corridor. There is also a significant risk from stormwater from the project during construction and in use. Of particular concern are the Commonwealth-listed peat swamps, Temperate Highland Peat Swamps on sandstone (THPSS) endangered ecosystem which is a Matters of Environmental Significance (MNES) under the *Environmental Protection and Biodiversity Conservation Act* (EPBC Act).

As well, the Environmental Impact Statement (EIS) lacks detailed studies in a number of critical areas which suggest that the EIS was prepared and released in haste. Further, the piecemeal approach to the GWH upgrades has led to less rigorous environmental assessment processes (review of environmental effects) and only used an EIS for the twin tunnels project.

The Society believes that the EIS should be withdrawn so that the issues can be more thoroughly investigated, assessed and addressed.

The construction and use of the tunnel is likely to have a significant impact on the environment surrounding the works as well as on a broader scale, with our key areas of concern including:

- Creek systems and nationally-listed Peat Swamps
- Stormwater
- Cross passages
- Biodiversity
- Pollution
- Weeds
- Vibrations and settlement
- Tunnel ventilation
- Emissions
- Commonwealth environmental assessment
- Introduction of larger trucks

KEY AREAS OF CONCERN

Creek systems and NSW and nationally listed peat swamps

All the upland swamps between Medlow Bath and Mt Victoria are part of the NSW-listed, Blue Mountains Swamps Valued Ecosystem Component (VEC) and part of the THPSS. They include valley floor and valley side swamps. All THPSS, either side of the tunnel corridor between Blackheath (including two valley swamp systems Southeast of the Blackheath tunnel portal and part of the Greaves Creek catchment) and Mt Victoria are potentially at risk if aquifers feeding those systems are impacted by the tunnel or tunnel portal. The closest swamps Southeast of the tunnel portal at Blackheath are potentially vulnerable to changes in surface hydrology and water quality associated with the construction and ongoing operation of the portal area.

There is a significant risk that construction for the proposed tunnel could negatively impact aquifers supplying groundwater to groundwater dependent ecosystems and their dependent species along both sides of the proposed tunnel corridor, including within the WHA. Of particular concern is the risk of reduced groundwater inputs to the THPSS Endangered Ecological Community (EEC), and to populations of Petalura gigantea (Giant Dragonfly) and Eulamprus leuraensis (Blue Mountains Water Skink), both Endangered and obligately groundwater dependent species recorded in the peat swamps between Medlow Bath and Mt Victoria. These include swamps in the Greaves Creek, Govett's Leap, Popes Glen, Porters Pass, Centennial Glen, Hat Hill Creek, Victoria Creek, upper Grose River, and Kerosene CReek catchments. It is imperative that a detailed hydrogeological study is undertaken along the tunnel corridor to characterize the aguifers which tunnel construction could potentially impact, and their relationships with the identified groundwater dependent swamp and moist cliff-face ecological communities.

This is a serious and fundamental omission. The Society is aware of incidents of damage to aquifers during the construction of the sewer tunnel from Mt Victoria to Winmalee wastewater treatment plant in the late 1990s to early 2000s. Two incidents which led to swamps drying out in North Leura/North Katoomba area were investigated by the EPA

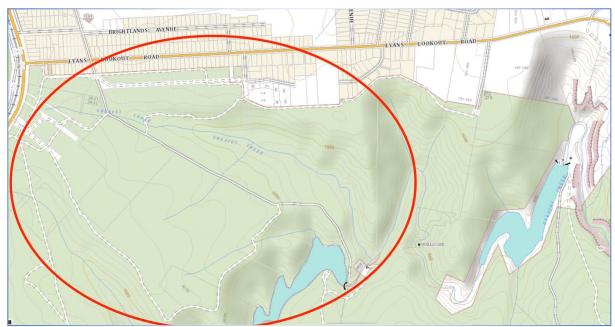
in 2000. The EIS should be held back until the questions of the full impacts on groundwater in the complex geology of the Blue Mountains are identified and analysed and therefore adequately assessed and addressed. This will also have implications for the adequacy of the Commonwealth assessment under the EPBC Act which needs to be undertaken urgently.

Further, the EIS does not include the findings from structural geological surveys that would address any faults, lineaments, folding or igneous intrusions, nor a hydrogeological survey. [e.g. at pp.360 and also S-21]. Faults would affect the difficulty of drilling and sealing the tunnel and the presence of igneous intrusions, such as vertical dykes or horizontal sills could slow the progress; these are areas where groundwater can flow in very quickly, and any change in groundwater affects all groundwater dependent species. Without these surveys, it is impossible to predict the expected impact to the groundwater.

The EIS does project the drawdown of water to between 5.1 to 20 metres; this is a significant amount. Any reduction in baseflows will likely affect the groundwater dependant ecosystems (GDE) associated with THPSS at Greaves Creek. The EIS should detail how extensive the exploration bore network is and have maps showing the predicted drawdown both during construction and over a 1-, 5- and 30-year period as this will help predict drops in groundwater and the long-term impacts on vegetation. It is necessary to ascertain groundwater impact prior to construction beginning, as opposed to modelling during, as once groundwater flow is severely interrupted, monitoring and modelling may not be accurate and by the time it is confirmed, the damage to the THPSS may be irreversible. This is another example of inadequacy of the EIS to address serious impacts.

Portal construction impacts

Of great concern is the Greaves Creek system due to its proximity to the Blackheath portal (see map below). The Greaves Creek system comprises THPSS that contain confirmed populations of Giant Dragonfly (*Petalura gigantea*) and Blue Mountains Water Skink (*Eulamprus leuraensis*), both endangered groundwater-dependent species.



Proximity of Greaves Creek Catchment to Blackheath portal and construction zone. SIX Maps, NSW Govt.

The map highlights the proximity of the Greaves Creek system to the highway corridor and clearly shows that the headwaters of this system are within the middle of the proposed Blackheath construction site. This area on the east of the GWH is also a designated Sydney Water Special Area. The *Blue Mountains Special Areas: Blackheath, Katoomba* are protected because they collect drinking water for the neighbouring Blue Mountains urban populations. According to WaterNSW's Facts Sheet, "'Special Areas' are large areas of mostly unspoilt bushland surrounding the reservoirs that provide drinking water for Sydney, the Blue Mountains and the Illawarra. Special Areas are vital to the protection of our drinking water because they help filter out unsafe nutrients and other substances before the water reaches the reservoirs." Because of this role the public is not allowed in these areas. This calls for extra effort to ensure drinking water is not being impacted. [See map at www.waternsw.com.au/water-services/water-storage/managing-dams-and-reservoirs]

Unlike the construction of the main traffic tunnels, the cut and cover method that is to be used for the construction of the two portals (Blackheath and Little Hartley) will likely allow for water ingress as the two portals are not being lined, despite a predicated reduction in baseflow. Any change to baseflow into the creek system will have an impact on the ecological stability of the creek and its communities.

The construction site near the portal at Evans Lookout Road, Blackheath, is likely to cause a change in drainage reaching the creek system due to the land being cleared and a change in surface structure. Drainage from the cleared land and construction site at Evans Lookout Road, Blackheath will likely impact the creek system too. The clearing of the land for the construction site will give rise to edge effects and the possibility of weeds establishing on the periphery of the site.

The cross passages are likely to impact baseflow water too. The passages from Blackheath to Soldiers Pinch will be lined with an impervious film and the water will flow around the passages into drains. The EIS states that the passages from Soldiers Pinch

to Little Hartley will not be lined, as they are constructed below the Claystone layer, yet it is possible there may be ingress to these. This could then impact on peat swamp endangered communities and their dependent species and the recorded communities of endangered Giant Dragonfly and endangered Blue Mountains Water Skink. Creeks that will likely be impacted too include Govett's Leap, Popes Glen, Porters Pass, Centennial Glen, Hat Hill Creek, Victoria Creek, upper Grose River, and Pulpit Hill Creek catchments. Without detailed hydrological surveys it is impossible to predict the extent of ingress.

Stormwater

Stormwater management during construction and when the project is completed is essential. Stormwater pollution and increased peak water flows coming from the GWH can damage peat-swamps and downstream watercourses. Flows from stormwater can erode and channelise watercourses and peat swamps, destroying the ecosystem and its associated species. We are already seeing increased frequency and intensity of rainfall and storm events due to climate change. These are predicted to increase as temperatures rise. Stormwater retention and management basins must be provided for the most extreme rainfall events to protect the nationally listed swamps and the values of the WHA.

Cross passages

In addition to the two main traffic tunnels, 90-120 cross passages (each 15 metres long) will be constructed roughly every 120 metres along the length of the main tunnels for safety and emergency use. These are likely to impact groundwater, due to the construction method and sealing being used. A road-header will be used to dig the cross passages before they are lined with an impervious film, unlike the tanked lining of the mainline tunnel, and there will be considerable water channelled around the passages into drains. We are concerned that, due to the multitude of passages, there will be considerable water ingress both during construction and after, due to the volume of passages across the length of the tunnel. It is highly likely that the baseflow of water throughout the upper mountains will be negatively impacted. In addition to the impact on Greaves Creek we are concerned about the lack of lining of passages after the midpoint and the inability to rectify ingress appropriately, should it occur.

Biodiversity

It is likely that water flow changes resulting from project construction will have a direct impact on threatened species. About half the ground-dependent ecosystems shown within the 1500m buffer zone assessment areas (the black dashed circle on the EIS maps for Blackheath and Soldiers Pinch, Figures 12.7 and 12.8), are to the east of the GWH and are within the Blue Mountains National Park, and all are THPSS, which are EPBC nationally-listed swamps. Although the EIS shows most of these swamps as medium probability GDE, there is no consideration in the EIS for THPSS located further downstream along the Greaves Creek catchment area into the WHA area and in the popular Grand Canyon hiking area region, nor further downstream into the WHA from the Soldiers Pinch 1500m buffer zone.

The EIS states that "the most notable predicted reduction of groundwater is at Greaves Creek, located immediately east of the proposed unlined (drained) Blackheath portal," and "reductions in baseflow of around 15 to 17 per cent (for a 95th percentile year (dry year)) are predicted at Greaves Creek near the Blackheath portal. In drier years there may be impacts to peat swamps." If there is a prolonged El Nino period with ongoing drought conditions and the portal construction is already reducing baseflows into Greaves, the EIS states there could be serious impacts on the many THPSS in this area including:

- the drying of swamp margins leading to a reduction in the area of the swamp changes to plant community type and structure and
- increased susceptibility to erosion from surface water or stream flows increased susceptibility to bushfire.

These nationally listed THPSS are some of the most unique ecosystems in Australia and an important consideration when the Blue Mountains National Park became listed as a WHA. Threatened species such as the Large-eared Pied Bat and the endangered Greater Glider partially depend on these wetland ecosystems for their food, and endangered species like the Giant dragonfly and the Blue Mountains water skink have been found in the catchment of Greaves Creek and other creeks adjacent to the worksites for the tunnel construction.

The EIS goes on to state that if revised modelling (that has yet to done) shows a reduction in baseflow to the valley floor infill swamps of Greaves Creek is likely and that there is a risk of detrimental impacts to these ecosystems as a result, then further mitigation measures would be investigated, such as lining the Blackheath tunnel portal. It is our position that considering the proximity of the Blackheath portal site to the Greaves Creek catchment and the WHA, that Transport for NSW (TfNSW) should be lining the tunnel portals here regardless of what the modelling shows. This is another example of important investigations not yet done when the EIS was released for public comment.

The EIS relies on offsets to compensate for any damage from the project. However, if suitable substitute land is not available, these schemes allow the proponent to make financial payments. This is a thoroughly discredited process that several reports and investigations have shown does not compensate for the environmental damage.

Regarding migratory birds, the project needs to acknowledge that the Blue Mountains play a significant role in the Annual Honeyeater Migration. During Autumn, (March to May) yellow faced honeyeaters migrate north to Southern Queensland in flocks and return in Spring. The groups can include other species, such as the white-naped honeyeater, fuscous honeyeater, noisy friarbird, and silvereye. The Blue Mountains provides food and shelter through continuous native vegetation as part of the eastern corridor the birds follow.

Pollution

There is a considerable risk to the environment surrounding the tunnel from pollution, both in the waterways, on land and in the air. Of particular concern to the Society are the potential impacts from concrete and cement seepage, the quality of treated water

being released back into the environment, chemical spills, sediment and fumes from the ventilation systems.

The EIS does not state what type of concrete or cement will be used to line the tunnels or cross passages. The Society is concerned about any leaching of concrete or cement and the risk of a change in pH to the water that will be coming out of the tunnel and being released back into local waterways, in particular the Greaves Creek system and River Lett catchment (which feeds into the Coxs River and Sydney's drinking water catchment). There is insufficient detail in the EIS about the way that the alkaline chemistry of concrete leachate is likely to affect the environment via groundwater and creeks and how the water run-off from concrete and cement both during and construction will be contained and treated. This water will flow, in particular, into Greaves Creek at the Blackheath end and the Cox's River at Little Hartley end.

An increase in pH in the water from run-off from concrete and cement will encourage the growth of various weeds near construction areas. This will have an adverse effect on the Commonwealth-listed swamps, creek systems, GDEs and surrounding WHA. There is little or no mention of how this will be monitored, managed or contained. The Society expects that different types of cement and concrete are likely to be used throughout construction depending upon requirements, e.g. precast, shotcrete and grout and filling cements. It is therefore necessary that the proponent provides specific details regarding the concrete and cement testing, monitoring, containment, management and treatment of water run-off to ensure there is no change in pH to the water and any seepage is not detrimental to the environment.

The EIS states that environmental mitigation measures will be 'investigated' or 'considered' for cement leachate if needed. However, this could be avoided by adopting appropriate concrete and cement for use throughout the construction of the tunnel, its cross passages and portals from the start. This vague commitment is not an adequate response. This problem should be investigated and a solution proposed before this project is allowed to proceed. This is yet an example of how rushed this EIS is. Mitigation measures post leachate will be limited in what can be achieved; the choice of cement and concrete could ensure better environmental protection.

The construction site at Blackheath will require the clearing of 23 hectares of land within Sydney Water catchment area which will change its surface structure. According to the EIS the Blackheath portal spoils, of approximately 5,000 cubic metres, will be left uncovered and therefore be exposed to weather events. If this is the case, there is the risk that it gets washed into the nearby waterways and impacts the creek systems. The planned stormwater management and sediment control for the highway diversions may be inadequate at the Blackheath portal, causing sediment pollution of Greaves Creek and Lake Greaves. Similar problems have been experienced on several occasions during the GWH upgrade, for example at Bullaburra Swamp.

As well, clearing areas required for the operational envelope for the tunnel portal at Blackheath was approved under the earlier narrower assessment by a Review of Environmental Effects (REF) for the Katoomba to Blackheath stage of the Great Western Highway upgrade. Thus, in the sensitive Greaves Creek catchment, an area where a referral is yet to be determined as a controlled action, clearing has been approved that is likely to have impacts. This piecemeal approach to the GWH upgrade project causes

an inadequate assessment of environmental impacts particularly cumulative impacts which favours the proponent rather than the environment.

For example, proposals in the current EIS for adequate pollution and stormwater controls at the Blackheath tunnel portal may be delayed for years. If these works are not installed prior to approved land clearing then major upland swamps are likely to be seriously damaged, as occurred at Bullaburra with the earlier highway upgrade.

Weeds

Invasive plants are a threat to the biodiversity of the Blue Mountains National Park and therefore the integrity of the WHA. The proposed Blackheath construction site is immediately adjacent and upslope of the Blue Mountains National Park. The process of land clearing, and excavation has the potential to spread weeds into the National Park, as weeds spread by wind, water, birds and by attaching to animals or vehicles/machinery.

The proposed construction area has 3 sources of weeds:

- 1. weeds present within the construction site;
- 2. weeds immediately adjacent; and
- 3. ongoing introduction of weeds

1. Weeds present within the construction site

All machinery moving across infested land will spread weeds. Excavation will not only spread existing seeds but also promote the germination of soil stored seeds, some of which are known to be viable for over 60 years (e.g. broom).

Two significant locations of weeds within the construction area are:

a. Around old house site / asbestos contaminated area

Anthoxanthum odoratum Sweet Vernal Grass Eragrostis curvula African lovegrass Kniphofia uvaria Red hot poker Watsonia bulbifera Sweet Vernal Grass African lovegrass Red hot poker Watsonia

Yucca aloifolia

b. Area north of house site (previously cleared)

Agrostis capillaris Browntop bent
Anthoxanthum odoratum Sweet Vernal Grass

Coreopsis lanceolata Coreopsis

Eragrostis curvula African lovegrass Erica lusitanica Spanish Heath

2. Weeds adjacent to construction area

Weeds are obvious along the highway edge, Evans Lookout Road and behind the houses. The clearing of vegetation to bare earth during construction will become a fertile breeding ground for the movement of these adjacent weeds via wind, water or birds.

Existing weeds around the boundaries include:

Acacia baileyana Cootamundra Wattle

Agapanthus praecox ssp orientalis Agapanthus

Cotoneaster spp Coreopsis lanceolata Crocosmiax crocosmiiflora Cyperus congestus

Erigeron karvinskianus Prunus serrulata Hypericum perforatum Ranunculus repens

Rubus fruticosus

Cotoneaster Coreopsis Montbretia Sedge

Seaside daisy Flowering Cherry St John's Wort creeping buttercup

Blackberry

Plus a wide range of weed grasses and groundlayer

Anthoxanthum odoratum

Cocksfoot,

Eragrostis curvula

Fennel
Fleabane
Paspalum
Purple top
Thistles
Yorkshire fog

Sweet Vernal Grass

African lovegrass

3. Ongoing introduction of weeds

The highway is an ongoing source of weeds from both the west and east, travelling on vehicle tyres. The gardens of Blackheath also contain many bird and wind spread weeds.

The only way to mitigate the threat from weeds is to avoid construction!

If construction is to proceed:

- Preconstruction weeding of a minimum of 2 years of intensive work both within
 and adjacent to the site: this will ensure a number of spray cycles and follow up
 of ground layer weeds, and also to deal with new plants germinating (from seed
 held on plants). Woody weeds, if treated by hand, should only require a 2-year
 primary and 3 year secondary treatment to guarantee eradication. However, if
 sprayed, more treatments will be required to eradicate these weeds.
- Preconstruction maintenance and supplementation of a dense buffer of an adequate width of local native plants: all plantings must be of local species and local provenance.
- Post construction weeding will be required intensively for almost 2 years (depending on the quality of the preconstruction weed control work) then for a further 3 years of less regular follow up to ensure no weed spread into the National Park.
- Strict hygienic practices need to be in place for all machinery/vehicles prior to any works being undertaken (including surveying).
- The choice of spray will be critical in ensuring that no species, including frogs, skinks, insects or native plants, for example, are negatively affected from the spraying or the cumulative effects from repeated spraying and drift, and that waterways are not polluted.

Vibrations and Settlement

Vibrations are likely to impact residents that live near the portals, especially those near Evans Lookout Road in Blackheath. It is estimated that approximately 20 or more homes will experience vibrations. House and property damage from road tunnelling in Sydney have been well publicised.

In addition to the vibrations, it is expected that settlement will occur along the tunnel corridor, to a maximum of 30mm. Many old timber homes in the Blue Mountains are built on piers and a change in ground height will likely affect the stability of these buildings.

The Blue Mountains has experienced several significant weather events over the past four years, with flooding that has impacted the groundwater and caused a number of landslides. It is likely that there may be increased impact from vibrations and settlement due to the current instability of the ground and that any movement to house foundations in Blackheath may cause cracking in walls.

Tunnel ventilation options

The Society notes that no decision been made on extraction of emissions from the tunnels, with two options being proposed. One option equates to stacks approximately 10 metres high and the second relies on exhaust fans to move the air out of the tunnel. The stack option will use 128,000kWh/day of electricity, while the portal ventilation system will use 55,000kWh/day. The operating costs for these will be very high. The stack option will create significant visual pollution as it is not conducive to the local environment whereas the exhaust fans will be cheaper to run and less visually impactful. The EIS should thoroughly assess both these options and identify the preferred solution.

Emissions

The EIS states that there will be an increase in traffic during construction and once completed the upgraded road will allow the movement of 36 metre B double trucks (where previously there were a maximum length of 30 metres). The increase in traffic during the seven years of construction will see an increase in exhaust pollution.

Similarly, the Society is concerned about public safety issues associated with the introduction of much larger and heavier trucks upon completion. The tunnel will provide a bypass for Blackheath yet once out of the tunnel, travelling east through the Blue Mountains, these trucks will travel through 16 townships, approximately 26 sets of traffic lights and pedestrian crossings and past numerous primary schools. This is about 60 kms of highway in the Blue Mountains. Quite apart from the impact on the environment from exhaust pollution, we believe that an overall assessment of impact of the introduction of these longer and larger trucks on the community should be part of the environmental assessment of this proposal and communities along the highway which will be impacted should be consulted.

Commonwealth Assessment

The environmental assessment is fragmented because of overlapping the stages of highway development. Further, the referral processes and controlled action decision under the *EPBC Act* were not undertaken during the scoping stage of this EIS. The timing, that should have been staged, meant the referral process occurred too late for public feedback to be incorporated into environmental assessments which would have ensured an adequate EIS process. The proponent needs to remedy any identified defects with further studies and revised proposals.

World Heritage status was awarded to the Greater Blue Mountains because of its Outstanding Universal Value. This value relates to its outstanding examples of ongoing ecological and biological processes significant in the evolution of Australia's highly diverse ecosystems and communities of plants and animals, and significant natural habitats for the in-situ conservation of biodiversity, including the eucalypts and eucalypt dominated communities and many rare and threatened plants and animals. It also encompasses the complex geological structures, geomorphology and water systems. It should be acknowledged in the EIS that the proposal is located in a buffer zone of the World Heritage property and is protected under the *EPBC Act* as a matter of national environmental significance. That protection extends to actions outside the boundaries of the inscribed property that may have a significant impact on the values of the property. The protection of groundwater and surface water systems are fundamental in any assessment of the potential impacts of the project on the inscribed World Heritage values of the area.

CONCLUSION

This multi-million dollar construction project appears to be driven by the Government's aim to facilitate the introduction of larger trucks for freight and reduce their travelling and stopping times by removing steep ascents and traffic signals. Large freight operators want a continuous trip with minimal need to stop. The Blue Mountains does not provide a terrain that delivers this and road authorities have gradually worked their way through the Blue Mountains section of the Great Western Highway smoothing and widening the road.

However, these larger vehicles are themselves an increased danger to the rest of the highway traffic including passenger vehicles. Local traffic of people living or visiting the Blue Mountains still have to use the highway even for short trips. Through freight, to or from the Central West, should be on trains not roads. Travel on the highway is also dangerous because of the increasing number of articulated dump trucks being allowed to carry spoil, sand and coal through the mountains. The NSW Government should be increasing rail freight which is the safest option for road users and not facilitating an increase of larger freight carriers or "high productivity vehicles". However, when the NSW Government road authority is given sole responsibility for proposing a solution to benefit the trucking industry, there is not any consideration that rail is a feasible and safer option. The plan to introduce larger trucks to the GWH will impact on the residents of Blue Mountains for the most of the 60 kilometres of Highway from the Nepean River to Mt Victoria. Public consultations on the government's proposal to increase trucks along the highway should be held.

The current piecemeal approach, dividing the GWH upgrade into sections for review, is totally inadequate as it will not provide a true understanding of the cumulative impact and long-term consequences for the environment.

There are considerable flaws in this EIS due to it being rushed as the necessary expert studies are not yet available. The Society is concerned about the EPBC referral process, that should have been staged and publicised to allow for public feedback and for these matters to be incorporated into environmental assessments and thereby ensure an adequate EIS process.

Thank you for the opportunity to comment on this proposal.

Yours sincerely

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