

Alm, Katja – Thursday, 26 November 2020 – 16:33:53

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Katja Alm
Sent	26/11/2020 4:33:53 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Katja Alm

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Please reply to Katja Alm at *****.

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Ambler, Susan – Friday, 27 November 2020 – 18:47:46

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Susan Ambler
Sent	27/11/2020 6:47:46 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Susan Ambler

• Katoomba DC, New South Wales, 2780, Australia

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Please reply to Susan Ambler at *****,

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Arns, Natalie – Thursday, 26 November 2020 – 21:29:55

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP You can help out planet!
From	Natalie Arns
Sent	26/11/2020 9:29:55 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Natalie Arns

• Katoomba DC, New South Wales, 2780, Australia

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Arthur, Kylie – Thursday, 26 November 2020 – 21:43:54

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Kylie Arthur
Sent	26/11/2020 9:43:54 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Kylie Arthur

Darwin City, Northern Territory, 0800, Australia

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Please reply to Kylie Arthur at *****.

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Asplin, Jennifer – Thursday, 26 November 2020 – 13:43:41

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jennifer Asplin
Sent	26/11/2020 1:43:41 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

jennifer asplin

New South Wales, 2540, Australia

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Please reply to jennifer asplin at *****.

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Atley, Finn – Thursday, 26 November 2020 – 10:43:44

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Finn Atley
Sent	26/11/2020 10:43:44 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Finn Atley

Seabrook, Victoria, 3028, Australia

This email was sent by Finn Atley via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Finn provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Finn Atley at *****.

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Baker, Greg – Thursday, 26 November 2020 – 19:33:24

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Greg Baker
Sent	26/11/2020 7:33:24 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Greg Baker

Belrose, New South Wales, 2085, Australia

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Please reply to Greg Baker at *****.

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Bankier, Dixi – Friday, 27 November 2020 – 10:16:42

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Dixi Bankier
Sent	27/11/2020 10:16:42 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

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Thank you for considering my concerns.

Yours sincerely,

Dixi Bankier

Darwin DC, Northern Territory, 0820, Australia

This email was sent by Dixi Bankier via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Dixi provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Dixi Bankier at *****,

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Barbour, Georgina – Thursday, 26 November 2020 – 16:06:01

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Georgina Barbour
Sent	26/11/2020 4:06:01 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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Thank you for considering my concerns.

Yours sincerely,

Georgina Barbour

Berry Springs, Northern Territory, 0838, Australia

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Barrett, Heidi – Friday, 27 November 2020 – 19:35:02

Subject	Please Stop Santos's NT Fracking plans
From	Heidi Barrett
Sent	27/11/2020 7:35:02 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Heidi Barrett

This email was sent by Heidi Barrett via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Heidi provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Heidi Barrett at *****.

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Bartlett, Wendy – Friday, 04 December 2020 – 07:34:43

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Wendy Bartlett
Sent	4/12/2020 7:34:43 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Wendy Bartlett

Byaduk, Victoria, 3301, Australia

This email was sent by Wendy Bartlett via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Wendy provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Wendy Bartlett at *****.

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Barton, Margaret – Thursday, 17 December 2020 – 17:49:56

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Margaret Barton
Sent	17/12/2020 5:49:56 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Margaret Barton via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Margaret provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Margaret Barton at *****.

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Belford, Michele – Thursday, 26 November 2020 – 17:57:43

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Michele Belford
Sent	26/11/2020 5:57:43 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Michele Belford

Molonglo, Australian Capital Territory, 2611, Australia

This email was sent by Michele Belford via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Michele provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Michele Belford at *****.

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Benn, Lynn – Thursday, 26 November 2020 – 12:53:44

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Lynn Benn
Sent	26/11/2020 12:53:44 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Lynn Benn

Green Hills, New South Wales, 2323, Australia

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Please reply to Lynn Benn at *****.

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Beumer, Philippa – Saturday, 28 November 2020 – 16:07:07

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Philippa Beumer
Sent	28/11/2020 4:07:07 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring

radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

I oppose Fracking in the NT to stop the environmental damage it will cause. Keep our precious water resources and environment natural and not tainted by mining companies.

Look after the planet she needs help and I am on her side.

Thank you for considering my concerns.

Yours sincerely,

Philippa Beumer

Gray, Northern Territory, 0830, Australia

This email was sent by Philippa Beumer via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Philippa provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Philippa Beumer at *****.

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Blakers, Caroline – Monday, 30 November 2020 – 22:03:25

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Caroline Blakers
Sent	30/11/2020 10:03:25 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Caroline Blakers

Shoalwater, Western Australia, 6169, Australia

This email was sent by Caroline Blakers via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Caroline provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Caroline Blakers at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Boyd, Kerry – Saturday, 19 December 2020 – 10:43:16

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Kerry Boyd
Sent	19/12/2020 10:43:16 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Kerry Boyd via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Kerry provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Kerry Boyd at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Branden, Wayne – Thursday, 26 November 2020 – 12:48:20

Subject	NO FRACING IN NT
From	Wayne Branden
Sent	26/11/2020 12:48:20 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGRS emissions estimates. NGRS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement." WE ARE FACING A CLIMATE EMERGENCY. WE ARE ON TRACK FOR A FOUR DEGREE TEMPERATURE INCREASE BY THE END OF THE CENTURY. THIS IS NOT COMPATIBLE WITH THE SURVIVAL OF OUR CIVILIZATION. EXPECT TO SEE BILLIONS OF PEOPLE STARVING TO DEATH OR KILLED BY ENSUING CIVIL WARS. ONLY A DUMB ASS WOULD THINK IT IS OK TO WRECK THE WORLDS CLIMATE.

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Wayne Branden

Cape Tribulation, Queensland, 4873, Australia

This email was sent by Wayne Branden via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Wayne provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Wayne Branden at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Bryan, Janet – Sunday, 29 November 2020 – 14:03:58

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Janet Bryan
Sent	29/11/2020 2:03:58 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Janet Bryan

Clayfield, Queensland, 4011, Australia

This email was sent by Janet Bryan via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Janet provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Janet Bryan at *****.

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Bryce, Joy – Thursday, 26 November 2020 – 17:51:47

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Joy Bryce
Sent	26/11/2020 5:51:47 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Joy Bryce

Saint Arnaud, Victoria, 3478, Australia

This email was sent by Joy Bryce via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Joy provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Joy Bryce at *****.

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Canaway, Margaret – Thursday, 26 November 2020 – 14:12:33

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Margaret Canaway
Sent	26/11/2020 2:12:33 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Margaret Canaway

Hopetoun Park, Victoria, 3340, Australia

This email was sent by Margaret Canaway via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Margaret provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Margaret Canaway at *****.

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Carew, Erin – Wednesday, 09 December 2020 – 13:59:22

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Erin Carew
Sent	9/12/2020 1:59:22 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Erin Carew

Wagait Beach, Northern Territory, 0822, Australia

This email was sent by Erin Carew via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Erin provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Erin Carew at *****.

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Carroll, Erin – Friday, 27 November 2020 – 05:06:23

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Erin Carroll
Sent	27/11/2020 5:06:23 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Erin Carroll

Darwin DC, Northern Territory, 0820, Australia

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Please reply to Erin Carroll at *****.

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Carruthers, Wendy – Thursday, 03 December 2020 – 15:34:55

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Wendy Carruthers
Sent	3/12/2020 3:34:55 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Wendy Carruthers

Red Head, New South Wales, 2430, Australia

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Please reply to Wendy Carruthers at *****.

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Cass, Pauline – Thursday, 26 November 2020 – 16:08:46

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Pauline Cass
Sent	26/11/2020 4:08:46 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Pauline Cass

Girraween, Northern Territory, 0836, Australia

This email was sent by Pauline Cass via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Pauline provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Pauline Cass at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Cerese, Boudicca – Thursday, 26 November 2020 – 09:30:04

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Boudicca Cerese
Sent	26/11/2020 9:30:04 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Boudicca Cerese

Darwin DC, Northern Territory, 0820, Australia

This email was sent by Boudicca Cerese via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Boudicca provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Boudicca Cerese at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Cocking, Jimmy – Saturday, 28 November 2020 – 15:38:04

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jimmy Cocking
Sent	28/11/2020 3:38:04 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Jimmy Cocking

White Gums, Northern Territory, 0870, Australia

This email was sent by Jimmy Cocking via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Jimmy provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Jimmy Cocking at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Conje, Barbara – Wednesday, 23 December 2020 – 08:08:26

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Barbara Conje
Sent	23/12/2020 8:08:26 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Barbara Conje

Marrara, Northern Territory, 0812, Australia

This email was sent by Barbara Conje via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Barbara provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Barbara Conje at *****.

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Connolly, Niall – Thursday, 26 November 2020 – 20:17:42

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Niall Connolly
Sent	26/11/2020 8:17:42 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Niall Connolly

Stanmore, New South Wales, 2048, Australia

This email was sent by Niall Connolly via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Niall provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Niall Connolly at *****.

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Conroy, Bodil – Thursday, 26 November 2020 – 11:14:40

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Bodil Conroy
Sent	26/11/2020 11:14:40 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Bodil Conroy

Moulden, Northern Territory, 0830, Australia

This email was sent by Bodil Conroy via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Bodil provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Bodil Conroy at *****.

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Cotton, Samantha – Friday, 27 November 2020 – 12:43:32

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Samantha Cotton
Sent	27/11/2020 12:43:32 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Samantha Cotton

Darwin DC, Northern Territory, 0820, Australia

This email was sent by Samantha Cotton via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Samantha provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Samantha Cotton at *****.

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Cowden, Lucinda – Thursday, 26 November 2020 – 12:00:18

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Lucinda Cowden
Sent	26/11/2020 12:00:18 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Lucinda Cowden

McCrae, Victoria, 3938, Australia

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Please reply to Lucinda Cowden at *****.

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Davey, Roger – Thursday, 26 November 2020 – 15:07:24

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Roger Davey
Sent	26/11/2020 3:07:24 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Roger Davey

Girraween, Northern Territory, 0836, Australia

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Please reply to Roger Davey at *****.

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DAY, ROSS – Sunday, 20 December 2020 – 21:49:34

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	ROSS DAY
Sent	20/12/2020 9:49:34 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

ROSS DAY

Moulden, Northern Territory, 0830, Australia

This email was sent by ROSS DAY via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however ROSS provided an email address (*****) which we included in the REPLY-TO field.

Please reply to ROSS DAY at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Delroy, Marianne – Saturday, 28 November 2020 – 21:36:15

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Marianne Delroy
Sent	28/11/2020 9:36:15 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Marianne Delroy

This email was sent by Marianne Delroy via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Marianne provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Marianne Delroy at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Dixon, Peter – Saturday, 28 November 2020 – 15:49:07

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Peter Dixon
Sent	28/11/2020 3:49:07 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Peter Dixon

Tennant Creek, Northern Territory, 0860, Australia

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Please reply to Peter Dixon at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Dodd, Justine – Thursday, 26 November 2020 – 10:55:48

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Justine Dodd
Sent	26/11/2020 10:55:48 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Justine Dodd

Bielsdown Hills, New South Wales, 2453, Australia

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Doecke, Susanne – Friday, 27 November 2020 – 22:36:02

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Susanne Doecke
Sent	27/11/2020 10:36:02 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Susanne Doecke

Western Australia, 0872, Australia

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Dooley, Glen – Thursday, 26 November 2020 – 11:51:42

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Glen Dooley
Sent	26/11/2020 11:51:42 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Glen Dooley

White Gums, Northern Territory, 0870, Australia

This email was sent by Glen Dooley via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Glen provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Glen Dooley at *****.

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Downie, Allan – Thursday, 26 November 2020 – 11:34:21

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Allan Downie
Sent	26/11/2020 11:34:21 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Allan Downie

Pinbarren, Queensland, 4568, Australia

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Drake, G – Thursday, 26 November 2020 – 19:38:48

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	G Drake
Sent	26/11/2020 7:38:48 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

G Drake

White Gums, Northern Territory, 0870, Australia

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Draper, Dean – Thursday, 26 November 2020 – 08:45:34

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Dean Draper
Sent	26/11/2020 8:45:34 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Dean Draper

Stratheden, New South Wales, 2470, Australia

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Edwards, Cassandra – Thursday, 26 November 2020 –
10:38:51

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Cassandra Edwards
Sent	26/11/2020 10:38:51 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Cassandra Edwards

Balgowan, Queensland, 4401, Australia

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Egger, Esther – Friday, 27 November 2020 – 15:59:06

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Esther Egger
Sent	27/11/2020 3:59:06 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Esther Egger

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Esther Egger via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Esther provided an email address (*****) which we included in the REPLY-TO field.

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Eldred, Velvet – Thursday, 26 November 2020 – 11:28:53

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Velvet Eldred
Sent	26/11/2020 11:28:53 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Velvet Eldred

Low Isles, Queensland, 4873, Australia

This email was sent by Velvet Eldred via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Velvet provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Velvet Eldred at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Elliott, Ray – Thursday, 03 December 2020 – 13:28:47

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Ray Elliott
Sent	3/12/2020 1:28:47 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

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3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Ray Elliott

Port Davis, South Australia, 5540, Australia

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Please reply to Ray Elliott at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Elliott, Ray – Thursday, 03 December 2020 – 15:10:06

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Ray Elliott
Sent	3/12/2020 3:10:06 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Ray Elliott

Australia

This email was sent by Ray Elliott via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Ray provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Ray Elliott at *****.

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Fackender, Peter – Thursday, 03 December 2020 – 15:16:33

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Peter Fackender
Sent	3/12/2020 3:16:33 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Peter Fackender

Calderwood, New South Wales, 2527, Australia

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Please reply to Peter Fackender at *****.

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Faulkner, Kelle – Thursday, 26 November 2020 – 12:49:04

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Kelle Faulkner
Sent	26/11/2020 12:49:04 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Kelle Faulkner via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Kelle provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Kelle Faulkner at *****.

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Fielding, Sue – Thursday, 26 November 2020 – 12:36:19

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Sue Fielding
Sent	26/11/2020 12:36:19 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Sue Fielding

White Gums, Northern Territory, 0870, Australia

This email was sent by Sue Fielding via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Sue provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Sue Fielding at *****.

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Flood, Marie – Thursday, 26 November 2020 – 20:39:42

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Marie Flood
Sent	26/11/2020 8:39:42 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Marie Flood

Alexandria, New South Wales, 2015, Australia

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Please reply to Marie Flood at *****.

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Freedman, Charlie – Friday, 27 November 2020 – 08:24:54

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Charlie Freedman
Sent	27/11/2020 8:24:54 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

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I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Charlie Freedman

White Gums, Northern Territory, 0870, Australia

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Please reply to Charlie Freedman at *****.

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GaynorSperring, Karen – Friday, 27 November 2020 – 13:42:17

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Karen Gaynor-Sperring
Sent	27/11/2020 1:42:17 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Karen Gaynor-Sperring

Darwin City, Northern Territory, 0800, Australia

This email was sent by Karen Gaynor-Sperring via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Karen provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Karen Gaynor-Sperring at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Gibson, Lorraine – Thursday, 26 November 2020 – 13:38:39

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Lorraine Gibson
Sent	26/11/2020 1:38:39 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Lorraine Gibson

Tennant Creek, Northern Territory, 0860, Australia

This email was sent by Lorraine Gibson via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Lorraine provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Lorraine Gibson at *****.

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Gillam, Mike – Saturday, 28 November 2020 – 06:58:30

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Mike Gillam
Sent	28/11/2020 6:58:30 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Mike Gillam

Alice Springs, Northern Territory, 0870, Australia

This email was sent by Mike Gillam via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Mike provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Mike Gillam at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Godden, Jenny – Friday, 27 November 2020 – 12:27:07

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jenny Godden
Sent	27/11/2020 12:27:07 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Jenny Godden

Darwin City, Northern Territory, 0800, Australia

This email was sent by Jenny Godden via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Jenny provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Jenny Godden at *****.

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Graeme – Saturday, 12 December 2020 – 19:31:54

Subject	Revised McArthur Basin Drilling Program NT Exploration Permit (EP) 161 EMP
From	Graeme
Sent	12/12/2020 7:31:54 PM

It's time to Protect Country

We are calling for a total ban on fracked shale gas in the Northern Territory because it will irreparably damage our water, country and climate.

Aboriginal and Torres Strait Islander communities are already impacted by climate change. We know that to stay below 2 degrees of warming we need to keep all new fossil fuels in the ground. Currently over 85% of the Northern Territory is covered in oil and gas exploration licences - this is unacceptable.

There is widespread opposition to fracking from many Aboriginal communities, Aboriginal station owners, pastoralists, and the broader public. People from all across the NT are coming together and will do whatever it takes to protect their land, water and ways of life from being poisoned by dangerous fracked shale gas.

We demand a ban on fracked shale gas and a safe climate future.

Graeme Batterbury
PO Box 3040,
Lismore NSW 2480
ph: ***** 690
e: ***** <mailto:*****>

Graeme
m: ***** 690
e: ***** <mailto:*****>

Attached Documents



GRAHAM, Sylvia – Friday, 27 November 2020 – 11:34:40

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Sylvia GRAHAM
Sent	27/11/2020 11:34:40 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

sylvia GRAHAM

Lower Belford, New South Wales, 2335, Australia

This email was sent by sylvia GRAHAM via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however sylvia provided an email address (*****) which we included in the REPLY-TO field.

Please reply to sylvia GRAHAM at *****.

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Griffiths, Damien – Thursday, 26 November 2020 – 15:18:47

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Damien Griffiths
Sent	26/11/2020 3:18:47 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Damien Griffiths

Edithvale, Victoria, 3196, Australia

This email was sent by Damien Griffiths via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Damien provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Damien Griffiths at *****.

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Hall, Marilyn – Thursday, 26 November 2020 – 22:38:13

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Marilyn Hall
Sent	26/11/2020 10:38:13 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Marilyn Hall

White Gums, Northern Territory, 0870, Australia

This email was sent by Marilyn Hall via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Marilyn provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Marilyn Hall at *****.

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Harley, Joy – Friday, 27 November 2020 – 06:54:55

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Joy Harley
Sent	27/11/2020 6:54:55 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Joy Harley

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Joy Harley via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Joy provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Joy Harley at *****.

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Harrison, Louise – Thursday, 26 November 2020 – 20:56:32

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Louise Harrison
Sent	26/11/2020 8:56:32 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Louise harrison

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Louise harrison via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Louise provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Louise harrison at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Higgins, Tina – Friday, 27 November 2020 – 15:15:05

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Tina Bernardi Higgins
Sent	27/11/2020 3:15:05 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Tina Bernardi Higgins

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Tina Bernardi Higgins via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Tina provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Tina Bernardi Higgins at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Hitch, Matthew – Tuesday, 01 December 2020 – 15:35:03

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Matthew Hitch
Sent	1/12/2020 3:35:03 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Matthew Hitch

This email was sent by Matthew Hitch via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Matthew provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Matthew Hitch at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Hoisington, Victor – Thursday, 26 November 2020 – 13:05:54

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Victor Hoisington
Sent	26/11/2020 1:05:54 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Victor Hoisington via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Victor provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Victor Hoisington at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Hooper, Helen – Thursday, 26 November 2020 – 11:39:56

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Helen Hooper
Sent	26/11/2020 11:39:56 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Helen Hooper

This email was sent by Helen Hooper via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Helen provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Helen Hooper at *****,

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Hopper, Simon – Sunday, 29 November 2020 – 19:41:15

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Simon Hopper
Sent	29/11/2020 7:41:15 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

6. Unacceptable amounts of water usage.

All life in the desert and every other ecosystem requires both the ground water and rain water to survive and thrive. The enormous amount of water usage in this and all fracking exploration and mining is unacceptable and puts all life in danger, both human and non human alike.

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

And please say no to this damaging project.

Yours sincerely,

Simon Hopper

Eastside, Northern Territory, 0870, Australia

This email was sent by Simon Hopper via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Simon provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Simon Hopper at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Howey, Kirsty – Tuesday, 22 December 2020 – 15:55:12

Subject	Submission - Santos EMP for EP 161
From	Kirsty Howey
Sent	22/12/2020 3:55:12 PM

To Whom it May Concern,

Please find attached our submission.

Kind regards,

Kirsty

Kind regards,

Kirsty

Kirsty Howey

Co-Director

Please note I typically work Mondays to Wednesdays.

ECNT is committed to positive flexible work practices. If I am sending this email outside of ordinary work hours, it is because it suits me. However there is no expectation that you will read or act on this email outside of your own ordinary hours of work.

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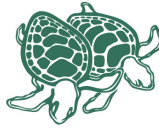
We acknowledge the Traditional Owners, The Larrakia people, on whose land we meet, live and work.

We pay our respects to their elders past, present and emerging.

We acknowledge Australia's First Nations never ceded sovereignty of their lands, seas and waters.

Attached Documents





22 December 2020

Petroleum Operations Unit
PO Box 3675
Darwin NT 0801

By email: santos.ep161@nt.gov.au

To Whom it May Concern,

Santos QNT Pty Ltd - Revised McArthur Basin Drilling Program NT Exploration Permit EP 161 EMP

The Environment Centre NT (**ECNT**) is the peak community sector environment organisation in the Northern Territory of Australia, raising awareness amongst community, government, business and industry about environmental issues and assisting people to reduce their environmental impact and supporting community members to participate in decision-making processes and action. Thank you for the opportunity to provide a comment on the draft revised EMP of Santos QNT Pty Ltd for assessment under the *Petroleum (Environment) Regulations 2016* (**Santos EMP**).

The Santos EMP proposes the construction of up to four horizontal wells and one new exploration pilot well at two existing well pads within Exploration Permit 161, within the McArthur Basin, approximately 350km south-east of Katherine.

New activities are scheduled to commence in 2021 and include:

- Drilling of Inacumba-1 pilot well;
- Decommissioning of the deepest section of the Inacumba-1 pilot well;
- Drilling of two horizontal wells from the Inacumba location;
- Drilling of two horizontal wells from the Tanumbirini location;
- Well integrity monitoring;
- Evaluation of exploration wells;
- Suspension and/or decommissioning of exploration wells;
- Rehabilitation of the exploration wells.

Santos has previously obtained approval for a number of other EMPs for its exploration activities in the McArthur Basin, including:

- Santos QNT Pty Ltd – McArthur Basin Hydraulic Fracturing 2019-20 Program approved 23 October 2019;
- Santos QNT Pty Ltd – McArthur Basin 2019 drilling program NT Exploration Permit EP 161 approved 19 July 2019;
- Santos QNT Pty Ltd – McArthur Basin Civil and Seismic program approved 6 June 2019;

- Santos QNT Pty Ltd – Dukas-1 – Conventional Gas well EP 112 and 125 approved 15 February 2019;
- Santos QNT Pty Ltd – water bore monitoring program EP 161 approved 12 December 2018;
- Santos QNT Pty Ltd – Tanumbirini North water bore monitoring program EP 161 approved 26 November 2018;
- Santos Ltd – McArthur River Basin EP 161 Stratigraphic Corehole Program approved 3 August 2016;
- Santos Ltd – McArthur Basin core hole program EP162 and EP 189;
- Santos Ltd - EP 161 Tanumbirini 1 Exploration Well Drilling approved 19 May 2014;
- Santos Ltd McArthur Basin EP 161 Seismic Exploration Survey approved 23 August 2013;
- Santos QNT Pty Ltd EP 161 2D Seismic Exploration Survey approved 16 July 2012.

ECNT is concerned that Santos' exploration activities in the McArthur Basin as a whole have not been subjected to a comprehensive environmental impact assessment. Santos appears to be obtaining piecemeal approvals of distinct exploration activities of short duration (for example, for the upcoming dry season) and within limited spatial parameters (for example, in relation to a specific drill pad or monitoring bore site). While some of these activities have been open for public comment, the fragmentation of these activities means that public submissions have had little impact on approvals, the assessment of which has been predictably confined to the specific activities for which approval is sought.

ECNT believes that this approach will lead to poor environmental outcomes, and falls far short of regulatory best practice. Santos' exploration activities should be assessed (and regulated) as a whole, and cumulatively with other impacts in the area (including arising from the exploration activities of other gas companies, and also arising from other land uses) rather than as a series of spatially and temporally discrete activities.

ECNT submits that Santos' exploration activities in the McArthur Basin clearly meet the threshold of having the potential to have a significant impact on the environment in the *Environment Protection Act 2019 (NT)*. This legislation requires a proponent to refer to the NTEPA a proposed action that has the potential to have a significant impact on the environment (s48). Of relevance to the question of whether Santos' exploration activities as a whole in the McArthur Basin (and the Beetaloo Sub-Basin) meet this threshold:

- (a) Section 5 defines "action" broadly as including a project, development, or an activity or a series of activities;
- (b) Section 10 defines "impact" to as including impacts that are cumulative and may occur over time;
- (c) Section 11 defines significant impact as an impact of major consequence having regard to the context and intensity of the impact, and the sensitivity, value and quality of the environment impacted on and the duration, magnitude and geographic extent of the impact.

The NTEPA's guidance on referring a proposed action under the *Environment Protection Act 2019 (NT)* also take a broad view of the threshold test for referral under the legislation

(https://ntepa.nt.gov.au/_data/assets/pdf_file/0009/805167/referring-proposed-action-to-ntepa-guideline.pdf). In particular, this guidance states:



“... it is important for proponents to examine all potential impact sources that relate to the action, and the potential impact pathways between the source of an impact and sensitive receptors and environmental values that may be impacted. These need to be considered for the life of the proposed action, both in isolation and cumulatively with other reasonably foreseeable proposals and approved actions.”

Thus, it is not only the cumulative impacts of Santos’ exploration activities which must be taken into account when assessing whether an action is likely to have a significant impact, but also the cumulative impacts of other gas exploration activities and land uses. ECNT notes, in this regard, that there is other environmentally significant and sensitive proposed development proposed in the Beetaloo region, including Sun Cable’s proposed solar farm at Powell Creek/Newcastle Waters station, and a 10,000 hectare cotton operation on Ucharondige Station.

ECNT also notes that there is case law regarding the “significant impact” test in the context of environmental impact assessment in Australia, requiring proponents to consider their proposed activities at their broadest scope, and to extend the assessment of potential adverse impacts to indirect and offsite impacts (<http://www.austlii.edu.au/au/journals/MelbULawRw/2007/5.html>).

If Santos’ exploration activities are taken as a whole, are assessed cumulatively with other gas exploration activities and land uses in the region, and are defined to include indirect and offsite impacts, the risk of the following impacts occurring in the region significantly increases:

- fragmentation of the habitat of native animals and native vegetation, a key threatening process for threatened species and ecological communities;
- a rise in greenhouse gas emissions;
- damage to cultural heritage and sacred sites;
- contamination to groundwater;
- contamination of surface water;
- contamination to soils; and
- damage to threatened species and ecological communities.

It is clear that Santos’ exploration activities, taken cumulatively and as a whole over time, and in combination with other reasonably foreseeable impacts in the McArthur Sub-Basin, meet the threshold of having the potential to have a significant impact on the environment. Santos’ exploration activities should therefore immediately be referred under the *Environment Protection Act 2019 (NT)*.

The EMP should not be approved until Santos refers its proposed exploration activities in the McArthur Basin under the *Environment Protection Act 2019 (NT)*, and a decision is made on the mode of assessment of these activities by the NTEPA.

ECNT also believes that Santos’ exploration activities as a whole should be referred for assessment under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*. Recent research as part of the Australian Government’s Bioregional Assessment for the Beetaloo Basin demonstrates a range of matters of national environmental significance occur, or may occur, within the in the assessment region, which includes Santos’ project area (**see attached report**). Within the area are one threatened ecological



community, 15 threatened species and two species that are both threatened and migratory. Santos' description of threatened species in the area does not appear to refer to or reflect this updated research. To take an example of a significant disparity between Santos' draft EMP and this research, page 75 of the Santos EMP states that there is zero likelihood of occurrence of the greater bilby in its project area. However, the attached report states that there is a "high" likelihood of the greater bilby being impacted by gas development in the area, because it "is known to occur in the Beetaloo GBA region and is regularly sighted in some areas. There is the potential for activities to negatively affect habitat and disrupt breeding". The Santos EMP requires immediate updating to incorporate this research, and Santos' exploration activities as a whole should be referred under the *EPBC Act* because of their likely significant impact on matters of national environmental significance.

Yours faithfully,



Kirsty Howey

Co-Director



Shar Molloy

Co-Director



Howey, Kirsty – Tuesday, 22 December 2020 – 19:07:02

Subject	Fw: Submission - Santos EMP for EP 161
From	Kirsty Howey
Sent	22/12/2020 7:07:02 PM

The attachment to ECNT's submission is now attached to this email.

Kind regards,

Kirsty

From: Kirsty Howey
Sent: 22 December 2020 15:55
To: ***** <*****>
Cc: Shar Molloy <*****>
Subject: Submission - Santos EMP for EP 161

To Whom it May Concern,

Please find attached our submission.

Kind regards,

Kirsty

Kind regards,

Kirsty

Kirsty Howey

Co-Director

Please note I typically work Mondays to Wednesdays.

ECNT is committed to positive flexible work practices. If I am sending this email outside of ordinary work hours, it is because it suits me. However there is no expectation that you will read or act on this email outside of your own ordinary hours of work.

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We acknowledge the Traditional Owners, The Larrakia people, on whose land we meet, live and work.

We pay our respects to their elders past, present and emerging.

We acknowledge Australia's First Nations never ceded sovereignty of their lands, seas and waters.

Attached Documents





Australian Government

**Department of Agriculture,
Water and the Environment**

Bureau of Meteorology

Geoscience Australia



Protected matters for the Beetaloo GBA region

Technical appendix for Geological and Bioregional Assessment: Stage 2

2020



The Geological and Bioregional Assessment Program

The Geological and Bioregional Assessment Program will provide independent scientific advice on the potential impacts from development of selected unconventional hydrocarbon plays on water and the environment. The geological and environmental data and tools produced by the Program will assist governments, industry, landowners and the community to help inform decision making and enhance the coordinated management of potential impacts.

The Program is funded by the Australian Government Department of the Environment and Energy. The Department of the Environment and Energy, Bureau of Meteorology, CSIRO and Geoscience Australia are collaborating to undertake geological and bioregional assessments. For more information, visit <http://www.bioregionalassessments.gov.au>.

Department of the Environment and Energy

The Department designs and implements Australian Government policy and programs to protect and conserve the environment, water and heritage, promote climate action, and provide adequate, reliable and affordable energy. For more information visit <http://www.environment.gov.au>.

Bureau of Meteorology

The Bureau of Meteorology is Australia's national weather, climate and water agency. Under the *Water Act 2007*, the Bureau is responsible for compiling and disseminating Australia's water information. The Bureau is committed to increasing access to water information to support informed decision making about the management of water resources. For more information, visit <http://www.bom.gov.au/water/>.

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Geoscience Australia is Australia's national geoscience agency and exists to apply geoscience to Australia's most important challenges. Geoscience Australia provides geoscientific advice and information to the Australian Government to support current priorities. These include contributing to responsible resource development; cleaner and low emission energy technologies; community safety; and improving marine planning and protection. The outcome of Geoscience Australia's work is an enhanced potential for the Australian community to obtain economic, social and environmental benefits through the application of first-class research and information. For more information, visit <http://www.ga.gov.au>.

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Authorship is listed alphabetically after first author.

On 1 February 2020 the Department of the Environment and Energy and the Department of Agriculture merged to form the Department of Agriculture, Water and the Environment. Work for this document was carried out under the then Department of the Environment and Energy. Therefore, references to both departments are retained in this report.

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The Geological and Bioregional Assessment Program is committed to providing web accessible content wherever possible. If you are having difficulties with accessing this document please contact bioregionalassessments@awe.gov.au.

Cover photograph

Mataranka Thermal Pools, Beetaloo GBA extended region, October 2018

Credit: Alf Larcher (CSIRO)

Element: GBA-BEE-2-381

Executive summary

Expansion of the shale, tight and deep coal gas industries in Australia has potential to impact on environmental matters. There is a need to examine impacts on Matters of National Environmental Significance (MNES) (i.e. *Environmental Protection and Biodiversity Conservation Act* (EPBC Act) matters) at a regional level and enable regulators to assess cumulative impacts of development on these matters. The Strategic Assessment process does this task. While a Strategic Assessment is not planned for the Beetaloo GBA region the current report describes a review of MNES, other matters protected by the EPBC Act, Matters of Territory Environmental Significance (MTES), other matters of environmental significance in the NT, and landscape classes. It does this for the Beetaloo GBA region and the broader Beetaloo GBA extended region.

MNES that occur, or potentially occur, in the Beetaloo GBA region are 14 threatened species, 13 migratory species and one species that is both threatened and migratory. Within the Beetaloo GBA extended region there are one threatened ecological community, 15 threatened species, 15 migratory species and two species that are both threatened and migratory.

Other protected matters in the Beetaloo GBA region consist of 21 listed marine species. Within the Beetaloo GBA extended region are located 23 listed marine species, and five areas of Commonwealth lands.

Among territory matters of environmental significance, one territory reserve, Bullwaddy Conservation Reserve, occurs entirely within the Beetaloo GBA region. A further four reserves are outside the Beetaloo GBA region but have 100% of their area within the Beetaloo GBA extended region. Four species that are classified as threatened under the NT's *Territory Parks and Wildlife Conservation Act* but not under the Commonwealth's EPBC Act have been recorded in the Beetaloo GBA region since 1990 and are considered likely to still occur there; a further two Territory-listed threatened species occur in the Beetaloo GBA extended region. Also, of environmental significance in the NT are nationally important wetlands. Two of these occur in the Beetaloo GBA extended region; Mataranka Thermal Pools and Lake Woods.

Among groundwater-dependent ecosystems (GDEs), springs do not occur within the Beetaloo GBA region but are present within the Beetaloo GBA extended region to the north-north-east and east as discharge complexes from the major northward flowing groundwater systems of the CLA. The springs at Mataranka Thermal Pools sustain dry-season flows in the Roper River system and support terrestrial and wetland GDEs. Connectivity between surface water and groundwater is limited within the Beetaloo GBA region because of the depth to groundwater (typically >40 m). Terrestrial GDEs are mostly limited to shallow perched aquifer systems that are fed by groundwater.

Key threatening processes operating in the Beetaloo GBA region include competition and land degradation by rabbits and unmanaged goats, predation by European red fox and feral cats, predation, habitat degradation, competition and disease transmission by feral pigs, novel

biota and their impact on biodiversity (e.g. feral horse, donkey, camel) and biological effects, including lethal toxic ingestion, caused by cane toads.

No socio-economic or cultural assets were identified in the EPBC Act protected matters searches. The searches did not identify any world heritage properties, national heritage places or Commonwealth heritage places in either the Beetaloo GBA region or the Beetaloo GBA extended region. A search of the NT heritage register identified 13 declared heritage places within the Beetaloo GBA extended region. A search of the NT archaeological sites database identified 39 Aboriginal archaeological sites within the Beetaloo GBA region and a further 80 within the GBA extended region.

To determine how impacts caused by shale, tight and deep coal gas exploration and development may affect ecosystems at a landscape scale in the Beetaloo GBA region, a landscape classification of six landscape classes was developed based on Queensland's Land Zones, (provided by the NT Government Department of Environment and Natural Resources). The landscape classification was developed to provide a basis for systematic assessment of the potential impacts on landscape function and the protected matters nested in each landscape class. The landscape classification showed that the region is dominated by loamy and sandy plains and clay plains.

A prioritisation process identified the following matters as being of the highest priority (priority 1) for assessment in Stage 3 of the project: four species listed as MNES, one species listed as a MTES, two wetlands of national importance, and all GDEs.

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Contributors to the Program

The following individuals have contributed to the Geological and Bioregional Assessment Program.

Role or team	Contributor(s)
Program Director	Department of the Environment and Energy: Anthony Swirepik
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Basin Leader	CSIRO: Kate Holland, Cameron Huddleston-Holmes, Paul Wilkes Geoscience Australia: Steven Lewis
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- Internal Peer Review Group: CSIRO: Jane Hodgkinson
- Technical Peer Review Group: Andrew Boulton, Peter McCabe, Catherine Moore, Jenny Stauber
- State Government Science Technical Review: This group includes scientists from the Northern Territory state government.

Abbreviations and acronyms

Abbreviation/acronym	Definition
ABS	Australian Bureau of Statistics
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
BI	Brittleness index
CSG	Coal seam gas
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GBA	Geological and Bioregional Assessment
GDE	Groundwater-dependent ecosystem
IBRA	Interim Biogeographic Regionalisation of Australia
ILUA	Indigenous Land Use Agreement
MNES	Matters of National Environmental Significance
LGA	Local government area

Units

Unit	Description
cm	Centimetre
g	Gram
ha	Hectare
km	Kilometre
km ²	Kilometre squared
m	Metre

The Geological and Bioregional Assessment Program

The \$35.4 million Geological and Bioregional Assessment (GBA) Program is assessing the potential environmental impacts of shale and tight gas development to inform regulatory frameworks and appropriate management approaches. The geological and environmental knowledge, data and tools produced by the Program will assist governments, industry, landowners and the community by informing decision making and enabling the coordinated management of potential impacts.

In consultation with state and territory governments and industry, three geological basins were selected based on prioritisation and ranking in Stage 1: Cooper Basin, Isa Superbasin and Beetaloo Sub-basin. In Stage 2, geological, hydrological and ecological data were used to define 'GBA regions': the Cooper GBA region in Queensland, SA and NSW; the Isa GBA region in Queensland; and the Beetaloo GBA region in NT. In early 2018, deep coal gas was added to the assessment for the Cooper GBA region, as this play is actively being explored by industry.

The Program will assess the potential impacts of selected shale and tight gas development on water and the environment and provide independent scientific advice to governments, landowners, the community, business and investors to inform decision making. Geoscience Australia and CSIRO are conducting the assessments. The Program is managed by the Department of the Environment and Energy and supported by the Bureau of Meteorology.

The Program aims to:

- inform government and industry and encourage exploration to bring new gas supplies to the East Coast Gas Market within five to ten years
- increase understanding of the potential impacts on water and the environment posed by development of shale, tight and deep coal gas resources
- increase the efficiency of assessment and ongoing regulation, particularly through improved reporting and data provision/management approaches
- improve community understanding of the industry.

The Program commenced in July 2017 and comprises three stages:

- **Stage 1 Rapid regional basin prioritisation** identified and prioritised geological basins with the greatest potential to deliver shale and/or tight gas to the East Coast Gas Market within the next five to ten years.
- **Stage 2 Geological and environmental baseline assessments** is compiling and analysing available data for the three selected regions to form a baseline and identify gaps to guide collection of additional baseline data where needed. This analysis includes a geological basin assessment to define structural and stratigraphic characteristics and an environmental data synthesis.
- **Stage 3 Impact analysis and management** will analyse the potential impacts to water resources and matters of environmental significance to inform and support Commonwealth and Territory management and compliance activities.

The PDF of this report and the supporting technical appendices are available at

<https://www.bioregionalassessments.gov.au/geological-and-bioregional-assessment-program>.

About this report

Presented in this technical appendix are the protected matters for the Beetaloo GBA region. It provides more detailed information regarding environmental and cultural protected matters, landscape classification, ecohydrological conceptualisation, and the prioritisation and screening process for protected matters in the Beetaloo GBA region. The structure and focus of the synthesis report and technical appendices reflect the needs of government, industry, landowners and community groups.

Technical appendices

Other technical appendices that support the geological and environmental baseline assessment for the Beetaloo GBA region are:

- Kirby JK, Golding L, Williams M, Apte S, Mallants D, King J, Otalega I and Kookana R (2020) Qualitative (screening) environmental risk assessment of drilling and hydraulic fracturing chemicals for the Beetaloo GBA region.
- Orr ML, Bernardel G, Owens R, Hall LS, Skeers N, Reese B and Woods M (2020) Geology of the Beetaloo GBA region.
- Hall LS, Wang L, Bailey AHE, Orr ML, Owens R, Jarrett, A, Lech ME, Skeers N, Reese, B and Woods M (2020) Petroleum prospectivity of the Beetaloo Sub-basin.
- Evans TJ, Radke BM, Martinez J, Buchanan S, Cook SB, Raiber M, Ransley TR, Lai ÉCS, Skeers N, Woods M, Evenden C, Cassel R and Dunn B (2020) Hydrogeology of the Beetaloo GBA region.
- Kear J and Kasperczyk D (2020) Hydraulic fracturing and well integrity review for the GBA regions.

All maps for the Beetaloo GBA region use the Map Grid of Australia (MGA) projection (zone 53) and the Geocentric Datum of Australia 1994 (GDA 1994)

1 Protected matters

Matters of National Environmental Significance (MNES) that occur, or potentially occur, in the Beetaloo GBA region are 14 threatened species, 13 migratory species and one species that is both threatened and migratory. Within the Beetaloo GBA extended region there are one threatened ecological community, 15 threatened species, 15 migratory species and two species that are both threatened and migratory.

Other protected matters in the Beetaloo GBA region consist of 21 listed marine species. Within the Beetaloo GBA extended region are located 23 listed marine species, and five areas of Commonwealth lands.

Among Matters of Territory Environmental Significance (MTES), 1 territory reserve, Bullwaddy Conservation Reserve, occurs entirely within the Beetaloo GBA region. A further four reserves are outside the Beetaloo GBA region but have 100% of their area within the Beetaloo GBA extended region. Four species that are classified as threatened under the NT's *Territory Parks and Wildlife Conservation Act* but not under the Commonwealth's *Environmental Protection and Biodiversity Conservation Act* (EPBC Act) have been recorded in the Beetaloo GBA region since and are considered likely to still occur there; a further two Territory-listed threatened species occur in the Beetaloo GBA extended region. Also of environmental significance in the NT are two nationally important wetlands: Mataranka Thermal Pools and Lake Woods.

Among groundwater-dependent ecosystems (GDEs), springs do not occur within the Beetaloo GBA region but are present within the Beetaloo GBA extended region to the north-north-east and east as discharge complexes from the major northward flowing groundwater systems of the CLA. The springs at Mataranka Thermal Pools sustain dry-season flows in the Roper River system and support terrestrial and wetland GDEs. Twenty springs occur within the Beetaloo GBA extended area but none are in the Beetaloo GBA region. Both the Beetaloo GBA region and extended region contain areas of aquatic and terrestrial GDEs. Connectivity between surface water and groundwater is limited within the Beetaloo GBA region because of the depth to groundwater (typically >40 m), therefore, terrestrial GDEs are mostly limited to shallow perched aquifer systems that are fed by groundwater.

Key threatening processes operating in the Beetaloo GBA region include competition and land degradation by rabbits and unmanaged goats, predation by European red fox and feral cats, predation, habitat degradation, competition and disease transmission by feral pigs, novel biota and their impact on biodiversity (e.g. feral horse, donkey, camel) and biological effects, including lethal toxic ingestion, caused by cane toads.

1.1 Matters of National Environmental Significance

The EPBC Act protected matters search identified the following Matters of National Environmental Significance (MNES) in the Beetaloo GBA region (Figure 1): 14 threatened species, 13 migratory species and one species that is both threatened and migratory. No other MNES were identified

from the Beetaloo GBA region. A list of these MNES together with a summary of each species' biology, distribution and habitat is given in Table 1.

Methods snapshot: Identifying protected matters

Most matters considered in this report were identified in the Beetaloo GBA region and Beetaloo GBA extended region (Figure 1) based on the EPBC Act protected matters reports run by the Department of the Environment and Energy on 6 September 2018. This search was re-run on 15 March 2019 to validate the original report and assess if any matters had either been added or removed from the list. An additional search was run on 23 September 2019 when the boundary of the Beetaloo GBA extended region was modified. The protected matters reports run for the Beetaloo GBA region and extended region searched for the following MNES: world heritage properties, wetlands of international importance, threatened species, threatened ecological communities, and migratory species. The report also searched for other matters protected under the EPBC Act that are not listed as MNES. These are Commonwealth lands, listed marine species, critical habitats, and Commonwealth reserves.

The EPBC Act protected matters reports also identified territory reserves and nationally important wetlands. Species classified as threatened under the NT's *Territory Parks and Wildlife Conservation Act* but not under the Commonwealth's *Environmental Protection and Biodiversity Conservation Act* (EPBC Act) were identified by examining data downloads provided by the NT government's Fauna and Flora Division on 10 June 2018 and again on 26 September 2019 (for the new extended boundary).

Groundwater-dependent ecosystems (GDEs) were identified by interrogating NT databases, specifically NT terrestrial ecosystem data for terrestrial GDEs and NT aquatic ecosystem data for aquatic GDEs. Springs data were obtained by combining the NT aquatic ecosystem data with the NT springs data to create a new layer containing all springs common to both datasets. This analysis was undertaken on 30 September 2019.

The EPBC Act protected matters search identified the following MNES in the Beetaloo GBA extended region (Figure 1): one threatened ecological community, 15 threatened species, 15 migratory species and two species that are both threatened and migratory. The threatened and migratory species within the Beetaloo GBA extended region included all the species identified as being of national environmental significance in the Beetaloo GBA region plus *Acrocephalus orientalis*, *Polytelis alexandrae*, *Pristis pristis*, and *Tringa nebularia*. A list of these MNES together with a summary of each species' biology, distribution and habitat is given in Table 1.

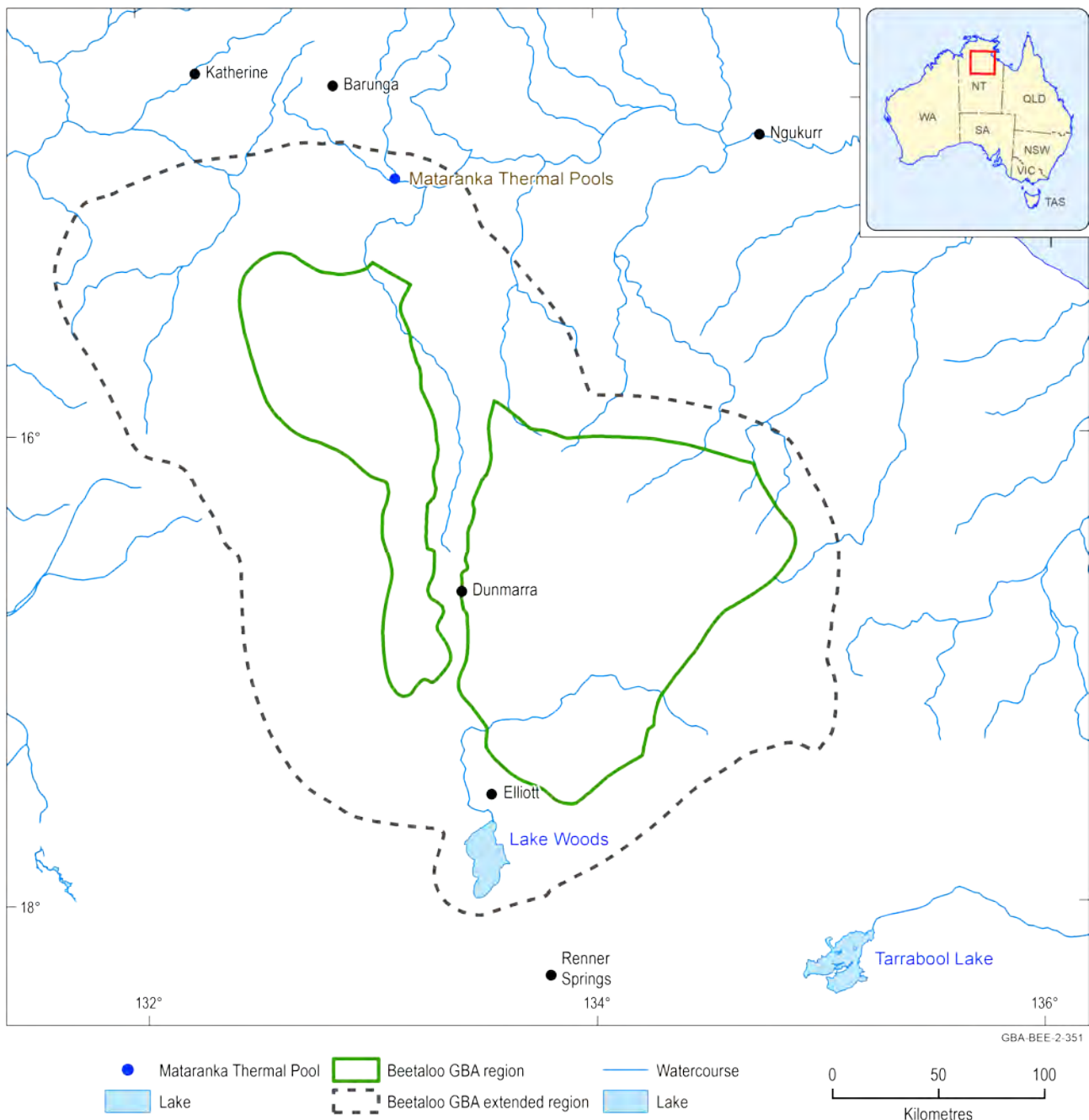


Figure 1 Map of the Beetaloo GBA region and extended Beetaloo GBA region

Data: Department of the Environment and Energy (2010)

Element: GBA-BEE-2-351

1.1.1 Nationally listed threatened species and threatened ecological communities

In total, 15 species listed as threatened (being either critically endangered, endangered or vulnerable) occur or potentially occur within the Beetaloo GBA region based on reports run by the Department of the Environment and Energy on 6 September 2018. These include birds (eight species), mammals (five species) and reptiles (two species). No fish, frogs, invertebrates or plants that are listed as threatened under the EPBC Act occur, or may occur, in the Beetaloo GBA region.

In total, 17 species are listed as threatened within the Beetaloo GBA extended region. These include birds (nine species), mammals (five species), reptiles (two species) and a freshwater fish. No frogs, invertebrates or plants that are listed as threatened under the EPBC Act occur, or are likely to occur, in the Beetaloo GBA extended region. The threatened species within the Beetaloo GBA extended region included all the species identified in the Beetaloo GBA region in addition to the princess parrot (*Polytelis alexandrae*) and freshwater sawfish (*Pristis pristis*).

The threatened ecological community that potentially occurs within the Beetaloo GBA extended region is the Arnhem Plateau sandstone shrubland complex (Figure 2). This community occurs to the north-east of the Beetaloo sub-basin on the Arnhem Plateau (within Djelk and Warddeken Indigenous Protected Areas) and on sandstone outliers at Ubirr, Nawurlandja and Burrunggui in Kakadu National Park and the Marawal Plateau in Nitmiluk National Park (Commonwealth of Australia 2011). The threatened ecological community has not been recorded in the Beetaloo GBA region. The community may occur in the north-east portion of the Beetaloo GBA extended region, but this has not been confirmed. If present in the Beetaloo GBA extended region, the community will be at the extreme southern edge of its range and is likely to cover a limited area.

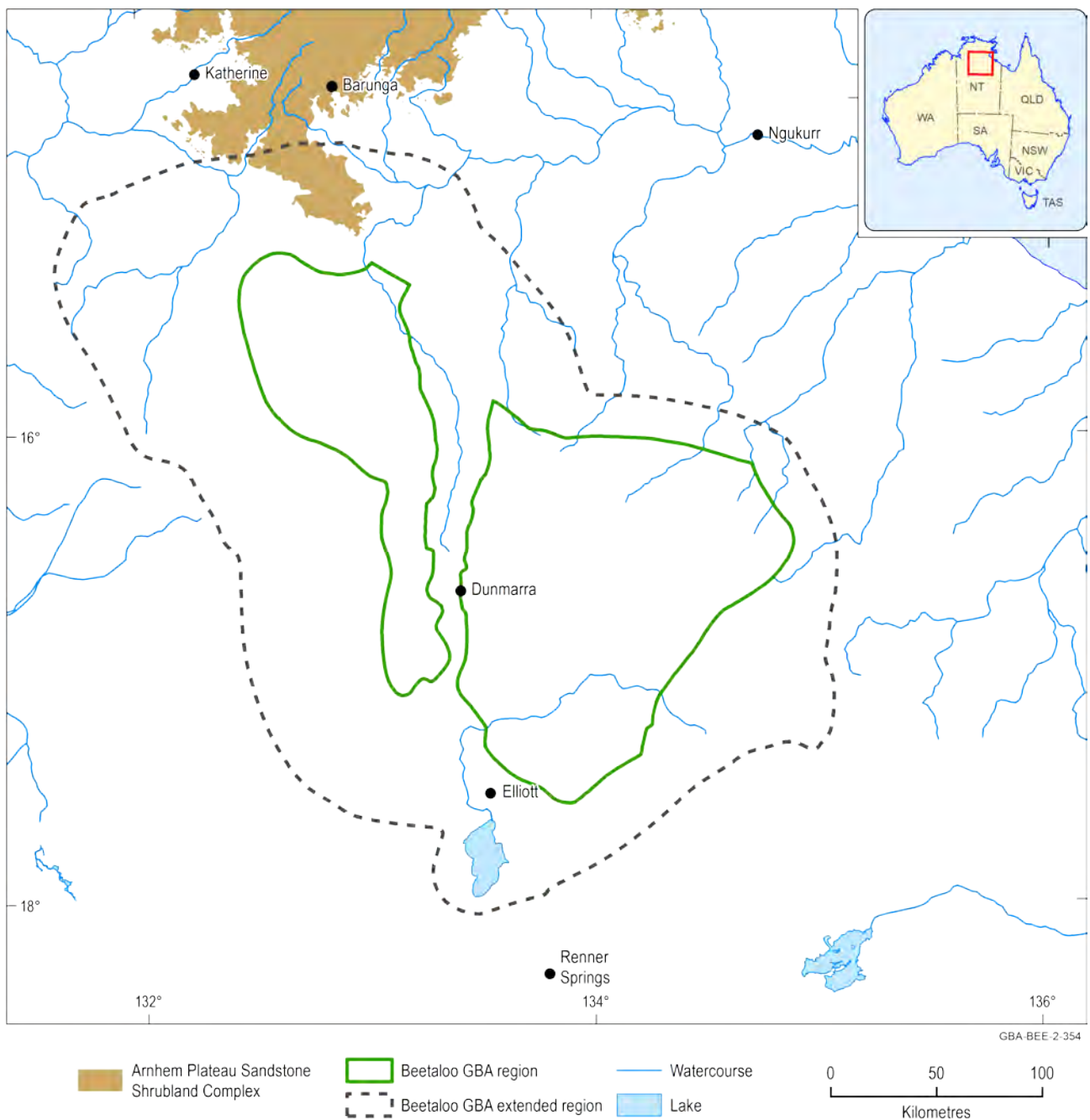


Figure 2 Potential distribution of the threatened ecological community, Arnhem Plateau Sandstone Shrubland Complex

Data: Department of the Environment and Energy (2018a)

Element: GBA-BEE-2-354

1.1.2 Nationally listed migratory species

In total, 14 species are listed as migratory under the EPBC Act and occur, or may occur, in the Beetaloo GBA region. This total includes one species, *Calidris ferruginea*, that is also listed as threatened.

In total, 17 species are listed as migratory under the EPBC Act and occur, or may occur, in the Beetaloo GBA extended region. This total includes two species, *Calidris ferruginea* and *Pristis pristis*, that are also listed as threatened. The migratory species within the Beetaloo GBA extended region include all the species identified in the Beetaloo GBA region plus three additional species: *Acrocephalus orientalis*, *Pristis pristis*, and *Tringa nebularia*.

Migratory species are those that are protected under bilateral international agreements. The EPBC Act list of migratory species is assembled from four bilateral agreements. These agreements are:

- China-Australia Migratory Bird Agreement (CAMBA)
- Japan-Australia Migratory Bird Agreement (JAMBA)
- Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)
- Bonn Convention (Convention on Conservation of Migratory Species of Wild Animals).

The International Union for Conservation of Nature’s (IUCN) classification of the global conservation status of each of the 15 migratory species that are not classified as threatened in Australia under the EPBC Act is given in Table 1. Many of these species have both a large global population size and a large population size in Australia. Each of the 15 species has an IUCN global concern status of ‘least concern’ – the status with the lowest level of concern in the IUCN classification system.

Table 1 Species classified as Matters of National Environment Significance under the Commonwealth’s *Environment Protection and Biodiversity Conservation Act 1999* that protected matters searches have identified as occurring, or potentially occurring, in the extended Beetaloo GBA region together with a summary of biology, distribution and habitat

For those species that are migratory, but not threatened, information is also provided on IUCN global conservation status and global population trend. The fourth column indicates whether protected matters searches have identified the species as occurring, or potentially occurring, in the Beetaloo GBA region (if so, then listed as ‘yes’) or whether it is restricted to the extended Beetaloo GBA region (listed as ‘no’).

Status	Scientific name	Common name	Present in GBA region	Summary of biology, distribution and habitat
Critically endangered	<i>Calidris ferruginea</i> ^{a, b}	Curlew sandpiper	Yes	Migratory shorebird. Breeds mainly in Siberian Arctic. Non-breeding migrant during Austral summer to Africa, Asia and Australasia. Large numbers visit Australia mostly on intertidal mudflats in sheltered coastal areas (estuaries, bays, inlets, lagoons). Less common inland on lakes, dams and bore drains. Global population estimate between 1.085 and 1.285 million birds. Numbers declining globally.

Status	Scientific name	Common name	Present in GBA region	Summary of biology, distribution and habitat
Endangered	<i>Dasyurus hallucatus</i>	Northern quoll	Yes	Carnivorous marsupial. Nocturnal. Endemic to northern Australia (eastern Queensland, Top End of NT to Kimberley and Pilbara in WA). Occupies savanna woodland and patches of rainforest and favours rocky escarpments. Numbers declining.
	<i>Elseya lavarackorum</i>	Gulf snapping turtle	Yes	Freshwater turtle. Endemic to northern Australia. Limited range covering upper and middle reaches of the Nicholson and Gregory rivers in north-west Queensland/north-east NT and upper reaches of Calvert River, NT. Occurs in deep water pools of permanent spring-fed rivers. Numbers stable. Not considered threatened in the NT (listed as near threatened).
	<i>Erythrura gouldiae</i>	Gouldian finch	Yes	Passerine bird. Endemic to northern Australia from inland north Queensland across Top End of NT to Kimberley in WA. Occupies open woodland close to water; it feeds on seeding grasses and nests in hollows in eucalypts. Evidence that numbers recovering.
	<i>Pezoporus occidentalis</i>	Night parrot	Yes	Parrot. Nocturnal, terrestrial. Endemic to arid zone; records in south-west Queensland, north-east SA and northern WA. Occupies mature spinifex grassland feeding on short-lived herbs and grasses. Trends in abundance unknown.
	<i>Rostratula australis</i> ^c	Australian painted snipe	Yes	Resident shorebird. Endemic to Australia. Occupies shallow freshwater wetlands. Recorded across mainland but its area of occupancy is comparatively small, estimated at about 2000 km ² . Numbers appear to be stable.
Vulnerable	<i>Acanthophis hawkei</i>	Plains death adder	Yes	Venomous snake. Endemic to northern Australia from north-east of WA across Top End and Barkly Tableland of NT/Queensland border and Mitchell Grass Downs in south-west Queensland. Occupies floodplains with cracking clay soils. Numbers may be declining due to consumption of cane toads.
	<i>Erythrotriorchis radiatus</i>	Red goshawk	Yes	Bird of prey. Endemic to Australia with patchy range across coastal and interior regions of Queensland, NT and north-east of WA and north-east NSW. Occurs in open forest and woodland and along rainforest edges. Numbers appear to be stable.
	<i>Falcunculus frontatus whitei</i>	Crested shrike-tit (northern)	Yes	Passerine bird. Occurs in northern Australia across Top End of NT to Kimberley in WA. Populations fragmented. Forages for invertebrates on trees within woodland. Numbers stable. Not considered threatened in the NT (listed as near threatened).

Status	Scientific name	Common name	Present in GBA region	Summary of biology, distribution and habitat
	<i>Grantiella picta</i>	Painted honeyeater	Yes	Passerine bird. Specialised on fruit of mistletoes. Wide distribution across eastern Australia extending to the tropics in north-west Queensland and north-east NT. Exhibits seasonal movement in response to food availability. Occupies acacia-dominated woodlands preferring those with mature trees. Numbers appear to be stable.
	<i>Macroderma gigas</i>	Ghost bat	Yes	Bat (largest insectivorous bat in Australia with body mass up to 165 g). Endemic to tropical northern Australia from Rockhampton, central Queensland across Top End of NT to Kimberley and Pilbara in WA. Daytime roosts in caves and disused mines, forages in woodland. Recent declines in numbers. Listed as threatened in 2016.
	<i>Macrotis lagotis</i>	Greater bilby	Yes	Ground-dwelling marsupial. Nocturnal. Endemic to arid Australia in south-western Queensland and across western deserts of NT and WA. Occurs in variety of habitats, favouring spinifex sandplains and paleodrainage areas in NT. Numbers appear to be stable although fluctuate naturally as resources fluctuate.
	<i>Phascogale pirata</i>	Northern brush-tailed phascogale	Yes	Carnivorous marsupial. Nocturnal. Endemic to Top End of NT. Occurs mostly in tall open forest dominated by eucalypts. Little is known about this species. Numbers may be declining.
	<i>Polytelis alexandrae</i>	Princess parrot	No	Parrot. Endemic to the western arid zone of Australia occurring in north-west SA and across the western deserts of NT and WA. Forages on flowers, seeds and other plant material on spinifex sandplains and woodlands and nests in hollows of large trees. Exhibits nomadic movements in response to pulses in food resources following rainfall. Numbers appear to be stable.
	<i>Pristis pristis</i> ^a	Freshwater sawfish	No	Freshwater fish (largest freshwater fish in Australia reaching maximum body length of 5.82 m). Occupies river (up to 400 km inland) and estuarine environments and up to 100 km offshore in northern and western Australia as well as in North and South America, Africa, Asia and New Guinea. In Australian rivers during dry-season habitat is a series of isolated waterholes. Numbers appear to be declining.
	<i>Saccolaimus saccolaimus nudicluniatatus</i>	Bare-rumped sheath-tailed bat	Yes	Insectivorous bat. Occurs in northern Australia (Townsville to Iron Range in Queensland and Top End of NT) and in New Guinea, Timor, Indonesia and elsewhere in south-east Asia. Forages in open space above woodland and roosts during day in colonies of up to 100 bats in tree hollows. Recent status change from critically endangered because of new information on distribution.

Status	Scientific name	Common name	Present in GBA region	Summary of biology, distribution and habitat
	<i>Tyto novaehollandiae kimberli</i>	Masked owl (northern)	Yes	Owl. Occurs across northern Australia from the coast of north Queensland across Top End to Kimberley in WA. Forages in tall open eucalypt forest and along margins of agricultural fields. Nests and roosts in hollows in large trees within forest patches. Numbers appear to be stable.
Migratory	<i>Acrocephalus orientalis^b</i>	Oriental reed-warbler	No	Passerine bird. Breeds in Russia, Mongolia and northern Asia. Non-breeding migrant to equatorial areas during the Austral summer. Very rare vagrant in Australia. IUCN global status is least concern; however, numbers may be decreasing.
	<i>Actitis hypoleucos^b</i>	Common sandpiper	Yes	Shorebird. Global population estimated at 2.6 to 3.2 million birds. Breeds in Europe and Asia. Non-breeding migrant in Austral summer in large numbers along all coastlines and in many inland areas of Australia. Mapped extent of potential habitat covers entire Australian continent. IUCN global status is least concern; however, numbers may be decreasing.
	<i>Apus pacificus^b</i>	Fork-tailed swift	Yes	Swift. Breeds in south-east China and adjacent countries. Non-breeding migrant in Austral summer across Australia. Mapped extent of potential habitat covers most of Australia. IUCN global status is least concern and numbers are stable.
	<i>Calidris acuminata^b</i>	Sharp-tailed sandpiper	Yes	Shorebird. Breeds in northern Siberia. Non-breeding migrant in Austral summer in large numbers along all coastlines and in inland areas of Australia. Population estimated at up to 140,000 birds (global population estimate is >160,000 birds). Mapped extent of potential habitat covers entire continent. IUCN global status is least concern and numbers are stable.
	<i>Calidris melanotos^b</i>	Pectoral sandpiper	Yes	Shorebird. Breeds in northern Russia and North America. Non-breeding migrant in Austral summer in low numbers along coastlines and inland areas of Australia. Global population estimate is 25,000 to 100,000 birds. Mapped extent of potential habitat covers entire continent. IUCN global status is least concern and numbers are stable.
	<i>Cecropis daurica^b</i>	Red-rumped swallow	Yes	Passerine bird. Widespread and abundant (global population estimate of 10 million to 50 million). Breeds in Russia, Mongolia, western Asia, northern Africa, Middle East and southern Europe. Non-breeding migrant to the tropics in the Austral summer. A vagrant in Australia with less than ten birds typically present in any given year. IUCN global status is least concern and numbers are stable.

Status	Scientific name	Common name	Present in GBA region	Summary of biology, distribution and habitat
	<i>Charadrius veredus</i> ^b	Oriental plover	Yes	Shorebird. Breeds in Mongolia and adjacent Russia. Approximately 90% of global population migrates to Australia in Austral summer occupying coastal and inland areas. Non-breeding in Australia. 144,000 birds at Eighty Mile Beach, WA, in February 2010. Occupies a wide range of marine, freshwater and terrestrial habitats. IUCN global status is least concern. The population trend is unclear.
	<i>Crocodylus porosus</i> ^b	Saltwater crocodile	Yes	Aquatic reptile. Occurs in Bangladesh, Brunei, Cambodia, India, Sri Lanka, Malaysia, Myanmar, Papua New Guinea, Philippines, Solomon Islands, Vanuatu, Vietnam, Timor and Indonesia. Occupies inland lakes, swamps and marshes and coastal brackish waters and tidal sections of rivers. In Australia occupies rivers and estuarine areas from Kimberley across northern Australia to southern coastal Queensland. IUCN global status is least concern with numbers increasing.
	<i>Cuculus optatus</i>	Oriental cuckoo	Yes	Cuckoo. Large global distribution including breeding range across the Palearctic region. Non-breeding migrant to the Top End of NT and eastern Australia in the Austral summer. Global population is estimated at between 5 and 15 million birds. IUCN global status is least concern and numbers are stable.
	<i>Glareola maldivarum</i> ^b	Oriental pratincole	Yes	Shorebird. Breeds in eastern China and Russia and parts of south-east Asia. Non-breeding migrant in Austral summer mainly in the north of WA and across Top End of NT to north-west Queensland. Occupies a wide range of marine, freshwater and grassland habitats. IUCN global status is least concern; however, numbers may be decreasing.
	<i>Hirundo rustica</i> ^b	Barn swallow	Yes	Passerine bird. One of the world's most widespread birds (global population estimate between 290 and 500 million) occurring across all continents except Antarctica. Rare summer visitor across north of Australia. IUCN global status is least concern. The population trend is unclear.
	<i>Motacilla cinerea</i>	Grey wagtail	Yes	Passerine bird. Widespread in the Northern Hemisphere and tropics with some populations breeding in Europe and Asia then migrating to tropical Africa and Asia. Global population estimate of 6.9 million to 19.8 million birds. A non-breeding vagrant in Australia. Occupies riverine areas. IUCN global status is least concern and numbers are stable.

Status	Scientific name	Common name	Present in GBA region	Summary of biology, distribution and habitat
	<i>Motacilla flava</i> ^b	Yellow wagtail	Yes	Passerine bird. Extremely large range from Europe to Siberia to west Asia and China south to Egypt. Global population estimate of 64 to 107 million birds. A non-breeding vagrant in Australia. Occupies terrestrial and freshwater habitat. IUCN global status is least concern. The population trend is unclear.
	<i>Pandion haliaetus</i> ^b	Osprey	Yes	Bird of prey. Occurs in all continents except Antarctica. Breeding resident along the entire coast of mainland Australia (but not Tasmania). The global population is between 100,000 and 499,999 birds and is increasing. IUCN global status is least concern and numbers are increasing.
	<i>Tringa nebularia</i> ^b	Common greenshank	No	Shorebird. Breeds in Scandinavia and across Russia. Non-breeding migrant in Austral summer in small numbers along most coastlines and in many inland areas of Australia. Australian population estimated at 18,000 to 19,000 birds (global population estimate of 440,000 to 1.5 million). Occupies a range of wetland types. IUCN global status is least concern with numbers stable.

^aAlso listed as migratory

^bAlso listed as marine

^cListed as marine under the name *Rostratula benghalensis*

1.2 Other matters protected by the EPBC Act

The protected matters search in the EPBC Act identified 23 listed marine species as occurring or potentially occurring in the extended Beetaloo GBA region. Of these, 21 listed marine species were identified for the Beetaloo GBA region with an additional two species only listed for the extended GBA region. In addition, the extended area held four Commonwealth lands.

1.2.1 Listed marine species

Listed marine species are those that occur in Commonwealth marine areas. A total of 21 listed marine species were identified as occurring or potentially occurring in the Beetaloo GBA region with an additional two species identified only from the Beetaloo GBA extended region. Of the 23 species, 16 species have already been covered as MNES (Table 1). The curlew sandpiper (*Calidris ferruginea*) is threatened and migratory, the painted snipe (*Rostratula benghalensis*) is threatened (although listed as the Australian painted snipe – see Table 1) and 14 other species are migratory. Only seven of the species that are listed marine species are not migratory or threatened or both (i.e. they are not MNES).

A brief profile of each of these seven listed marine species is given in Table 2 together with information on each species' biology, distribution, habitat, IUCN global conservation status and global population trend. All species were listed for both regions. Each of the seven species has an IUCN global concern status of least concern – the status with the lowest level of concern in the IUCN classification system.

1.2.2 Commonwealth lands

Five areas of Commonwealth land are located within the Beetaloo GBA extended region but outside of the Beetaloo GBA region. These areas are not managed for conservation; four locations are managed by the Department of Defence for defence purposes. These assets are the Delamere Weapons Range, Willeroo Station Radar Site, Killarney Station Radar Site and an un-named site adjacent to the Delamere Weapons Range. These four sites are in the extreme north-west portion of the Beetaloo GBA extended region. The final area is an un-named property within the town of Elliott. Because of the location of these areas, none are considered to be at risk from the development of a shale gas industry.

Table 2 Listed marine species classified as other matters protected by the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* that occur, or potentially occur, in the Beetaloo GBA region and the Beetaloo GBA extended region, together with a summary of biology, distribution, habitat, IUCN global conservation status and global population trend. Species that are also Matters of National Environmental Significance are not covered in this list

Scientific name	Common name	Biology, distribution and habitat
<i>Anseranas semipalmata</i>	Magpie goose	Waterbird. Occurs in Australia and southern regions of the island of New Guinea. Nomadic, congregating in large numbers in wetlands or wet grasslands. In Australia occurs from the Kimberley region of WA across Top End of NT down east coast to northern NSW. Also recorded from southern Victoria and SA. Populations appear to be stable and IUCN conservation status is least concern.
<i>Ardea alba</i>	Great egret	Waterbird. Massive global distribution including North and South America, Africa, Asia and Europe. Global population estimated at 41.5 to 69.9 million birds. Occupies wide range of inland and coastal wetlands. Mapped extent of potential habitat covers entire Australian continent. IUCN conservation status is least concern.
<i>Ardea ibis</i>	Cattle egret	Waterbird. Massive global distribution including North and South America, Africa, Asia and Europe. Global population estimated at 4 to 9.85 million birds. Occupies open grassy areas and some wetlands. Mapped extent of potential habitat covers most of Australian continent. Populations appear to be increasing and IUCN conservation status is least concern.
<i>Chrysocolaptes osculans</i>	Black-eared cuckoo	Cuckoo. Breeding resident in Australia, southern regions of the island of New Guinea and in Timor and Indonesian islands. Occupies woodland and shrubland, mostly in inland Australia although mapped extent of potential habitat covers most of Australian continent. Populations appear to be stable and IUCN conservation status is least concern.
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	Bird of prey. Range includes coastal India, Sri Lanka, south-east Asia, Philippines, Indonesia and Papua New Guinea. In Australia, occurs along coast and extends inland along some of the larger rivers. Australian population size estimated at >500 pairs. Populations appear to be decreasing but IUCN conservation status is least concern.
<i>Merops ornatus</i>	Rainbow bee-eater	Bee-eater. Outside Australia occurs in Indonesia, Timor-Leste, Papua New Guinea and Solomon Islands. The population is estimated to number at least 1 million birds. Mapped extent of potential habitat covers entire Australian continent. Populations appear to be stable and IUCN conservation status is least concern.
<i>Crocodylus johnstoni</i>	Freshwater crocodile	Aquatic reptile. Endemic to northern Australia where it occurs in the Kimberley region of WA across the Top End of the NT across northern Queensland. It occupies freshwater wetlands. Populations appear to be stable and IUCN conservation status is least concern.

Information is sourced from: IUCN (2019). Refer to Table 1 for a listing of threatened species and migratory species.

1.3 Species accounts

The accounts provided in this section are intended to provide a summary of scientific understanding of each species as at 30 June 2019. Information has been sourced from review documents such as recovery plans wherever possible. The assessment of water dependency refers to the species itself not its food species. If a species lives in water, needs to drink water to survive or depends on nest or roost sites that are in trees that are water dependent it has been classified as water dependent. The assessment of the likelihood of being impacted by gas development in the Beetaloo GBA region refers to unconventional gas development and is specific to the Beetaloo GBA region. That is, a species may have a high likelihood of being impacted by unconventional gas development in other regions but a low likelihood in the Beetaloo GBA region. Such a situation arises if the species has a limited distribution in the Beetaloo GBA region that does not include areas that will be impacted by gas development. A dichotomy of 'low' and 'high' is used to assess this category. The knowledge of species' distributions within the Beetaloo GBA region is based on searches carried out 6 September 2018. This search was re-run on 15 March 2019 to validate the original report and assess if any matters had either been added or removed from the list. An additional search was run on 23 September 2019 when the boundary of the Beetaloo GBA extended region was modified.

Curlew sandpiper, *Calidris ferruginea**Overview*

The curlew sandpiper is listed as critically endangered and as a migratory and marine species under the EPBC Act. The curlew sandpiper is a migratory shorebird that breeds mainly in the Arctic region of northern Siberia and spends the Austral summer in a non-breeding phase distributed across Africa, Asia and Australasia (Figure 3). The species does not breed in Australia, but significant numbers spend the non-breeding season here. In Australia the curlew sandpiper mainly occurs on the coast particularly intertidal mudflats in sheltered coastal areas such as estuaries, bays, inlets and lagoons. Non-tidal coastal areas include swamps, lakes and lagoons and ponds in sewage farms and saltworks. The curlew sandpiper occurs less commonly inland. Here it occupies lakes, dams and bore drains.

The global population of the curlew sandpiper is estimated to number between 1.085 million and 1.285 million.

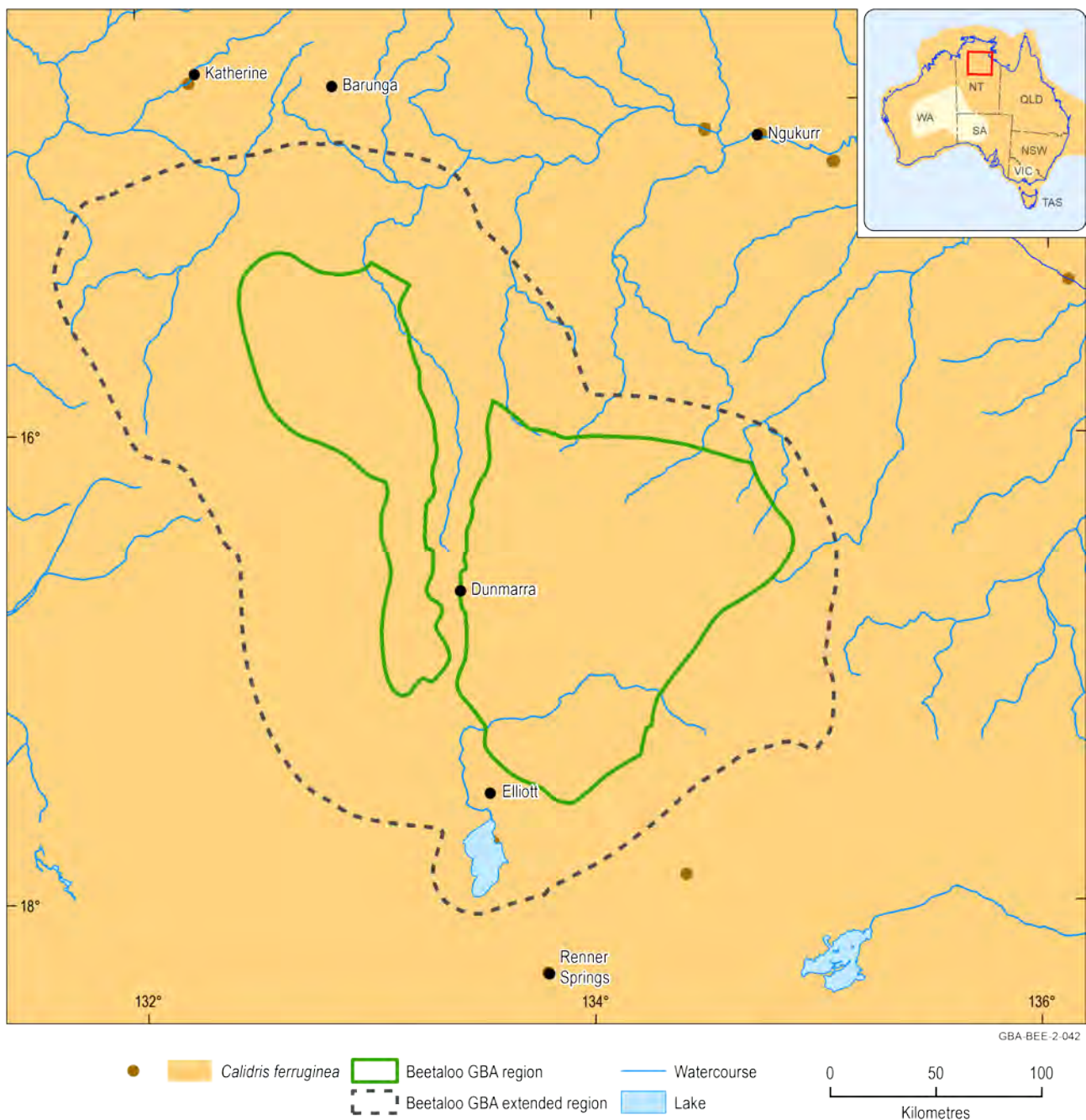


Figure 3 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the curlew sandpiper, *Calidris ferruginea*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
Element: GBA-BEE-2-042

Water dependency

The curlew sandpiper is water dependent. It will not occur in an area unless suitable foraging habitat in the form of wetlands with bare edges of mud or sand with water to a depth up to 60 mm is available.

Impacts from shale and other unconventional gas development

The key areas of the landscape are shallow freshwater wetlands and estuarine environments.

Potential effects likely to be experienced by this species include:

- exposure to soil, groundwater and/or surface water contamination;
- changed surface water quality and/or flows; and
- contamination of estuarine waters.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on a moderate likelihood of occurrence in the region based on available knowledge. If present, the species will be in low numbers.

Information sources

Department of Environment and Energy (2019)

IUCN (2019)

Red goshawk, *Erythroriorchis radiatus*

Overview

The red goshawk is a large hawk that has a wingspan of up to 1.35 m and a length of 45 to 60 cm. The sexes differ in size; females attain a maximum body mass of 1.1 kg compared to maximum body mass of 0.6 kg for males. The red goshawk has a wide but patchy distribution across coastal and interior regions of Queensland, the NT and the north-east of WA. It also occurs in north-east NSW (Figure 4). The species mainly occurs in open forest and woodland but also is present along the edges of rainforest. It mostly feeds on medium to large birds.

The red goshawk is currently listed nationally as vulnerable.

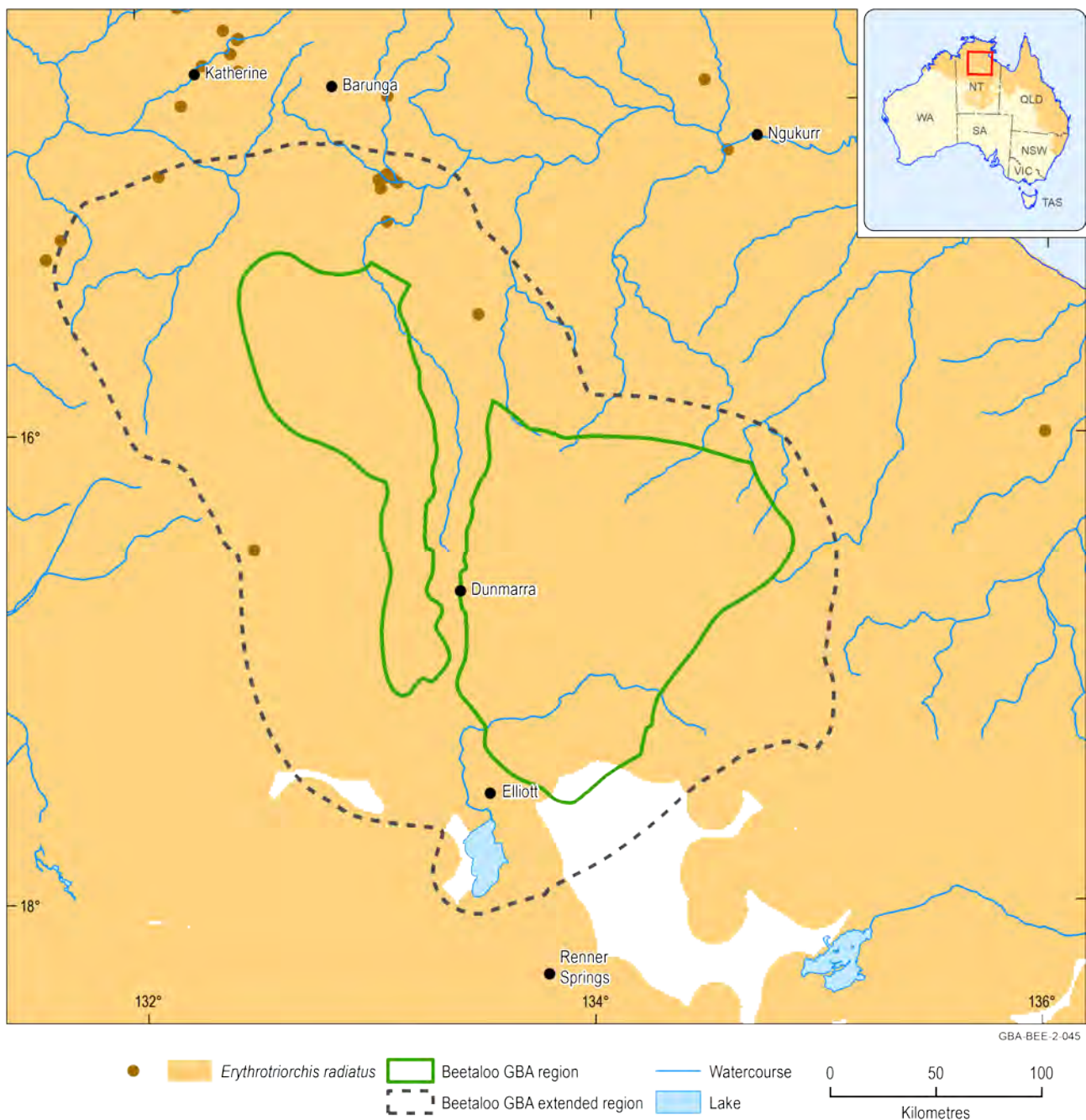


Figure 4 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the redgoshawk, *Erythrotriorchis radiatus*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
Element: GBA-BEE-2-045

Water dependency

The species is classed here as water dependent because of the likely water dependency of its nest sites. Nests are constructed in tall trees (mean height of 31 m) that are located within 1 km of, and commonly beside, permanent water. Water sources include rivers, swamps and pools (Department of Environment and Resource Management, 2012).

Impacts from shale and unconventional gas development

The key areas of the landscape for the species are likely to be riverine/gallery forest that support mature trees suitable for breeding.

Potential effects likely to be experienced by this species include:

- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows
- changed groundwater quality and/or levels
- bank instability and erosion.

Likelihood of being impacted by gas development in Beetaloo GBA region

High. Although the species is not known from the GBA region it breeds in the GBA extended region around Mataranka Thermal Pools. Nesting trees are likely to be within terrestrial GDEs which are connected to groundwater systems in the GBA region. Consequently, there is potential for some activities to negatively affect breeding habitat.

Information sources

Department of Environment and Energy (2019)

Department of Environment and Resource Management (2012)

Garnett et al. (2011)

Gouldian finch, *Erythrura gouldiae**Overview*

The Gouldian finch is a bird that occurs across northern Australia from inland north Queensland across the Top End of the NT to the Kimberley of WA (Figure 5). The species is multi-coloured with a combination of vivid colours. It is small with a body mass of 14 to 15 g. The Gouldian finch occupies open woodland that is relatively close to water; it feeds on seeding grasses and nests in hollows in eucalypts.

The species is endangered nationally. There is mounting evidence that populations are recovering (Garnett et al., 2011).

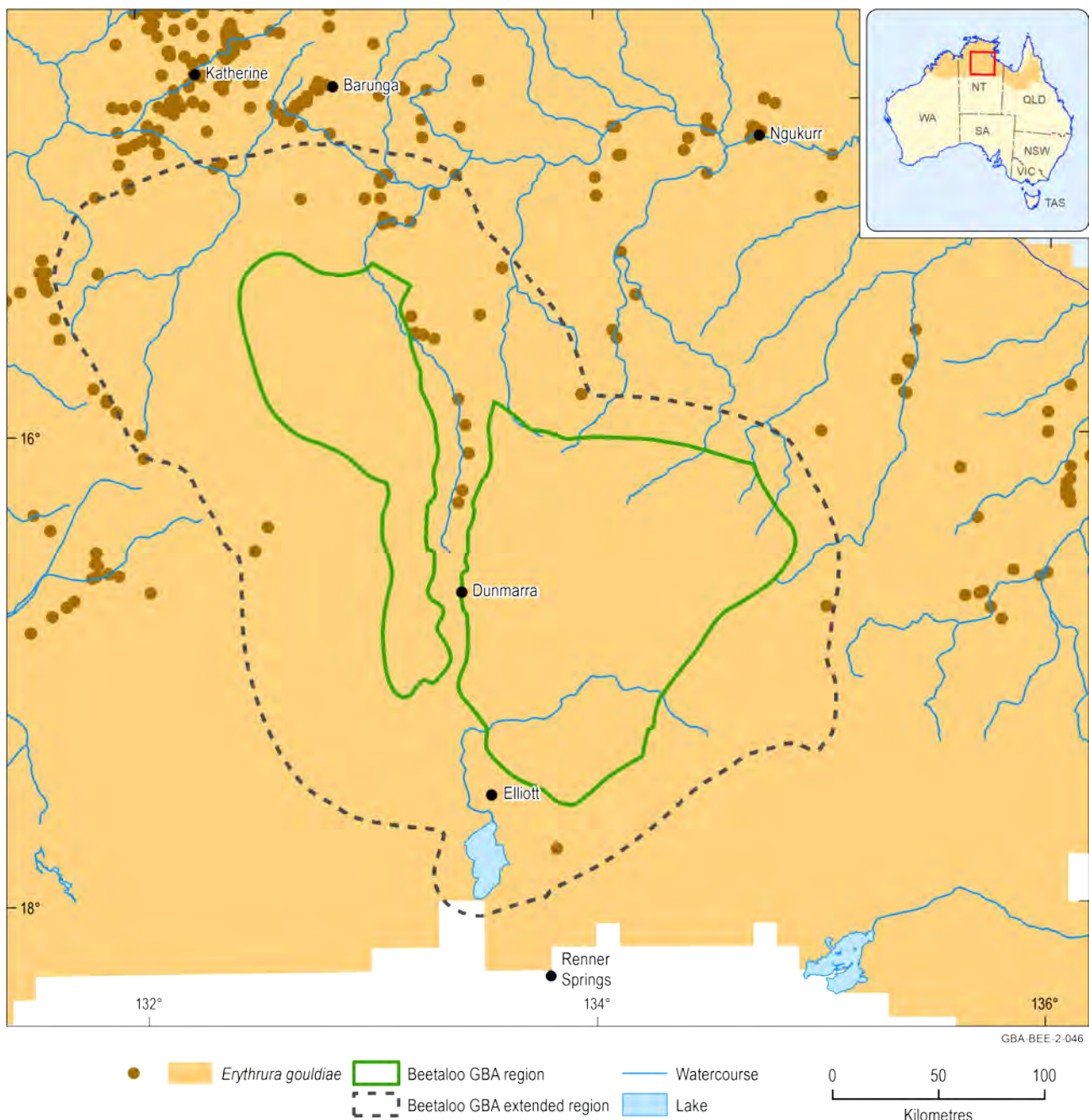


Figure 5 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the Gouldian finch, *Erythrura gouldiae*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)

Element: GBA-BEE-2-046

Water dependency

The Gouldian finch is water dependent. It relies on surface water sources, which it will visit daily. These typically occur in waterholes in creeks. Birds breed within 2 to 4 km of perennial waterholes or springs.

Impacts from shale and unconventional gas development

The key areas of the landscape for the species are waterholes and springs (on which it relies for water) and hollow-bearing trees in which it nests.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- introduction of invasive plants
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows
- bank instability and erosion.

Likelihood of being impacted by gas development in Beetaloo GBA region

High. Assessment is based on known occurrence in the region and potential of activities to negatively affect habitat, disrupt breeding and decrease size of the population.

Information sources

Department of Environment and Energy (2019)

Garnett et al. (2011)

Crested shrike-tit (northern), *Falcunculus frontatus whitei*

Overview

The northern subspecies of the crested shrike-tit is currently listed nationally as vulnerable. It is a small species of bird with a body mass of 20 to 30 g. It occurs in a range of different *Eucalyptus*-dominated woodlands in northern Australia. The northern subspecies of the crested shrike-tit forages for invertebrates in the foliage, branches, trunk and bark of trees. It is endemic to north-western Australia from the Kimberley region of WA to Borroloola in the north-east of the NT (Figure 6).

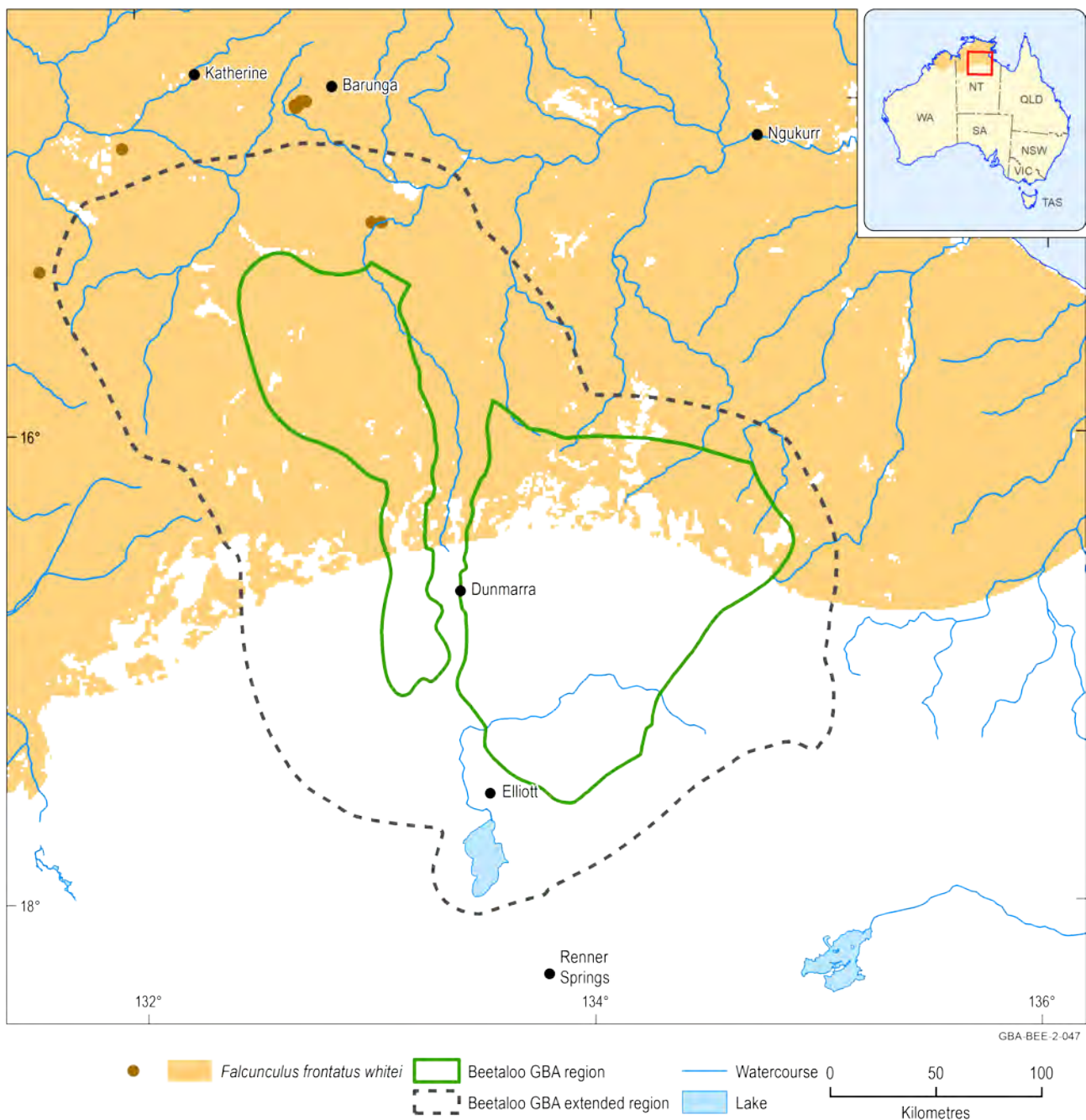


Figure 6 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the crested shrike-tit (northern), *Falcunculus frontatus whitei*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
Element: GBA-BEE-2-047

Water dependency

The crested shrike-tit is assessed here as being water dependent requiring daily access to surface water to drink.

Impacts from shale and unconventional gas development

The key areas of the landscape for the species are eucalypt-dominated woodlands.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- introduction of invasive plants
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

High. Assessment is based on known occurrence in the region and potential of activities to negatively affect habitat, disrupt breeding and decrease size of the population.

Information sources

Department of Environment and Energy (2019)

Painted honeyeater, *Grantiella picta*

Overview

The painted honeyeater is a small species of bird (body mass 18 to 25 g) that has a wide distribution across eastern Australia extending to the tropics in north-west Queensland and north-east NT (Figure 7). It is a specialised bird feeding mainly on the fruit of mistletoes and exhibits seasonal movements in response to food availability. The painted honeyeater occupies acacia-dominated woodlands showing a preference for those with mature trees (Garnett et al., 2011). Many birds move to semi-arid regions in northern Australia following the completion of breeding in late summer/early autumn.

The painted honeyeater is listed nationally as vulnerable.

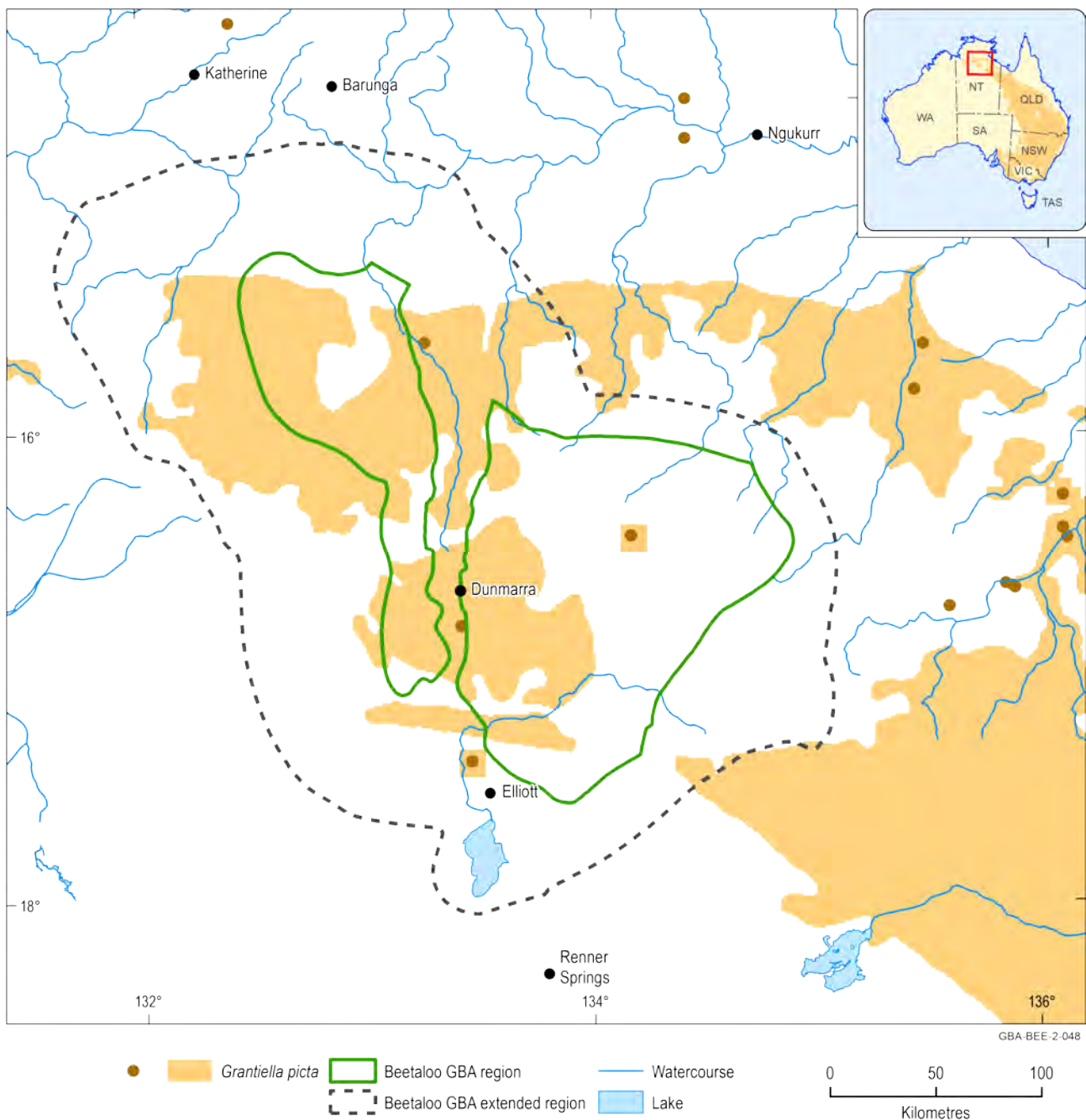


Figure 7 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the painted honeyeater, *Grantiella picta*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
Element: GBA-BEE-2-048

Water dependency

The painted honeyeater is assessed here as being water dependent requiring daily access to surface water to drink.

Impacts from shale and unconventional gas development

The key areas of the landscape for the species are those that support mature trees with good numbers of mistletoes.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- introduction of invasive plants
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Although known to occur in the region; it is a non-breeding visitor. Numbers in the region are likely to be low (last record was in 2002) and the region represents a small portion of its geographic range.

Information sources

Department of Environment and Energy (2019)

Garnett et al. (2011)

Night parrot, *Pezoporus occidentalis*

Overview

The night parrot is a ground-dwelling bird that has a body mass of about 100 g. It is an enigmatic species that has only been regularly sighted, although in a small geographic range, since 2013. The night parrot is endemic to the Australian arid zone where it occurs in south-west Queensland, north-east SA and WA. In Queensland it occurs near Diamantina Lakes National Park and further to the north (Figure 8). It is cryptic and nocturnal. It shelters during the day in mature spinifex (*Triodia*) hummocks and flies up to 10 km to nearby feeding grounds soon after dusk. The diet is likely to be dominated by short-lived herbs and grasses. The species is currently listed as endangered.

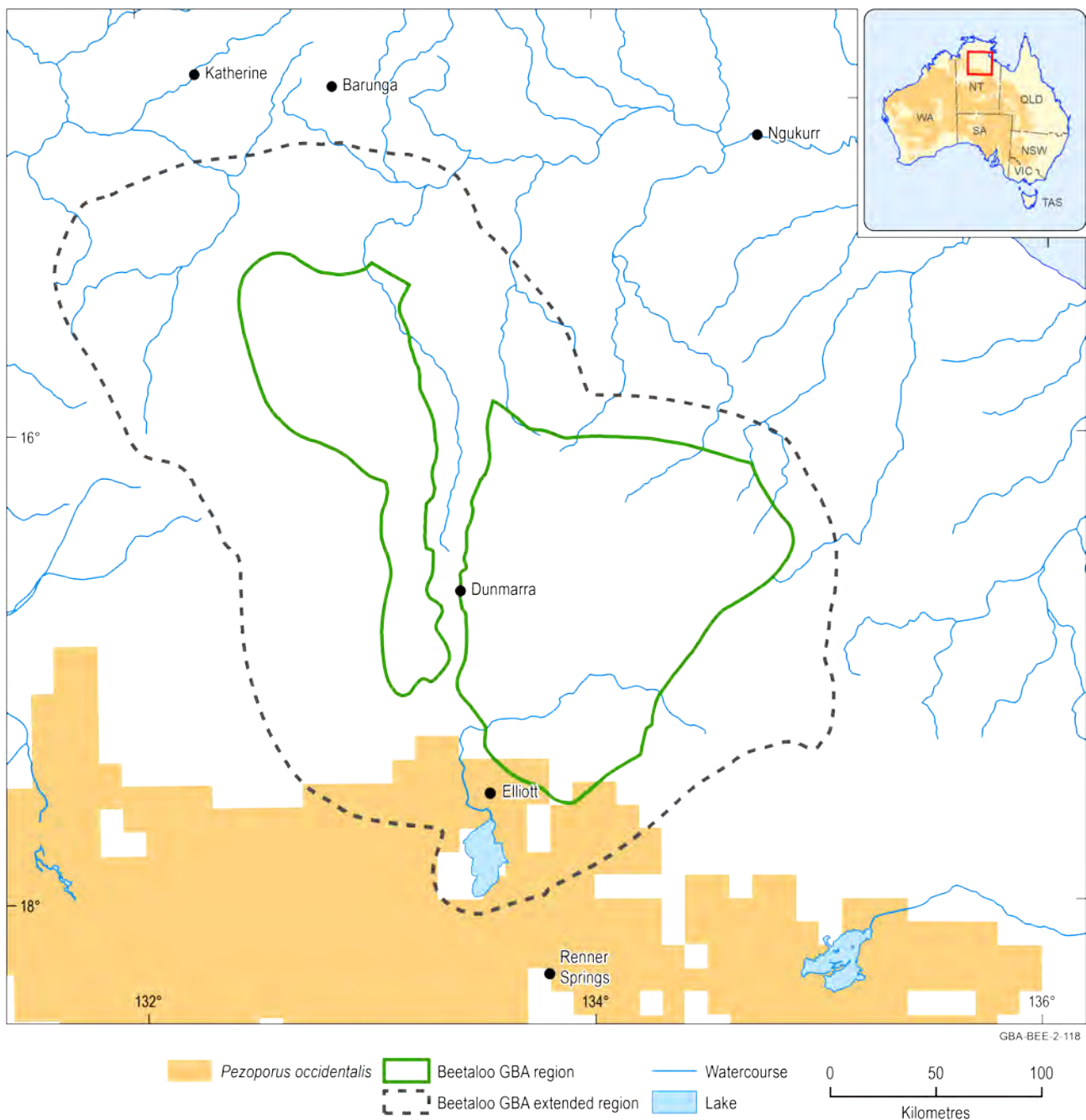


Figure 8 Potential distribution of the night parrot, *Pezoporus occidentalis*

Data: Department of the Environment and Energy (2018b)

Element: GBA-BEE-2-118

Water dependency

The night parrot is not considered to be water dependent.

Impacts from shale and unconventional gas development

The key areas of the landscape for the species are those that support mature spinifex in which it roosts during the day and its foraging habitat which is in broad, shallow depressions that are fed from local runoff supporting cracking clay soils and mixed herb-grasslands.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- introduction of invasive plants
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on low likelihood of occurrence in the region. There are no historical records from the region and there is a lack of suitable habitat.

Information sources

Department of Environment and Energy (2019)

Princess parrot, *Polytelis alexandrae*

Overview

The princess parrot is endemic to Australia's arid zone. It occurs in the western arid zone from north-west SA across the western deserts of the NT and WA (Figure 9). The species forages on flowers, seeds and other plant material on spinifex sandplains and woodlands and nests in the hollows of large trees. Princess parrots exhibit nomadic movements in response to pulses in primary productivity. The species is listed as vulnerable under the EPBC Act. Numbers appear to be stable.

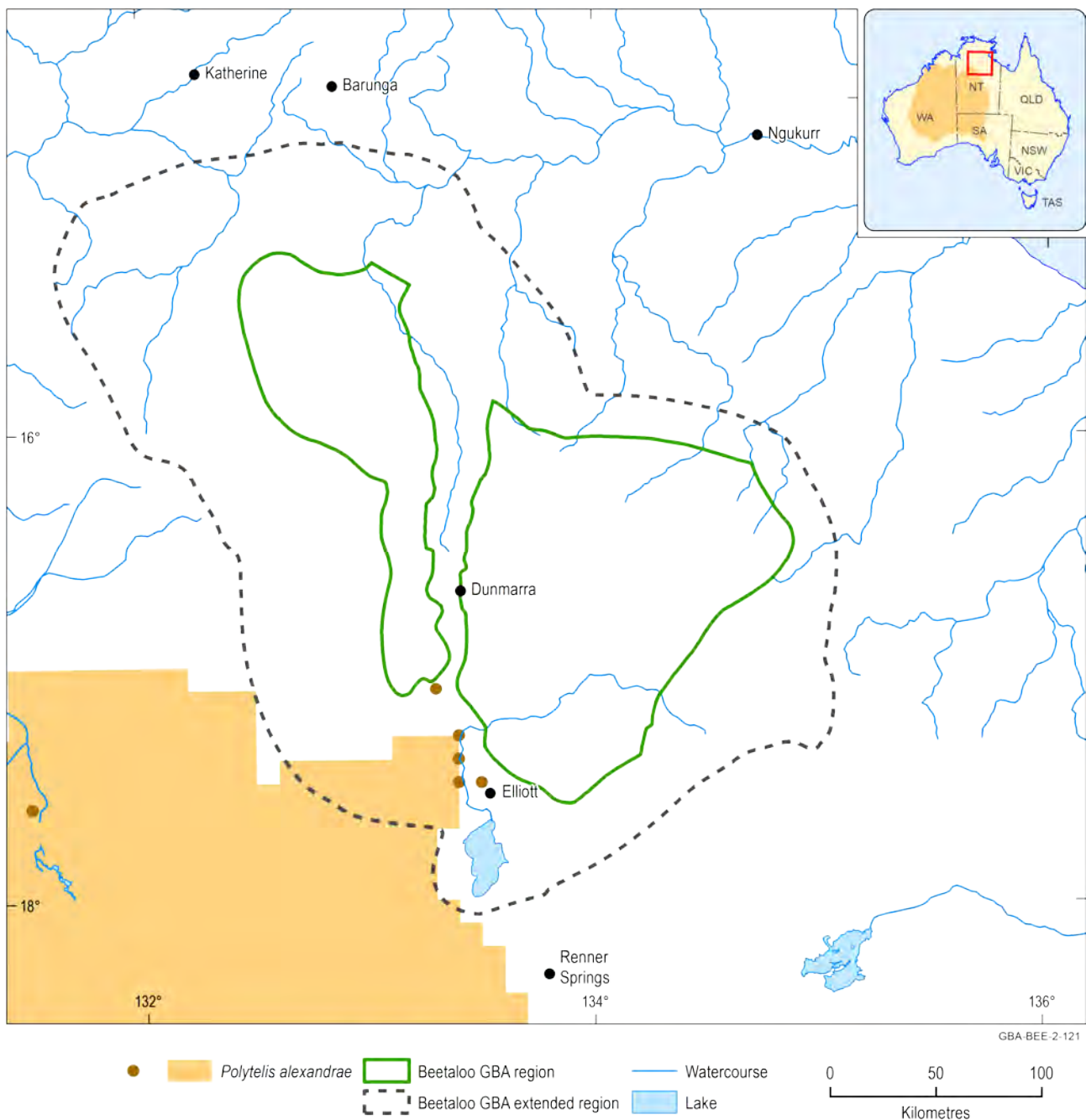


Figure 9 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the princess parrot, *Polytelis alexandrae*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)

Element: GBA-BEE-2-121

Water dependency

The princess parrot is not water dependent.

Impacts from shale and unconventional gas development

The key areas of the landscape for the species are spinifex sandplains and woodlands especially those that support large hollow-bearing trees that are used as nests.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- introduction of invasive plants
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on low likelihood of the species regularly occurring in the region. The most recent record is from 1976 and the records are considered to have low locational reliability.

Information sources

Department of Environment and Energy (2019)

Australian painted snipe, *Rostratula australis*

Overview

The Australian painted snipe (*Rostratula australis*) is a species endemic to Australia that occupies shallow freshwater wetlands. It is listed as endangered and as a marine species under the EPBC Act. Although the species has been recorded across the Australian continent, the area of occupancy is comparatively small and was estimated at about 2000 km² by (Garnett et al., 2011) (Figure 10).

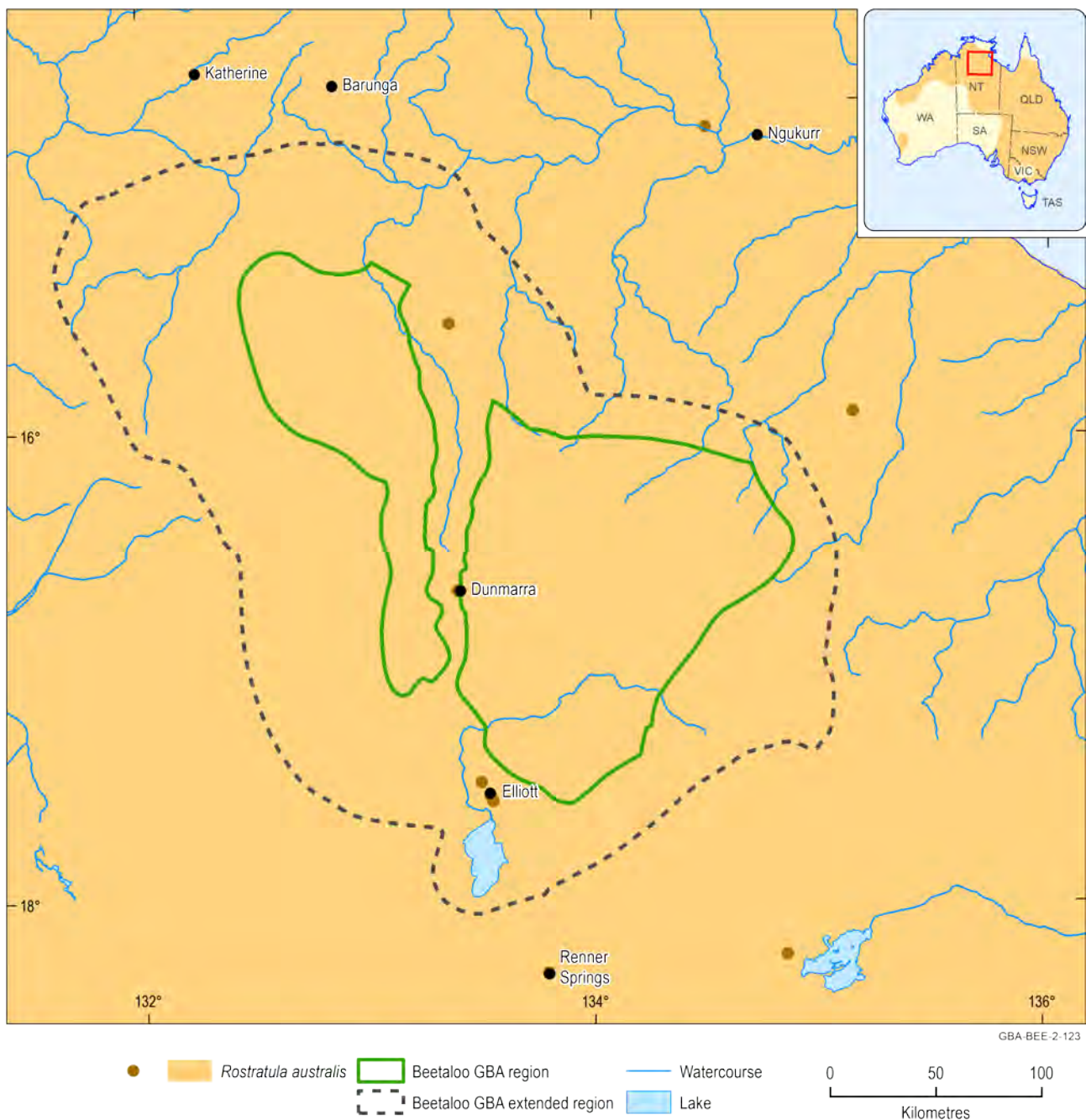


Figure 10 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the Australian painted snipe, *Rostratula australis*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)

Element: GBA-BEE-2-123

Water dependency

The Australian painted snipe is a water-dependent species. The main habitat of this species is shallow freshwater wetlands. Suitable habitat includes lakes, swamps, claypans, inundated or waterlogged grassland and saltmarsh and artificial wetlands including dams, rice crops, sewage farms and bore drains.

Impacts from shale and other unconventional gas development

The key areas of the landscape for this species are shallow freshwater wetlands.

Potential effects likely to be experienced by this species include:

- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

High. Assessment is based on known occurrence in the region and potential of activities to negatively affect habitat and disrupt breeding.

Information sources

Department of Environment and Energy (2019)

Garnett et al. (2011)

Masked owl (northern), *Tyto novaehollandiae kimberli*

Overview

The northern subspecies of the masked owl occurs across northern Australia from the coast of north Queensland across the Top End to the Kimberley region in WA (Figure 11). It is a large bird (body mass 400 g) with a distinctive heart-shaped facial disc. The masked owl (northern) typically forages in tall open forests of eucalypts and along the margins of agricultural fields. Here it captures rodents and other small mammals. Masked owls nest and roost in hollows in large trees within forest patches.

The northern subspecies of the masked owl is listed nationally as vulnerable.

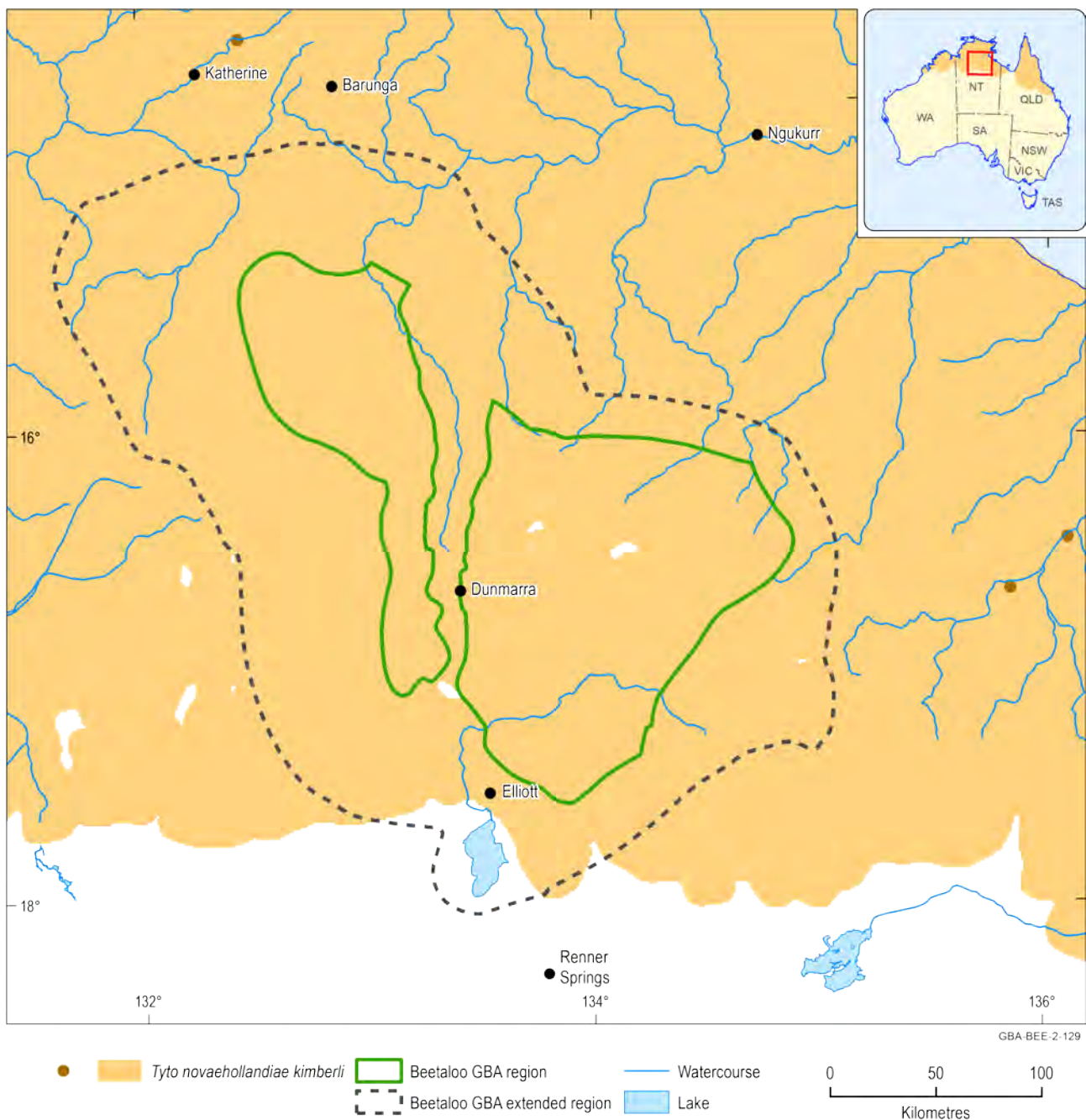


Figure 11 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the masked owl (northern), *Tyto novaehollandiae kimberli*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)

Element: GBA-BEE-2-129

Water dependency

The masked owl (northern) is not considered to be water dependent.

Impacts from shale and other unconventional gas development

The key areas of the landscape for the species are likely to be forest patches that support mature trees with hollows that are used for breeding and roosting.

Potential effects likely to be experienced by this species include:

- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows
- changed groundwater quality and/or levels
- bank instability and erosion.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on lack of records and low likelihood of occurrence in the region.

Information sources

Department of Environment and Energy (2019)

Garnett et al. (2011)

Northern quoll, *Dasyurus hallucatus*

Overview

The northern quoll is a medium-sized carnivorous marsupial. The sexes differ in size; males attain a maximum body mass of 1.12 kg compared to maximum body mass of 0.69 kg for females. The species is an omnivore feeding on fruits, invertebrates and some vertebrates including mammals, birds, reptiles and frogs. Northern quolls shelter during the day in rock crevices, tree hollows, termite mounds and similar structures. At night they forage both on the ground and in trees in savanna woodland and patches of rainforest and appear to favour rocky escarpments.

The northern quoll is the largest remaining carnivorous marsupial in most of northern Australia. The range of the species includes eastern and northern Queensland, the Top End of the NT and the Kimberley and Pilbara regions of WA (Figure 12). The northern quoll is listed nationally as endangered.

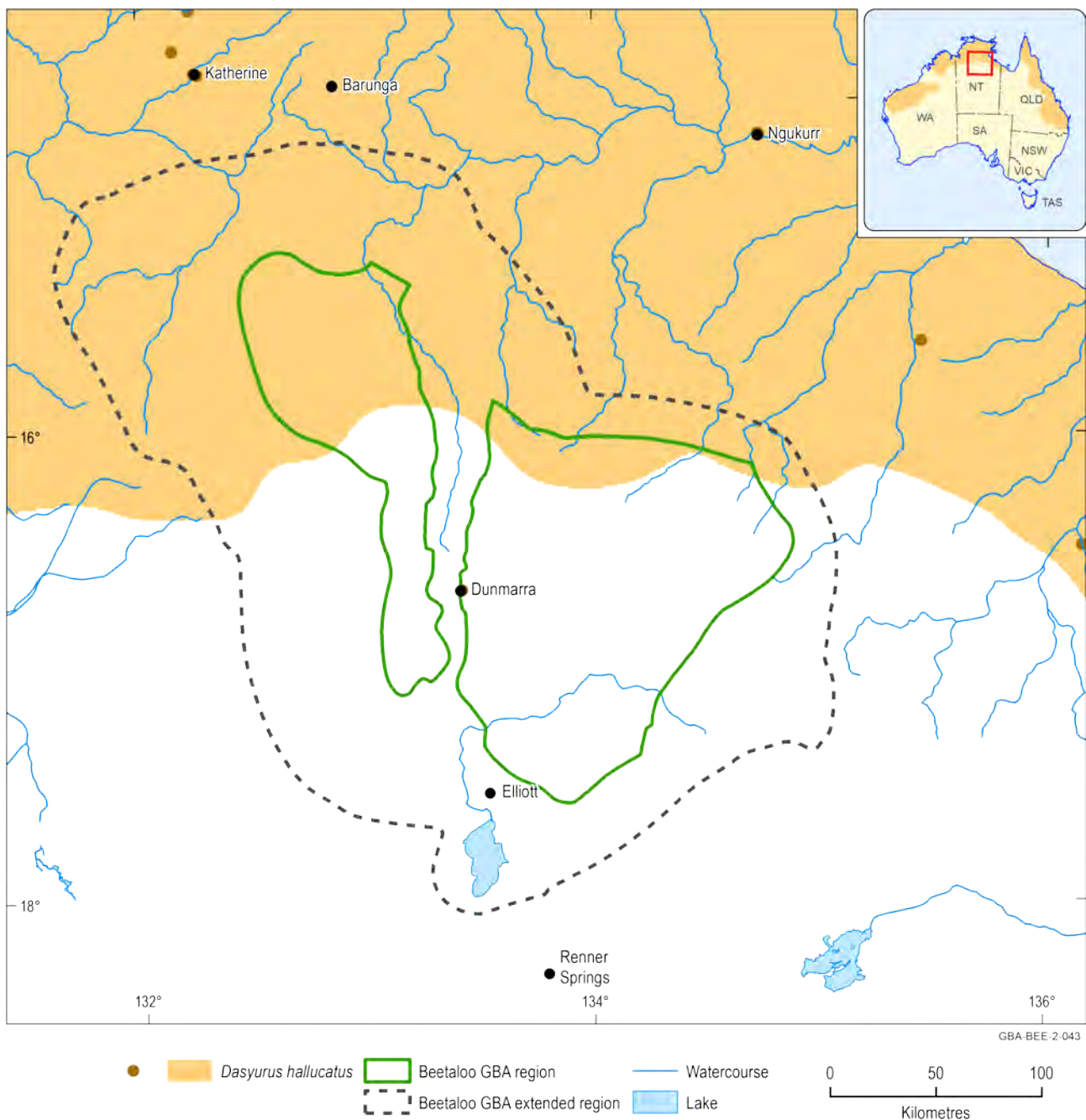


Figure 12 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the northern quoll, *Dasyurus hallucatus*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
 Element: GBA-BEE-2-043

Water dependency

The northern quoll is not considered to be water dependent. It will drink water when it is available but appears able to obtain enough moisture from its food when surface water sources dry up towards the later stages of the dry season in northern Australia (van Dyck and Strahan, 2008).

Impacts from shale and other unconventional gas development

The species has broad habitat requirements in terms of foraging and shelter sites. Rocky habitats are of importance. The northern quoll is known to be at risk from predation by cats and dingoes

and by ingesting cane toads. Therefore, it is imperative that activities undertaken as part of the development of a shale gas industry do not encourage these species. Specifically, sources of resource subsidies for predators of quolls (such as open rubbish dumps and accessible sources of water) should be avoided.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on the low likelihood of the species occurring in the region as represented by the post 1999 distribution of the species given in Hill and Ward (2010). If the species was present it is expected that population size in the region would be very low.

Information sources

Hill and Ward (2010)

van Dyck and Strahan (2008)

Northern brush-tailed phascogale, *Phascogale pirata*

Overview

The northern brush-tailed phascogale is a carnivorous marsupial, with a body mass of 150 to 230 g. Northern brush-tailed phascogales mostly occur in tall open forests dominated by species of *Eucalyptus*. They feed on the ground and in trees and shelter during the day in tree hollows. The species is endemic to the Top End of the NT occurring from Litchfield National Park across to West Island (Figure 13).

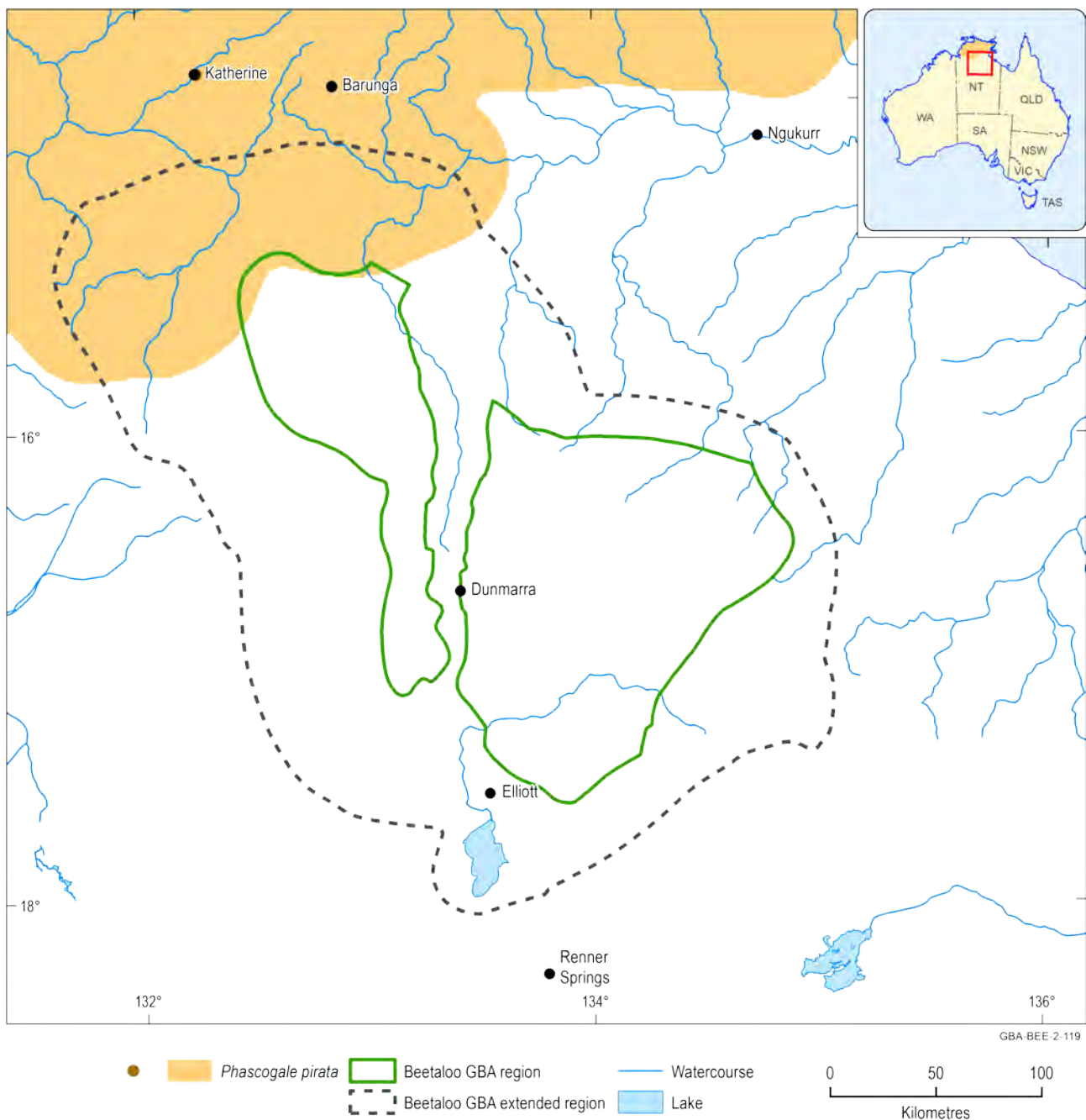


Figure 13 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the northern brush-tailed phascogale, *Phascogale pirata*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
 Element: GBA-BEE-2-119

Water dependency

This species is not considered to be water dependent.

Impacts from shale and other unconventional gas development

The key areas of the landscape are areas of tall open forests dominated by eucalypts.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- introduction of invasive plants
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on a lack of records of the species in the region, the lack of suitable habitat, and the likelihood that, if it does occur, numbers will be very low as the Beetaloo GBA area is at the extreme south of its potential range.

Information sources

Department of Environment and Energy (2019)

van Dyck and Strahan (2008)

Greater bilby, *Macrotis lagotis*

Overview

The greater bilby is a medium-sized ground-dwelling native marsupial (body mass 600 to 2500 g) that is the only surviving member of the sub-family Thylacomyinae within the bandicoot family (Peramelidae). Although its range has declined considerably since European settlement of Australia it is still found in south-western Queensland and across the western deserts of the NT and WA (Figure 14). It is a nocturnal species that shelters during the day in burrows that it digs itself. It has an omnivorous diet. It occupies a wide range of vegetation assemblages including hummock grassland and acacia shrublands.

The greater bilby is an iconic desert marsupial that has become a flagship species for conservation in Australia. It is listed nationally as vulnerable. The species is considered to play an important role as an ecosystem engineer by digging the soil and facilitating nutrient cycling.

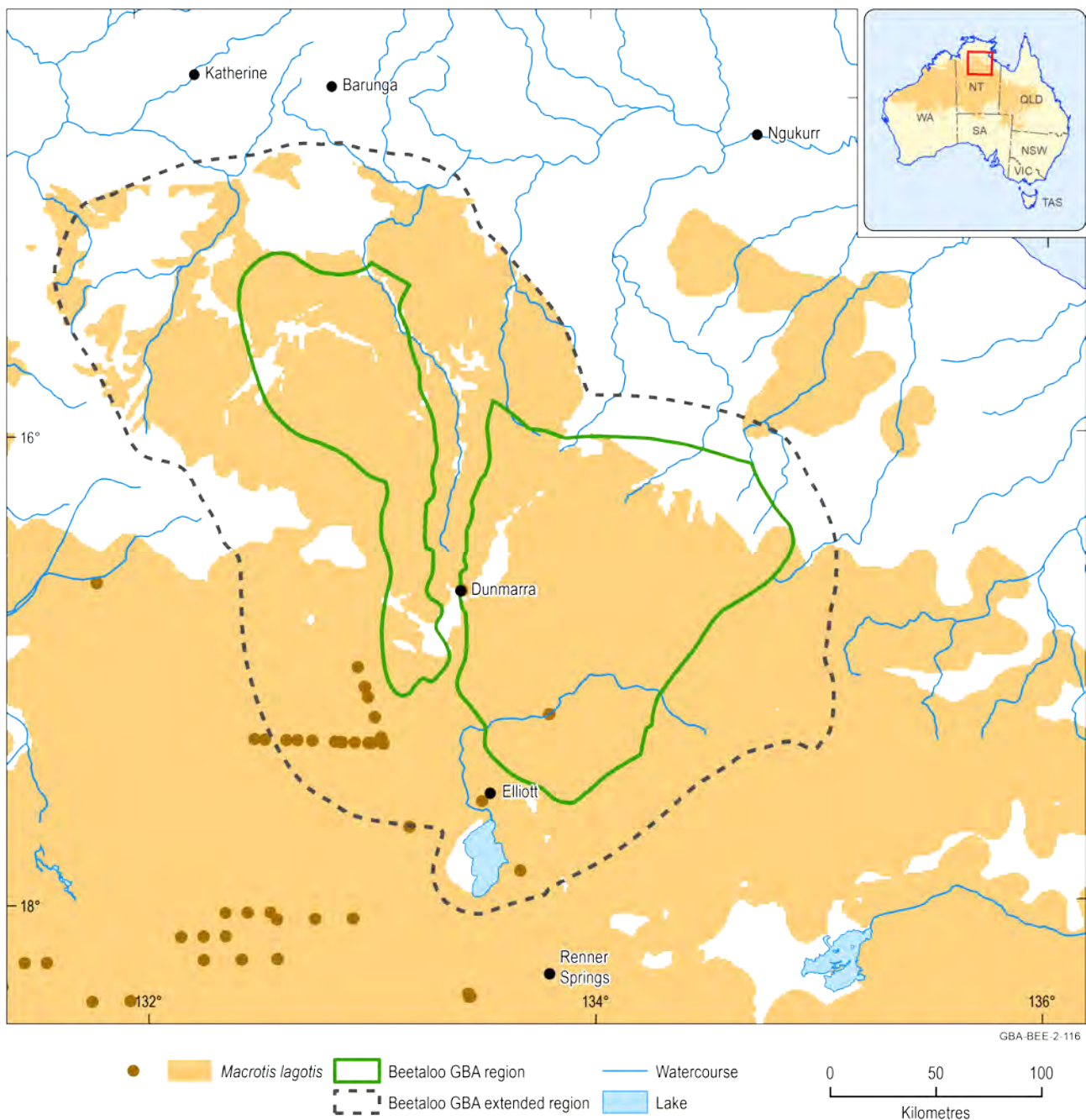


Figure 14 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the greater bilby, *Macrotis lagotis*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
 Element: GBA-BEE-2-116

Water dependency

This species is not considered to be water dependent. The species obtains most of its water from its food.

Impacts from shale and other unconventional gas development

The key areas of the landscape are areas of tall open forests dominated by eucalypts.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

High. The greater bilby is known to occur in the Beetaloo GBA region and is regularly sighted in some areas. There is the potential for activities to negatively affect habitat and disrupt breeding.

Information sources

Department of Environment and Energy (2019)

van Dyck and Strahan (2008)

Ghost bat, *Macroderma gigas*

Overview

The ghost bat is the largest species of microchiropteran bat that occurs in Australia. It has a head-body length of 10 to 13 cm, a wingspan of up to 60 cm and a body mass of up to 165 g. The ghost bat is a spectacular looking animal with a prominent noseleaf and large ears. The species is confined to the tropical north of Australia although formerly (till the 1960s) it was patchily distributed in central Australia and, historically when the climate was warmer and wetter, it occurred as far south as the Nullarbor Plain (Figure 15).

The ghost bat spends the day in subterranean roosts, usually caves, rocky overhangs and disused mine adits and shafts. Therefore, it has distinct roosting and foraging sites. Foraging takes place in woodland with individuals foraging over an area of up to 61 ha.

The species has recently undergone decreases in population size. The exact cause(s) are unclear at this stage. The conservation status of the ghost bat was elevated to vulnerable in 2016.

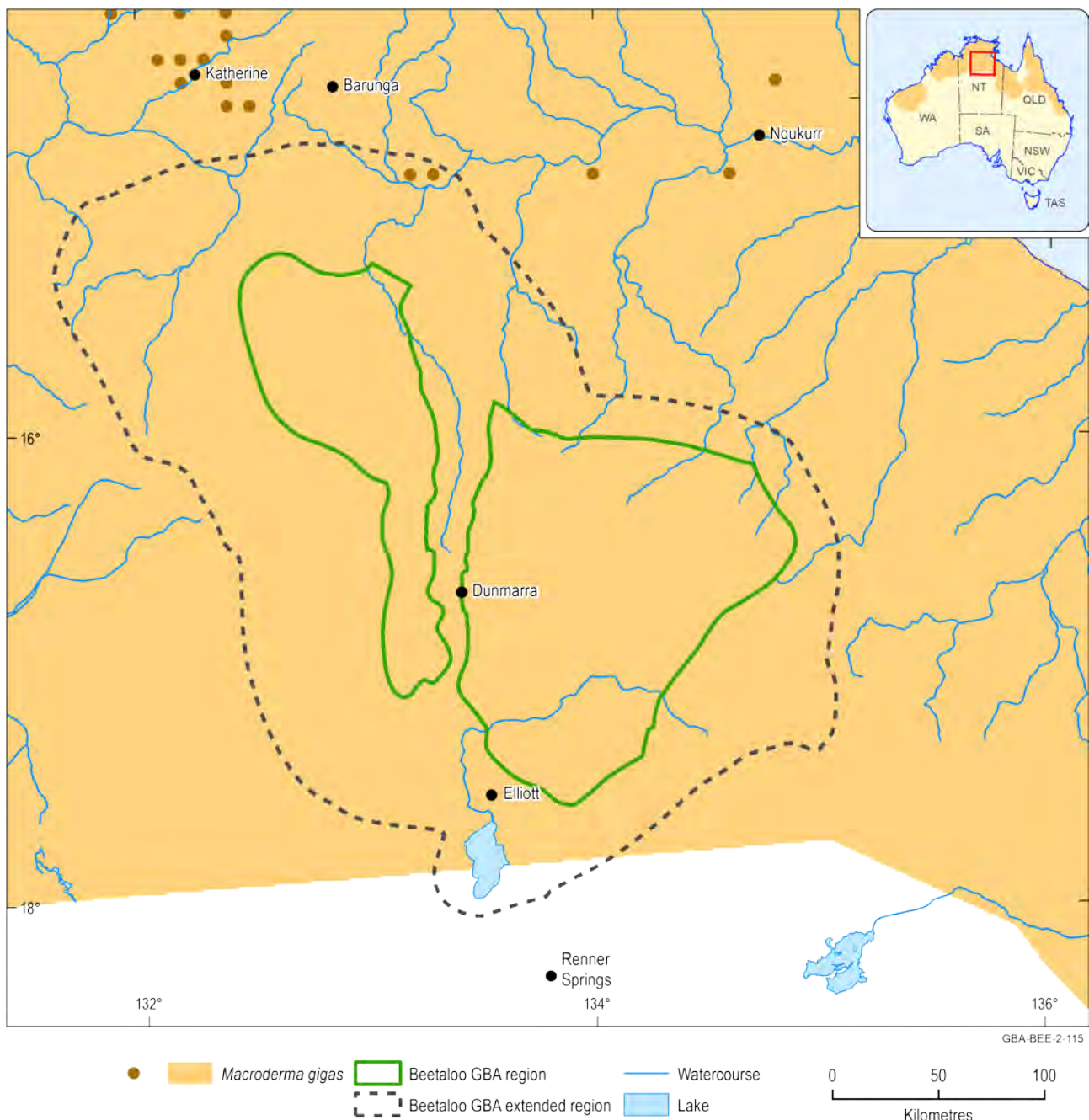


Figure 15 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the ghost bat, *Macroderma gigas*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
Element: GBA-BEE-2-115

Water dependency

The ghost bat is not considered to be water dependent. It is likely to access surface water to drink while foraging at night when it is available.

Impacts from shale and other unconventional gas development

The key areas of the landscape for this species are likely to be subterranean (caves, disused mines) roost sites (which may suffer unintentional disturbance) and surface water (used for drinking). Extensive foraging habitat in eucalypt forest and woodland exists for this species.

Potential effects likely to be experienced by this species include:

- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

No. Assessment is based on a low likelihood of its continued occurrence in the region with last record in 1987 and the stated decline of the species throughout its range. No important roost sites for the species are known in the Beetaloo GBA region or in the Beetaloo GBA extended region.

Information sources

Department of Environment and Energy (2019)

Bare-rumped sheath-tailed bat, *Saccolaimus s. nudicluniat*

Overview

The bare-rumped sheath-tailed bat is a large microchiropteran bat that occurs in northern Australia and New Guinea, Timor, Indonesia and elsewhere in south-east Asia. It has a body mass up to 55 g and a head-body length of up to 95 mm. The species feeds on insects at night that it captures while foraging in open space. It has fast, direct flight. During the day the bare-rumped sheath-tailed bat roosts in colonies of up to 100 individuals located in tree hollows.

Until recently, it was listed as critically endangered, but the species is now classified nationally as vulnerable. In Australia it has been recorded along the east coast of Queensland from Townsville up to Iron Range on Cape York Peninsula and across the Top End of the NT (Milne et al., 2009) (Figure 16).

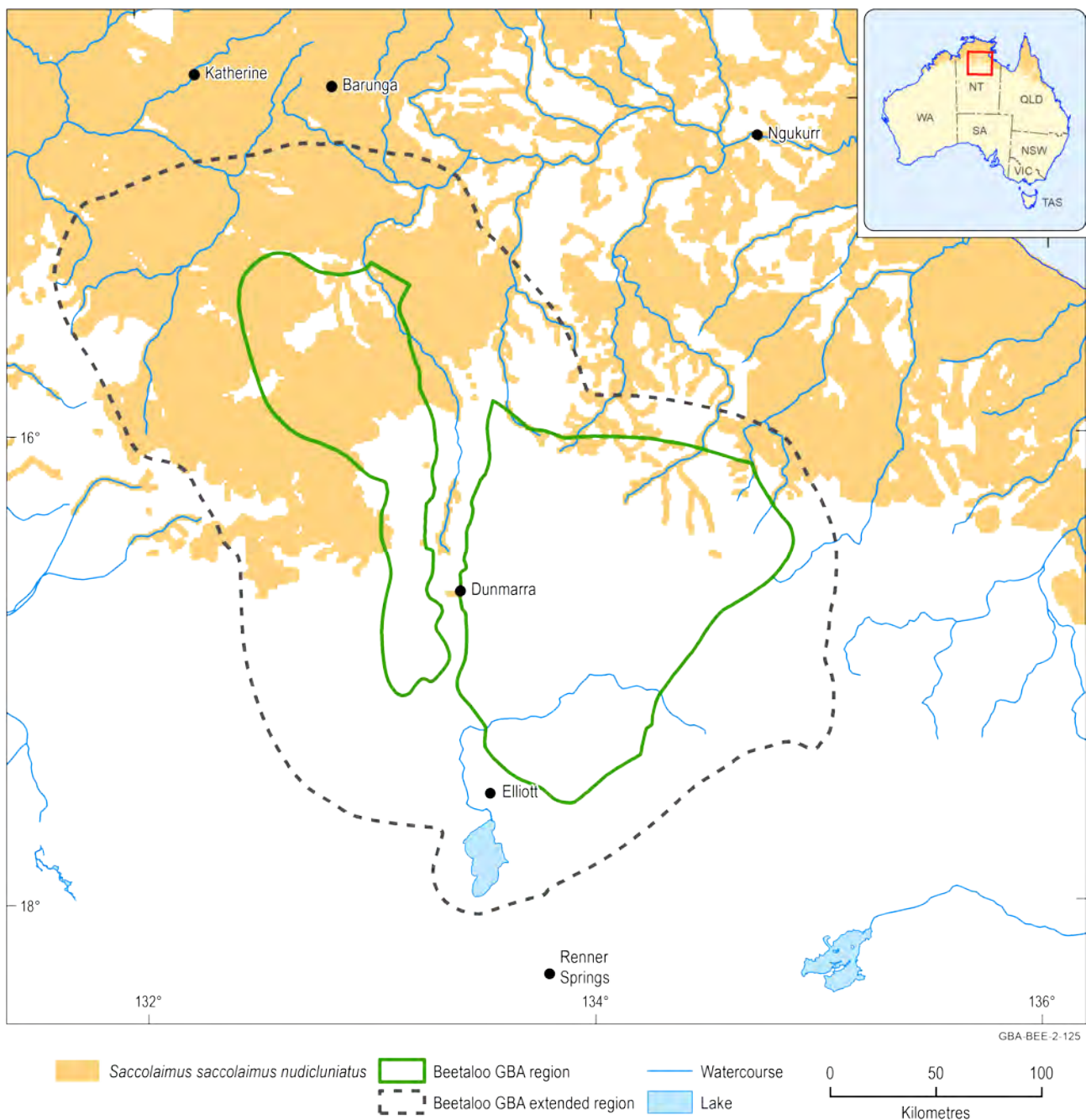


Figure 16 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the bare-rumped sheath-tailed bat, *Saccolaimus s. nudicluniatus*

Data: Department of the Environment and Energy (2018b)

Element: GBA-BEE-2-125

Water dependency

The bare-rumped sheath-tailed bat is not considered to be water dependent.

Impacts from shale and other unconventional gas development

The key areas of the landscape are likely to be roosts in hollows of large trees. Extensive foraging habitat in eucalypt forest and woodland exists for this species.

Potential effects likely to be experienced by this species include:

- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows
- changed groundwater quality and/or levels
- bank instability and erosion (which may impact roost trees).

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on lack of records and low likelihood of occurrence in the region.

Information sources

Department of Environment and Energy (2019)

Milne et al. (2009)

Schulz and Thomson (2007)

Plains death adder, *Acanthophis hawkei*

Overview

The plains death adder is a small (body length of about 0.6 m), stout-bodied terrestrial snake. It occurs across northern Australia from the extreme north-east of WA, across the Top End and Barkly Tableland of the NT/Queensland border and the Mitchell Grass Downs in south-west Queensland (Figure 17). The plains death adder occurs on floodplains that have cracking clay soils. The conservation status of this species is vulnerable. Populations have declined because of cane toad invasion in to northern Australia; the species readily captures toads but is highly susceptible to the toad's toxins.

The plains death adder feeds on reptiles, frogs and small mammals, especially rodents. Reptiles and frogs are taken when the snakes are young. The species is like other death adders in being an ambush predator.

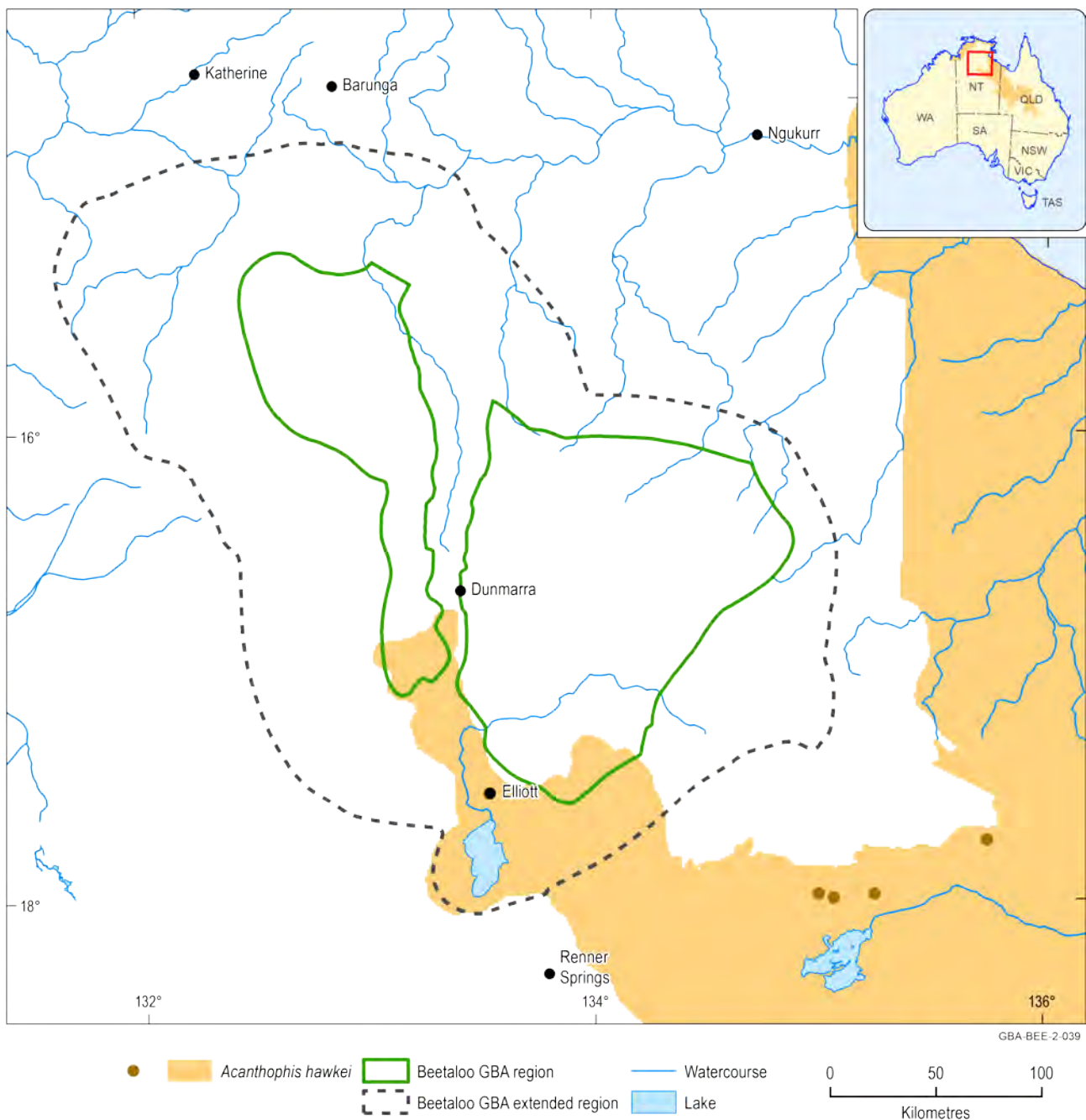


Figure 17 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the plains death adder, *Acanthophis hawkei*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)
Element: GBA-BEE-2-039

Water dependency

The water dependency of the species is poorly understood but it is considered unlikely to be water dependent.

Impacts from shale and other unconventional gas development

The key areas of the landscape for this species are likely to be floodplains that have cracking clay soils.

Potential effects likely to be experienced by this species include:

- habitat loss and fragmentation
- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on moderate likelihood of occurrence in the region and relatively small portions of suitable habitat for the species.

Information sources

Department of Environment and Energy (2019)

Ward and Phillips (2012)

Gulf snapping turtle, *Elseya lavarackorum*

Overview

The gulf snapping turtle is a species of freshwater turtle that was first described from fossils found at Riversleigh Station and was subsequently discovered to be extant. The gulf snapping turtle has a short neck and grows to a maximum length of 35 cm. It is an aquatic species that is entirely herbaceous and is confined to riverine habitat. It nests by laying eggs in the soil near the edge of the water.

Based on current understanding of species boundaries in the genus, the gulf snapping turtle appears to have a limited distribution that encompasses the upper and middle reaches of the Nicholson and Gregory Rivers in north-west Queensland and north-east NT and the upper reaches of the Calvert River in the NT (Freeman et al., 2014) (Figure 18). These areas are characterised by stony hills and escarpments. The gulf snapping turtle occurs in deep water pools of permanently flowing spring-fed rivers and occurs in highest densities where the riparian vegetation is undisturbed (Freeman et al. 2014). The gulf snapping turtle is listed nationally as endangered. However, in the NT it is listed as being of least concern.

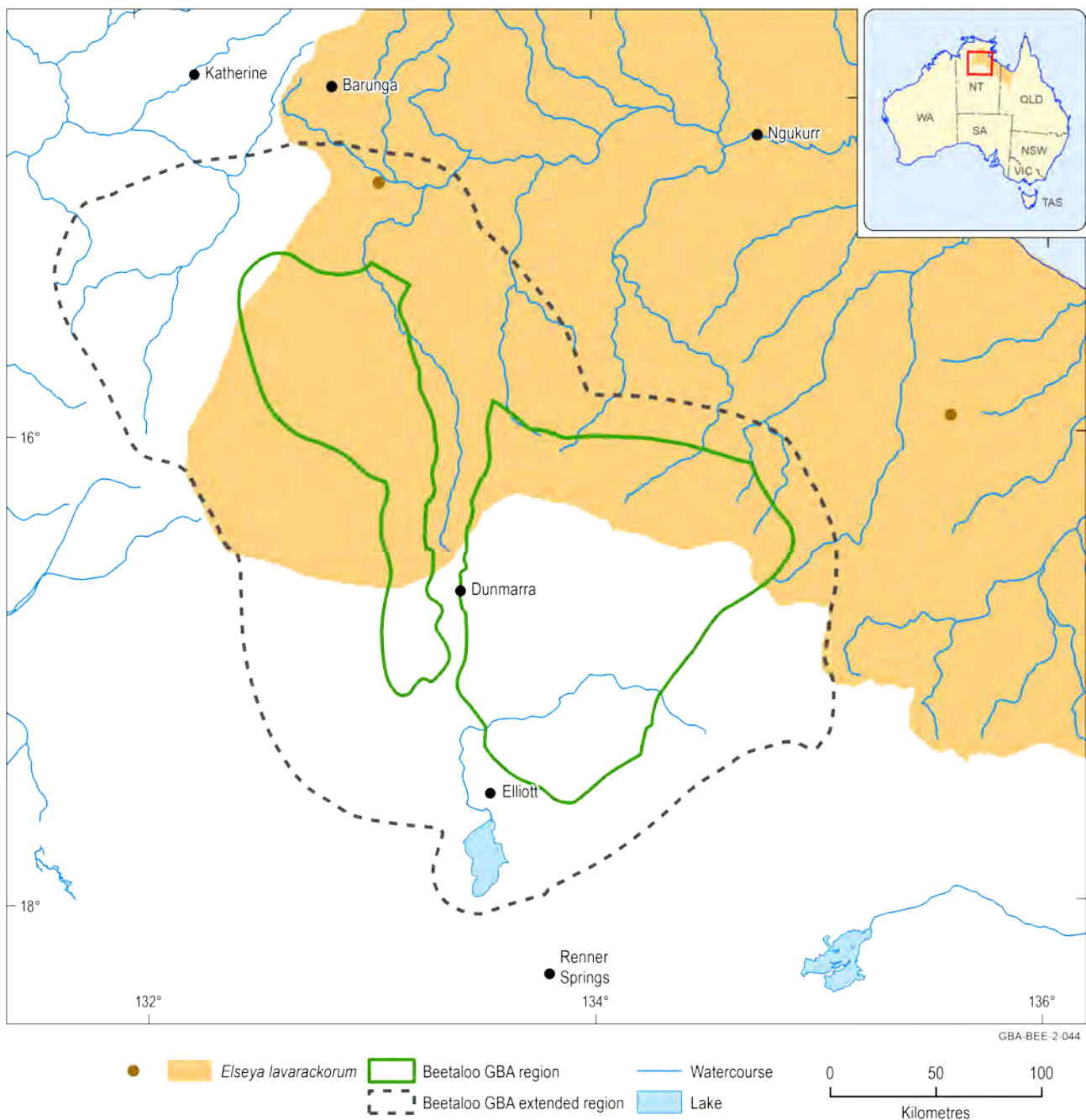


Figure 18 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the gulf snapping turtle, *Elseyia lavarackorum*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)

Element: GBA-BEE-2-044

Water dependency

This species is water dependent throughout its life.

Impacts from shale and other unconventional gas development

Key areas for the gulf snapping turtle are deep water pools of permanently flowing spring-fed rivers especially where the riparian vegetation is largely undisturbed.

Potential effects likely to be experienced by this species include:

- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows
- changed groundwater quality and/or levels
- bank instability and erosion
- changed groundwater composition.

Likelihood of being impacted by gas development in Beetaloo GBA region

Uncertain. Occurrence in the region is uncertain because of taxonomic confusion. If present there is the potential of activities to decrease population size, reduce area of occupancy and negatively affect habitat.

Information sources

Department of Environment and Energy (2019)

Woinarski (2006)

Freeman et al. (2014)

Freshwater sawfish, *Pristis pristis*

Overview

The freshwater sawfish is a large, slender fish. It is the largest freshwater fish found in Australia reaching a maximum body length of 5.82 m (Commonwealth of Australia 2015a). The species lives in river and estuarine environments and up to 100 km offshore in northern and western Australia as well as in North and South America, Africa, Asia and New Guinea (Figure 19). The species is classified as vulnerable nationally and is also listed as migratory under the EPBC Act.

Freshwater sawfish inhabit the sandy or muddy floors of shallow coastal waters, estuaries and river mouths and have been recorded up to 400 km inland in the central and upper reaches of freshwater rivers and in isolated waterholes. Freshwater bodies and estuaries are occupied by neonates and juveniles whereas adults occur mainly in estuaries and coastal marine environments. In Australian rivers, nursery areas fragment during the dry season and turn in to a series of isolated waterholes that are reconnected during the subsequent wet season.

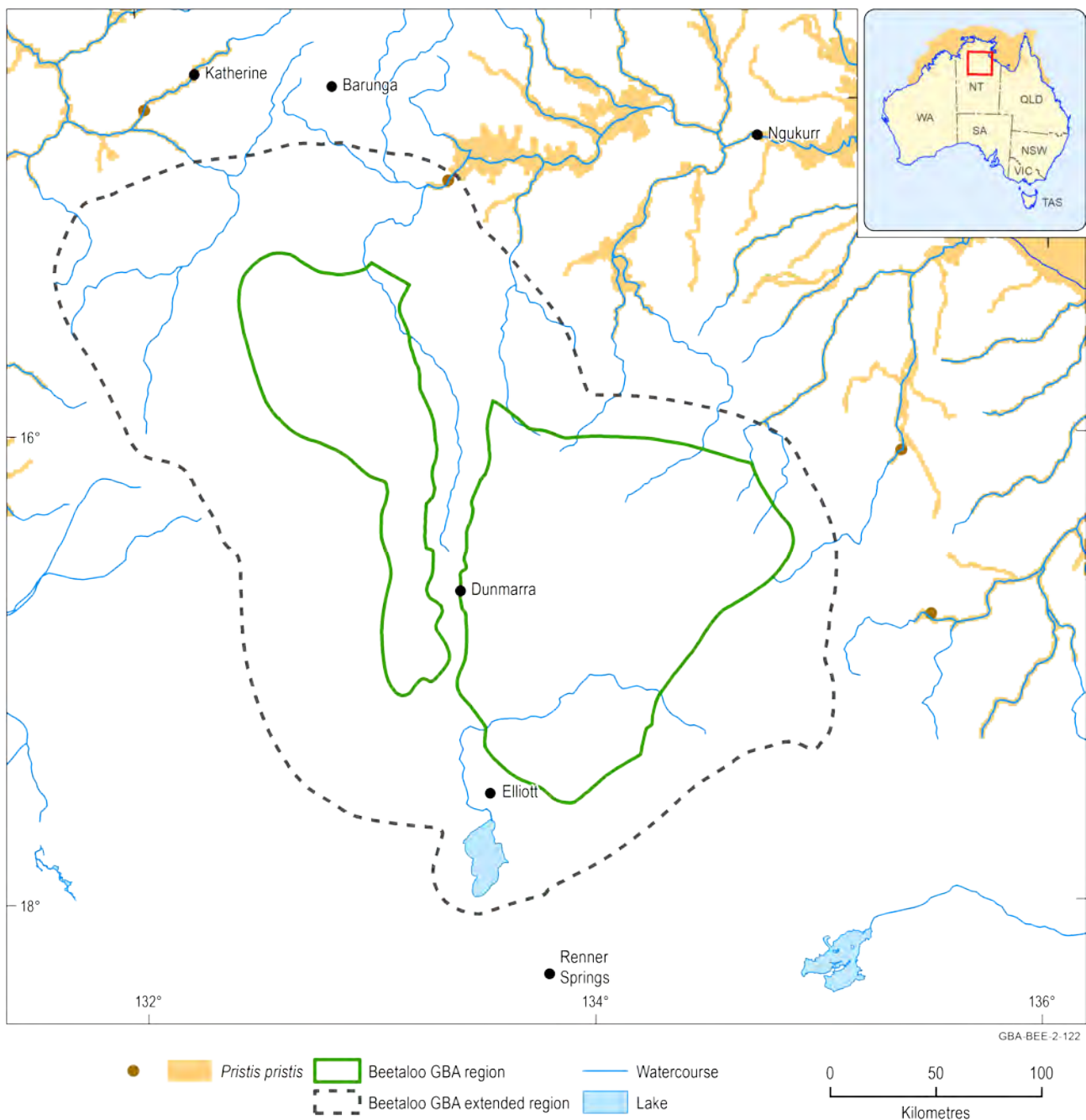


Figure 19 Potential distribution (solid colour) and Atlas of Living Australia observations (dots) of the freshwater sawfish, *Pristis pristis*

Data: Atlas of Living Australia (2019); Department of the Environment and Energy (2018b)

Element: GBA-BEE-2-122

Water dependency

This species is aquatic.

Impacts from shale and other unconventional gas development

Key areas in tropical rivers for freshwater sawfish are likely to be the central and upper reaches of freshwater rivers and isolated waterholes.

Potential effects likely to be experienced by this species include:

- exposure to soil, groundwater and/or surface water contamination
- changed surface water quality and/or flows
- changed groundwater quality and/or levels
- bank instability and erosion
- changed groundwater composition
- contamination of estuarine waters.

Likelihood of being impacted by gas development in Beetaloo GBA region

Low. Assessment is based on a very low likelihood of the species occurring in the region. There is a possibility that if changes in groundwater flows affect discharge at springs such as at Mataranka the species will be impacted. This will be addressed in Stage 3 of the project.

Information sources

Commonwealth of Australia (2015a)

Commonwealth of Australia (2015b)

1.4 Matters of Territory Environmental Significance

Two matters of environmental significance classified under NT legislation are potentially relevant to the Beetaloo GBA region and extended region. These matters are:

1. parks and reserves (listed under the *Territory Parks and Wildlife Conservation Act*)
2. species listed as threatened (i.e. critically endangered, endangered, vulnerable) under the *Territory Parks and Wildlife Conservation Act* but not under the Commonwealth's EPBC Act.

In addition to matters listed under NT legislation, the GBA Program also considered the following two categories as being of environmental significance within the NT:

3. nationally important wetlands identified in the *Directory of Important Wetlands in Australia* (DIWA) (Department of the Environment and Energy, 2010)
4. groundwater-dependent ecosystems.

1.4.1 State and territory reserves

One territory reserve, Bullwaddy Conservation Reserve, occurs entirely within the Beetaloo GBA region (Table 3). A further four reserves are outside the Beetaloo GBA region but have 100% of their area within the Beetaloo GBA extended region (Table 3).

Table 3 List of national parks, reserves and conservation covenants under the *Territory Parks and Wildlife Conservation Act* located in the Beetaloo GBA region and the Beetaloo GBA extended area, together with a summary of key attributes

Location	Name of reserve	Details
Beetaloo GBA region	Bullwaddy Conservation Reserve	Only reserve within the Sturt Plateau IBRA region. Contains stands of bullwaddy, <i>Macropteranthes kekwickii</i> .
Beetaloo GBA extended region	Eley National Park	Protects Mataranka Thermal Pools. Refugium for endemic plants.
	Frew Pond	A waterhole along the route of the Overland Telegraph Line named by explorer John McDouall Stuart in 1862.
	Lake Woods Conservation Covenant	Covers Lake Woods. Significant wetland.
	Longreach Waterhole Protected Area	Protects part of the Lake Woods system.

1.4.2 Territory-listed threatened species

Four species of vertebrate animal, that have been classified as threatened in the NT but not nationally, have been recorded within the Beetaloo GBA region since 1990 and are considered to possibly still occur there (Table 4). These species are: grey falcon (*Falco hypoleucos*), pale field-rat (*Rattus tunneyi*), Merten's water monitor (*Varanus mertensi*), and floodplain monitor (*Varanus panoptes*). A further two species has been recorded from the extended GBA region since 1990: Mitchell's water monitor (*Varanus mitchelli*) and the land snail, *Trachiopsis victoriana*. Each of these species is classified as vulnerable in the NT.

Table 4 Fauna species recorded from the Beetaloo GBA extended region that are listed as threatened under TPWCA, but not listed under EPBC Act, also indicating if recorded within the Beetaloo GBA region

Scientific name	Common name	Conservation status	Present in GBA region
<i>Falco hypoleucos</i>	Grey falcon	Vulnerable	Yes
<i>Rattus tunneyi</i>	Pale field-rat	Vulnerable	Yes
<i>Trachiopsis victoriana</i>	land snail	Vulnerable	No
<i>Varanus mertensi</i>	Mertens' water monitor	Vulnerable	Yes
<i>Varanus mitchelli</i>	Mitchell's water monitor	Vulnerable	No
<i>Varanus panoptes</i>	Floodplain monitor	Vulnerable	Yes

1.4.3 Nationally important wetlands

Two wetlands in the Beetaloo GBA extended region are listed as nationally important wetlands (Department of the Environment and Energy, 2010). These wetlands are Lake Woods and Mataranka Thermal Pools. Lake Woods is an ephemeral freshwater wetland that is located south

of the Beetaloo GBA region. It typically occupies an area of 350 km² but has expanded up to 850 km² during major floods (1993, 2001). When inundated the Lake Woods system consists of a diversity of wetland environments including open water and large areas of Lignum (*Duma florulenta*) swamp and holds over 100,000 waterbirds. Mataranka Thermal Pools is a series of perennial spring wetlands fed by groundwater in the upper Roper River system. The area has 10 species of plants endemic to the NT and often supports a large roost of flying-foxes (*Pteropus* spp.). It lies to the north of the Beetaloo GBA region.

1.4.4 Groundwater-dependent ecosystems

The Beetaloo GBA region and extended region both contain important groundwater-dependent ecosystems (GDEs) (Figure 20). The identification of springs for this report combines two datasets to obtain a more complete springs spatial dataset of springs (Geological and Bioregional Assessment Program (2019c) and Department of Environment and Natural Resources (NT) (2013)). There are 20 likely or confirmed spring locations in the Beetaloo GBA extended region but none within the Beetaloo GBA region. Both the Beetaloo GBA region and the extended region support areas of aquatic GDEs and terrestrial GDEs (Table 5).

Table 5 Groundwater-dependent ecosystems in the Beetaloo GBA region and the Beetaloo GBA extended region

Type of GDE	Area within GBA region	Area within extended GBA region	Number within GBA region	Number within extended GBA region
Springs	NA	NA	NA	20
Aquatic GDEs	1007	3401	35	147
Terrestrial GDEs	7115	34895	9	153

Data: Geological and Bioregional Assessment Program (2019d)

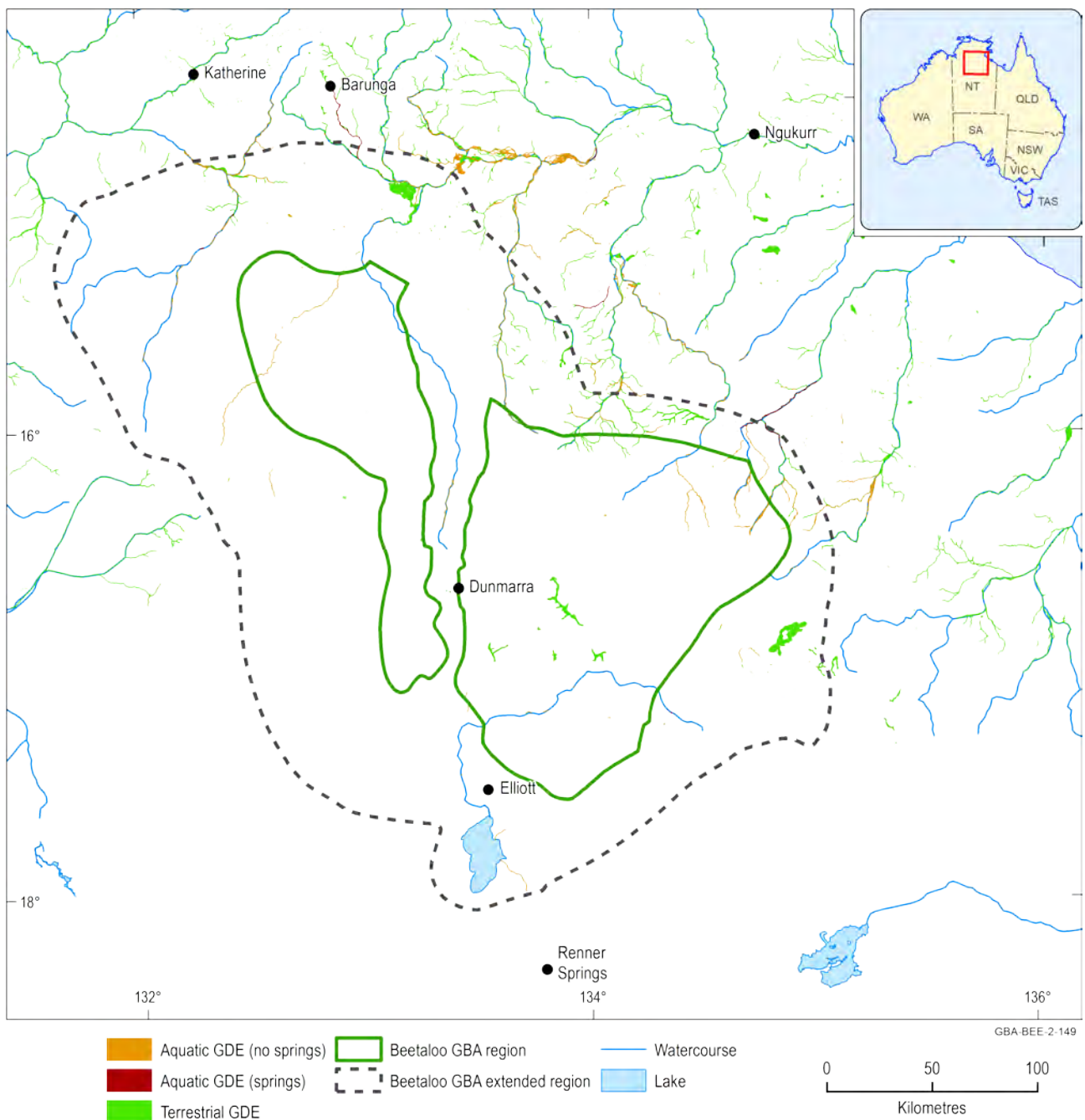


Figure 20 Groundwater-dependent ecosystems in the Beetaloo GBA region and Beetaloo GBA extended region

Data: Geological and Bioregional Assessment Program (2019a, 2019d, 2019b)

Element: GBA-BEE-2-149

2 Cultural baseline synthesis

No cultural assets were identified in the EPBC Act protected matters searches. The searches did not identify any national heritage places or Commonwealth heritage places in either the Beetaloo GBA region or the Beetaloo GBA extended region.

A search of the Northern Territory heritage register identified 13 declared heritage places within the Beetaloo GBA extended region (but none within the Beetaloo GBA region). A search of the NT archaeological sites database identified 119 Aboriginal archaeological sites within the Beetaloo GBA extended region, of which 39 are within the Beetaloo GBA region.

No cultural assets were identified in the EPBC Act protected matters searches. The searches did not identify any national heritage places or Commonwealth heritage places in either the Beetaloo GBA region or the Beetaloo GBA extended region.

Cultural assets were searched for in EPBC Act protected matters searches run by the Australian Government Department of the Environment and Energy. A search was run on 16 September 2018 and re-run on 15 March 2019 to validate the original report and assess if any matters had either been added or removed from the list. An additional search was run on 23 September 2019 when the boundary of the Beetaloo GBA extended region was modified. The search looked for national heritage places and Commonwealth heritage places.

Territory-listed Aboriginal archaeological sites and declared heritage places, listed under the *Heritage Act 2011* NT, were identified during searches of the NT archaeological sites database and NT heritage register, respectively. The searches were carried out on 8 October 2019.

A total of 13 sites listed on the NT heritage register occur within the Beetaloo GBA extended region. These sites are:

- Birdum historic township
- Daly Waters aviation complex
- Daly Waters flying fox
- Elsey memorial cemetery
- Frew Ponds overland telegraph poles
- Murrniji track, Murrniji bore and waterhole
- Murrniji track, number 11 bore
- Newcastle Waters township
- Ucharonidge Station number 1 bore and windmill
- Union Camp (Gurindgi walk-off headquarters)
- WWII Gorrie airfield precinct
- WWII Larrimah telephone repeater station and powerhouse
- Warloch Ponds road bridge.

None of these are within the Beetaloo GBA region.

The search of the NT archaeological sites database identified 39 sites within the Beetaloo GBA region. An additional 80 Aboriginal archaeological sites were within the Beetaloo GBA extended region. Further details are not provided here because this information is deemed to be sensitive and is not publicly available.

3 Landscape classification and ecohydrological conceptualisation

To determine how hydrological and other changes caused by shale and tight gas development may affect ecosystems at a landscape scale, six landscape classes have been identified, based on Queensland's Land Zones. The Beetaloo GBA region is dominated by loamy and sandy plains, and by clay plains. There are also substantial areas of floodplain and alluvium, and undulating country on fine-grained sedimentary rocks. There are only traces of tablelands and duricrusts, and basalt plains and hills.

3.1 Description of landscape classes

The methodology for defining landscape classes is based on submethodology M03 for assigning receptors to water-dependent assets from the Bioregional Assessment Technical Programme (O'Grady et al., 2016), with modifications that reflect the broader purpose of the Geological and Bioregional Assessment Program. A landscape classification approach was used to systematically define geographical areas into landscape classes that are similar in physical and/or biological and hydrological character.

Conceptually, landscape classes can be considered as bundles of ecosystem assets (Bureau of Meteorology, 2013; United Nations et al., 2014), that produce ecosystem services that provide benefit to humanity. Landscape classification aims to:

- reduce ecosystem and landscape complexity to a limited number of regional-scale landscape classes that are mutually exclusive and comprehensive
- guide the development and review of conceptual models, including their spatial and temporal scope
- where possible, use existing data sources and existing classifications or typologies
- provide a natural aggregation for reporting potential impacts
- be applicable to data-poor regions.

Inputs into the landscape classification were based on existing classification schemes wherever possible and can be purely physical, biological or predictive (Linke et al., 2011). Choice of approach depends on the availability of data at an appropriate scale, as well as the expertise and resources for undertaking the assessment. Landscape classifications should be credible, transparent, logical and consistently applied; where possible, match other classifications (or at least some of their classes); and be feasible within available resourcing.

The landscape classification developed for the Beetaloo GBA region is based on the Queensland Land Zones (Wilson and Taylor, 2012). Consistent with the principles outlined above, it sought to use existing data sources and classifications, and to leverage the extensive effort already expended to develop highly relevant conceptual models at both landscape scale and wetland scale

by the Queensland Government as part of its Wetlands Program (Department of Environment and Science (Qld), 2017).

A detailed landscape classification, based on Queensland's Land Zones, was provided by the NT Government Department of Environment and Natural Resources (Department of Environment and Natural Resources (NT), 2019). The areas of each Land Zone (Queensland) and corresponding landscape class (GBA) are given in Table 6, along with descriptions of the landscape classes.

Table 6 Landscape classes of the geological and bioregional assessment in the Beetaloo GBA region, and corresponding Land Zones. The area of each landscape class is also given

Landscape class (GBA)	Land Zones (Qld)	Geological description	Area (km ²)
Loamy and sandy plains	Tertiary-early Quaternary loamy and sandy plains and plateaus	Tertiary-early Quaternary extensive, uniform near level or gently undulating plains with sandy or loamy soils. Includes dissected remnants of these surfaces. Also includes plains with sandy or loamy soils of uncertain origin, and plateau remnants with moderate to deep soils usually overlying duricrust. Excludes recent Quaternary alluvial systems, exposed duricrust, and soils derived from underlying bedrock. Soils are usually Tenosols and Kandosols, also minor deep sandy surfaced Sodosols and Chromosols. There may be a duricrust at depth.	19,979
Clay plains	Tertiary-early Quaternary clay plains	Tertiary-early Quaternary clay deposits, usually forming level to gently undulating plains not related to recent Quaternary alluvial systems. Excludes clay plains formed <i>in-situ</i> on bedrock. Mainly Vertosols with gilgai microrelief but includes thin sandy or loamy surfaced Sodosols and Chromosols with the same paleo-clay subsoil deposits.	4,937
Floodplain and alluvium	Recent Quaternary alluvial systems	Recent Quaternary alluvial systems, including closed depressions, paleo-estuarine deposits currently under freshwater influence, inland lakes and associated wave-built lunettes. Excludes colluvial deposits such as talus slopes and pediments. Includes a diverse range of soils, predominantly Vertosols and Sodosols; also with Dermosols, Kurosols, Chromosols, Kandosols, Tenosols, Rudosols and Hydrosols; and Organosols in high rainfall areas.	1,809
Undulating country on fine-grained sedimentary rocks	Fine-grained sedimentary rocks	Fine-grained sedimentary rocks, generally with little or no deformation and usually forming undulating landscapes. Siltstones, mudstones, shales, calcareous sediments, and labile sandstones are typical rock types although minor interbedded volcanics may occur. Includes a diverse range of fine textured soils of moderate to high fertility, predominantly Vertosols, Sodosols, and Chromosols.	1,406
Tablelands and duricrusts	Cainozoic duricrusts	Cainozoic duricrusts formed on a variety of rock types, usually forming mesas or scarps. Includes exposed ferruginous, siliceous or mottled horizons and associated talus and colluvium, and remnants of these features, for example low stony rises on downs. Soils are usually shallow Rudosols and Tenosols, with minor Sodosols and Chromosols on associated pediments, and shallow Kandosols on plateau margins and larger mesas.	383

Landscape class (GBA)	Land Zones (Qld)	Geological description	Area (km ²)
Basalt plains and hills	Cainozoic igneous rocks	Cainozoic igneous rocks, predominantly flood basalts forming extensive plains and occasional low scarps. Also includes hills, cones and plugs on trachytes and rhyolites, and associated interbedded sediments, and talus. Excludes deep soils overlying duricrust. Soils include Vertosols, Ferrosols and shallow Dermosols.	7
	Total		28,521

Source: Department of Environment and Natural Resources (NT) (2019) adapted from Wilson and Taylor (2012)

The total area of Beetaloo GBA region is 28,521 km² (Table 6). It is dominated by loamy and sandy plains (19,979 km²) and by clay plains (4937 km²), mainly associated with the Sturt Plateau IBRA region (Table 7), although the southern-most clay plains are associated with Mitchell Grass Downs IBRA region (Table 7).

The 1809 km² of Floodplain and alluvium is mainly within the Sturt Plateau IBRA region but also within the Gulf Fall Uplands IBRA region (Table 7). The Sturt Plateau watercourses are generally short and braided and include Western and Birdum Creeks in the north-west of the region and Newcastle Creek in the south.

The landscape class, undulating country on fine-grained sedimentary rocks, comprises an area of 1406 km² in the Beetaloo GBA region. This is in the north and is associated with headwaters of creeks and rivers in both the Gulf Fall Uplands and Sturt Plateau IBRA regions (Table 7).

There are very small areas of tablelands and duricrusts (383 km²) and basalt plains and hills (7 km²) in the Beetaloo GBA region. Sandstone ranges, and hills and lowlands on metamorphic rocks, occur just outside the Beetaloo GBA region (Figure 21). No springs occur in the Beetaloo GBA region, but Mataranka Springs are situated in the Roper River Catchment in Elsey National Park, some 40 km north of the Beetaloo GBA region, and other springs occur in the Beetaloo GBA extended region.

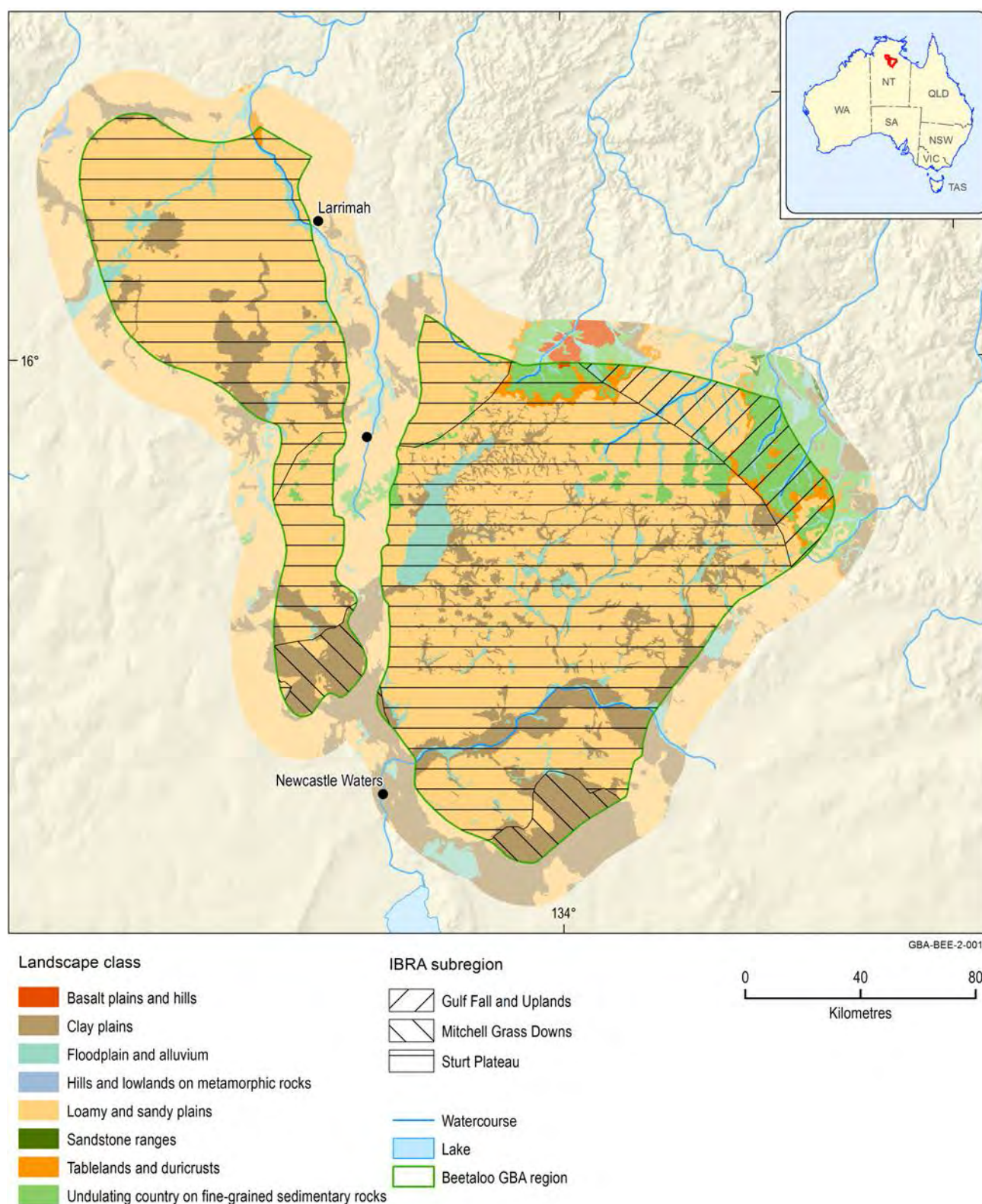


Figure 21 Landscape classes with the Beetaloo GBA region. IBRA regions are also indicated. Note that the landscape classification extends slightly outside the GBA boundary for context

Data: Department of Environment and Natural Resources (NT) (2019)

Element: GBA-BEE-2-001

Table 7 IBRA regions in the Beetaloo GBA region

IBRA region	Area (km ²)
The Sturt Plateau region mostly comprises a gently undulating plain on lateritised Cretaceous sandstones. Soils are predominantly neutral sandy red and yellow earths. The most extensive vegetation is eucalypt woodland with tussock grass or <i>Triodia</i> understorey, but there are also large areas of lancewood (<i>Acacia shirleyi</i>) thickets, and bullwaddy (<i>Macropteranthes kekwickii</i>) woodlands. Elevation ranges from 100 to 300 m above sea level and falls gently from south to north. The Sturt Plateau lies over the Dunmulla, Daly, Wiso, and McArthur Basins, where Tertiary formed laterites of the Birdum Creek Beds and Cainozoic deposited sands occur. There are two major catchment areas: The Roper drainage system captures all streams east of, and including the Western Creek system, while the Dry River catchment in the west eventually contributes to the Daly River. The drainage systems are weakly developed. Channel incision is poor in the southern and central areas and it is not until the lower reaches of the Dry River and Elsey Creek are approached that some maturity is observed. Within the Roper drainage system, Newcastle Creek flows south into Lake Woods. Generally, less than 5% of rainfall will contribute eventually to streamflow as a result of the flat terrain, the apparent high storage capacity of waterholes and swamps and the existence of sinkholes.	25,155
The Barkly Tableland subregion of the Mitchell Grass Downs region is dominated by <i>Astrebla pectinata</i> grasslands on the extensive Tertiary clay plains overlying limestone beds. A variety of mulga (<i>Acacia aneura</i>), eucalypt and chenopod open woodland to shrubland communities occur on swamps or sand sheets associated with deposits from the adjacent Northwest Highlands bioregion. Intermittent drainage lines and associated alluvial plains supporting eucalypt woodland, grasslands or open herblands are scattered across the Barkly Tableland (as they are across all provinces in the Mitchell Grass Downs bioregion).	1,338
The McArthur subregion of the Gulf Fall and Uplands region is composed almost entirely of low hills and plateaus on gently deformed pre-Cambrian sediments, overlain in places by Mesozoic sediments of the Carpentaria Basin forming residual plateaus and scarps. Folded pre-Cambrian sediments underlie most of the subregion, and outcrop mainly along its eastern margin. Sandy alluvia are common along the larger watercourses. Sandstone areas sometimes contain springs and other areas of permanent or near-permanent water. This is a remote subregion and its biology is poorly known. It drains largely into a series of rivers including the Roper, Towns, Cox, Arnold and Limmen Bight Rivers, and then into the Gulf of Carpentaria.	2,027

Source: Baker et al. (2005); Wilson (1999); Morgan (1999); Yin Foo (2002)

3.2 Landscape classes and associated conceptual models

Loamy and sandy plains

There are extensive areas of loamy and sandy plains within the Beetaloo GBA region; mainly associated with the Sturt Plateau IBRA subregion, which is characterised by undulating plain on lateritised Cretaceous sandstones and Cainozoic deposited sands (Table 6). Loamy and sandy plains may be formed by redeposition of colluvium or be formed in-situ from 'old' alluvial processes (Wilson and Taylor, 2012). They may also result from prolonged, intense, deep weathering of parent rock material high in iron and/or aluminium oxides and kaolin clays. Landforms are flat to gently undulating plains, plateaus and dissected tablelands.

Within the Beetaloo GBA region, the vegetation is dominated by woodlands and open forests of *Corymbia* and *Acacia*, with some areas of *Macropteranthes* woodlands and tussock grasslands.

Figure 22 shows a schematic of this landscape class based on the 'sandy plains' conceptual model (Queensland Government, 2015).

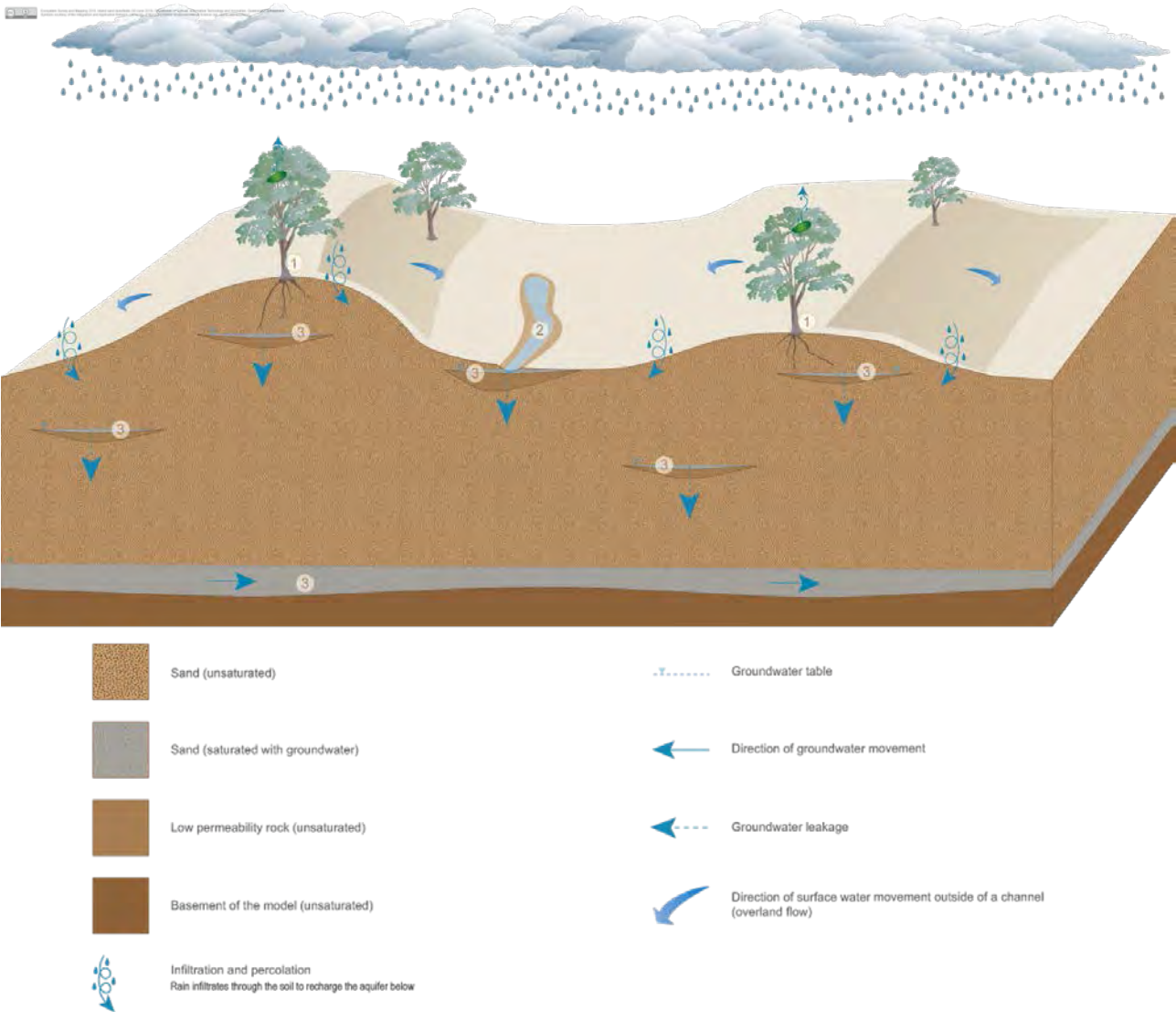


Figure 22 Sandy plains ecohydrological conceptual model

1. Terrestrial GDEs. Regional ecosystems and riverine wetlands may depend on the subsurface presence of groundwater within the capillary zone for some or all of their water requirements.

2. Subterranean GDEs. Aquifer and cave subterranean wetlands may depend on the subterranean expression of groundwater for some or all of their water requirements.

3. Surface expression GDEs. Lacustrine wetlands, palustrine wetlands and riverine water bodies may depend on the surface expression of groundwater for some or all of their water requirements.

Source: Pictorial conceptual models, WetlandInfo, Department of Environment and Science, Queensland, viewed 19 March 2019 (Queensland Government, 2015)

Element: GBA-BEE-2-150

Clay plains

Clay plains are mainly associated with the Sturt Plateau IBRA region although the southern-most clay plains are associated with Mitchell Grass Downs IBRA region. Clay plains are either on relict drainages or associated with modern creeks such as Newcastle Creek.

Clay plains are typically gently undulating plains, with clay soils and texture-contrast soils derived from fine-grained sediments. Clay plains includes paleo-clay unconsolidated sediments originating from ‘old’ alluvial processes and aeolian clays, forming predominantly level to gently undulating plains, but includes lesser rises and low hills particularly in arid areas. These paleo-clay deposits are now elevated above and usually isolated from the alluvial valleys and floodplains (Wilson and

Taylor, 2012). As a result, this is now an erosional landscape with poorly defined drainage. Soils are dominated by Vertosols with gilgai microrelief. Larger gilgai may provide ephemeral wetland habitat as a result of ponding of rainfall. Soils usually have restricted rooting depth due to the adverse effects of high sodium levels.

Within the Beetaloo GBA region, vegetation is dominated by *Eucalyptus* and *Corymbia* woodlands, and by *Melaleuca* low woodland.

This landscape class is represented by the 'high-level alluvia' conceptual model (Queensland Government, 2017a). The term 'high-level alluvia' refers to alluvia deposited in ancestral valleys, which are located above the channels in the current landscape in the form of inverted relief. Over time a channel will erode through older alluvial deposits resulting in older alluvia appearing in the banks above the channel.

Figure 23 shows a schematic of this landscape class based on the 'high-level alluvia' conceptual model (Queensland Government, 2017a).

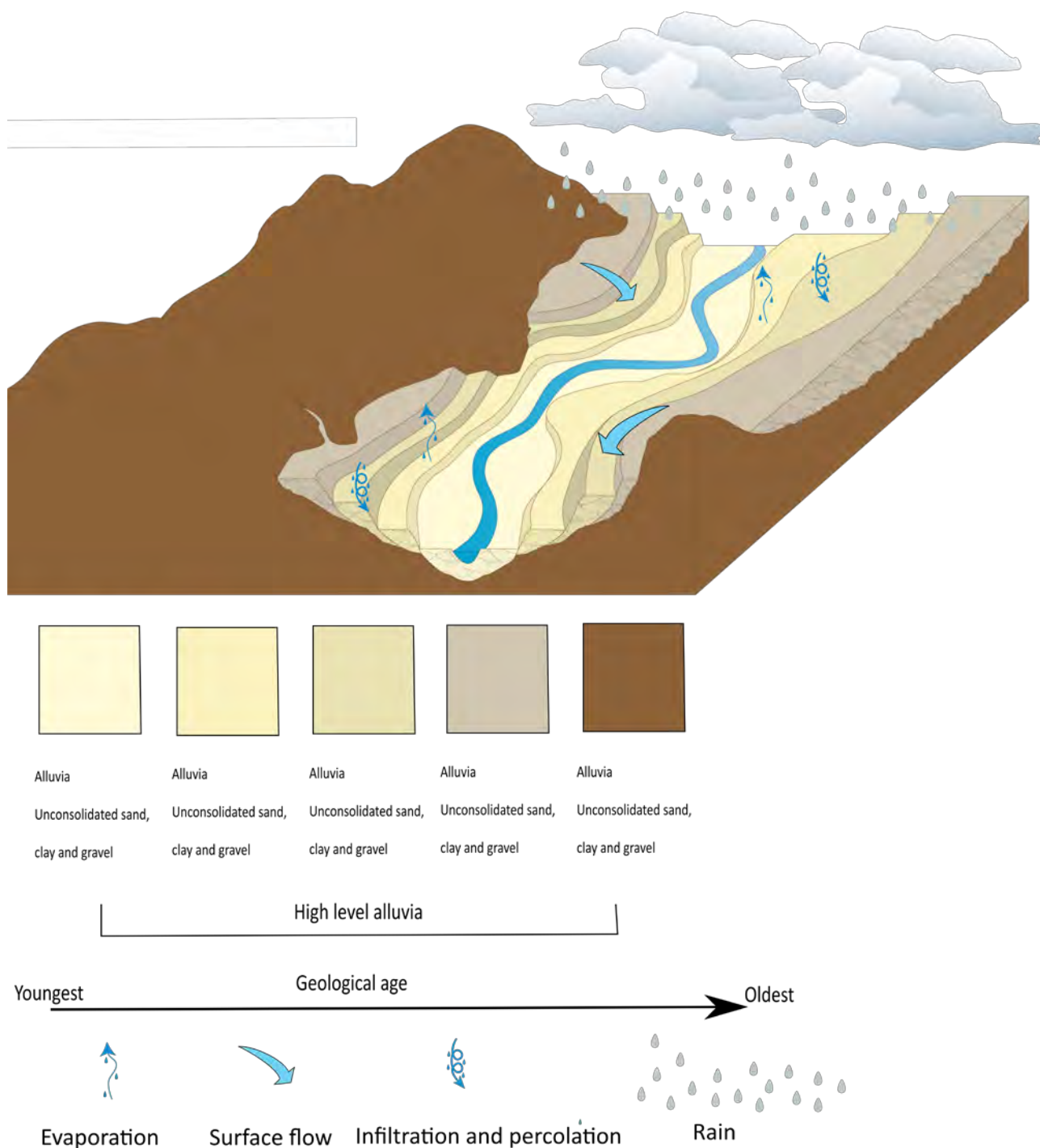


Figure 23 Clay plains conceptual model, based on the 'high-level alluvia' conceptual model

Source: Pictorial conceptual models, WetlandInfo, Department of Environment and Science, Queensland, viewed 19 March 2019 (Queensland Government, 2017a)

Element: GBA-BEE-2-151

Floodplain and alluvium

Floodplain and alluvium are associated with numerous creeks (Birdum, Sunday, Western, Elsey, Cow, Middle, Bucket, Ross, Newcastle) in the Sturt Plains IBRA region, with several rivers (Arnold, Hodgson, Cox) and the creeks that feed them in the Gulf Fall and Uplands IBRA regions, and with their associated floodplains (Figure 21).

Floodplain and alluvium include a wide variety of landforms including, but not limited to, fans, plains, flats, banks, benches, bars, channels and streams, depressions, lakes, playa, swamps and terraces (Wilson and Taylor, 2012). In all these landforms, there may be frequent active erosion and aggradation by channelled and overbank streamflow, or the landforms may be relict from these processes (National Committee on Soil and Terrain, 2009).

Floodplain and alluvium landforms are mostly flat to gently undulating with levées, bars, streambeds and banks creating minor local relief (Wilson and Taylor, 2012). Soils are very diverse and are dominated by Vertosols and Sodosols but include a diverse range of other soils. They are usually fertile and often cleared or developed for agriculture or pastoralism. Riparian vegetation adjacent to watercourses is generally more biodiverse than that of the surrounding landscape and is often denser due to greater water availability.

Within the Beetaloo GBA region, vegetation is dominated by *Melaleuca*, *Eucalyptus* and *Corymbia* woodlands and low woodlands.

Figure 24 shows a schematic of the landscape class 'Floodplain and alluvium' based on the Alluvia—mid-catchment conceptual model (Queensland Government, 2017a).

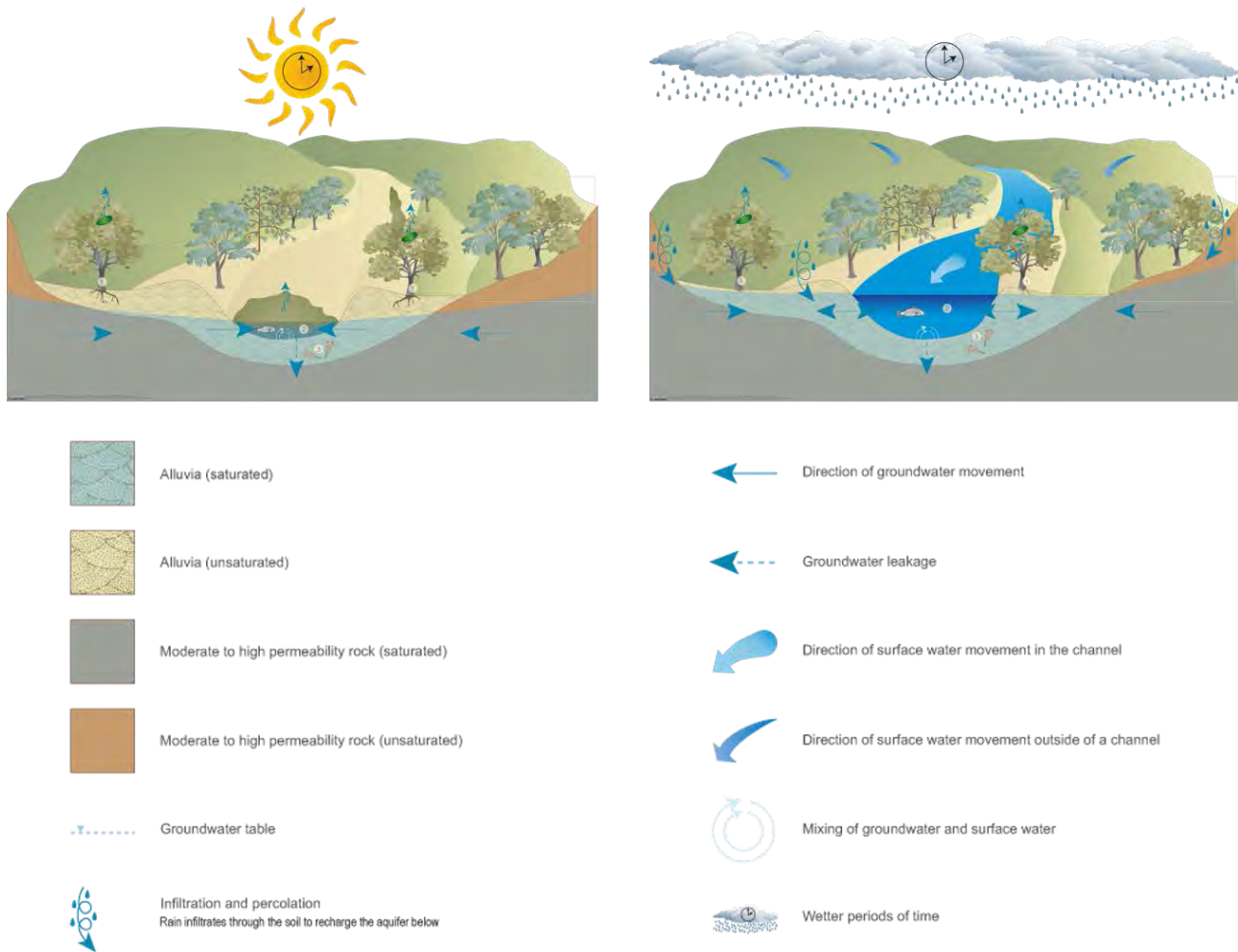


Figure 24 Floodplains and alluvia ecohydrological conceptual model based on the Alluvia—mid-catchment conceptual model

1. Terrestrial GDEs. Regional ecosystems and riverine wetlands may depend on the subsurface presence of groundwater within the capillary zone for some or all of their water requirements.
2. Subterranean GDEs. Aquifer and cave subterranean wetlands may depend on the subterranean expression of groundwater for some or all of their water requirements.
3. Surface expression GDEs. Lacustrine wetlands, palustrine wetlands and riverine water bodies may depend on the surface expression of groundwater for some or all of their water requirements.

Source: Pictorial conceptual models, WetlandInfo, Department of Environment and Science, Queensland, viewed 19 March 2019 (Queensland Government, 2017a)

Element: GBA-BEE-2-152

Undulating country on fine-grained sedimentary rocks

Undulating country on fine-grained sedimentary rocks in the Beetaloo GBA region is found mainly in the Gulf Fall and Uplands IBRA subregion, which is composed almost entirely of low hills and plateaus on gently deformed pre-Cambrian sediments, overlain in places by Mesozoic sediments of the Carpentaria Basin forming residual plateaus and scarps.

Fine-grained sedimentary rocks include siltstones, mudstones and shales. Depending on the lithology (mineral composition) of the lithic fragments, these fine-grained sedimentary rocks formed clayey soils or soils with clay subsoils (Wilson and Taylor, 2012). Due to the general 'soft' nature of the sedimentary rocks and the readily weathered nature of the lithology, the landforms are dominated by gently undulating plains and rises, many of which have been extensively developed or cleared for pasture. Soils are predominantly Vertosols, Sodosols, and Chromosols.

The vegetation in the Beetaloo GBA region is dominated by *Eucalyptus* and *Corymbia* woodland, with areas of tussock grassland, *Melaleuca* low woodland and *Acacia* open forest.

Figure 25 shows the landscape class ‘undulating country on fine-grained sedimentary rocks’ represented by the ‘exclusion zones’ conceptual model (Queensland Government, 2017b).



Figure 25 Undulating country on fine-grained sedimentary rocks conceptual model based on the exclusion zones ecohydrological conceptual model

Source: Pictorial conceptual models, WetlandInfo, Department of Environment and Science, Queensland, viewed 19 March 2019 (Queensland Government, 2017b)

Element: GBA-BEE-2-153

Tablelands and duricrusts

Tablelands and duricrusts occur in the north-west of the Beetaloo GBA region, mainly in the Gulf Fall and Uplands IBRA subregion (Table 7), which are composed almost entirely of low hills and plateaus on gently deformed pre-Cambrian sediments, overlain in places by Mesozoic sediments of the Carpentaria Basin, forming residual plateaus and scarps.

Tableland and duricrust areas are also known as dissected residuals, breakaways or ironstone jump-ups. They are characterised by a silcrete or ferricrete surface that has been eroded to form low but steep escarpments, mesas and buttes (Santos, 2015) with colluvial slopes (talus) with shallow soils (<0.5 m) over deeply weathered rock (Wilson and Taylor, 2012). Soils are either absent (exposed rock) or dominated by shallow (<0.5 m) Rudosols and Tenosols, with Kandosols on plateau and tableland margins. They may have gibber-covered foot slopes. Permanent surface water is scarce on elevated areas of tablelands (Santos, 2015).

Within the Beetaloo GBA region, the vegetation is dominated by *Acacia* woodland and low woodlands, with some areas of *Corymbia*, *Eucalyptus* and *Melaleuca* woodland, and some areas of tussock grassland.

This landscape class is represented by the ‘exclusion zones’ conceptual model (Queensland Government, 2017b) and is shown in Figure 25.

Basalt plains and hills

Basalt plains and hills are lava plains and associated volcanic cones and plugs (Wilson and Taylor, 2012). The extensive undulating plains are broken occasionally by low scarps, hills, and plateaus.

Vegetation on basalt plains and hills in the Beetaloo GBA region is dominated by *Melaleuca* low woodland.

This landscape class is represented by the 'exclusion zones' conceptual model (Queensland Government, 2017b) and is shown in Figure 25.

4 Protected matters prioritisation and screening

4.1 *Protected matters prioritisation and screening approach*

A prioritisation and screening process was adopted to identify individual protected matters that were likely to be impacted by potential shale and tight gas development within the Beetaloo GBA region. The approach reviewed each matter identified in relation to its potential extent and distribution within the Beetaloo GBA region. The steps in the prioritisation and screening process are outlined below.

4.1.1 Step one: identify matters

There are five categories of Matters of National Environmental Significance (MNES) identified under the EPBC Act that are potentially relevant to the Beetaloo GBA region and extended region. These are:

1. world heritage properties
2. national heritage places
3. wetlands of international importance (listed under the Ramsar Convention)
4. listed threatened species and threatened ecological communities
5. migratory species listed under international agreements.

Another two categories of protected matters identified under the EPBC Act that are potentially relevant to the Beetaloo GBA region and extended region:

1. listed marine species
2. Commonwealth lands.

These matters were identified from the Protected Matters Search Tool (PMST). In addition to these matters, the landscape classes defined by the GBA Program were also included, although these are not protected by the EPBC Act. A summary of the MNES identified and their data sources is given in Table 8.

Table 8 Matters that are considered to be of national importance in the Beetaloo GBA region and extended region consisting of Matters of National Environmental Significance (MNES) and other protected matters listed under the EPBC Act and landscape classes together with the source of data

Category of matter	Data source
Matters of National Environmental Significance	
World heritage properties	PMST
National heritage places	PMST
Wetlands of international significance (Ramsar)	PMST
Nationally listed threatened species	PMST
Nationally listed threatened ecological communities	PMST
Migratory species protected under international agreements	PMST
Other matters protected by the EPBC Act	
Listed marine species	PMST
Whales and other cetaceans	PMST
Commonwealth lands	PMST
Matters not protected by the EPBC Act	
Landscape classes	GBA

Three categories of Matters of Territory Environmental Significance (MTES) that are classified under NT legislation are also potentially relevant to the Beetaloo GBA region and extended region. These matters are:

1. parks and reserves (listed under the *Territory Parks and Wildlife Conservation Act*)
2. species listed as threatened (i.e. critically endangered, endangered, vulnerable) under the *Territory Parks and Wildlife Conservation Act* but not under the Commonwealth’s EPBC Act
3. cultural heritage areas including NT heritage places.

In addition to matters listed under NT legislation, the GBA Program also considered the following two categories as being of environmental significance within the NT:

- nationally important wetlands identified in the *Directory of Important Wetlands in Australia* (DIWA) (Department of the Environment and Energy, 2010)
- groundwater-dependent ecosystems.

A summary of these matters and their data sources is given in Table 9.

Table 9 Matters of Territory Environmental Significance (MTES) and other matters of significance in the Northern Territory relevant to the Beetaloo GBA region and extended region

Category of matter	Description	Data source
Parks and reserves	Parks and reserves listed under the <i>Territory Parks and Wildlife Conservation Act 2006</i>	PMST
Threatened species	Plant and animal species identified as threatened wildlife under the <i>Territory Parks and Wildlife Conservation Act 2006</i>	NT Fauna Atlas NT Flora Atlas
Heritage areas	Heritage places and objects listed under the <i>Heritage Act 2011</i> . These include: • boriginal archaeological sites • eritage places.	NT Heritage Register NT Archaeological Sites Database
Nationally important wetland	Wetlands that are of national significance and that are listed in the <i>Directory of Important Wetlands in Australia</i> (DIWA)	Australian Wetlands Database
Groundwater-dependent ecosystems (GDEs)	All groundwater-dependent ecosystems including springs, aquatic GDEs and terrestrial GDEs	NT terrestrialecosystem database NT aquatic ecosystem database NT springs database

4.1.2 Step two: prioritise matters

To identify individual matters that were likely to be impacted by potential shale and tight gas development within the Beetaloo GBA region, each matter was reviewed in relation to its extent and distribution within the region. Landscape classes were also included. Matters were assigned to one of three priorities:

Priority 1. Importance of the region to the matter warrants a detailed level of assessment. Future assessment of the matter will endeavour to provide the following assessments:

- Spatial extent and quantification of possible impacts where possible
- Scale of impact relative to national and territory values (e.g. EPBC significant impact guidelines, Table 11)
- Field or remote sensing data validation of occurrence and areas of impact
- Details of direct and indirect impact causes and effects that may result (expressed as a narrative table and conceptual model)
- Recommended specific and standard mitigation measures.

Priority 2. Importance of the region to the matter warrants a high-level assessment. Future assessment will endeavour to provide the following assessments:

- spatial extent of potential impacts where possible
- description of possible direct and indirect impact causes and effects.

Priority 3. Importance of the region to the matter does not warrant further assessment. Impacts on these matters will not be assessed but it is anticipated that general mitigation and avoidance measures will provide some level of protection to biodiversity.

MNES, MTES and other matters were initially categorised as shown in Table 10.

Table 10 Initial categorisation of protected matters

	Priority
MNES	
World heritage properties	Not present
National heritage places	Not present
Internationally important (Ramsar) wetlands	Not present
Nationally listed threatened species	1
Nationally listed threatened ecological communities	1
Nationally listed migratory species protected under international agreements	1
Other matters protected by the EPBC Act	
Listed marine species	2
Whales and other cetaceans	Not present
Commonwealth lands	2
Other matter not protected by the EPBC act	
Landscape classes	2
MTES	
Territory parks, reserves and conservation covenants	2
Territory-listed threatened species – Critically Endangered, Endangered, Vulnerable	1
Territory-listed species - Near Threatened and Data Deficient	3
Heritage areas & Aboriginal archaeological sites	2
Other matters	
Nationally important wetlands	1
GDEs	1

4.1.3 Step three: further screening of priority 1 and priority 2 matters

Following initial categorisation, matters categorised as priority 1 or 2 were subject to additional screening.

The first stage of this approach was applied to species and threatened ecological communities where it was uncertain whether they occurred in the Beetaloo GBA region. In other words, the protected matters searches identified that these species/communities were ‘likely to occur’ or ‘may occur’ in the region as opposed to being ‘known to occur’. Additional information on distribution, to ascertain whether the matters were likely to be present within the Beetaloo GBA region, was obtained both from additional modelling undertaken as part of a NESP Northern Australian Hub project and by seeking expert opinion. At this stage multiple species/communities were excluded from further assessment because it was determined that they did not occur within the Beetaloo GBA region. These species/communities were:

- Arnhem Plateau Sandstone Shrubland Complex (Threatened Ecological Community)

- Northern quoll
- Gulf snapping turtle
- Northern brush-tailed phascogale
- Princess parrot
- Freshwater sawfish.

Next, matters categorised as priority 1 or 2 were screened further using the significant impact guidelines (Commonwealth of Australia, 2013) (Table 11). Where the protected matter was a *place*, e.g. a wetland of national significance, the matter was included if the area:

- partially or wholly intersected with areas licenced for exploration and within areas deemed to be prospective for shale and tight gas development, or
- could be deemed to be hydrologically connected to these areas from a surface water or groundwater perspective, or
- was thought to contain potential habitat for an identified species protected matter.

Matters that were not retained were assigned to priority 3. Landscape classes were assessed using the same criteria as for the *place* protected matters.

Where the protected matter was a *species*, species occurrence records were downloaded from the Atlas of Living Australia. In addition to these records the spatial data associated with the predicted distribution of each EPBC-listed species were reviewed (Figure 2 to Figure 19). The presence of each species within the Beetaloo GBA region, based on known records and predicted distributions, was assessed in relation to its national distribution and potential for significant impact assessed using the significant impact guidelines (Table 11), species recovery plans, conservation advices and threat abatement plans.

For critically endangered and endangered species, the species was retained as priority 1 if it was known or expected to occur in the Beetaloo GBA region and there was a possibility of negative impacts occurring to the species in the region as outlined in Table 10. Otherwise the species was classed as priority 2. This approach moved species to priority 2 if there was little suitable habitat in the region resulting in it only occurring as a vagrant.

For vulnerable and migratory species, the species was retained as priority 1 only if the Beetaloo GBA region supported an important population of the species. Otherwise the species was moved to priority 2.

Those protected matters that occurred or potentially occurred in the extended Beetaloo GBA region but not in the Beetaloo GBA region were given a score of 3. However, if in Stage 3 (impact analysis and management) of this work there is evidence that impacts from shale and tight gas development will extend beyond the Beetaloo GBA region, these assessments will be reconsidered.

Protected matters and landscape classes that remained after this screening process were matters that are potentially exposed to significant impacts associated with development within the region and are to be considered further as part of the impact assessment.

Table 11 Significant impact guidelines for assessing Matters of National Environmental Significance

Class	Status	Criteria
Listed threatened species and ecological communities	Extinct in the wild species	N/A
Listed threatened species and ecological communities	Critically endangered or endangered species	An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will: • lead to a long-term decrease in the size of a population • reduce the area of occupancy of the species • fragment an existing population into two or more populations • adversely affect habitat critical to the survival of a species • disrupt the breeding cycle of a population • modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline • result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat • introduce disease that may cause the species to decline, or • interfere with the recovery of the species.
Listed threatened species and ecological communities	Vulnerable species	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will: • lead to a long-term decrease in the size of an important population of a species • reduce the area of occupancy of an important population • fragment an existing important population into two or more populations • adversely affect habitat critical to the survival of a species • disrupt the breeding cycle of an important population • modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline • result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat • introduce disease that may cause the species to decline, or • interfere substantially with the recovery of the species.
Listed threatened species and ecological communities	Critically endangered or endangered communities	N/A ¹

Class	Status	Criteria
Listed migratory species		An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will: - substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species - result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or - seriously disrupt the life cycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species
Wetlands of international importance (Ramsar)		N/A ¹
The Commonwealth marine environment		N/A ¹
World heritage properties		N/A ¹
National heritage places		N/A ¹

¹for the sake of brevity and clarity, guidelines (Commonwealth of Australia, 2013) are only reproduced for matters that are present in the Beetaloo GBA region or Beetaloo GBA extended region

4.2 Screening matters for Stage 3

4.2.1 Priority 1 matters

Four species of national environmental significance were identified as being potentially at risk from future unconventional gas development and thus will be assessed as priority 1 matters in Stage 3 (impact analysis and management). These include:

- the endangered species
 - Erythrura gouldiae* (Gouldian finch)
 - Rostratula australis* (Australian painted snipe)
- and the vulnerable species
 - Falcunculus frontatus whitei* (Crested shrike-tit (northern))
 - Macrotis lagotis* (Greater bilby).

In addition, one species, *Falco hypoleucos* (Grey falcon) that is a matter of territory environmental significance was identified as being potentially at risk from future unconventional gas development and will be assessed as a priority 1 matter in Stage 3. It is listed as vulnerable in the NT.

The two nationally important wetlands, Mataranka Thermal Pools and Lake Woods, were assessed as priority 1 matters. Although outside the Beetaloo GBA region there is sufficient evidence, for both these wetlands, of hydrological connectivity to areas within the Beetaloo GBA region that are

deemed to be prospective for shale and tight gas development to warrant their inclusion as priority 1 matters. Mataranka Thermal Pools show evidence of groundwater connectivity and Lake Woods of surface water connectivity to areas within the Beetaloo GBA region. Several Territory parks, reserves and conservation covenants are included within the area of these two wetlands. Specifically, Elsey National Park covers Mataranka Thermal Pools and Lake Woods includes Lake Woods conservation covenant and Longreach Waterhole protected area. Hence these three matters will not be assessed separately.

In addition to these matters, all GDEs were identified as priority 1 matters for assessment in Stage 3.

4.2.2 Priority 2 matters

The critically endangered *Calidris ferruginea* (curlew sandpiper) may occur within the Beetaloo GBA region hence the species will be assessed as priority 2 matters in Stage 3 (impact analysis and management).

Six additional Matters of National Environmental Significance were identified as being potentially at some risk from future unconventional gas development, although this risk will not be experienced by an important population of the species. Hence the species will be assessed as priority 2 matters in Stage 3 (impact analysis and management). These include:

- the endangered species *Peroporus occidentalis* (night parrot), and
- the vulnerable species
 - *Acanthophis hawkei* (plains death adder)
 - *Grantiella picta* (painted honeyeater)
 - *Macroderma gigas* (ghost bat)
 - *Saccolaimus saccolaimus nudiclunatus* (bare-rumped sheat-tailed bat)
 - *Tyto novaehollandiae kimberli* (masked owl (northern)).

In addition, four species that are Matters of Territory Environmental Significance were identified as being potentially at some risk from future unconventional gas development, although this risk will not be experienced by an important population of the species. Hence the species will be assessed as priority 2 matters in Stage 3. Each species is listed as vulnerable in the NT. These include:

- *Rattus tunneyi* (pale field-rat)
- *Varanus mertensi* (Merten's water monitor)
- *Varanus mitchelli* (Mitchell's water monitor)
- *Varanus panoptes* (Floodplain monitor).

Bullwaddy Conservation Reserve was identified as a priority 2 matter for assessment in Stage 3.

In addition, each landscape class, except 'basalt plains and hills', was identified as a priority 2 matter for assessment in Stage 3.

5 Knowledge gaps

Adequate understanding of the geographic distribution and ecology, including diet, habitat use and breeding season, of Matters of National Environmental Significance (MNES) and other protected matters and Matters of Territory Environmental Significance are key knowledge gaps for the study area. The knowledge gaps in this case represent understanding of both where matters occur in relation to potential unconventional petroleum resource development and how the ecological requirements of species and ecological communities may be impacted by the resource development pathway. Currently, the majority of protected matters are identified as 'likely to occur' or 'may occur' rather than 'known to occur' within the Beetaloo GBA region. Resolving whether individual matters occur (or did occur) within the GBA region and, if so, when and where, is necessary to identify those matters that may be impacted by future unconventional petroleum resource development. Likewise, understanding the ecological requirements (including diet, habitat use and breeding season) and life histories of individual species is essential information for assessing how each will respond to environmental change resulting from the unconventional petroleum development pathway in a region. This is an important knowledge gap.

Another important knowledge gap relates to the interaction between existing key threatening processes in the region and causal pathways that will eventuate during resource development. As an example, road construction during the establishment phase of unconventional petroleum resource development may facilitate the movement of invasive species (both animals and plants) in to new areas. Knowledge of the nature and extent of these interactions and how they may differ across landscape classes is scarce.

The landscape classification is limited by the quality of available datasets, including surface geology, elevation, vegetation and landform mapping, and extent and quality of ground observations. Additional information of these types will assist in refining and increasing the accuracy of the landscape classification.

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Glossary

The register of terms and definitions used in the Geological and Bioregional Assessment Program is available online at <http://registry.it.csiro.au/def/gba/glossary> (note that terms and definitions are respectively listed under the 'Name' and 'Description' columns in this register). This register is a list of terms, which are the preferred descriptors for concepts. Other properties are included for each term, including licence information, source of definition and date of approval. Semantic relationships (such as hierarchical relationships) are formalised for some terms, as well as linkages to other terms in related vocabularies. Many of the definitions for these terms have been sourced from external glossaries – several from international sources; spelling variations have been preserved to maintain authenticity of the source.

abandonment: a process which involves shutting down the well and rehabilitating the site. It includes decommissioning the well.

accumulation: in petroleum geosciences, an 'accumulation' is referred to as an individual body of moveable petroleum

activity: for the purposes of Impact Modes and Effects Analysis (IMEA), a planned event associated with unconventional gas resource development. For example, activities during the exploration life-cycle stage include drilling and coring, ground-based geophysics and surface core testing. Activities are grouped into ten major activities, which can occur at different life-cycle stages.

anticline: an arch-shaped fold in rock in which rock layers are upwardly convex. The oldest rock layers form the core of the fold and, outward from the core, progressively younger rocks occur.

aquifer: rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit quantities of water to bores and springs

aquitard: a saturated geological unit that is less permeable than an aquifer, and incapable of transmitting useful quantities of water. Aquitards commonly form a confining layer over an artesian aquifer.

artesian aquifer: an aquifer that has enough natural pressure to allow water in a bore to rise to the ground surface

asset: an entity that has value to the community and, for the purposes of geological and bioregional assessments, is associated with a GBA region. An asset is a store of value and may be managed and/or used to maintain and/or produce further value. An asset may have many values associated with it that can be measured from a range of perspectives; for example, the values of a wetland can be measured from ecological, sociocultural and economic perspectives.

bed: in geosciences, the term 'bed' refers to a layer of sediment or sedimentary rock, or stratum. A bed is the smallest stratigraphic unit, generally a centimetre or more in thickness. To be labeled a bed, the stratum must be distinguishable from adjacent beds.

biogenic gas: hydrocarbon gases (which are overwhelmingly (greater than or equal to 99%) methane) produced as a direct consequence of bacterial activity

bore: a narrow, artificially constructed hole or cavity used to intercept, collect or store water from an aquifer, or to passively observe or collect groundwater information. Also known as a borehole or piezometer.

brittleness: a material is brittle if, when subjected to stress, it breaks without significant plastic deformation

brittleness index: brittleness index (BI) is used to calculate the ease at which a shale rock breaks. It can be estimated from the normalised Young's modulus and Poisson's ratio

casing: a pipe placed in a well to prevent the wall of the hole from caving in and to prevent movement of fluids from one formation to another

casing string: steel pipe used to line a well and support the rock. The casing extends to the surface and is sealed by a cement sheath between the casing and the rock. Often, multiple casings are used to provide additional barriers between the formation and well.

charge: in petroleum geoscience, a 'charge' refers to the volume of expelled petroleum available for entrapment

cleat: the vertical cleavage of coal seams. The main set of joints along which coal breaks when mined.

coal: a rock containing greater than 50 wt.% organic matter

coal seam gas: coal seam gas (CSG) is a form of natural gas (generally 95% to 97% pure methane, CH₄) extracted from coal seams, typically at depths of 300 to 1000 m. Also called coal seam methane (CSM) or coalbed methane (CBM).

compression: lateral force or stress (e.g. tectonic) that tends to decrease the volume of, or shorten, a substance

conceptual model: an abstraction or simplification of reality that describes the most important components and processes of natural and/or anthropogenic systems, and their response to interactions with extrinsic activities or stressors. They provide a transparent and general representation of how complex systems work, and identify gaps or differences in understanding. They are often used as the basis for further modelling, form an important backdrop for assessment and evaluation, and typically have a key role in communication. Conceptual models may take many forms, including descriptive, influence diagrams and pictorial representations.

confined aquifer: an aquifer saturated with confining layers of low-permeability rock or sediment both above and below it. It is under pressure so that when the aquifer is penetrated by a bore, the water will rise above the top of the aquifer.

consequence: synonym of impact

conventional gas: conventional gas is obtained from reservoirs that largely consist of porous sandstone formations capped by impermeable rock, with the gas trapped by buoyancy. The gas can often move to the surface through the gas wells without the need to pump.

Cooper Basin: the Cooper Basin geological province is an Upper Carboniferous – Middle Triassic geological sedimentary basin that is up to 2500 m thick and occurs at depths between 1000 and 4400 m. It is overlain completely by the Eromanga and Lake Eyre basins. Most of the Cooper Basin is in south-west Queensland and north-east SA, and includes a small area of NSW at Cameron Corner. It occupies a total area of approximately 130,000 km², including 95,740 km² in Queensland, 34,310 km² in SA and 8 km² in NSW.

crude oil: the portion of petroleum that exists in the liquid phase in natural underground reservoirs and remains liquid at atmospheric conditions of pressure and temperature. Crude oil may include small amounts of non-hydrocarbons produced with the liquids.

crust: the outer part of the Earth, from the surface to the Mohorovicic discontinuity (Moho)

dataset: a collection of data in files, in databases or delivered by services that comprise a related set of information. Datasets may be spatial (e.g. a shape file or geodatabase or a Web Feature Service) or aspatial (e.g. an Access database, a list of people or a model configuration file).

deep coal gas: gas in coal beds at depths usually below 2000 m are often described as 'deep coal gas'. Due to the loss of cleat connectivity and fracture permeability with depth, hydraulic fracturing is used to release the free gas held within the organic porosity and fracture system of the coal seam. As dewatering is not needed, this makes deep coal gas exploration and development similar to shale gas reservoirs.

deformation: folding, faulting, shearing, compression or extension of rocks due to the Earth's forces

deposition: sedimentation of any material, as in the mechanical settling of sediment from suspension in water, precipitation of mineral matter by evaporation from solution, and accumulation of organic material

development: a phase in which newly discovered oil or gas fields are put into production by drilling and completing production wells

discovered: the term applied to a petroleum accumulation/reservoir whose existence has been determined by its actual penetration by a well, which has also clearly demonstrated the existence of moveable petroleum by flow to the surface or at least some recovery of a sample of petroleum. Log and/or core data may suffice for proof of existence of moveable petroleum if an analogous reservoir is available for comparison.

dome: a type of anticline where rocks are folded into the shape of an inverted bowl. Strata in a dome dip outward and downward in all directions from a central area.

ecosystem: a dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit. Note: ecosystems include those that are human-influenced such as rural and urban ecosystems.

ecosystem asset: an ecosystem that may provide benefits to humanity. It is a spatial area comprising a combination of biotic and abiotic components and other elements which function together.

effect: for the purposes of Impact Modes and Effects Analysis (IMEA), a change to water or the environment, such as changes to the quantity and/or quality of surface water or groundwater, or to the availability of suitable habitat. An effect is a specific type of an impact (any change resulting from prior events).

Eromanga Basin: an extensive geologic sedimentary basin formed from the Early Jurassic to the Late Cretaceous that can be over 2500 m thick. It overlies several older geological provinces including the Cooper Basin, and is in part overlain by the younger Cenozoic province, the Lake Eyre Basin. The Eromanga Basin is found across much of Queensland, northern SA, southern NT, as well as north-western NSW. The Eromanga Basin encompasses a significant portion of the Great Artesian Basin.

erosion: the wearing away of soil and rock by weathering, mass wasting, and the action of streams, glaciers, waves, wind, and underground water

exploration: the search for new hydrocarbon resources by improving geological and prospectivity understanding of an area and/or play through data acquisition, data analysis and interpretation. Exploration may include desktop studies, field mapping, seismic or other geophysical surveys, and drilling.

extraction: the removal of water for use from waterways or aquifers (including storages) by pumping or gravity channels. In the oil and gas industry, extraction refers to the removal of oil and gas from its reservoir rock.

fault: a fracture or zone of fractures in the Earth's crust along which rocks on one side were displaced relative to those on the other side

field: in petroleum geoscience, a 'field' refers to an accumulation, pool, or group of pools of hydrocarbons or other mineral resources in the subsurface. A hydrocarbon field consists of a reservoir with trapped hydrocarbons covered by an impermeable sealing rock, or trapped by hydrostatic pressure.

floodplain: a flat area of unconsolidated sediment near a stream channel that is submerged during or after high flows

flowback: the process of allowing fluids and entrained solids to flow from a well following a treatment, either in preparation for a subsequent phase of treatment or in preparation for cleanup and returning the well to production. The flowback period begins when material introduced into the well during the treatment returns to the surface following hydraulic fracturing or refracturing. The flowback period ends when either the well is shut in and permanently disconnected from the flowback equipment or at the startup of production.

fold: a curve or bend of a formerly planar structure, such as rock strata or bedding planes, that generally results from deformation

formation: rock layers that have common physical characteristics (lithology) deposited during a specific period of geological time

formation water: water that occurs naturally in sedimentary rocks

fracking: see hydraulic fracturing

fracture: a crack or surface of breakage within rock not related to foliation or cleavage in metamorphic rock along which there has been no movement. A fracture along which there has been displacement is a fault. When walls of a fracture have moved only normal to each other, the fracture is called a joint. Fractures can enhance permeability of rocks greatly by connecting pores together, and for that reason, fractures are induced mechanically in some reservoirs in order to boost hydrocarbon flow. Fractures may also be referred to as natural fractures to distinguish them from fractures induced as part of a reservoir stimulation or drilling operation. In some shale reservoirs, natural fractures improve production by enhancing effective permeability. In other cases, natural fractures can complicate reservoir stimulation.

free gas: the gaseous phase present in a reservoir or other contained area. Gas may be found either dissolved in reservoir fluids or as free gas that tends to form a gas cap beneath the top seal on the reservoir trap. Both free gas and dissolved gas play important roles in the reservoir-drive mechanism.

gas cap: part of a petroleum reservoir that contains free gas

geological formation: stratigraphic unit with distinct rock types, which is able to mapped at surface or in the subsurface, and which formed at a specific period of geological time

groundwater: water occurring naturally below ground level (whether stored in or flowing through aquifers or within low-permeability aquitards), or water occurring at a place below ground that has been pumped, diverted or released to that place for storage there. This does not include water held in underground tanks, pipes or other works.

groundwater-dependent ecosystem: ecosystems that require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements

groundwater system: see water system

hazard: an event, or chain of events, that might result in an effect (change in the quality and/or quantity of surface water or groundwater)

hydraulic fracturing: also known as ‘fracking’, ‘fracking’ or ‘fracture stimulation’. This is a process by which geological formations bearing hydrocarbons (oil and gas) are ‘stimulated’ to increase the flow of hydrocarbons and other fluids towards the well. In most cases, hydraulic fracturing is undertaken where the permeability of the formation is initially insufficient to support sustained flow of gas. The process involves the injection of fluids, proppant and additives under high pressure into a geological formation to create a conductive fracture. The fracture extends from the well into the production interval, creating a pathway through which oil or gas is transported to the well.

hydraulic fracturing fluid: the fluid injected into a well for hydraulic fracturing. Consists of a primary carrier fluid (usually water or a gel), a proppant such as sand and chemicals to modify the fluid properties.

hydrocarbons: various organic compounds composed of hydrogen and carbon atoms that can exist as solids, liquids or gases. Sometimes this term is used loosely to refer to petroleum.

hydrogeology: the study of groundwater, including flow in aquifers, groundwater resource evaluation, and the chemistry of interactions between water and rock

hydrological connectivity: a descriptive measure of the interaction between water bodies (groundwater and/or surface water)

hydrostatic pressure: equal pressure in all direction, equivalent to the pressure which is exerted on a portion of a column of water as a result of the weight of the fluid above it

impact: the difference between what could happen as a result of activities and processes associated with extractive industries, such as shale, tight and deep coal gas development, and what would happen without them. Impacts may be changes that occur to the natural environment, community or economy. Impacts can be a direct or indirect result of activities, or a cumulative result of multiple activities or processes.

impact cause: an activity (or aspect of an activity) that initiates a hazardous chain of events

impact mode: the manner in which a hazardous chain of events (initiated by an impact cause) could result in an effect (change in the quality and/or quantity of surface water or groundwater). There might be multiple impact modes for each activity or chain of events.

Impact Modes and Effects Analysis: a systematic hazard identification and prioritisation technique based on Failure Modes and Effects Analysis

injection: the forcing or pumping of substances into a porous and permeable subsurface rock formation. Examples of injected substances can include either gases or liquids.

kerogen: insoluble (in organic solvents) particulate organic matter preserved in sedimentary rocks that consists of various macerals originating from components of plants, animals, and bacteria. Kerogen can be isolated from ground rock by extracting bitumen with solvents and removing most of the rock matrix with hydrochloric and hydrofluoric acids.

known accumulation: the term accumulation is used to identify an individual body of moveable petroleum. The key requirement to consider an accumulation as known, and hence contain reserves or contingent resources, is that each accumulation/reservoir must have been penetrated by a well. In general, the well must have clearly demonstrated the existence of moveable petroleum in that reservoir by flow to surface or at least some recovery of a sample of petroleum from the well. However, where log and/or core data exist, this may suffice, provided there is a good analogy to a nearby and geologically comparable known accumulation.

Lake Eyre Basin: a geologic province containing Cenozoic terrestrial sedimentary rocks within the Lake Eyre surface water catchment. It covers parts of northern and eastern SA, south-eastern NT, western Queensland and north-western NSW. In the Cooper GBA region, the basin sedimentary package is less than 300 m thick.

landscape class: for the purposes of geological and bioregional assessments (GBA), a collection of ecosystems with characteristics that are expected to respond similarly to changes in groundwater and/or surface water due to unconventional gas resource development. Note that there is expected to be less heterogeneity in the response within a landscape class than between landscape classes. They are present on the landscape across the entire GBA region and their spatial coverage is exhaustive and non-overlapping. Conceptually, landscape classes can be considered as types of ecosystem assets.

life-cycle stage: one of five stages of operations in unconventional gas resource development considered as part of the Impact Modes and Effects Analysis (IMEA). These are exploration, appraisal, development, production, and rehabilitation. Each life-cycle stage is further divided into major activities, which are further divided into activities.

likelihood: probability that something might happen

lithology: the description of rocks, especially in hand specimen and in outcrop, on the basis of characteristics such as colour, mineralogic composition and grain size

material: pertinent or relevant

mature: a hydrocarbon source rock that has started generating hydrocarbons

metamorphic rock: a rock formed from pre-existing rock due to high temperature and pressure in the Earth's crust, but without complete melting

methane: a colourless, odourless gas, the simplest paraffin hydrocarbon, formula CH₄. It is the principal constituent of natural gas and is also found associated with crude oil. Methane is a greenhouse gas in the atmosphere because it absorbs long-wavelength radiation from the Earth's surface.

migration: the process whereby fluids and gases move through rocks. In petroleum geoscience, 'migration' refers to when petroleum moves from source rocks toward reservoirs or seep sites. Primary migration consists of movement of petroleum to exit the source rock. Secondary migration occurs when oil and gas move along a carrier bed from the source to the reservoir or seep. Tertiary migration is where oil and gas move from one trap to another or to a seep.

Moho: the Mohorivicic discontinuity (seismic reflector) at the base of the crust

natural gas: the portion of petroleum that exists either in the gaseous phase or is in solution in crude oil in natural underground reservoirs, and which is gaseous at atmospheric conditions of pressure and temperature. Natural gas may include amounts of non-hydrocarbons.

oil: a mixture of liquid hydrocarbons and other compounds of different molecular weights. Gas is often found in association with oil. Also see petroleum.

oil-prone: organic matter that generates significant quantities of oil at optimal maturity

organic matter: biogenic, carbonaceous materials. Organic matter preserved in rocks includes kerogen, bitumen, oil and gas. Different types of organic matter can have different oil-generative potential.

outcrop: a body of rock exposed at the surface of the Earth

overpressure: occurs when the pore pressure is higher than the hydrostatic pressure, caused by an increase in the amount of fluid or gas in the rock, or changes to the rock that reduce the amount of pore space. If the fluid cannot escape, the result is an increase in pore pressure. Overpressure can only occur where there are impermeable layers preventing the vertical flow of water, otherwise the water would flow upwards to equalise back to hydrostatic pressure.

P10: in terms of petroleum resource classification, P10 indicates a 10% probability that this volume of oil or gas will be found or exceeded

pay: a reservoir or portion of a reservoir that contains economically producible hydrocarbons. The term derives from the fact that it is capable of 'paying' an income. Pay is also called pay sand or pay zone. The overall interval in which pay sections occur is the gross pay; the smaller portions of the gross pay that meet local criteria for pay (such as minimum porosity, permeability and hydrocarbon saturation) are net pay.

pay zone: see pay

permeability: the measure of the ability of a rock, soil or sediment to yield or transmit a fluid. The magnitude of permeability depends largely on the porosity and the interconnectivity of pores and spaces in the ground.

petroleum: a naturally occurring mixture consisting predominantly of hydrocarbons in the gaseous, liquid or solid phase

petroleum system: the genetic relationship between a pod of source rock that is actively producing hydrocarbon, and the resulting oil and gas accumulations. It includes all the essential elements and processes needed for oil and gas accumulations to exist. These include the source, reservoir, seal, and overburden rocks, the trap formation, and the hydrocarbon generation, migration and accumulation processes. All essential elements and processes must occur in the appropriate time and space in order for petroleum to accumulate.

play: a conceptual model for a style of hydrocarbon accumulation used during exploration to develop prospects in a basin, region or trend and used by development personnel to continue exploiting a given trend. A play (or group of interrelated plays) generally occurs in a single petroleum system.

plug: a mechanical device or material (such as cement) placed within a well to prevent vertical movement of fluids

porosity: the proportion of the volume of rock consisting of pores, usually expressed as a percentage of the total rock or soil mass

potential effect: specific types of impacts or changes to water or the environment, such as changes to the quantity and/or quality of surface water or groundwater, or to the availability of suitable habitat

produced water: a term used in the oil industry to describe water that is produced as a by-product along with the oil and gas. Oil and gas reservoirs often have water as well as hydrocarbons, sometimes in a zone that lies under the hydrocarbons, and sometimes in the same zone with the oil and gas. The terms 'co-produced water' and 'produced water' are sometimes used interchangeably by government and industry. However, in the geological and bioregional assessments, 'produced water' is used to describe water produced as a by-product of shale and tight gas resource development, whereas 'co-produced water' refers to the large amounts of water produced as a by-product of coal seam gas development.

producing: a well or rock formation from which oil, gas or water is produced

production: in petroleum resource assessments, 'production' refers to the cumulative quantity of oil and natural gas that has been recovered already (by a specified date). This is primarily output from operations that has already been produced.

production activity: any physical activity associated with drilling and hydraulic fracturing (which may include clearing and/or well construction) pursuant to the granting of production approvals for onshore shale gas on a production licence

production approvals: all operational approvals granted under the Schedule and all environmental approvals granted under the Petroleum Environment Regulations on a production licence for a production activity

production well: a well used to remove oil or gas from a reservoir

proppant: a component of the hydraulic fracturing fluid system comprising sand, ceramics or other granular material that 'prop' open fractures to prevent them from closing when the injection is stopped

reserves: quantities of petroleum anticipated to be commercially recoverable in known accumulations from a given date forward under defined conditions. Reserves must further satisfy four criteria: they must be discovered, recoverable, commercial and remaining (as of the evaluation date) based on the development project(s) applied.

reservoir: a subsurface body of rock having sufficient porosity and permeability to store and transmit fluids and gases. Sedimentary rocks are the most common reservoir rocks because they have more porosity than most igneous and metamorphic rocks and form under temperature conditions at which hydrocarbons can be preserved. A reservoir is a critical component of a complete petroleum system.

reservoir rock: any porous and permeable rock that contains liquids or gases (e.g. petroleum, water, CO₂), such as porous sandstone, vuggy carbonate and fractured shale

ridge: a narrow, linear geological feature that forms a continuous elevated crest for some distance (e.g. a chain of hills or mountains or a watershed)

riparian: within or along the banks of a stream or adjacent to a watercourse or wetland; relating to a riverbank and its environment, particularly to the vegetation

risk: the effect of uncertainty on objectives (AS/NZ ISO 3100). This involves assessing the potential consequences and likelihood of impacts to environmental and human values that may stem from an action, under the uncertainty caused by variability and incomplete knowledge of the system of interest.

runoff: rainfall that does not infiltrate the ground or evaporate to the atmosphere. This water flows down a slope and enters surface water systems.

sandstone: a sedimentary rock composed of sand-sized particles (measuring 0.05–2.0 mm in diameter), typically quartz

seal: a relatively impermeable rock, commonly shale, anhydrite or salt, that forms a barrier or cap above and around reservoir rock such that fluids cannot migrate beyond the reservoir. A seal is a critical component of a complete petroleum system.

sediment: various materials deposited by water, wind or glacial ice, or by precipitation from water by chemical or biological action (e.g. clay, sand, carbonate)

sedimentary rock: a rock formed by lithification of sediment transported or precipitated at the Earth's surface and accumulated in layers. These rocks can contain fragments of older rock transported and deposited by water, air or ice, chemical rocks formed by precipitation from solution, and remains of plants and animals.

seismic survey: a method for imaging the subsurface using controlled seismic energy sources and receivers at the surface. Measures the reflection and refraction of seismic energy as it travels through rock.

shale: a fine-grained sedimentary rock formed by lithification of mud that is fissile or fractures easily along bedding planes and is dominated by clay-sized particles

shale gas: generally extracted from a clay-rich sedimentary rock, which has naturally low permeability. The gas it contains is either adsorbed or in a free state in the pores of the rock.

shear: a frictional force that tends to cause contiguous parts of a body to slide relative to each other in a direction parallel to their plane of contact

source rock: a rock rich in organic matter which, if heated sufficiently, will generate oil or gas. Typical source rocks, usually shales or limestones, contain about 1% organic matter and at least 0.5% total organic carbon (TOC), although a rich source rock might have as much as 10% organic matter. Rocks of marine origin tend to be oil-prone, whereas terrestrial source rocks (such as coal) tend to be gas-prone. Preservation of organic matter without degradation is critical to creating a good source rock, and necessary for a complete petroleum system. Under the right conditions, source rocks may also be reservoir rocks, as in the case of shale gas reservoirs.

spring: a naturally occurring discharge of groundwater flowing out of the ground, often forming a small stream or pool of water. Typically, it represents the point at which the watertable intersects ground level.

stress: the force applied to a body that can result in deformation, or strain, usually described in terms of magnitude per unit of area, or intensity

stressor: chemical or biological agent, environmental condition or external stimulus that might contribute to an impact mode

structure: a geological feature produced by deformation of the Earth's crust, such as a fold or a fault; a feature within a rock, such as a fracture or bedding surface; or, more generally, the spatial arrangement of rocks

surface water: water that flows over land and in watercourses or artificial channels and can be captured, stored and supplemented from dams and reservoirs

terrane: an area of crust with a distinct assemblage of rocks (as opposed to terrain, which implies topography, such as rolling hills or rugged mountains)

tight gas: tight gas is trapped in reservoirs characterised by very low porosity and permeability. The rock pores that contain the gas are minuscule, and the interconnections between them are so limited that the gas can only migrate through it with great difficulty.

total organic carbon: the quantity of organic matter (kerogen and bitumen) is expressed in terms of the total organic carbon (TOC) content in mass per cent. The TOC value is the most basic measurement for determining the ability of sedimentary rocks to generate and expel hydrocarbons.

trap: a geologic feature that permits an accumulation of liquid or gas (e.g. natural gas, water, oil, injected CO₂) and prevents its escape. Traps may be structural (e.g. domes, anticlines), stratigraphic (pinchouts, permeability changes) or combinations of both.

unconfined aquifer: an aquifer whose upper water surface (watertable) is at atmospheric pressure and does not have a confining layer of low-permeability rock or sediment above it

unconventional gas: unconventional gas is generally produced from complex geological systems that prevent or significantly limit the migration of gas and require innovative technological solutions for extraction. There are numerous types of unconventional gas such as coal seam gas, deep coal gas, shale gas and tight gas.

water system: a system that is hydrologically connected and described at the level desired for management purposes (e.g. subcatchment, catchment, basin or drainage division, or groundwater management unit, subaquifer, aquifer, groundwater basin)

watertable: the upper surface of a body of groundwater occurring in an unconfined aquifer. At the watertable, pore water pressure equals atmospheric pressure.

weathering: the breakdown of rocks and other materials at the Earth's surface caused by mechanical action and reactions with air, water and organisms. Weathering of seep oils or improperly sealed oil samples by exposure to air results in evaporative loss of light hydrocarbons.

well: typically a narrow diameter hole drilled into the earth for the purposes of exploring, evaluating, injecting or recovering various natural resources, such as hydrocarbons (oil and gas), water or carbon dioxide. Wells are sometimes known as a 'wellbore'.

well barrier: envelope of one or several dependent barrier elements (including casing, cement, and any other downhole or surface sealing components) that prevent fluids from flowing unintentionally between a bore or a well and geological formations, between geological formations or to the surface.

well integrity: maintaining full control of fluids (or gases) within a well at all times by employing and maintaining one or more well barriers to prevent unintended fluid (gas or liquid) movement between formations with different pressure regimes, or loss of containment to the environment

well pad: the area of land on which the surface infrastructure for drilling and hydraulic fracturing operations are placed. The size of a well pad depends on the type of operation (for example, well pads are larger during the initial drilling and hydraulic fracturing than at production).

www.bioregionalassessments.gov.au



Australian Government

**Department of Agriculture,
Water and the Environment**

Bureau of Meteorology

Geoscience Australia



Hughes, Anne – Thursday, 26 November 2020 – 18:16:10

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Anne Hughes
Sent	26/11/2020 6:16:10 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Anne Hughes

North Maleny, Queensland, 4552, Australia

This email was sent by Anne Hughes via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Anne provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Anne Hughes at *****.

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Hughes, Teghan – Monday, 30 November 2020 – 00:14:44

Subject	Strong Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Teghan Hughes
Sent	30/11/2020 12:14:44 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my strong objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Teghan Hughes

Darwin DC, Northern Territory, 0820, Australia

This email was sent by Teghan Hughes via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Teghan provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Teghan Hughes at *****.

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Huigen, Anna – Thursday, 26 November 2020 – 13:39:28

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Anna Huigen
Sent	26/11/2020 1:39:28 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

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5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Anna Huigen

White Gums, Northern Territory, 0870, Australia

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Jacob, Rosemary – Sunday, 29 November 2020 – 18:03:42

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Rosemary Jacob
Sent	29/11/2020 6:03:42 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Rosemary Jacob

Darwin DC, Northern Territory, 0820, Australia

This email was sent by Rosemary Jacob via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Rosemary provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Rosemary Jacob at *****.

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Jansons, Sergei – Thursday, 26 November 2020 – 12:29:07

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Sergei Jansons
Sent	26/11/2020 12:29:07 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

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I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Sergei Jansons

White Gums, Northern Territory, 0870, Australia

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Please reply to Sergei Jansons at *****.

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John – Thursday, 10 December 2020 – 06:14:52

Subject	Call on the NTEPA to subject Santos and Origin's fracking plans to a full public environmental impact assessment
From	John
Sent	10/12/2020 6:14:52 AM

To the Northern Territory Environment Protection Authority (NTEPA), we the undersigned call on you to immediately call in Santos and Origin's fracking plans for public environmental assessment under the Environment Protection Act 2019 (NT).

Origin and Santos are right now seeking permission from the Gunner Government to drill 6 new wells for fracking in the Beetaloo Basin.

These are the latest of many fracking approvals handed out by the Northern Territory Government. Since the moratorium on onshore fracking in the Territory was lifted in April 2018, there have been 18 separate approvals given for gas exploration activities in the Beetaloo Basin alone.

Despite the extensive activities of gas companies across the Beetaloo Basin for many years, there has never been a public environmental impact assessment of these activities.

The gas industry is establishing itself by stealth, using fragmented, piecemeal approvals to entrench its presence without appropriate public scrutiny of its impacts.

This must stop.

The NTEPA has power to "call in" any projects that have the potential to have a significant impact on the environment for environmental impact assessment under the new Environment Protection Act 2020 (NT). It's time for these new laws to be put to the test!

The drilling and fracking of new fracking wells, and other activities related to fracking, pose the following threats:

- (a) the risk of damage to cultural heritage, and land and waters subject to native title rights and interests;
- (b) the risk of contamination of groundwater;
- (c) the risk of contamination of surface water;
- (d) the risk of contamination to soils;
- (e) the risk of greenhouse gas emissions in the project area;
- (f) the risk of damage to threatened species in the project area; and
- (g) the risk of damage to flora in the project area.

The NTEPA should immediately call in Santos and Origin's fracking plans for public environment assessment under the Environment Protection Act (NT), so that their activities can be subjected to transparent and scientific scrutiny.

To the NTEPA, we the undersigned call on you to immediately call in Santos and Origin's fracking plans for public environmental assessment under the Environment Protection Act 2020 (NT).

Joost, Oliver – Tuesday, 01 December 2020 – 15:41:39

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Oliver Joost
Sent	1/12/2020 3:41:39 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

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Please reply to Oliver Joost at *****.

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Kahler, Patricia – Thursday, 26 November 2020 – 19:48:43

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Patricia Kahler
Sent	26/11/2020 7:48:43 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Patricia Kahler

New South Wales, 2540, Australia

This email was sent by Patricia Kahler via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Patricia provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Patricia Kahler at *****.

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Kaoustos, Gabrielle – Thursday, 26 November 2020 – 11:56:46

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Gabrielle Kaoustos
Sent	26/11/2020 11:56:46 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Gabrielle Kaoustos

Truganina, Victoria, 3029, Australia

This email was sent by Gabrielle Kaoustos via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Gabrielle provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Gabrielle Kaoustos at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Kelly, Jane – Friday, 27 November 2020 – 12:39:38

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jane Kelly
Sent	27/11/2020 12:39:38 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Jane Kelly

Girraween, Queensland, 4382, Australia

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Please reply to Jane Kelly at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Kent, Judyanne – Thursday, 26 November 2020 – 15:10:19

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Judyanne Kent
Sent	26/11/2020 3:10:19 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Judyanne Kent

Girraween, Northern Territory, 0836, Australia

This email was sent by Judyanne Kent via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Judyanne provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Judyanne Kent at *****.

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Koelen, Jacki – Thursday, 26 November 2020 – 22:00:24

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jacki Koelen
Sent	26/11/2020 10:00:24 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Jacki Koelen

Girraween, Northern Territory, 0836, Australia

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Please reply to Jacki Koelen at *****.

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Koser, Dianne – Thursday, 26 November 2020 – 11:42:50

Subject	Concern about increased Greenhouse gas and rising temperatures.Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Dianne Koser
Sent	26/11/2020 11:42:50 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Dianne Koser

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Dianne Koser via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Dianne provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Dianne Koser at *****.

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Kretser, Steve – Monday, 07 December 2020 – 09:45:31

Subject	In case you didn't know....
From	Steve De Kretser
Sent	7/12/2020 9:45:31 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I'm a NT resident since 1971, and enjoy the wild and clean environment around Darwin.

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Steve de Kretser

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Steve de Kretser via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Steve provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Steve de Kretser at *****.

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Kuhl, Christine – Thursday, 26 November 2020 – 10:40:43

Subject	No Fracking - For my children and their children
From	Christine Kuhl
Sent	26/11/2020 10:40:43 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGRS emissions estimates. NGRS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Christine Kuhl

Darwin City, Northern Territory, 0800, Australia

This email was sent by Christine Kuhl via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Christine provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Christine Kuhl at *****.

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Kyriacou, Sharon – Thursday, 03 December 2020 – 14:59:46

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Sharon Kyriacou
Sent	3/12/2020 2:59:46 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Sharon Kyriacou

Girraween, Northern Territory, 0836, Australia

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Please reply to Sharon Kyriacou at *****.

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Lancaster, Sandra – Thursday, 26 November 2020 – 12:27:02

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Sandra Lancaster
Sent	26/11/2020 12:27:02 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Sandra Lancaster

Nightcliff, Northern Territory, 0810, Australia

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Please reply to Sandra Lancaster at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Ledger, Annie – Thursday, 26 November 2020 – 11:01:31

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Annie Ledger
Sent	26/11/2020 11:01:31 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns. I sincerely hope for your attention to these concerns, that you can understand the importance of these concerns and that you act for good, for health, for the rights of the land and people.

Yours sincerely,

Annie Ledger

North Maleny, Queensland, 4552, Australia

This email was sent by Annie Ledger via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Annie provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Annie Ledger at *****.

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Ledger, Joshua – Saturday, 28 November 2020 – 14:01:44

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Joshua Ledger
Sent	28/11/2020 2:01:44 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I deeply resent the misleading/soft image that Santos projects on public media. Pursuing this project will destroy the very values that Santos publicly claims to promote and protect, community and environment. This hypocrisy alone makes Santos' projects a serious concern for all Australians.

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

joshua ledger

Capel, Western Australia, 6271, Australia

This email was sent by joshua ledger via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however joshua provided an email address (*****) which we included in the REPLY-TO field.

Please reply to joshua ledger at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Lennie, Amiuus – Thursday, 26 November 2020 – 11:52:55

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Amiuus Lennie
Sent	26/11/2020 11:52:55 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

WATER IS TOO PRECIOUS TO WASTE, SIMPLY FOR RETURN ON INVESTMENT!

Estimates suggest between 20- 40 mega litres of water are used per well. The CSIRO has said that fracking in arid areas is not considered best practice. Community members have not been provided with accurate, up to date information regarding the amounts of water being drawn from the aquifers during the fracking process. Given the resistance to the government's pending approval for a 40 megalitre per annum water license for a horticultural enterprise, surely you can acknowledge that the outcry would be enormous if people were properly informed regarding the quantity of water used in fracking. **YOU HAVE NO SOCIAL LICENCE TO PROCEED. TRY TELLING YOUR CHILDREN THEY ARE NOT ALLOWED TO DRINK WATER BECAUSE YOU NEED TO MAKE A ROI!**

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Amiuis Lennie

Flynn, Northern Territory, 0875, Australia

This email was sent by Amius Lennie via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Amius provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Amius Lennie at *****.

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Lohmann, Berny – Thursday, 26 November 2020 – 13:22:57

Subject	Berny Lohmanns Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Berny Lohmann
Sent	26/11/2020 1:22:57 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

My name is Berny Lohmann. I am an Australian citizen and full time worker.

I am writing to express my objection to the Environmental damage and poison being done to the land and waters.

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Berny Lohmann

Kensington Park, South Australia, 5068, Australia

This email was sent by Berny Lohmann via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Berny provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Berny Lohmann at *****.

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Lowcock, John – Thursday, 26 November 2020 – 14:07:24

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	John Lowcock
Sent	26/11/2020 2:07:24 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

john lowcock

Moulden, Northern Territory, 0830, Australia

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Please reply to john lowcock at *****.

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Maddock, Donna – Thursday, 03 December 2020 – 13:28:18

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Donna Maddock
Sent	3/12/2020 1:28:18 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

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Please reply to Donna Maddock at *****.

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Maddocks, Geoffrey – Friday, 04 December 2020 – 15:11:23

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Geoffrey Maddocks
Sent	4/12/2020 3:11:23 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Geoffrey Maddocks

Oaklands Park, South Australia, 5046, Australia

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Please reply to Geoffrey Maddocks at *****.

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Mahaffey, Leeanne – Thursday, 26 November 2020 – 11:03:07

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Leeanne Mahaffey
Sent	26/11/2020 11:03:07 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

leeanne mahaffey

Nightcliff, Northern Territory, 0810, Australia

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Please reply to leeanne mahaffey at *****.

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Marsden, Alesoun – Saturday, 05 December 2020 – 07:25:40

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP. Stop Fracking.
From	Alesoun Marsden
Sent	5/12/2020 7:25:40 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

This is appalling!

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Alesoun Marsden

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Please reply to Alesoun Marsden at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Mattia, Lou – Wednesday, 09 December 2020 – 14:54:50

Subject	Call on the NTEPA to subject Santos and Origin's fracking plans to a full public environmental impact assessment
From	Lou De Mattia
Sent	9/12/2020 2:54:50 PM

To the Northern Territory Environment Protection Authority (NTEPA), we the undersigned call on you to immediately call in Santos and Origin's fracking plans for public environmental assessment under the Environment Protection Act 2019 (NT).

Origin and Santos are right now seeking permission from the Gunner Government to drill 6 new wells for fracking in the Beetaloo Basin.

These are the latest of many fracking approvals handed out by the Northern Territory Government. Since the moratorium on onshore fracking in the Territory was lifted in April 2018, there have been 18 separate approvals given for gas exploration activities in the Beetaloo Basin alone.

Despite the extensive activities of gas companies across the Beetaloo Basin for many years, there has never been a public environmental impact assessment of these activities.

The gas industry is establishing itself by stealth, using fragmented, piecemeal approvals to entrench its presence without appropriate public scrutiny of its impacts.

This must stop.

The NTEPA has power to "call in" any projects that have the potential to have a significant impact on the environment for environmental impact assessment under the new Environment Protection Act 2020 (NT). It's time for these new laws to be put to the test!

The drilling and fracking of new fracking wells, and other activities related to fracking, pose the following threats:

- (a) the risk of damage to cultural heritage, and land and waters subject to native title rights and interests;
- (b) the risk of contamination of groundwater;
- (c) the risk of contamination of surface water;
- (d) the risk of contamination to soils;
- (e) the risk of greenhouse gas emissions in the project area;
- (f) the risk of damage to threatened species in the project area; and
- (g) the risk of damage to flora in the project area.

The NTEPA should immediately call in Santos and Origin's fracking plans for public environment assessment under the Environment Protection Act (NT), so that their activities can be subjected to transparent and scientific scrutiny.

To the NTEPA, we the undersigned call on you to immediately call in Santos and Origin's fracking plans for public environmental assessment under the Environment Protection Act 2020 (NT).

Mcevoy, Andrew – Thursday, 26 November 2020 – 13:20:36

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Andrew Mcevoy
Sent	26/11/2020 1:20:36 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Andrew McEvoy

Moulden, Northern Territory, 0830, Australia

This email was sent by Andrew McEvoy via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Andrew provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Andrew McEvoy at *****.

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Mcgill, Ian – Friday, 27 November 2020 – 07:10:23

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Ian McGill
Sent	27/11/2020 7:10:23 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

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Please reply to Ian McGill at *****.

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Mcginley, Billee – Thursday, 26 November 2020 – 17:02:50

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Billee McGinley
Sent	26/11/2020 5:02:50 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Billee McGinley

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Billee McGinley via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Billee provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Billee McGinley at *****,

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Mcintyre, Heather – Friday, 27 November 2020 – 21:52:25

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Heather McIntyre
Sent	27/11/2020 9:52:25 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Heather McIntyre

White Gums, Northern Territory, 0870, Australia

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Please reply to Heather McIntyre at *****.

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Mcphee, Bernadette – Thursday, 26 November 2020 –
12:14:34

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Bernadette Mcphee
Sent	26/11/2020 12:14:34 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

I write on behalf of myself, adult family of 6 with large and extended families, networks and communities. I also write on behalf of my and your future generations. I also write in solidarity with Traditional Owners, the First Nations People who have cared for and nurtured this land for 125K+ years, sovereignty was never ceded, and like the majority of people on this great southern land, say No to Gas, and especially no to fracking. Fossil Fuels are destroying this country, our world and planet. Renewables are cheaper and readily available. Gas and Coal are nothing but stranded assets, and you know it!

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Bernadette McPhee

Glen Waverley , Victoria, 3150, Australia

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Please reply to Bernadette McPhee at ***** .

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Merry, Kate – Thursday, 26 November 2020 – 10:36:21

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Kate Merry
Sent	26/11/2020 10:36:21 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Kate Merry

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Please reply to Kate Merry at *****.

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Messthaler, Wolf – Thursday, 10 December 2020 – 17:12:31

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Wolf Messthaler
Sent	10/12/2020 5:12:31 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

wolf Messthaler

Bouddi, New South Wales, 2251, Australia

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Please reply to wolf Messthaler at *****.

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Mindszenty, Katalina – Friday, 27 November 2020 – 09:26:01

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Katalina Mindszenty
Sent	27/11/2020 9:26:01 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Katalina Mindszenty

Alice Springs, Northern Territory, 0870, Australia

This email was sent by Katalina Mindszenty via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Katalina provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Katalina Mindszenty at *****.

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Molanus, Barbara – Monday, 07 December 2020 – 11:47:52

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Barbara Molanus
Sent	7/12/2020 11:47:52 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Barbara Molanus

White Gums, Northern Territory, 0870, Australia

This email was sent by Barbara Molanus via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Barbara provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Barbara Molanus at *****.

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Montey, Karen – Friday, 18 December 2020 – 01:26:27

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Karen Montey
Sent	18/12/2020 1:26:27 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Karen Montey

White Gums, Northern Territory, 0870, Australia

This email was sent by Karen Montey via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Karen provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Karen Montey at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Morgan, Michelle – Saturday, 28 November 2020 – 07:03:33

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Michelle Morgan
Sent	28/11/2020 7:03:33 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

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Please reply to Michelle Morgan at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

MORONY, Amanda – Thursday, 26 November 2020 – 11:32:07

Subject	Stop SANTOS fracking
From	Amanda MORONY
Sent	26/11/2020 11:32:07 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Amanda MORONY

Adelaide, South Australia, 5000, Australia

This email was sent by Amanda MORONY via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Amanda provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Amanda MORONY at *****.

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Mortimer, Shane – Thursday, 26 November 2020 – 14:13:53

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Shane Mortimer
Sent	26/11/2020 2:13:53 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Shane Mortimer

Curtin, Australian Capital Territory, 2605, Australia

This email was sent by Shane Mortimer via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Shane provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Shane Mortimer at *****.

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Murfet, Maree – Tuesday, 01 December 2020 – 13:36:52

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Maree Murfet
Sent	1/12/2020 1:36:52 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Maree Murfet

Deeral, Queensland, 4871, Australia

This email was sent by Maree Murfet via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Maree provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Maree Murfet at *****.

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Murray, Neil – Thursday, 26 November 2020 – 11:31:33

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Neil Murray
Sent	26/11/2020 11:31:33 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Neil Murray

Lake Bolac, Victoria, 3351, Australia

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Please reply to Neil Murray at *********.

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Naden, Chris – Thursday, 26 November 2020 – 10:39:55

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Chris Naden
Sent	26/11/2020 10:39:55 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Chris Naden

Darwin DC, Northern Territory, 0820, Australia

This email was sent by Chris Naden via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Chris provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Chris Naden at *****.

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Napaltjari, Lorraine – Tuesday, 01 December 2020 – 23:31:25

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Lorraine Gibson Napaltjari
Sent	1/12/2020 11:31:25 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Lorraine Gibson Napaltjari via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Lorraine provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Lorraine Gibson Napaltjari at *****.

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Newham, Dianna – Sunday, 29 November 2020 – 18:17:44

Subject	Objection to SANTOS' plans to frack in the NT
From	Dianna Newham
Sent	29/11/2020 6:17:44 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I have lived in Alice Springs for 19 years and am extremely concerned about the NT Government's support for a hydraulic fracturing industry. I am concerned because of the risk to our water, because of the greenhouse gas emissions and because of the lack of economic gains in this industry. Specifically, I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below. I think it is extremely poor form to have a consultation process for three EMPs that closes in mid December, at the end of what has been a particularly stressful and tiring year.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Dianna Newham

White Gums, Northern Territory, 0870, Australia

This email was sent by Dianna Newham via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Dianna provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Dianna Newham at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Newman, Lynette – Friday, 04 December 2020 – 15:55:06

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Lynette Newman
Sent	4/12/2020 3:55:06 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Lynette Newman

, Queensland, 4650, Australia

This email was sent by Lynette Newman via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Lynette provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Lynette Newman at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Norman, Rosa – Thursday, 17 December 2020 – 03:25:39

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Rosa Norman
Sent	17/12/2020 3:25:39 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Rosa Norman

Darwin DC, Northern Territory, 0820, Australia

This email was sent by Rosa Norman via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Rosa provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Rosa Norman at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

O'keefe, Allan – Thursday, 26 November 2020 – 18:11:38

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Allan O'keefe
Sent	26/11/2020 6:11:38 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Allan O'Keefe

This email was sent by Allan O'Keefe via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Allan provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Allan O'Keefe at *****.

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Oloughlin, Nick – Thursday, 26 November 2020 – 13:39:22

Subject	Pepper Requirements and Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Nick O'loughlin
Sent	26/11/2020 1:39:22 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Nick O'Loughlin via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Nick provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Nick O'Loughlin at *****.

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Oreilly, Rachel – Thursday, 26 November 2020 – 22:16:30

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Rachel O'reilly
Sent	26/11/2020 10:16:30 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Rachel O'Reilly

Highgate Hill, Queensland, 4101, Australia

This email was sent by Rachel O'Reilly via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Rachel provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Rachel O'Reilly at *****.

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Orstavik, Arne – Monday, 30 November 2020 – 12:01:34

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Arne Orstavik
Sent	30/11/2020 12:01:34 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Arne Orstavik

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Arne Orstavik via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Arne provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Arne Orstavik at *****,

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Owheel, Monica – Thursday, 26 November 2020 – 12:37:20

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Monica O'wheel
Sent	26/11/2020 12:37:20 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Monica O'Wheel

Joslin, South Australia, 5070, Australia

This email was sent by Monica O'Wheel via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Monica provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Monica O'Wheel at *****.

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Passmore, Ruth – Friday, 04 December 2020 – 19:58:55

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Ruth Passmore
Sent	4/12/2020 7:58:55 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Ruth Passmore

Toolara Forest, Queensland, 4570, Australia

This email was sent by Ruth Passmore via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Ruth provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Ruth Passmore at *****.

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Pearce, Sarah – Saturday, 05 December 2020 – 05:47:24

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Sarah Pearce
Sent	5/12/2020 5:47:24 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Sarah Pearce

Maffra, Victoria, 3860, Australia

This email was sent by Sarah Pearce via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Sarah provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Sarah Pearce at *****,

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Pecorari, Domenico – Thursday, 26 November 2020 – 12:29:48

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Domenico Pecorari
Sent	26/11/2020 12:29:48 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Domenico Pecorari

White Gums, Northern Territory, 0870, Australia

This email was sent by Domenico Pecorari via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Domenico provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Domenico Pecorari at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Petursson, Jenny – Thursday, 26 November 2020 – 18:07:26

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jenny Petursson
Sent	26/11/2020 6:07:26 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Jenny Petursson

Coolalinga, Northern Territory, 0839, Australia

This email was sent by Jenny Petursson via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Jenny provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Jenny Petursson at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Philipp, Kristine – Thursday, 26 November 2020 – 22:28:21

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Kristine Philipp
Sent	26/11/2020 10:28:21 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Kristine Philipp

Abbotsford, Victoria, 3067, Australia

This email was sent by Kristine Philipp via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Kristine provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Kristine Philipp at *****.

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Pietsch, Nicole – Saturday, 28 November 2020 – 16:47:56

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Nicole Pietsch
Sent	28/11/2020 4:47:56 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Nicole Pietsch

White Gums, Northern Territory, 0870, Australia

This email was sent by Nicole Pietsch via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Nicole provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Nicole Pietsch at *****.

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Purnell, Maddison – Tuesday, 01 December 2020 – 09:24:25

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Maddison Purnell
Sent	1/12/2020 9:24:25 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Maddison Purnell

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Maddison Purnell via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Maddison provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Maddison Purnell at *****.

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Quan, Richard – Monday, 30 November 2020 – 14:54:44

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Richard Quan
Sent	30/11/2020 2:54:44 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Richard Quan

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Richard Quan via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Richard provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Richard Quan at *****.

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Ralston, Chris – Thursday, 26 November 2020 – 15:31:32

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Chris Ralston
Sent	26/11/2020 3:31:32 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Chris Ralston

Adelaide River, Northern Territory, 0846, Australia

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Please reply to Chris Ralston at *****.

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Ratajczyk, Sally – Monday, 21 December 2020 – 16:46:09

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Sally Ratajczyk
Sent	21/12/2020 4:46:09 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Sally Ratajczyk

Cherokee, Victoria, 3434, Australia

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Please reply to Sally Ratajczyk at *****.

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Rawlings, Andrew – Thursday, 03 December 2020 – 06:27:03

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Andrew Rawlings
Sent	3/12/2020 6:27:03 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Andrew Rawlings

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Andrew Rawlings via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Andrew provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Andrew Rawlings at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Ray, Jason – Thursday, 26 November 2020 – 21:02:28

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jason Ray
Sent	26/11/2020 9:02:28 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Jason Ray

Batman, Victoria, 3058, Australia

This email was sent by Jason Ray via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Jason provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Jason Ray at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Reilly, Lesley – Monday, 07 December 2020 – 21:09:56

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Lesley Reilly
Sent	7/12/2020 9:09:56 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Lesley Reilly

White Gums, Northern Territory, 0870, Australia

This email was sent by Lesley Reilly via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Lesley provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Lesley Reilly at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Richmond, Alex – Saturday, 28 November 2020 – 09:02:41

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Alex Richmond
Sent	28/11/2020 9:02:41 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Alex Richmond

Rum Jungle, Northern Territory, 0822, Australia

This email was sent by Alex Richmond via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Alex provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Alex Richmond at *****.

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Richter, Suzanne – Friday, 27 November 2020 – 12:17:19

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Suzanne Richter
Sent	27/11/2020 12:17:19 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Suzanne Richter

White Gums, Northern Territory, 0870, Australia

This email was sent by Suzanne Richter via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Suzanne provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Suzanne Richter at *****.

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Robertson, Peter – Thursday, 26 November 2020 – 11:13:22

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Peter Robertson
Sent	26/11/2020 11:13:22 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Peter Robertson

Darwin DC, Northern Territory, 0820, Australia

This email was sent by Peter Robertson via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Peter provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Peter Robertson at *****.

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Robins, Crystal – Thursday, 26 November 2020 – 13:54:49

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Crystal Robins
Sent	26/11/2020 1:54:49 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Crystal Robins

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Crystal Robins via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Crystal provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Crystal Robins at *****.

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Robins, Dan – Wednesday, 23 December 2020 – 17:27:33

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Dan Robins
Sent	23/12/2020 5:27:33 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Dan Robins via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Dan provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Dan Robins at *****.

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Robins, Daniel – Thursday, 26 November 2020 – 10:41:20

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Daniel Robins
Sent	26/11/2020 10:41:20 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Daniel Robins

Nightcliff, Northern Territory, 0810, Australia

This email was sent by Daniel Robins via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Daniel provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Daniel Robins at *****.

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Rogers, Lorraine – Thursday, 26 November 2020 – 14:31:05

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Lorraine Rogers
Sent	26/11/2020 2:31:05 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Lorraine Rogers

Kuitpo, South Australia, 5201, Australia

This email was sent by Lorraine Rogers via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Lorraine provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Lorraine Rogers at *****.

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Rolfe, Margaret – Friday, 18 December 2020 – 13:03:15

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Margaret Rolfe
Sent	18/12/2020 1:03:15 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Margaret Rolfe via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Margaret provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Margaret Rolfe at *****.

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Rosmann, Filippo – Friday, 27 November 2020 – 14:45:26

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Filippo Rosmann
Sent	27/11/2020 2:45:26 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

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1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Filippo Rosmann

White Gums, Northern Territory, 0870, Australia

This email was sent by Filippo Rosmann via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Filippo provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Filippo Rosmann at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Russell, Saffron – Thursday, 26 November 2020 – 11:14:13

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Saffron Russell
Sent	26/11/2020 11:14:13 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

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In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Saffron Russell

This email was sent by Saffron Russell via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Saffron provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Saffron Russell at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Savage, Melissa – Thursday, 26 November 2020 – 16:04:04

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Melissa Savage
Sent	26/11/2020 4:04:04 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

melissa savage

Nightcliff, Northern Territory, 0810, Australia

This email was sent by melissa savage via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however melissa provided an email address (*****) which we included in the REPLY-TO field.

Please reply to melissa savage at *****.

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Sawyer, Graeme – Wednesday, 23 December 2020 – 16:04:54

Subject	see attached response.
From	Graeme Sawyer
Sent	23/12/2020 4:04:54 PM

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Protect Country
Alliance Graeme Sawyer
Ph 0411881378
~~Environmental and Cultural Heritage~~

Introduction

The Protect Country Alliance (PCA) brings together impacted landholders, communities, and civil society groups concerned about gas fracking proposals or projects in the Northern Territory. The Alliance is made up of delegates representing regional communities across the NT including; Elliott, Marlinja, Minyeri, Borroloola, Mataranka, Jilkminngan and Hermannsberg. The PCA also has member organisations based in all major population centres across the NT.

Based on ongoing relationships and conversations with landholders, Traditional owners, and groups across the NT, the PCA writes to object to the SANTOS EMP on the grounds that it does not sufficiently demonstrate best practice, nor has SANTOS practiced appropriate community consultation. There is no social licence for chemical fracking processes within the NT.

We note that the existing land access agreement expires at the end of 2020 and the lack of social licence will mean some difficulties in renewing the licence.

Despite SANTOS's claims that all landholders and traditional owners consent to this project, the PCA works with many in the region who strongly object. This division and discrepancy should be acknowledged in the EMP. The current EMP presents unacceptable risk to the Territory's water, land and culture.

This EMP shows a clear set of examples where the risks mean the project should be delayed to enable further information to be gathered to answer some key questions. This is in line with the Pepper inquiry recommendations:

In a number of cases, the Panel has recommended that a strategic regional environmental and baseline assessment (SREBA) (see Chapter 15) must be undertaken to provide the additional scientific knowledge and baseline information required before a final risk assessment can be made.

There are a number of concerns around corrosion, unrecognised pressure and salinity in the basin and uncertainty about the implications for well integrity. These issues should be better understood before proceeding. They have major implications for any risk assessment relating to the processes outlined in the EMP.

As time progresses more and more information is emerging from the United States about the impacts of Fracking on underground Water . It is inappropriate to create such risks and this is a clear breach of the ESD principles that are supposed to guide the decision making around fracking.¹

There are a number of aspects to this plan that breach the concepts with the ESD principles and the EMP should be rejected until there is clarification about how these issues are to be addressed. The Samuel's report highlighted the inadequacies of implementation of the EPBC act and this needs to be addressed before legal action is taken to focus on these inadequacies.

¹ <https://stateimpact.npr.org/pennsylvania/2020/06/25/pa-grand-jury/>

The Saltel Industries example below and other research shows corrosion is a major issue in the long term and what might be legacy issues for future generations. It has already been a problem in QLD.² The issues relating to corrosion are not even mentioned in the EMP document and no attempt is made to address the issues. The EMP must be rejected until this oversight is corrected.

This proposal involves the use of a range of substances and chemicals that have not been adequately evaluated and further there are high risks that these chemicals and other pollutants created during the fracking process will not stay in the deep aquifers where they are injected.

The Moroak Aquifer underlies the Beetaloo sub-basin and is above the upper, middle, and lower Velkerri layers where fracking companies hope there is enough gas for them to start production. See diagram Formation Layers at end of document.

Data from wells such as Ronald 1 and Tanumbirini 1 show reason for great concern. The aquifer is at significant pressure (over 1500 psi) and very high salinity (118000 ppm from Ronald1). This raises a number of concerns about corrosion and movement of pollutants to other aquifers.

The NT Government, in a letter this September 2019, (File reference: LRM2017/0119-0002 M19-0291DENR) was unable to answer the questions as to what is the pressure and salinity in the Moroak Aquifer. This lack of knowledge is incredibly concerning with regard to this Santos request to frack both vertically and horizontally, with the well going through the Moroak aquifer. This is alarming, especially in light of the fact that the government has approved the drilling of holes through this aquifer and the high injection of a range of dangerous chemicals into the shale for fracking below this layer and along the vertical shaft. Clearly this current lack of knowledge means that a renewed risk assessment must now be conducted and the EMP should not be approved until a risk assessment of the Moroak is done.

The risks created by the Moroak aquifer have clear implications for reg 4(b) (which concerns the 'precautionary principle'), clearly there is a risk of inter aquifer pollution and this could turn the Gum ridge aquifer saline making it unsuitable for human and stock use. The regulated activity poses a threat of serious or irreversible environmental damage which warrants the application of the precautionary principle.

The NT Government has a long history of inadequacies monitoring environmental projects, Montara oil and other examples, and unless time is taken to evaluate these risks there is likely to be another example from Fracking.

The waste water management plan is inadequate. The use of the term biocide to describe chemicals is inadequate. As an example, common biocides used in the industry are 'highly toxic with long lasting impacts' to aquatic organisms and must not be released into the environment according to the Material Safety data sheet. Given the risks created by the pressure within these proposed drilling areas and the impacts of sulphide reducing bacteria the specific chemical compounds must be provided to enable an understanding of the risks of these chemicals to stygofauna and aquatic and terrestrial systems.

The likelihood of corrosion and pressure causing saline water and fracking chemicals to move up the aquifer systems at some point in the future is very high. Clearly there are massive risks for negative impacts on future generations.

² <https://web.archive.org/web/20190328182110/https://www.cinpresswire.com/article/480473562/xpandable-patches-to-extend-the-life-of-corroded-csg-wells-in-queensland-australia>

The scenario breaches reg 9(1)c as it could have devastating impacts on biodiversity and aquatic systems. For biocides to be released into the aquifers and river systems would be devastating.

Well Integrity

The EMP confirms the use of biocides which confirms corrosive bacteria are a concern. If this is being done to keep corrosive bacteria at bay then the point about corrosion from the outside in becomes relevant.

Feedback from experts and research indicates this is potentially a massive problem. It means all wells are going to fail eventually and potentially in the near future and the contents, including these biocides and other chemicals will leak, and these breaches are likely to be 'close to surface', right in the beneficial aquifers.

The Oil and Gas Industry can only control sulphide reducing bacteria (SRB) when it is on the inside of a well with biocides. The outside of the well is in a natural control until. A gas or oil well goes through the environment where they are (mainly damp soil with organic material present or other bacteria which can provide a food source/or aquifers), this gas or oil well, if cement coated gives the SRB food and their numbers grow as the natural control (food) is no longer in short supply. As they "eat" the sulphates in the cement they exhaust Hydrogen Sulphate (rotten egg gas) which in the presence of water turns to acid, the whole cycle starts again.

How long a wells external surface will last before it is broken down enough to allow cross contamination of the Aquifers, depends greatly upon the number of Bacteria present, but this will eventually cause the connection between neighboring aquifers to occur.

An example not from the Beetaloo but highlighting similar issues: The effect of corrosive water on cementing and casing in the NT is provided by deep oil exploration wells (McDills and Dakota) drilled in the Perdika/Great Artesian Basin in the 1960s. (The Perdika Basin is one of the prospective unconventional shale gas areas of the NT). Now, some fifty years later, the steel casing has almost entirely corroded away, resulting in inter-aquifer contamination. This well required expensive rehabilitation work to stem artesian flow. This single bore cost the Territory and Commonwealth Governments \$500,000 to plug as the company responsible for the well was insolvent. This example highlights the issue of operator insolvency due to the boom and bust cycles of oil and gas development which complicates efforts to hold liable parties responsible and provide for timely environmental reclamation.

This information confirms that corrosion is an issue in the CSG areas of QLD and confirms our fears that this is going to cause wells to fail eventually and injected chemicals and related material released from the fractured rock layers in the basin will leach eventually into waterways. This includes the Roper and McArthur and other flows out of the catchments in the Beetaloo area.

We have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. We also have concerns about the numerous springs throughout the region that are so important to people and wildlife. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

The water studies in the SREBA must be completed before these approvals are considered. Edna sampling and testing must be conducted on the water systems before this EMP can be considered.

Saltel Industries was approached in 2016 by one of Australia's leading natural gas producers, to tailor a solution for their unusual problem: in some of their CSG wells in Queensland, the 7in production casing must cope with severe and localized external corrosion, developing at shallow depth. These corrosion cases are suspected to be caused by bacteria growing under specific pressure and temperature environments.

Microbiologically-influenced corrosion seems to be systemic in the region, and other operators might encounter similar issues in their CSG wells. There needs to be further study of this issue in the SREBA before these wells are allowed to proceed.

The hypersaline nature of the deep aquifers and the high temperature further raises concerns about the integrity of the wells. Corrosion is an issue in QLD after 10 years and there is a major concern among stakeholders that integrity failure will connect the hypersaline deep aquifers like the Moroak to the beneficial fresh water systems like the Gum Ridge aquifer. This poses a massive risk to the human and animal use of the region in the medium and long term and is clearly a breach of ESD principle for intergenerational equity.

Water Issues

The use of the Inacumba aquifer for water is unacceptable until the resource has been appropriately verified and tested by independent sources to establish its connectivity.

There needs to be Edna testing to establish its connectivity and related stygofauna assemblies in order for an appropriate analysis of the risks associated with drilling to be made. SANTOS was not given permission to use the Bukaklara system for water and it is not appropriate for the newly described Inacumba aquifer to be used until its status is clarified. It is also not appropriate to rely on SANTOS data for this process it needs to be independent. This should be done as a part of the SREBA and the EMP should not be approved until this work has been completed and peer reviewed.

Concerns related to fracking chemicals

SANTOS has chemicals listed that will be used in the fracturing process that have no data available as to the actual contents contained by these chemicals. The NT government needs to ensure that all chemicals used have been through health testing by the manufacturers before use.

Many of the chemicals that are being used present no danger as a stand-alone product. However, in the fracking process, many chemicals get mixed together, including with unknown elements in the ground. This can result in toxic and harmful chemicals. More information is required as to how the proposed chemicals mix and what the products of this might be.

Some of the fracking chemicals SANTOS plans to use are harmful to health both human and animal health and more study is required through the SREBA before they can be used. The list of substances SANTOS want to use have known health impacts. An independent review of the substances shows they are linked to: acute toxicity, respiratory irritation, tissue damage, burns, and cancer. Some are very toxic to aquatic life with long lasting effects.

The highest risk area for spills of the dangerous fracking chemicals is during transport. Yet SANTOS simply say that they will have road traffic controls in place and a spill response plan, so there's no further consideration needed. Road traffic controls in the Wet season are very different to what are required in the Dry. The risks are compounded to an unacceptable level, and the timeline for moving fracking chemicals both around and off the site should be prohibited during the Wet. SANTOS have also failed to do an overview of the specific transport routes and the sensitive environmental receptors that they may pass through with the fracking chemicals.

The transportation of chemicals involves risks of:

- "Human and environmental receptor exposure to chemicals as a result of accidental release during transport from supplier warehouse to well lease or between well leases (i.e. truck rollover).
- Human and environmental receptors exposed to surface water bodies that received runoff from an accidental release during transportation.
- Human and environmental receptor exposure to chemicals as a result of accidental release during transport of surplus chemicals and wastes (i.e., flowback) from the well lease to a disposal/management facility.
- Human and environmental receptor exposure to chemicals as a result of accidental release of stored wastes and/or flow back.
- Human and environmental receptors exposed to surface water bodies that received runoff from an accidental release of stored wastes and/or flow back."

Territorians and the landscape and waterways should not be burdened by these risks.

Open air wastewater tanks pose unacceptable risk to biodiversity

The Protect Country Alliance has strong concerns at SANTOS 's plans to store wastewater fluid and toxic chemical flowback fluid in open air waste ponds. This practice directly contradicts recommendation 7.12 from the Fracking Inquiry and presents significant risk to biodiversity in the region.

First and foremost the area concerned can only be described as data deficient in relation to biodiversity and environmental information and these inadequacies in knowledge fundamentally challenge the conclusions in the EMP. As an example to just do a desktop audit of biodiversity about the area and then assume that there are no concerns does not reflect the data deficient basis of the systems used. This lack of information about the region's biodiversity extends across the land and water throughout the region and was highlighted in the Pepper Inquiry.

It is vitally important that work be done to provide guidance around these many issues as in situations where knowledge is uncertain the Precautionary Principle underlying our environmental legislation requires a very cautious approach.

If companies are wishing to exploit non-renewable resources in the area they have a responsibility to do the work required to ensure that environmental risks are 'acceptable'. Decisions based on

such limited and flawed data are unacceptable and a range of on-ground work needs to be undertaken to improve the knowledge base upon which to evaluate decisions.

Open water storages should be not allowed in line with the Pepper inquiry recommendation 7.12 and others. To allow these pits will lead to dramatic and unacceptable changes in Biodiversity and massively increase risks that would not happen if the enclosed tanks were used.

It is unacceptable that SANTOS outlines the risks to birds from the open storage tanks (that were supposed to be banned):

“Water will be managed through the use of engineered treatment tanks that will contain liquids but may have the potential for exposures to avian receptors.”

SANTOS admits that the below chemicals are harmful and could be accessed by birds:

- Amine oxides, cocoalkyldimethyl (CAS number 61788-90-7)
- Chlorous acid, sodium salt (CAS number 7758-19-2)
- Glutaraldehyde (CAS number 111-30-8)

Tributyl tetradecyl phosphonium chloride (CAS number 81741-288)” This is unacceptable.

Amphibians

The fencing around freshwater storages and all other water needs to be frog proof, not just to have wildlife ladders installed. Native burrowing frogs are likely to try to access standing water. This highlights one of the risks relating to holding polluted water in open evaporation ponds in that it is likely to attract native species who cannot detect the pollutants. This include elements like surfactants which are not a human health issue but a massive issue for biodiversity, especially amphibians.

Low walled water storage areas, even if pumped dry will have residues and when rains come they will attract frog species.

There are many unknowns about this region's biodiversity but especially the frogs. There is a need to determine the range of the Water-holding frog *Litoria platycephala* and to determine whether the species in the Macarthur/ Beetaloo area is in fact a different species.

Cane toads *Rhinella marina* are a major threat to a number of animal species with population level declines documented (Doody 2004, 2006, 2009). Allowing open water storage pits will dramatically increase cane toad numbers in the region with broad biodiversity implications.

Doody (2009) concludes, “ We observed population-level declines in Australian predatory lizards caused by the arrival of an invasive species, *Bufo marinus*, at two sites along the Daly River. In contrast, there were no significant declines in populations of *Crocodylus johnstoni*. *Amphibolurus gilberti* populations increased substantially, presumably due to the losses in *Varanus panoptes*, a known predator of this species. These findings indicate that the invasion of *B. marinus* into this ecosystem caused a structural change in the lizard community. Changes in the abundance and community structure of these top predators may alter species-species interactions, in particular patterns of predation and competition, and the energy dynamics of the ecosystem. Recovery from low numbers, and possibly local extinction, may depend on the control of *Bufo*

marinus, and/or the recolonization from individuals from the surrounding landscape”

Further personal communication with the author indicates follow up surveys showed some species, like *V.panoptes* and *V.mitchelli* , are no longer present at the survey sites. Follow up work in the Kimberley’s reinforced the initial findings from the NT and indicated a broader range of varanid species were impacted.

Many areas of the NT were originally thought to be too dry for cane toads to colonise but this has been shown to be incorrect and the main reason that toads have been able to colonise large areas of Semi-arid and arid NT is because of the use of Open water storage in the cattle industry. The creation of such spaces for water and waste water storage will create a situation where cane toads will seek refuge and breed in the area. This would otherwise not be the case and the cane toad population would be massively increased if open water pits were introduced

This is particularly destructive of varanid populations and other reptile species. By introducing standing water bodies into an area the cane toad population will not only increase but breeding of cane toads will occur at the sites. This introduces a size class of cane toads into the area that would not be occurring without the water pits and this causes dramatic declines and even local extinctions of smaller Varanid species and the juvenile stages of the larger Varanid species such as *V.panoptes*, *V.gouldii* and *V.mertensii*.

Species that will be impacted negatively are likely to include:

<i>Varanus acanthurus</i>	Ridge-tailed Monitor
<i>Varanus baritji</i>	Black-spotted Ridge-tailed Monitor
<i>Varanus mertensi</i>	Merten's Water Monitor
<i>Varanus mitchelli</i>	Mitchell's Water Monitor
<i>Varanus scalaris</i>	Spotted Tree Monitor
<i>Varanus tristis</i>	Black-tailed Monitor
<i>Tiliqua scincoides</i>	Common Blue-Tongued Lizard
<i>Varanus panoptes</i>	Yellow Spotted Monitor
<i>Varanus gouldii</i>	Sand Monitor

There is also research indicating impacts on smaller lizard species due to large toad populations. In a two-year study in the Roper River region of the Northern Territory, Catling et al. (1999) found

that high cane toad densities were associated with a significant reduction in the abundance of small lizards, possibly caused by reducing their invertebrate food supply. Like so many of these aspects of the local environment there is a deficiency of data that should be addressed before any such changes are created in the local environment.

Plastic lined pits can be death traps for many species of native frogs that do not have toe pads. Plastic pits have been used as traps for some frog species. The risk includes many of the burrowing Frog fauna in the Beetaloo region and these species are likely to move to standing water bodies to breed. The pits should not be allowed, but if they are they need to be carefully designed. This elevated risk includes the period over the wet season where the pits may be emptied to avoid them overflowing. They will still collect water and become frog breeding sites, especially for burrowing frogs and any residues will cause problems E.G. Surfactants are highly toxic to native frog tadpoles at very low concentrations.

There are additional issues with the use of chemicals and this puts the waste water elements of this plan in a particularly high risk category. Surfactants and many other chemicals are especially toxic for frogs and have implications for other species such as birds. Even if the pits are emptied there will be residues from waste water present and this will impact on wildlife.

Bird life

Anecdotal evidence from ongoing discussions with land holders and Traditional owners in the proposed drilling area highlight the impact that a record breaking hot and dry season has had on local water and wildlife. Birds and other wildlife are relying on limited water. If SANTOS were to introduce bodies of open water in the area through open storage ponds- there would be wildlife accessing these ponds. This could poison wildlife and spread contamination. Many bird species will drink from available water pits and bathe in the shallows and some will plunge into the water to drink and to preen. Water with surfactants or toxic chemicals can cause issues and lead to deaths of birds.

The claim has been made that surfactants are “no more toxic than common household substances”, and are 'commonly found in everyday products, from toothpaste to laxatives to detergent to ice cream' (University of Colorado, 2014). However, surfactants can be deadly for birds and frogs. This complete lack of concern for biodiversity is unacceptable especially given the biodiversity crisis highlighted by the Paris accord in 2019.

Most bird taxa have a gland at the base of the tail, the uropygial or preen gland. The oil it produces keeps the feathers flexible and assists the interlocking barbules to stay intact, thus forming a barrier that helps repel water and insulate the bird. In the case of waterbirds, preening oil helps them stay afloat, and without it birds may even drown.

Birds may also die because surfactants reduce the ability of feathers to act as insulation in cold weather, and have been used in the USA to control populations of pest species (Lustick, 1976).

In semi-arid areas of the NT temperatures have been known to fall very low in winter, and in the driest months of the year, the time when birds are likely to be seeking water.

There are a range of other chemicals within the flow back and other waste water from Fracking and it is unacceptable to expose our biodiversity to the associated risks when there is a solution of enclosed storage as recommended.

There is also not enough detail in the EMP about how biodiversity, especially birdlife would be prevented from accessing the wastewater. There is also no mention of the pond covers being heat or extreme weather tested for Territory conditions.

Fracking wastewater is suggested to remain on site for over 12 months, including around 6 million litres of waste remaining on site during the unpredictable wet season months. This is unacceptable. The occasional requirement for a cover over the open ponds does not meet Recommendation 7.12.

Biocides are also very toxic to a range of wildlife and are especially dangerous in aquatic systems. The water systems like the Gum Ridge Aquifer are poorly studied in relation to troglofaunal and aquatic flows and yet very dangerous substances are being injected into these areas by these practices.

Transport risks and tourism impacts

Landholders and traditional owners in the NT are well aware of the increased traffic associated with mining activities. Pastoralists at Lucy Creek Station recall 50 road trains moving through their property on the first day of an experimental fracking well drilled by Petrofrontier in 2013. Just one well caused huge disruptions to their way of life and quality of roads in and out of the station.

Predicted vehicle movements per day is significant as it is. Local roads are used by pastoralists and local communities to access water bores and to access country for cultural reasons. Deterioration of roads and increased traffic will create safety issues. As SANTOS intends to drill more wells in the future this number of vehicle movements will be significantly multiplied.

The NT already experiences heavy traffic on the Stuart Highway during peak tourist seasons. Tourism operators and local business along the Stuart highway should be properly consulted as part of the approval process for SANTOS to begin drilling. SANTOS says they care about cumulative impacts, but have failed to talk to tourism operators about the risks of increased traffic on the Stuart Highway and Carpentaria Hwy, or to people living downstream from their fracking exploration activities.

The transport of equipment or heavy water tankers over the roads including the Carpentaria and Tablelands highways are of major concern as these roads deteriorate each year and are not capable of supporting lots of heavy loads, especially after rains. The risks to other road users and local amenity need to be considered.

Further References

Doody J. S., Green B., Sims R. (2004). 'The Impact of Cane Toads on Native Frog-eating Predators in the Northern Territory'. A Progress Report submitted to CSIRO for Sustainable Ecosystems, Canberra 1 November 2004 Applied Ecology Research Group, University of Canberra, ACT 2601

Doody J. S., Green B., Sims R. and Rhind , D. I (2006) nitial impacts of invasive cane toads (Bufo marinus) on predatory lizards and crocodiles in Science of Cane Toad Invasion and Control. Proceedings of the Invasive Animals CRC/CSIRO/Qld NRM&W Cane Toad Workshop 5-6 June 2006, Brisbane

Mann, R.M., Bidwell, J.R. (2000) The acute toxicity of agricultural surfactants to the tadpoles of four Australian and two exotic frogs, Environmental Pollution 114 pp195-205

Formation Layers Beetaloo Sub-basin

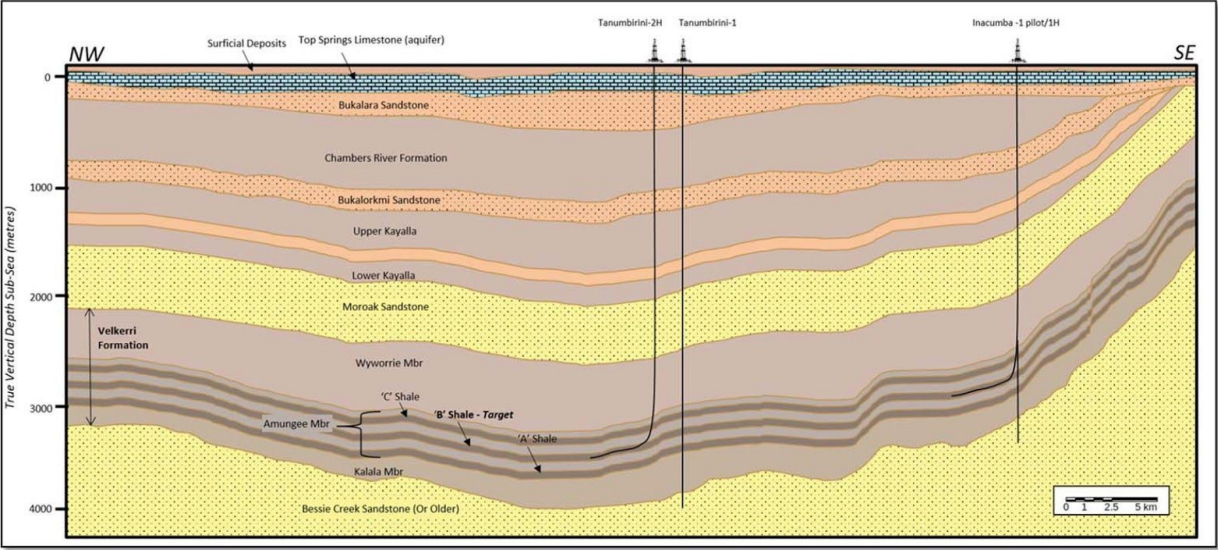


Figure 3-4 Illustrative section through the Beetaloo Sub-basin showing proposed target intervals of the Tanumbirini 2H and Inacumba 1/1H wells relative to the deepest aquifer

Schmah, Kathie – Thursday, 26 November 2020 – 13:39:13

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Kathie Schmah
Sent	26/11/2020 1:39:13 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

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I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

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Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Kathie Schmäh via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Kathie provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Kathie Schmäh at *****.

To learn more about Do Gooder visit www.dogooder.co

To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

Scriven, Adam – Monday, 30 November 2020 – 10:11:31

Subject	Objection to Santos expansion in the NT
From	Adam Scriven
Sent	30/11/2020 10:11:31 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am a long term resident of the NT and oppose fracking due to its devastating impact on health and environment.

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Adam Scriven

Nightcliff, Northern Territory, 0810, Australia

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Please reply to Adam Scriven at *****.

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Sheerin, Karen – Thursday, 26 November 2020 – 16:10:07

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Karen Sheerin
Sent	26/11/2020 4:10:07 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Karen Sheerin

Wonthaggi, Victoria, 3995, Australia

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Sheppard, Teresa – Thursday, 03 December 2020 – 13:56:54

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Teresa Sheppard
Sent	3/12/2020 1:56:54 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Teresa Sheppard

Frenchman Bay, Western Australia, 6330, Australia

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Please reply to Teresa Sheppard at *****.

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Smith, Judy – Thursday, 26 November 2020 – 12:48:12

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Judy Smith
Sent	26/11/2020 12:48:12 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Judy Smith

Thrumster, New South Wales, 2444, Australia

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Please reply to Judy Smith at *****.

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Sobek, Vivienne – Sunday, 29 November 2020 – 09:27:01

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Vivienne Sobek
Sent	29/11/2020 9:27:01 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Vivienne Sobek via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Vivienne provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Vivienne Sobek at *****.

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Sparkle, Breezy – Saturday, 28 November 2020 – 08:32:20

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Breezy Sparkle
Sent	28/11/2020 8:32:20 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express concern and objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

There are concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen

Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

Thank you for considering the concerns raised.

Kindly,

Breezy Sparkle

This email was sent by Breezy Sparkle via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Breezy provided an email address (*****) which we included in the REPLY-TO field.

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Sri, Anna – Thursday, 26 November 2020 – 10:48:36

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Anna Sri
Sent	26/11/2020 10:48:36 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory. As a veterinarian and public health advocate who has lived and worked in the NT including in remote communities, my concerns largely relate to the impact on ecosystems and wildlife as well as human health and safety.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Kind regards,

Anna Sri BVSc (Hons) MPH

48 Maltman St South

Caloundra, QLD 4551

This email was sent by Anna Sri via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Anna provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Anna Sri at *****.

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Stahre, Jude – Saturday, 28 November 2020 – 08:05:24

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jude Stahre
Sent	28/11/2020 8:05:24 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

jude stahre

Clemant, Queensland, 4816, Australia

This email was sent by jude stahre via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however jude provided an email address (*****) which we included in the REPLY-TO field.

Please reply to jude stahre at *****.

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Stammers, Beverley – Monday, 21 December 2020 – 20:57:52

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Beverley Stammers
Sent	21/12/2020 8:57:52 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

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Please reply to Beverley Stammers at *****.

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To learn more about web protocol RFC 3834 visit: <https://tools.ietf.org/html/rfc3834>

STARKEY, KATIEANNA – Friday, 27 November 2020 –
09:02:02

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	KATIE-ANNA STARKEY
Sent	27/11/2020 9:02:02 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

KATIE-ANNA STARKEY

Nightcliff, Northern Territory, 0810, Australia

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Stefanoff, Lisa – Saturday, 28 November 2020 – 15:51:01

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Lisa Stefanoff
Sent	28/11/2020 3:51:01 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Dr Lisa Stefanoff

Alice Springs, Northern Territory, 0870, Australia

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Please reply to Lisa Stefanoff at *****.

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Stevenson, Margaret – Thursday, 26 November 2020 –
21:18:48

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Margaret Stevenson
Sent	26/11/2020 9:18:48 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Margaret Stevenson

White Gums, Northern Territory, 0870, Australia

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Please reply to Margaret Stevenson at *****.

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Suttor, Anthony – Thursday, 26 November 2020 – 12:47:45

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Anthony Suttor
Sent	26/11/2020 12:47:45 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Anthony Suttor

Bakewell, Northern Territory, 0832, Australia

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Please reply to Anthony Suttor at *****.

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Sykes, Jennifer – Thursday, 03 December 2020 – 14:35:09

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jennifer Sykes
Sent	3/12/2020 2:35:09 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Jennifer Sykes

Faulconbridge, New South Wales, 2776, Australia

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Please reply to Jennifer Sykes at *****.

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Tapp, Caoline – Thursday, 26 November 2020 – 17:31:55

Subject	#SRSly Objection to frack vandals SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Caoline WATER Tapp
Sent	26/11/2020 5:31:55 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods and during droughts.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies." I mean I ask you in 2020 that this is even having to be stated. Wilful maleficence in disregard to the most basic of mining requirements.

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos's outrageous and reckless plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife, important insects, food chains from the cocktail of for-life neuro toxic substances should not be stored in the way Santos is sleazily proposing. Not on. Most basic high risk mitigation standards ffs.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have very grave concerns about most likely impacts to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream. And through breaking through aquifers and sub water tables and watershed catchments.

4. CHEMICAL RISK ASSESSMENTS

I demand that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic, bird, plant, soil and biodiversity life should be banned from being used, as high known risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

I also remind this department of the grave water security at foot not least that about to be unravelled by fracking 51% of the agri food bowl Outback. Water is life. Not if. When!!

Thank you for considering my concerns.

Yours sincerely,

Caoline WATER Tapp

Emungalan, Northern Territory, 0850, Australia

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*****), however Caoline provided an email address (*****)) which we included in the REPLY-TO field.

Please reply to Caoline WATER Tapp at *****.

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Taylor, Jenny – Thursday, 26 November 2020 – 12:34:51

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Jenny Taylor
Sent	26/11/2020 12:34:51 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Jenny Taylor

White Gums, Northern Territory, 0870, Australia

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Please reply to Jenny Taylor at *****.

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Taylor, Joy – Thursday, 26 November 2020 – 12:05:05

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Joy Taylor
Sent	26/11/2020 12:05:05 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am a long term resident of NT. I am a business owner. I am concerned about the present and long term future for NT's people, environment and wildlife and economy.

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

The risk is too great.

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

The Fracking Inquiry recommendation must be followed.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Joy Taylor

Alice Springs, Northern Territory, 0870, Australia

This email was sent by Joy Taylor via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Joy provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Joy Taylor at *****.

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Tenosar, S – Thursday, 26 November 2020 – 13:50:18

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	S Tenosar
Sent	26/11/2020 1:50:18 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

S Tenosar

Darwin City, Northern Territory, 0800, Australia

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Please reply to S Tenosar at *****.

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Thomas, Mark – Thursday, 26 November 2020 – 17:31:17

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Mark Thomas
Sent	26/11/2020 5:31:17 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Mark Thomas

Port Lincoln, South Australia, 5606, Australia

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Please reply to Mark Thomas at *****.

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Thompson, Kathryn – Thursday, 26 November 2020 – 19:58:23

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Kathryn Thompson
Sent	26/11/2020 7:58:23 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

kathryn thompson

White Gums, Northern Territory, 0870, Australia

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Please reply to kathryn thompson at *****.

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Thompson, Ruth – Wednesday, 02 December 2020 – 16:59:53

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Ruth Thompson
Sent	2/12/2020 4:59:53 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Ruth Thompson

Nowra DC, New South Wales, 2541, Australia

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Please reply to Ruth Thompson at *****.

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Trudgen, Michelle – Monday, 21 December 2020 – 07:26:14

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Michelle Trudgen
Sent	21/12/2020 7:26:14 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: "In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement."

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

This email was sent by Michelle Trudgen via Do Gooder, a website that allows people to contact you regarding issues they consider important. In accordance with web protocol RFC 3834 we have set the FROM field of this email to our generic no-reply address at *****, however Michelle provided an email address (*****) which we included in the REPLY-TO field.

Please reply to Michelle Trudgen at *****.

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Wackett, Bryn – Friday, 27 November 2020 – 11:25:36

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Bryn Wackett
Sent	27/11/2020 11:25:36 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

I am concerned SANTOS will be undertaking fracture stimulation activities during high rainfall periods.

As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Bryn Wackett

Alawa, Northern Territory, 0810, Australia

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Please reply to Bryn Wackett at *****.

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Walker, Rachel – Thursday, 26 November 2020 – 10:56:49

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Rachel Walker
Sent	26/11/2020 10:56:49 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Rachel Walker

Highgate Hill, Queensland, 4101, Australia

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Please reply to Rachel Walker at *****.

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Walsh, Gem – Tuesday, 08 December 2020 – 21:21:06

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Gem Walsh
Sent	8/12/2020 9:21:06 PM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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As stated in the NT Fracking Inquiry on page 153: "...there is still the very real possibility of overtopping of storage ponds during the wet season." And on page 156: "... it is during the wet season that road transport accidents are most problematic, with any spilt contaminants potentially being washed overland to ecologically important temporary or permanent waterbodies."

2. WASTEWATER STORAGE AND WILDLIFE

I object to Santos' plans to store flowback fluids and drill cuttings in open dams that could be accessible to birdlife. It is a clear derogation from the NT Fracking Inquiry recommendation 7.2. This must be rectified. The mix of chemical substances, naturally occurring radioactive materials and unstudied health impacts to birdlife from the cocktail of substances should not be stored in the way Santos is proposing.

3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

I have concerns about impacts to the impact to the Towns River, Magaranyi River, Cox River, Mantungula Creek, Lagoon Creek, Tanumbirini Creek, October Creek and Limmen Bight

River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Gem Walsh

White Gums, Northern Territory, 0870, Australia

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Please reply to Gem Walsh at *****.

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Wilson, Kim – Tuesday, 08 December 2020 – 10:47:20

Subject	Objection to SANTOS' McArthur Basin Drilling Program NT Exploration Permit (EP) 161 Revised EMP
From	Kim Wilson
Sent	8/12/2020 10:47:20 AM

Dear Department of Environment, Parks and Water Security - Petroleum Operations,

I am writing to express my objection to the revised Environmental Management Plan submitted by SANTOS for the Macarthur Basin EP 161 frack site in the Northern Territory.

My key concerns with this plan are outlined below.

1. INAPPROPRIATE PLANNED TIMING OF HYDRAULIC FRACTURING ACTIVITIES

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2. WASTEWATER STORAGE AND WILDLIFE

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3. RIVERS ACROSS THE SANTOS PETROLEUM EXPLORATION LICENCE

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River. There have not been sufficient studies that look at the sensitive receptors over those areas, where exactly chemicals and waste will be transported and the risks downstream.

4. CHEMICAL RISK ASSESSMENTS

I recommend that the NT Government require that manufacturers conduct health testing before chemicals can be manufactured. They should also require companies to publicly disclose the identities and Chemical Abstracts Service numbers of chemicals that are manufactured commercially, and identify oil and gas wells in which the chemicals are used. The dangerous chemicals that pose risks to aquatic life should be banned from being used, as risk mitigation.

5. CLIMATE IMPACTS

Total Greenhouse Gas (GHG) emissions generated during exploration activities for this Santos drilling process are anticipated to be approximately 132,304.5CO₂e (tonnes of Carbon Dioxide equivalent) for the duration of the activity. Santos is using NGERS emissions estimates. NGERS was found by the NT Fracking Inquiry to not be the most accurate estimation of the gas leaks likely from an onshore gas field. They said: “In many cases, the emissions reported through the NGER are based upon emission factors rather than direct measurement.”

In light of the information gaps and concerns, I object to the plans outlined in this EMP.

Thank you for considering my concerns.

Yours sincerely,

Kim Wilson

Kilmany, Victoria, 3851, Australia

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Please reply to Kim Wilson at *****.

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