District Council of Tumby Bay
Environmental Services Officer's Report

Released 8/5/18 Sc/05 2018

REPORT TO: Mayor and Councillors

FROM: Manager Environmental Services

DATE: 11th July 2017

REPORT REF: MESCONF 2/717

SUBJECT: Soil Assessment of Lot 443 and 444 Trezise Street Tumby Bay

1.0 PROPOSAL

To present a summary of findings to date of the environmental investigations, a recommended way forward and indicative cost estimates for the former Council depot site.

2.0 BACKGROUND DISCUSSION

In October 2016 Council determined '*That Council does not accept the offer of $245,000 for the purchase of Lot 443 and 444. That Council remove Lot 443 and 444 from sale and undertake soil tests to determine the extent and cost of any required remediation in accordance with the Environment Protection Act.*'

Mud Environmental was engaged by Council to undertake a staged environmental assessment to assist Council in assessing the feasibility of divestment. The Preliminary Site Investigation (PSI) has been completed and reviewed by the auditor. The PSI identified a number of potentially Contaminating Activities (PCAs). A Sampling, Analysis and Quality Plan (SAQP) was prepared and endorsed by the auditor for soil and groundwater investigations to assess these PCAs.

3.0 RELEVANCE TO STRATEGIC PLAN AND BUDGET

Strategic Plan

Goal	**1**	**Infrastructure** Maintain, develop and improve Council's infrastructure to meet current & future needs
Outcome	**1.9**	Land Development
Strategy	**1.9.1**	Assist with land development to meet future needs.

Due to previously bringing the value of Lots 443 and 444 in to Council's budget Council needs to make a net profit of $200,000 to cover that previously allocated value. Any net profit above $200,000 will be surplus to the current budget.

There were no budget allocations for the survey costs of subdividing those allotments, open space contributions, providing utilities, real estate fees, conveyancing fees or GST. The net profit will therefore need to take all these items into account.

4.0 RISK ASSESSMENT

Council has a proposed Development Plan Amendment to rezone the Home Industry Zone to Residential. The allotments cannot be used for residential use without carrying out soil test requirements as outlined in the *Environment Protection Act (the Act).* If Council disposes of the land in its current form it is very unlikely that the further investigations and remediation work will ever be undertaken, this will have a negative impact on the proposed rezoning in this vicinity. It is now expected that this process will be completed and ready for Minister endorsement by December 2017. Having the land rezoned and the remediation work completed, an increased sale price per allotment should be achievable.

Any resultant remediation costs are determined by the results of the additional investigations.

5.0 DISCUSSION DETAIL

The soil and groundwater Detailed Site Investigation (DSI) was completed over the course of a number of site visits in March 2017. Mud Environmental report is attached for information (Attachment 1).

A summary of the findings to date are:

Soils

- Apart from petroleum hydrocarbons, no other soil contamination was identified in the context of all land uses (including residential use).
- Petroleum hydrocarbon contamination was identified at a number of locations

Groundwater

- Groundwater flow is to the east towards the coast.
- Apart from metals, which are inferred to be background conditions and hydrocarbons no other groundwater contamination was identified.
- Hydrocarbon impacted groundwater was identified. The impacts are characterised by heavier fraction petroleum hydrocarbons, polycyclic aromatic hydrocarbons and trace chlorinated hydrocarbons that are likely to be associated with a historical release of diesel fuel. The lateral extent of the contaminated groundwater has not been delineated.
- It is noted that potential groundwater impacts associated with some of the soil impacts identified above has not yet been assessed.

Way Forward

The attached flowchart (**Attachment 2**) outlines the assessment, remediation and audit process for a typical site in South Australia. Currently we are in the DSI stage, where the nature and extent of the soil and groundwater contamination is being characterised.

Once the location and magnitude of the contamination is known, a risk assessment process identifies what remediation is or remains necessary for future use of the site.

- **Additional investigations**
  Additional investigations have been agreed with by the auditor to characterise the nature and extent of soil and groundwater contamination and provide inputs for future groundwater modelling. (Table 1 page 3 of Attachment 1)

- **Remediation**
  At this stage, the most cost-effective soil remediation is likely to be excavation and off-site disposal. This can only occur once some of the existing improvements are removed. It is proposed that the asbestos identified in the asbestos register be removed the existing improvements on the site be released for public tender.

  Typically, the volume of contaminated soils is defined before remediation works commence, so that there is some certainty around cost and time.

  The requirement to remediate groundwater can only be determined once the groundwater contamination has been mapped. Due to the nature of the measured impacts (largely heavier fraction hydrocarbons), vapour intrusion is unlikely to drive any groundwater remediation. Given the proximity of the site to the marine ecosystem, groundwater modelling will be required to assess future migration of the contaminated groundwater. If the modelled behaviour of the plume does not impact on any receptors, then groundwater remediation will not be required. If the modelled behaviour of the plume does impact on any receptors, then some groundwater remediation will be required.

Presented on the attached spreadsheet are the financial implications of the two options (Attachment 3).

Option 1 is to proceed to sell the land with full disclosure of the assessments undertaken. It is assumed that an offer would be similar to the previous offer of $245000 due to the restricted use of the allotments.

Option 2 is to remove the land from sale and carry out the additional investigations and remediation and subdivide the allotments (preliminary plan of division Attachment 4).

6.0 REVIEW PROVISIONS – N/A

7.0 RECOMMENDATION (S)

That Council undertake additional investigations to determine the nature and extent of soil and groundwater contamination.

That Council proceed with the required remediation of Lot 443 and Lot 444 in accordance with the Environment Protection Act after the additional investigations are undertaken.

That Council proceed to subdivide Lot 443 and 444 in accordance with the proposed plan of Division.

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24 June 2017

District Council of Tumby Bay
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Attention: Ms. Emma McDonald
Via email: EMcDonald@tumbybay.sa.gov.au

SUMMARY OF FINDINGS TO DATE, RECOMMENDED WAY FORWARD + INDICATIVE BUDGET ESTIMATES FORMER COUNCIL DEPOT – BUTTERFIELD STREET, TUMBY BAY

Dear Emma,

1. INTRODUCTION

Further to our recent discussions with yourself and the auditor, please find following a summary of the findings to date of the environmental investigations, a recommended way forward and indicative budget estimates for the above site.

2. BACKGROUND

Mud Environmental is completing a staged environmental assessment of the above site to assist the District Council of Tumby Bay in assessing the feasibility of divestment.

2.1 Preliminary Site Investigation ('PSI', or site history)

The Preliminary Site Investigation (PSI, or site history)[1] is the first stage of any environmental assessment and was finalised on 15 December 2016 following review and comment by the auditor. The PSI identified a number of Potentially Contaminating Activities ('PCAs') from historical use of the site, including:

1. Fill or soil importation;
2. Septic tanks;
3. Localised use of termiticides;
4. Possible broad application of fertilisers and insecticides;
5. Solvent or oil storage;
6. Fuel storage; and
7. Vehicle maintenance and washing.

A Sampling, Analysis and Quality Plan ('SAQP')[2] was prepared and endorsed by the auditor for soil and groundwater investigations to assess these PCAs.

[1] Mud Environmental Report '*Preliminary Site Investigation, District Council of Tumby Bay, Lots 443 and 444 Trezise Street, Tumby Bay, South Australia*' dated 15 December 2016 (Ref.: ME-133.R1).
[2] Mud Environmental letter '*Sampling, Analysis + Quality Plan + Preliminary Conceptual Site Model, Former Council Depot – Butterfield Street, Tumby Bay*' dated 13 February 2017.

2.2 Detailed Site Investigation ('DSI')

The soil and groundwater investigations were completed over the course of a number of site visits in March 2017. Summary tables of results and plans showing investigation locations are included as **Attachment 1**.

A summary of the findings to date are:

Soils

- Apart from petroleum hydrocarbons, no other soil contamination was identified in the context of all land uses (including residential use).
- Petroleum hydrocarbon contamination was identified at a number of locations (refer to sketch plan included in **Attachment 1**):
  - Relatively shallow impacts have been identified at soil bore locations SS6, SB32, SB4, SS8, SB8, SB10, SB13, although the lateral extent and depth has not been accurately delineated.
  - Deeper impacts were identified at locations SB29 (adjacent vehicle service pit) and SB16/SB17 (former AST adjacent oil store building). These impacts are expected to reach groundwater at around 1.1m depth and be the source of groundwater contamination, but have not been accurately delineated.
  - Whilst no impacts were identified to date, the former UST location has not been identified with soil bores, and test pits are required to confirm that no contamination exists.

Groundwater

- Groundwater flow is to the east towards the coast.
- Apart from metals, which are inferred to be background conditions and hydrocarbons no other groundwater contamination was identified.
- Hydrocarbon impacted groundwater was identified at well MW3 located adjacent to the former AST near the oil shed. The impacts are characterised be heavier fraction petroleum hydrocarbons, polycyclic aromatic hydrocarbons and trace chlorinated hydrocarbons) that are likely to be associated with a historical release of diesel fuel. The lateral extent of the contaminated groundwater has not been delineated.
- It is noted that potential groundwater impacts associated with some of the soil impacts identified above has not yet been assessed.

3. WAY FORWARD

The attached flowchart (**Attachment 2**) outlines the assessment, remediation and audit process for a typical site in South Australia. Currently we are in the DSI stage, where the nature and extent of the soil and groundwater contamination is being characterised.

Once the location and magnitude of the contamination is known, a risk assessment process identified what remediation is or remains necessary for future use of the site.

3.1 Additional investigations

Table 1 overleaf summarises the additional investigations agreed with the auditor to characterise the nature and extent of soil and groundwater contamination and provide inputs for future groundwater modelling.

/K

Table 1 – Additional soil + groundwater investigations

Item	Objective	Targeted to	Targeted analytes
Shallow soil bores (hand augers)	To characterise nature and extent of soil contamination prior to risk assessment / remediation	SS6, SB32, SB4, SS8, SB8, SB10, SB13 – allow 3 at each location = 21 + 3 concrete cores	TRH
Deeper soil bores (drill rig)		SB29, SB16/SB17 – allow 4 at each location = 8 + 4 concrete cores	TRH
Test pits (trenches)	To identify the former location of the UST east of Shed N2	Soil bore locations SB19-SB23	TRH
Groundwater monitoring wells	To characterise nature and extent of groundwater contamination (hydrocarbons) and the natural attenuation potential of the aquifer, and assess background concentrations of metals	SS6 (1 well), SB29 (3 wells), SS8 (1 well), MW3 (2 wells), SB10/SB13 (1 well) = 8 + 2 concrete cores	boron, copper, selenium, uranium, zinc, TRH, PAH, natural attenuation parameters

3.2 Remediation

At this stage, the most cost-effective soil remediation is likely to be excavation and on-site treatment or off-site disposal. This can only occur once some of the existing improvements are removed.

Typically, the volume of contaminated soils is defined before remediation works commence, so that there is some certainty around cost and time. However, an alternative that Council may wish to consider is to use an excavator or backhoe to 'chase' out the shallow soil impacts using visual/olfactory/PID observations in the field. This could be effective at locations SS6, SB32, SB4, SB8, SB10 and SB13. Contaminated soils could be stored in the shed(s) pending classification and validation sampling and testing of the excavations would be used to prove that the contaminated soils have been removed from these areas. The excavator or backhoe could also be used to dig some trenches around the former location of the UST, which we were unable to locate with soil bores. However, using a backhoe at locations SB29, SS8 and SB16/SB17 could be problematic due to the presence of buildings and/or the depth of the known soil impacts and therefore drilling is recommended at these locations, unless demolition of the Oil shed, Sign shed (N3) and Shed N2 is something that Council would entertain?

The requirement to remediate groundwater can only be determined once the groundwater contamination has been mapped. Due to the nature of the measured impacts (largely heavier fraction hydrocarbons), vapour intrusion is unlikely to drive any groundwater remediation. Given the proximity of the site to the marine ecosystem, groundwater modelling will be required to assess future migration of the contaminated groundwater. If the modelled behaviour of the plume does not impact on any receptors, then groundwater remediation will not be required. If the modelled behaviour of the plume does impact on any receptors, then some groundwater remediation will be required.

4. BUDGET ESTIMATE

A ballpark budget estimate is included as **Attachment 3** for consideration by Council and comes to **$175K + demolition + audit fees with no contingency**.

The budget estimate is based on the following assumptions:

- All investigations will be completed with existing improvements in place – therefore soil bores will be used to delineate all soil impacts (apart from the test pitting for the UST investigation)
- All remediation activities will be completed following demolition of some improvements (by Council).
- Excavations will be backfilled with clean fill.

5. CLOSURE

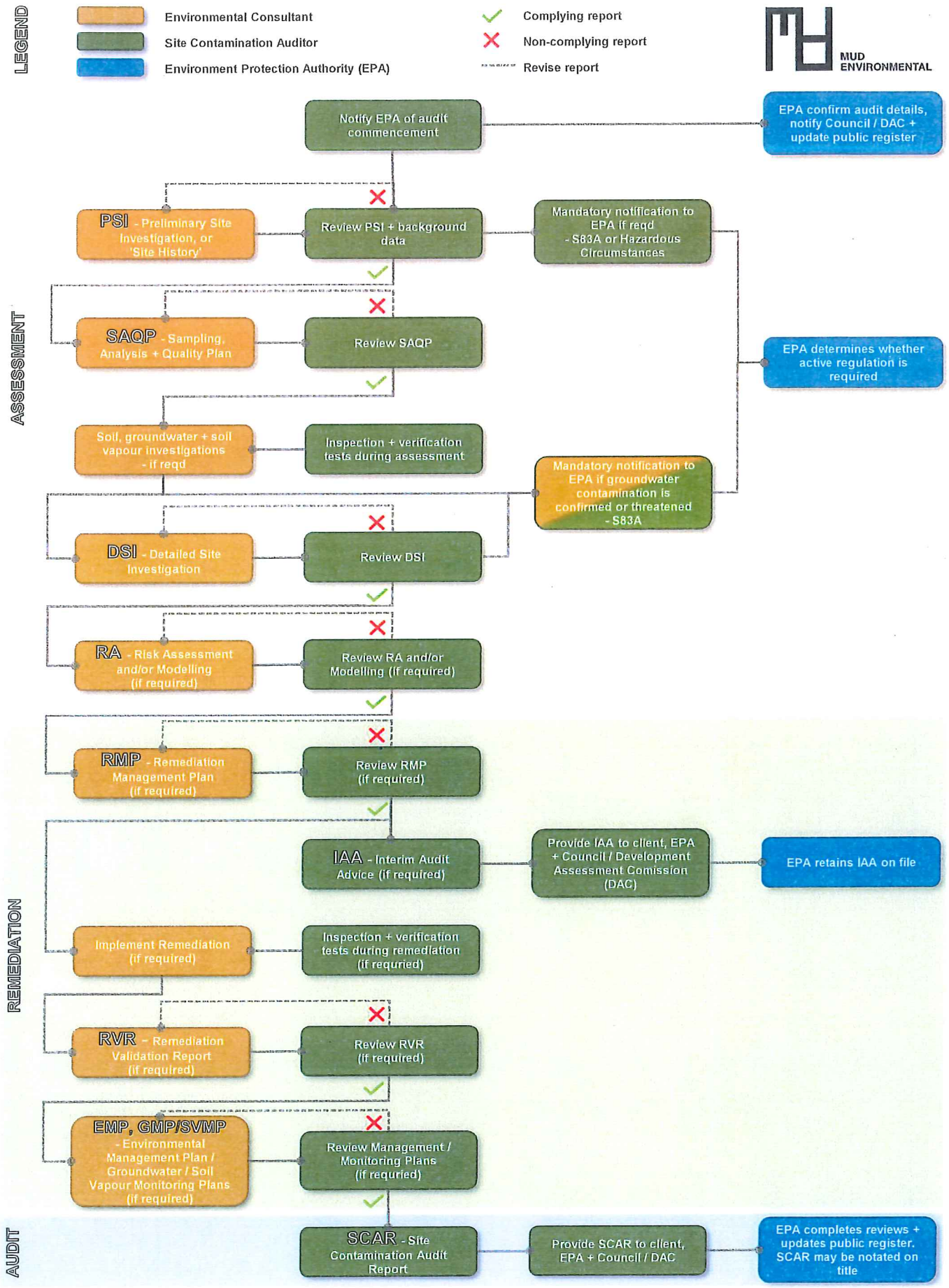
I trust that this provides sufficient detail to discuss internally at Council. Please call me if you have any queries or require further information.

Yours Sincerely

Adrian Webber
Director

File: C:\Mud\Projects\ME-133 DC Tumby Bay Depot\Correspondence\ME-133.02_Tumby_Bay_summary_240617.docx

Attachments:
1. Summary tables + figures
2. Flowchart of typical assessment, remediation + audit process in SA
3. Budget estimate table


LEGEND
Environmental Consultant
Site Contamination Auditor
Environment Protection Authority (EPA)
Complying report
Non-complying report
Revise report
MUD ENVIRONMENTAL
ASSESSMENT
Notify EPA of audit commencement
EPA confirm audit details, notify Council / DAC + update public register
PSI - Preliminary Site Investigation, or 'Site History'
Review PSI + background data
Mandatory notification to EPA if reqd - S83A or Hazardous Circumstances
SAQP - Sampling, Analysis + Quality Plan
Review SAQP
EPA determines whether active regulation is required
Soil, groundwater + soil vapour investigations - if reqd
Inspection + verification tests during assessment
Mandatory notification to EPA if groundwater contamination is confirmed or threatened - S83A
DSI - Detailed Site Investigation
Review DSI
RA - Risk Assessment and/or Modelling (if required)
Review RA and/or Modelling (if required)
REMEDIATION
RMP - Remediation Management Plan (if required)
Review RMP (if required)
IAA - Interim Audit Advice (if required)
Provide IAA to client, EPA + Council / Development Assessment Comission (DAC)
EPA retains IAA on file
Implement Remediation (if required)
Inspection + verification tests during remediation (if requried)
RVR - Remediation Validation Report (if required)
Review RVR (if required)
EMP, GMP/SVMP - Environmental Management Plan / Groundwater / Soil Vapour Monitoring Plans (if required)
Review Management / Monitoring Plans (if requried)
AUDIT
SCAR - Site Contamination Audit Report
Provide SCAR to client, EPA + Council / DAC
EPA completes reviews + updates public register. SCAR may be notated on title

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Attachment 3

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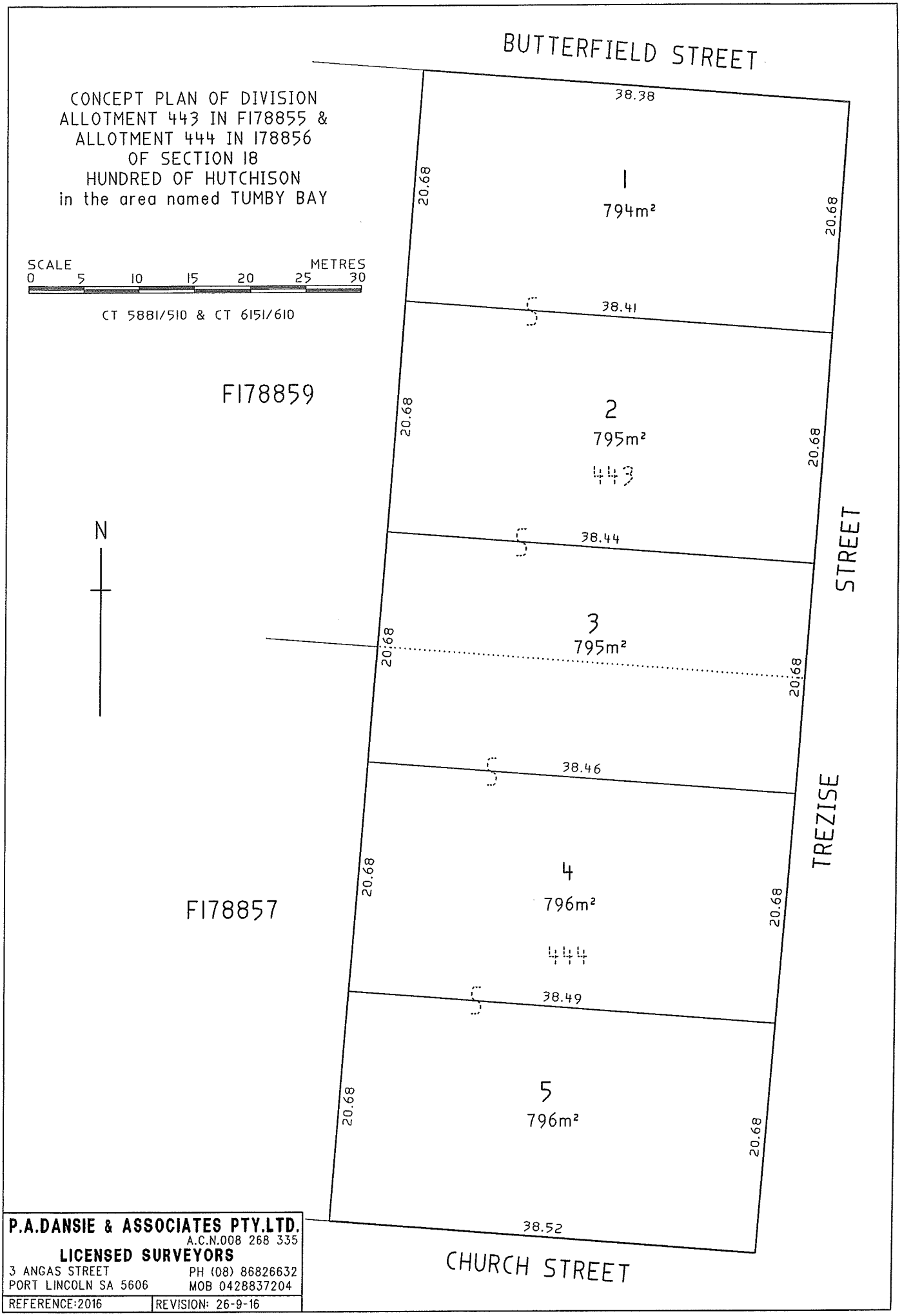
CONCEPT PLAN OF DIVISION
ALLOTMENT 443 IN F178855 &
ALLOTMENT 444 IN 178856
OF SECTION 18
HUNDRED OF HUTCHISON
in the area named TUMBY BAY

SCALE METRES
0 5 10 15 20 25 30

CT 5881/510 & CT 6151/610



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REFERENCE:2016 | REVISION: 26-9-16

8c/072017 **MESCONF 2/717** **Soil Assessment of Lot 443 and 444 Trezise Street, Tumby Bay**

Moved - Kroemer Seconded - Collins

That Council undertake additional investigations to determine the nature and extent of soil and groundwater contamination.

That Council proceed with the required remediation of Lot 443 and Lot 444 in accordance with the Environment Protection Act after the additional investigations are undertaken and costs are in line with the estimates as presented to Council in Attachment 3 in MESCONF 2/717.

CARRIED