PLANNING AND ENVIRONMENT COURT OF QUEENSLAND

CITATION:	*Austin BMI Pty Ltd v Ipswich City Council & Ors* [2023] QPEC 27
PARTIES:	**AUSTIN BMI PTY LTD (ACN 164 204 308)** (appellant) **v** **IPSWICH CITY COUNCIL** (respondent) And **CHIEF EXECUTIVE, DEPARTMENT OF STATE DEVELOPMENT, MANUFACTURING, INFRASTRUCTURE AND PLANNING** (first co-respondent by election) And **CLEANAWAY SOLID WASTE PTY LTD (ABN 55 120 175 635)** (second co-respondent by election) And **HAENKE NO.3 PTY LTD** (third co-respondent by election)
FILE NO/S:	912 of 2020
DIVISION:	Planning and Environment Court
PROCEEDING:	Applicant appeal against deemed refusal
ORIGINATING COURT:	Planning and Environment Court of Queensland, Brisbane
DELIVERED ON:	20 June 2023
DELIVERED AT:	Brisbane
HEARING DATE:	11, 12, 13, 14, 17, 18 & 19 May 2021 14, 15, 16, 17 & 18 June 2021 19, 20, 21, 26 & 27 July 2021 12 & 13 August 2021 Written submissions received on 18 August 2021 and 12 October 2021

JUDGE: Williamson KC DCJ

ORDER: **I will hear from the parties about a date for a review.**

CATCHWORDS: PLANNING AND ENVIRONMENT – APPEAL – appeal against deemed refusal of a development application for an integrated waste facility – whether the development application complies with the respondent's planning scheme – whether the development application complies with two Temporary Local Planning Instruments – whether there is a need for additional landfill airspace capacity – whether the development would operate as a disincentive for recycling and resource recovery – whether the development is contrary to contemporary waste management planning – whether the development application should be approved or refused in the exercise of the discretion under s 60 of the *Planning Act 2016*.

LEGISLATION: *Integrated Planning Act 1997*, ss 1.2.1, 1.3.3 & 2.1.3
Planning Act 2016, ss 3, 4, 5, 8, 23, 45, 59, 60, 229, sch 1 & sch 2
Planning & Environment Court Act 2016, ss 43 and 45
Planning Regulation 2017, Schedule 10

CASES: *Abeleda v Brisbane City Council* (2020) 6 QR 441
Arksmead Pty Ltd v Gold Coast City Council [2001] 1 Qd R 347
Ashvan Investments Unit Trust v Brisbane City Council & Ors [2019] QPELR 793
Brisbane City Council v YQ Property Pty Ltd [2021] QPELR 987
Broad v Brisbane City Council [1986] 2 Qd R 317
Cleanaway Solid Waste Pty Ltd v Ipswich City Council & Ors [2023] QPEC 26
Clermont Quarries Pty Ltd v Isaac Regional Council & Ors [2021] QPELR 65
GFW Gelatine International Ltd v Beaudesert Shire Council & Ors [1993] QPLR 342
HPC Urban Design & Planning Pty Ltd & Anor v Ipswich City Council & Ors [2020] QPELR 534
Indooroopilly Golf Club v Brisbane City Council [1982] QPLR 13
Isgro v Gold Coast City Council [2003] QPELR 414
Lane v Gatton Shire Council & Anor [1988] QPLR 49
Lantrak Property Holdings (Qld) Pty Ltd v Ipswich City Council & Ors [2023] QPEC 25
Mackay v Brisbane City Council [1992] QPLR 65
Nerinda Pty Ltd v Redland City Council [2019] 1 Qd R 523
Sincere International Group Pty Ltd v Council of the City of Gold Coast [2019] QPELR 247
Terrace Tower Holdings Pty Ltd v Sutherland Shire Council (2003) 129 LGERA 195
Trinity Park Investments Pty Ltd v Cairns Regional Council &

Ors; Dexus Funds Management Ltd v Fabcot Pty Ltd & Ors [2022] QPELR 309
William McEwans Pty Ltd v Brisbane City Council [1981] QPLR 33
Wilhelm v Logan City Council & Ors [2021] QPELR 1321
Yorkeys Knob BP Pty Ltd v Cairns Regional Council [2022] QCA 168

COUNSEL: Mr S Holt KC and Mr M Batty for the appellant
Mr C Hughes KC, Mr J Lyons and Mr B Rix for the respondent
Mr D O'Brien KC and Mr J Ware for the first co-respondent by election
Mr J Rivett (Solicitor) for the third co-respondent by election

SOLICITORS: McCullough Robertson for the appellant
McInnes Wilson for the respondent
Hopgood Ganim for the first co-respondent by election
Second co-respondent by election excused from participation in the trial
Coast to Coast Legal for the third co-respondent by election

Overview

[1] This is an appeal against Council's deemed refusal of a non-putrescible landfill and resource recovery facility on a former mining site at New Chum. The site is degraded. A prominent feature is a large open cut void. It is proposed to rehabilitate the void by filling it with a combination of mine spoil and non-putrescible waste. The non-putrescible landfill component has an airspace capacity in the order of 8.9 million cubic metres and an estimated operating life of 14 to 18 years.

[2] Council, supported by the third co-respondent by election, contends the development application should be refused. The refusal case is based on alleged non-compliance with a number of planning documents. Central to this allegation is a contention that the proposed development is inappropriate in terms of its environmental and amenity performance. The extent to which there can be confidence in the environmental performance, and associated risk, of the proposed development was approached by the refusing parties with the optimism of '*Henny Penny*'. This optimism was reflected in the broad range of topics advanced under the heading of '*poor environmental performance and risk*', which was said to be a reason warranting refusal of the development application in its own right.

[3] It was further contended that non-compliance with relevant planning controls was reinforced by:

(a) an absence of need for additional landfill airspace to accommodate non-putrescible waste for the foreseeable future;

(b) contemporary planning policy, which encourages recycling and resource recovery with landfill as a last resort;

(c) reason that the proposed development, if approved, would act as a disincentive for recycling and resource recovery; and

(d) reason that the subject land will, in the event of a refusal, be rehabilitated pursuant to existing obligations associated with former mining activities.

[4] Austin has discharged its onus. The development application will be approved in due course, subject to conditions.

[5] It has been demonstrated the proposed development can be conditioned to manage its environmental and amenity impacts to a high standard. Compliance has, as a consequence, been demonstrated with Council's 2006 planning scheme and State Code 22, which forms part of the State Development Assessment Provisions.

[6] Council alleged non-compliance with Temporary Local Planning Instrument No.1 of 2018 (and as amended in August 2018) and No.1 of 2020. For the purpose of this appeal, these documents are, for all intents and purposes, identical. At the date these reasons were published, both TLPIs had been repealed. Despite their repeal, an assessment was undertaken against the Activity Code forming part of each TLPI. The assessment established that development of the kind proposed is anticipated on the land, subject to compliance with specific development controls. Compliance has been demonstrated with the development controls specified in the Activity Code for each TLPI.

[7] If an alternative view is adopted, non-compliance with each Activity Code is limited to Specific Outcome 4(5)(a). Non-compliance with this provision is technical in nature and does not sound in any adverse town planning consequences.

[8] Compliance with the planning scheme is a matter that attracts significant weight in the exercise of the planning discretion under s 60 of the *Planning Act 2016*. It is a compelling ground in favour of approval and lends strong support to the conclusion that an approval should be granted, subject to conditions.

[9] An approval should be granted, provided there are no valid town planning reasons to suggest otherwise in the circumstances. I am persuaded there are no planning reasons advanced by the refusing parties that attract such weight as to call for refusal of the development application in the face of compliance with Council's planning scheme. The development application will be approved in due course. The parties will now be given an opportunity to prepare and agree upon conditions of approval.

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Introduction

[10] All communities, irrespective of their size and composition, generate waste. Waste can take many forms, including putrescible or non-putrescible. There has been an appreciable shift in community attitudes towards the responsible management of waste, including its reuse and final disposal. Whilst this shift is undoubtedly a positive thing, it will still be necessary to direct a proportion of the waste generated by a community to landfill for disposal; not all waste is suitable for recycling, recovery, reuse or repurposing. In such circumstances, it can be said with confidence that landfill facilities are, and will remain, necessary pieces of community infrastructure.

[11] Existing landfill infrastructure servicing South East Queensland is owned and operated by both private and public entities. It is anticipated the capacity of private non-putrescible landfill facilities serving this region will be exhausted sometime between now and 2031.[1] This has been a driver for three development applications under the *Planning Act 2016* (**PA**). Each development application seeks approval for a material change of use that involves receiving, and disposing, non-putrescible waste on land located in the Ipswich City Council (**Council**) local government area. Each development application is the subject of an appeal to this Court.[2]

[12] I heard each of the appeals. Save for common issues with respect to need and the waste industry, they were heard consecutively, essentially in the order filed. As to the common issues, they were the subject of a joint hearing (**the common need and waste hearing**). Agreement was reached between all parties as to the evidence that was cross-admissible to facilitate this hearing.[3] The agreed body of evidence, in conjunction with the submissions made on behalf of each party, have been considered in these reasons for judgment.

[13] This appeal is brought by Austin BMI Pty Ltd (**Austin**). Austin forms part of the BMI Group, an experienced operator of resource recovery facilities in South East Queensland. Across its network of facilities, the BMI Group provides recycling, waste transfer, landfill and land rehabilitation services.[4]

[14] In February 2018, Austin made a development application to Council. The application sought approval to start a new integrated waste management facility at a former open cut coal mine located at Whitwood Road and Barclay Street, New Chum (**the land**).[5] The proposed facility comprises a non-putrescible landfill and resource recovery area. The landfill component has an airspace capacity of approximately 8.9 million cubic metres and an estimated operating life of 14 to 18 years. The development is intended to complement the BMI Group's existing network of resource recovery facilities.

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1 Ex.8.001, Figure 8.40, para 627; Figure 8.36, para 628.

2 The other appeals are *Cleanaway Solid Waste Pty Ltd v Ipswich City Council & Ors* [2023] QPEC 26 and *Lantrak Property Holdings (Qld) Pty Ltd v Ipswich City Council & Ors* [2023] QPEC 25.

3 Ex.14.022.

4 Ex.9.002, paras 3 to 8.

5 Ex.8.011, paras 62 and 66.

[15] The development application comprises essentially three parts.[6] First, an impact assessable application seeking approval for a material change of use under Council's 2006 planning scheme (**the planning scheme**). Second, a code assessable application for Environmentally Relevant Activities (**ERAs**) associated with the proposed material change of use. Third, a code assessable application for operational works (vegetation clearing).

[16] Council did not decide the development application within the prescribed decision making period. This gave rise to a right of appeal against a deemed refusal.[7] Austin elected to exercise that right and commenced this appeal in late March 2020.[8] Austin bears the onus and must establish the appeal should be upheld.[9] The appeal is a hearing anew.[10]

[17] In keeping with a long-standing practice of the Court, the hearing before me was limited to the determination of this threshold question: whether Austin's development application should be approved, or refused? Austin contends for approval on the footing the proposed development complies with the applicable planning controls, or alternatively, any non-compliance does not call for refusal having regard to a number of favourable planning considerations.[11] Here, an important planning control is the planning scheme.

[18] It is fair to observe from the outset that the case in favour of approval starts on a sound footing. This flows from the following matters:

(a) the land is degraded and highly modified due to extensive former mining activities;[12]

(b) the proposed development is intended to rehabilitate the land[13] for future industrial purposes in circumstances where the planning scheme recognises the need to rehabilitate land impacted by former mining activities, along with the need for the same land to be used in an '*appropriate manner*';[14]

(c) as to an appropriate use, the land is included in a Sub Area of the planning scheme that, subject to the management of environmental and amenity impacts, supports '*difficult to locate uses*', including those involving waste recycling, reprocessing and disposal; [15]

(d) the planning scheme recognises that the proposed development is consistent with the outcomes sought for the zones in which it is included, subject to

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6 Ex.8.011, p.23, para 62.

7 s 229(1)(a)(iii); Schedule 1, Table 1, item 1(b); and definition of '*deemed refusal*' Schedule 2 of the *Planning Act 2016* (**PA**).

8 Ex.5.001, p.3, Notice of Appeal.

9 s 45(1)(a), *Planning and Environment Court Act 2016* (**PECA**).

10 s 43, PECA.

11 Ex.13.022, para 6(d).

12 Ex.8.010, para 7.

13 It was agreed by the geotechnical, landfill design and environmental management experts that the '*opportunistic landfilling of sites can represent a valid and appropriate method of site rehabilitation*' (Ex.8.002, p.12, para 1). Mr Perkins was of a similar view, provided it was demonstrated that the filling method was acceptable (T33-39, L18-29).

14 Ex.3.001, p.1-67, s 6.14(2)(j); p.1-85, s 6.19(2)(e).

15 Ex.3.001, p.1-74, s 6.16(2)(a)(iv)(F) and definition for 'special industry', p.1-134, (f).

meeting a stated test, namely the development is of a type and scale appropriate for the area and circumstances of the site and surrounds[16] - the land is in an area dominated by industrial land uses, including waste facilities and landfills;[17] and

(e) there is no dispute the proposed development can be conditioned to deal with issues associated with ecology, aquatic ecology, koalas, air quality, noise and traffic.[18]

[19] As against this, Council contends for refusal. The risk associated with, and the management of, environmental impacts is at the forefront of its case.

[20] The refusal case is founded on the proposition that the development is inappropriate in terms of environmental performance, landfill design and amenity impacts.[19] The issues are interrelated and are relied upon to establish non-compliance with a suite of planning controls, including the planning scheme. Further, and to reinforce its refusal case, Council contends there are relevant planning considerations that militate against approval.[20]

[21] The third co-respondent by election (**Haenke**) has an interest in adjoining land. It made an adverse submission to Council about the development application. Haenke's position aligns with Council. It supports Council's refusal case.

[22] The first co-respondent by election (**Chief executive**) actively participated in the appeal and, to the extent of its prescribed referral jurisdiction, agitated for conditions to be attached to an approval, assuming one was granted.[21]

[23] The second co-respondent by election (**Cleanaway**), who made an adverse submission about the development application, did not press for refusal. It was excused from participating in this part of the appeal.[22]

[24] I will now deal with some background and the statutory assessment and decision-making regime applicable to the appeal.

The land and surrounding locality

[25] The land comprises seven (7) contiguous lots; is irregular in shape; and has a total area of 108.66 hectares.

[26] At present, there are two industrial uses conducted on the land, namely a tyre recycling facility and a business that manufactures and supplies bulk explosives and related chemicals.[23]

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16 Ex.3.001, p.1-77, s 6.17(2)(t); p.1-89, s 6.22(2)(t).
17 T32-92, L10-11.
18 T40-19, L1-16, referring to Ex.13.022, para 4. Further, Mr Rivett who appeared for Haenke did not submit to the contrary.
19 Ex.14.024, para 6.
20 Ex.14.024, para 12(c) and (d).
21 Ex.15.001, para 5.
22 Cleanaway wishes to be heard in relation to conditions attaching to an approval.
23 Ex.8.011, paras 53, 54 and Figure 1.

[27] The land is subject to a Mining Lease (ML50115) and an Environmental Authority (EMPL02454414) for clay pit mining.[24] There are no active mining areas within the mining lease. Existing activities on the land are limited to rehabilitation and preparation for future development.[25]

[28] It is uncontroversial the land is highly modified, degraded and in need of rehabilitation.

[29] The extent of modification and degradation is the direct product of past underground and open cut coal mining activities. As would be expected, activities of this kind have caused extensive disturbance. The activity has altered the surface and subsurface of the land.[26] It can be readily seen in the form of steep walls and benches, stockpiles of overburden and haul roads.[27] Steep and unvegetated benches and stockpiles of overburden are prominent features of the land. Photomontages reveal the benches and stockpiles of overburden are visible[28] at a residential community located approximately 1.2 kilometres to the east.[29] The benches are an unattractive feature of the skyline and appear as a '*scar*' on the landscape.[30]

[30] A prominent man-made feature is a void, which is in direct connection with the groundwater regime.[31] It was created by open cut mining and located on the eastern side of the land, having a footprint of 21 hectares.[32] The deepest point is at RL -61.9m AHD.[33] It is partially filled with 6,500 megalitres of water.[34] Water enters the void by a combination of surface water runoff and groundwater infiltration.[35] Whilst there is uncertainty as to the percentage mix,[36] surface water is likely to account for the largest proportion of water in the void.[37] It was uncontroversial the void is acting as a '*sink*'[38] in the landscape collecting surface water. This has resulted in significant reductions in discharge from the land to the receiving environment.[39] The evidence indicates the water level in the void is likely to continue to rise, with a 5 to 10% risk of uncontrolled spill from the void to the receiving environment.[40]

[31] The quality of the water in the void was sampled from October 2017 to November 2020. It is similar in quality to that of the receiving environment[41] and is suitable for discharge[42]. The receiving environment comprises an unnamed drainage channel

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24 Ex.13.018 and Ex.6.001, p.3.
25 Ex.13.018, s 4.1.
26 Demonstrated by a comparison of 1972 pre-mining contours with the contours of the disturbed surface (Ex.9.017, pp.17-20 and Ex.14.021).
27 Ex.8.011, para 46(e).
28 T33-5, L36.
29 T33-25, L12-22.
30 Ex.8.010, para 9; Ex.10.001, pp. 19, 36 and 52; T32-99, L17-19.
31 Ex.8.006, para 46 and Ex.8.011, p. 21, Figure 1.
32 Ex.8.011, para 46(e).
33 Ex.1.002, p.1, Section A.
34 Ex.9.001, para 9.
35 Ex.9.001, para 9.
36 T25-31, L3-8.
37 T25-28, L1-7.
38 T25-19, L1-4.
39 Ex.8.006, p.14, para 42.
40 Ex.9.013, para 14.
41 Ex.9.003, p.12, para 27 and 30.
42 Ex.8.006, p.15, para 56.

flowing east and connecting to Six Mile Creek.[43] Outflow of water in the void is towards Six Mile Creek via a preferential pathway, made up of alluvium, under the unnamed drainage channel.[44] The outflow expresses as discharge, and baseflow, within the creek.[45]

[32] Mining activities have adversely impacted the ecological features of the land.[46] Save for isolated patches of remnant vegetation/koala habitat, the land is cleared and offers limited opportunities for fauna refuge and fodder. It is largely impermeable for terrestrial fauna.[47]

[33] An Environmental Authority for clay pit mining applies to the land.[48] The Authority was granted subject to conditions, including F1-1. This condition does not require the land, either in whole or part, to be rehabilitated for environmental purposes. Rather, it calls for '*All areas significantly disturbed by mining activities*' to be rehabilitated in accordance with Schedule F – Table 1. This table provides, in part:

Disturbance Type	Projected surface area (ha)	Rehabilitation outcomes
Mine void	31	Industrial
Spoil stockpiles	13	Industrial
Roads	3	No rehabilitation required - retain
Water storages	1.5	No rehabilitation required - retain

[34] Disturbed land nominated for an '*Industrial*' outcome is considered rehabilitated under the Environmental Authority when it is stabilised and does not, or will not, have potential to cause environmental harm.[49] The Environmental Authority does not prescribe when rehabilitation is to commence. Nor does it prescribe when rehabilitation, in the sense described by the document, is to be completed.

[35] The rehabilitation of the land will need to include the treatment of an area of combustible and heated material. It is located in the western portion of the land,[50] which I visited during the site inspection. Treatment is required to ensure the material does not re-heat and combust spontaneously.

[36] The obligations imposed by the Environmental Authority, including those with respect to rehabilitation, are secured by way of financial assurance.[51]

[37] Looking beyond the boundaries of the land, the surrounding locality has a highly modified landscape. Like the land, it has been impacted by mining activities.[52] The

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43 Ex.9.013, paras 14 and 15; Ex.9.001, paras 9 and 10.
44 T25-19, L3-25 and T25-29; and Ex.14.011.
45 Ex.8.006, p.15, para 51.
46 Ex.9.016, para 26 and Ex.8.009. p.8 to 10, Table 2.
47 Ex.8.009, para 17, 18 and Ex.9.016, para 4, 5 and 6.
48 Ex.6.001, p.12.
49 Ex.6.001, p.12, condition F2-1.
50 The location of the material is identified in Ex.1.001, p.23 and discussed in Ex.8.002 at para 7.
51 Ex.6.001, p.6, conditions A2-1 and A2-2.
52 Ex.8.011, paras 57 and 58 and Ex.8.010, para 12.

extent of the impact can be seen in Figure 1 to the visual amenity joint expert report[53] and Attachment C to the town planning joint expert report.[54] The latter, in particular, reveals the extent to which the land, and surrounding area, have been subject to significant and appreciable anthropogenic interference. The resulting landform is in many parts scarred and, where elevated, is as an unattractive feature of the skyline.

[38] Attachment C to the town planning joint expert report and Figure 1 to the visual amenity joint expert report greatly assist in understanding the surrounding land use context in New Chum.[55] The surrounding area is dominated by industrial land uses, including landfills.[56]

[39] Surrounding land uses include:[57] (1) to the north, a former landfill operated by Council[58] and an existing landfill operated by Cleanaway;[59] (2) to the east, there is pit mining for clay to facilitate the production of bricks and pavers;[60] (3) existing waste related activities are located to the east and south;[61] and (4) an existing coal mine is located to the south.[62] The modified landform and waste activities on the Cleanaway site can, like the land, be seen from the residential community to the east.[63]

[40] The extent of industrial development in the locality is a reflection of a number of well-recognised locational advantages. The land, and surrounding locality, enjoy good access to major road and transport infrastructure. This infrastructure includes the Cunningham Highway, Warrego Highway and Ipswich Motorway.[64] The Cunningham Highway adjoins the western boundary of the land, co-incident with a band of vegetation providing a buffer to the impacts of the Highway. In addition to major road infrastructure, the land and surrounding locality are proximate to, and supported by, a substantial employment catchment. The locality provides employment growth opportunities to support the population of Ipswich, which, like many parts of South East Queensland, is forecast to increase substantially in the coming decades.[65]

[41] Whilst there is a band of vegetation along the western boundary of the land,[66] limited greenspace connectivity is achieved with the surrounding greenspace network. The greenspace areas are located: (1) in a band parallel to the eastern side of the Cunningham Highway; (2) on the western side of the Cunningham Highway, north and south of the land; and (3) to the east of the land as a buffer to Six Mile

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53 Ex.8.010, p.5.
54 Ex.8.011, p.166.
55 Ex.8.011, p.166 and Ex.8.010, p.5.
56 T32-92, L10-11 and Ex.8.011, paras 57 and 58.
57 Ex.8.011, para 59.
58 Ex.8.011, p.166, Attachment C, site 10.
59 Ex.8.011, p.166, Attachment C, site 12.
60 Ex.8.011, p.166, Attachment C, sites 6, 7 and 9.
61 Ex.8.011, p.166, Attachment C, sites 8 and 5.
62 Ex.8.011, p.166, Attachment C, site 3.
63 T33-25, L10-22.
64 Ex.3.001, p.1-30, Note 6.7C, item (1).
65 Ex.3.001, p.1-193, 'Introduction to the Study Area'.
66 Ex.4.001, p.193.

Creek.[67] The area between the land and Six Mile Creek is a mixture of vegetated, cleared, and disturbed land. Aerial photography suggests the extent, and degree of intactness of the existing vegetation increases as one moves from the land in an easterly direction towards Six Mile Creek.[68] The creek is approximately 900 metres from the mining void.[69]

[42] The aquatic habitat in Six Mile Creek is characterised as '*moderately disturbed waters*'.[70] This is consistent with it being typical of a creek flowing through land that has been modified for a range of uses, including urban development, mining/quarrying, landfill and industrial uses. In that setting, riparian vegetation has been cleared resulting in some erosion. There has also been artificial channelisation. Despite this, Six Mile Creek supports a diversity of native aquatic flora and fauna.[71]

[43] The aquatic condition of Six Mile Creek can be contrasted with the unnamed drainage channel connecting to the void. The channel was assessed as having poor to fair aquatic habitat condition. It was fairly described as '*a drainage feature lacking stable aquatic habitat and with very little riparian vegetation*'.[72]

The proposed development

[44] Austin's development application seeks approval to start two new uses, namely '*special industry*' (landfill, waste transfer station, resource recovery and ancillary activities) and '*caretaker residential*', both of which are defined in the planning scheme.[73] Associated approvals for operational works and ERAs are also sought.

[45] There is a substantial body of material describing the development and measures to be planned, implemented and executed to manage its impacts.[74] The material reveals that an integrated waste facility is proposed, comprising two components; a landfill, and a resource recovery facility.[75] The latter provides an opportunity for a final pass through material destined for landfill to ensure everything that can viably be recovered, or recycled, will be.

[46] Before discussing the proposed development in detail, it is relevant to observe that an Environmental Authority (**EA**) for an integrated waste facility was also applied for, and obtained, under the *Environmental Protection Act 1994*. The EA was issued by the administering authority on 22 November 2019[76] and granted subject to conditions. The EA is for an integrated waste facility on the land. Central to the authority is a requirement that contaminants not be released from the land, other than as permitted by conditions of the EA.[77] The decision to grant the EA is not the

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67 Ex.8.011, p.226 – see Green spaces identified as 'RBB1', 'CON' and 'REC'.
68 Ex.8.010, para 16 c.
69 T26-43, L44 to T26-44, L2.
70 Ex.9.001, p.38, para 96.
71 Ex.9.001, p.38, para 95.
72 Ex.9.001, p.12, para 22.
73 Ex.6.001, pp.54 and 77.
74 A helpful description of the development is to be found in Ex.8.011, pp.23 to 29.
75 General arrangement plan, Ex.1.002, p.2.
76 Ex.6.001, pp.17-51..
77 Ex.6.001, p.33, Condition L1, p.34 Condition WT1.

subject of an appeal to this Court. It will take effect if, and when, a development approval is granted by this Court.

[47] The EA, and conditions attaching to it, are relied upon by Austin in support of approval. Austin invited the Court to approach the exercise of the discretion on the footing the conditions attaching to the EA are part of a large body of evidence demonstrating the proposed development can be conditioned to successfully mitigate its impacts. The conditions of the EA, when considered in this way, are relied upon as being responsive to the reasons for refusal.[78] I accept the EA can be relied upon for this purpose. I will, as a consequence, discuss some conditions of the EA while describing the development for which approval is sought.

[48] The landfill operation involves the progressive filling and rehabilitation of the void created by open cut mining. The void is to be filled with non-putrescible waste, namely construction and demolition waste (C&D), commercial and industrial waste (C&I) and contaminated soils.[79] The air space capacity of the void is approximately 8,900,000 m^3.[80] Filling will occur in stages. It is estimated that 700,000 tonnes of waste per annum will be received, rising at a rate of 3% per annum over the life of the landfill.[81] Based on assumed acceptance rates for waste,[82] the landfill will have an operating life in the order of 14 to 18 years.[83]

[49] Upon completion, the landfill is to be capped and monitored for a period of 30 years.[84] The final landform will reach a maximum height of RL86m AHD and will be vegetated, in part. The intention is that the land, in the long term, will be suitable for industrial uses of the kind anticipated for a Regionally Significant Business and Industry Area.[85]

[50] The resource recovery facility will receive about 275,000 tonnes[86] of waste per annum to extract suitable material for reprocessing, crushing and/or recycling. Material falling into this category, once processed, will be removed from the land. Any residual waste that cannot be recycled or processed will be deposited in the void. It is intended the resource recovery facility will continue to operate after the mining void is filled, capped and rehabilitated.[87] The continuation of this part of the development is consistent with long term planning for the Swanbank New Chum Sub Area.[88] This is a Sub Area identified by the planning scheme.

[51] Mr Dekker, who is the General Manager of the BMI Group, explained that the co-location of the resource recovery infrastructure with a landfill is an efficient

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78 Austin's Written Reply for the Austin Specific Hearing dated 18 August 2021, para 11.
79 Ex.8.011, p.25, para 73.
80 Ex.8.011, para 75.
81 Ex.9.002, para 42 and 43.
82 Ex.8.011, p.25, para 75 – 369,000 to 660,000 t/pa for C&D and C&I waste and 100,000 to 179,000 t/pa for contaminated soil.
83 Ex.8.011, p.25, para 76.
84 Ex.8.002, p.15, para 7.
85 Ex.8.011, p.27, para 97.
86 Ex.8.005, p.8, para 7; comprising 220,000 tonnes of C&D waste, 42,500 tonnes of separated concrete and 12,500 tonnes of timber and green waste.
87 Ex.8.011, p.24, para 70.
88 Ex.3.001, p.1-74, s 6.16(2)(a)(iv)(F).

resource recovery model. This evidence, which was not challenged, was supported by the following reasons given by Mr Dekker:[89]

> "(a) the co-location of the two activities ensures the efficient utilisation of buffer areas with such areas with appropriate distances from sensitive receptors difficult to find in an urban setting.
>
> (b) Logistical costs and impacts on [the] traffic network is reduced. The processing of recovered material from sorting operation to crushing or shredding process as well as the carting of residuals to landfill all on the one site removes a significant number of truck movements off the local roads.
>
> (c) It promotes purchase of recycled products as trucks servicing the construction industry may dispose of waste and then return to the construction site with recycled construction materials."

[52] I accept Mr Dekker's evidence.

[53] The physical layout of the development is depicted in a number of plans.[90] They reveal the development comprises four distinct parts, with the development footprint concentrated towards the centre and eastern side of the land. Moving left to right (west to east) on the '*General Arrangement Plan*',[91] the four parts of the development are: (1) a buffer area; (2) a site infrastructure area; (3) a sorting, processing and recycling area; and (4) the landfill. Access is obtained to parts (2), (3) and (4) via an internal road connecting to Austin Street. The development is proposed to proceed in two stages.[92] Stage 1 comprises parts (1), (2), (3), and the southern end of (4). Stage 2 involves the final stages of filling the void.

[54] The buffer area is parallel to the Cunningham Highway. A comparison between a number of maps included in the town planning joint expert report and book of plans, indicates it is included in the Regional Business and Industry Buffer Zone of the planning scheme.

[55] The purpose of the proposed buffer area is two-fold. First, it provides a physical separation distance between the development footprint, Cunningham Highway and residential areas further to the west. Separation distances are measured at two points on the proposed plans. Both measurements demonstrate a meaningful separation distance is provided. The distances measure 103 metres and 221 metres.[93] Second, the buffer area, as the name suggests, is intended to perform the function of a vegetated buffer between the development, Cunningham Highway and residential development to the west. To achieve this, the area will be rehabilitated.[94] It will not be used as part of the integrated waste facility. It is an area free from built form and

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89 Ex.9.002, para 28. See also para 31 of the same statement.
90 Ex.1.001 and Ex.1.002.
91 Ex.1.001, p.11.
92 Ex.1.001, p.13.
93 Ex.1.001, p.11.
94 Ex.1.001, p.28 read with Ex.9.015, pp.5 to 6.

hard infrastructure. The vegetation, in combination with the separation distances, will screen the development from viewing points located to the west of the land.

[56] A proposed rehabilitation strategy for all of the land was agreed between three terrestrial ecology experts. The strategy involves: (1) the retention of existing vegetation, including regulated vegetation in the south-western corner of the buffer area; (2) the relocation of a patch of threatened regrowth vegetation (*Marsdenia coronata*); (3) the creation of replanting and revegetation zones; (4) maintenance and weed control measures for the life of the development; and (5) the planting of vegetation that is suitable for koalas.[95] The execution of the rehabilitation strategy is anticipated to create connections and linkages to permit fauna movement through the land and beyond. Whilst a 1.8 to 1.9 ha patch of remnant vegetation is to be cleared to make way for the proposed development,[96] it was agreed that the overall rehabilitation strategy, which provides for a rehabilitated area of about 7.67 ha,[97] will improve the ecological function of the land and beyond.[98] I accept this represents a positive outcome for the ecological values of the land and surrounding area.[99]

[57] The site infrastructure area adjoins the eastern edge of the buffer area. It is through this area that the integrated waste facility is accessed from Austin Street. In this location there is[100] an administration office, carpark, weighbridge, wheel wash, water tanks, '*untarping areas*' for B-Double trucks, caretaker's accommodation and a workshop/fuel storage. The proposed concept rehabilitation plan indicates this area, and the access to it, will be landscaped.[101] The footprint of the infrastructure area sits predominantly, if not entirely, within the Regional Business and Industry Investigation Zone of the planning scheme.

[58] The sorting, processing and recycling area adjoins the eastern edge of the infrastructure area. It is about 10 ha in size (approximately 300m long x 350m wide).[102] The plans of development reveal it will contain recycled product storage bays, three recovery and processing sheds and a bin storage shed. The sheds will be constructed generally in accordance with a concept building design,[103] which contemplates the sheds being 15 metres in height and finished with a dark subdued colour palette. This, in combination with a 30 to 40 metre vegetated buffer that surrounds the edge of the sorting, processing and recycling area, is to ensure the built form merges into the landform and vegetation.[104] The sheds have also been positioned to screen activities from viewing points to the east. Processing of material will occur within the sheds. This will assist in the mitigation of amenity impacts, such as those related to dust, odour and noise emissions.

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95 Ex.8.009, p.7, paras 17 to 24; Ex.8.011, pp.45-46, para 163.
96 Ex.8.009, p.7, para 19 and Ex.8.011, pp.26-27, para 89.
97 Ex.8.011, p.26, para 88.
98 Ex.8.009, p.8, DC comments and p.21, para 44.
99 Ex.8.009, p.7 para 24 and Ex.8.011, p.27, paras 90 and 91.
100 Ex.1.001, p.20.
101 Ex.1.001, p.28.
102 Measured on Fig 02 at A3 size and by reference to the scale in bottom right hand corner (Ex.1.001, p.11).
103 Ex.5.001, p.73, Visual Amenity condition 1 and Attachment A at pp.75 to 81.
104 Ex.9.014, p.6. para 13 and T32-93, L38 to T32-94, L7.

[59] Beneath the sorting, processing and recycling area is carbonaceous material susceptible to spontaneous combustion.[105] This material is to be removed and placed in the flooded part of the void. This will occur after the void is partially dewatered and then filled to create a base for a composite liner discussed below.[106]

[60] The landfill adjoins the eastern edge of the sorting, processing and recycling area. It is included in the Regional Business and Industry Investigation Zone of the planning scheme.

[61] Four steps need to occur before waste can be received and deposited in the void.

[62] First, overland flow intercepted by the void is to be diverted. This involves re-instating the unnamed drainage channel around the southern boundary of the void.[107] To achieve this, earthworks are proposed. This involves forming an embankment and reconstructed channel.[108] These works will divert surface flow away from the void and, instead, direct flow into the unnamed drainage channel around the eastern and north-eastern perimeter of the land. The surface water and stormwater experts agreed this would return surface water discharges from the land to pre-mining levels. The same experts agreed that such an outcome would be a '*major improvement*'.[109] I accept this evidence.

[63] Second, the void is to be partially dewatered by progressive pumping to the unnamed drainage channel. The water in the void would be lowered from RL27.6m AHD[110] to RL18m AHD for Stage 1, and RL15m AHD for Stage 2.[111] The purpose for dewatering the void is to create a dry space for the construction of the base for the composite landfill liner.

[64] The dewatering of the void will occur concurrently with the backfilling described below.[112] It is planned to occur at a rate of 70 litres per second. A water balance model suggests the process will take in the order of 12 to 18 months.[113] There is, however, a dispute about this. Mr Collins, a very experienced hydraulic engineer called by Council, estimated the time for the engineering works and dewatering to be in the order of 30 months.[114]

[65] Water drawn from the void will be pumped to the unnamed drainage channel. Whilst it is thought to be acceptable for release,[115] before doing so, the void water will be subject to '*in-line testing*'[116] by a containerised monitoring system for real time water quality assessment. This system will monitor whether the water meets limits prescribed in the conditions of the EA discussed above, in particular,

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105 Ex.1.001, p.23.
106 Ex.8.002, p.27-28, paras 43 to 45.
107 Ex.9.013, para 17.
108 Ex.9.013, para 17 and p.25 Appendix B.
109 Ex.8.006, p.14, para 42.
110 Ex.9.013, para 18.
111 Ex.8.002, p.30, para 52.
112 T25-55, L14-22.
113 Ex.9.013, para 18.
114 Ex.8.006, para 23. Mr Marszalek, disagreed - T25-54, L6-9 and T25-68, L24-27.
115 T26-48, L14 -18.
116 T25-55, L39.

conditions WT2 and WT3.[117] Where water to be discharged from the void to the unnamed drainage channel does not meet one or more of the prescribed limits, pumping will cease, and the water will be treated.

[66] Not all of the limits prescribed in the EA can be tested 'in-line'.[118] The limits that cannot be tested in line will be subject to manual sampling and laboratory analysis.[119] Real time monitoring samples will also be collected and analysed monthly for a range of parameters in accordance with a draft receiving environment monitoring program (**REMP**). This program is required by condition G15 of the EA and is the subject of a specific recommendation made by Austin's aquatic ecologist, Ms Thorburn.[120] Her evidence, which I accept, was unchallenged.

[67] Complete dewatering of the void is impractical.[121] This is due, in part, to an expectation that a high rate of inflow of recharged groundwater would flow into the lower levels of the void, along with drainage from exposed overburden backfill material and former mine workings.[122] Construction safety issues also arise. Carrying out earthworks at the depths required, coupled with the potential for unstable internal batters, creates an unsafe workplace.[123]

[68] Third, the void will be backfilled in two zones, namely: (1) a general backfill zone; and (2) an engineered backfill zone.[124] The total depth of backfill will be 77 metres at the deepest part of the void.[125]

[69] The void will be backfilled to a level that is 5 metres below the base of the liner system. This filling was described as the '*general backfill zone*'. The backfill material is to be of a maximum particle size of 300mm. It will comprise a combination of former mine overburden stockpiled on the land, material blasted from the perimeter eastern open cut high wall and, if required, imported clean fill.[126] This material will be pushed from a tip edge, or tip head, into the void and placed loose under water. Filling will advance laterally across the backfill area and[127] be compacted by way of proof rolling to ensure there is a competent surface on which to place the next fill layer.[128] Prior to the placement of the next layer of fill, the general backfill zone will be surveyed and certified by a CQA Engineer.[129] The need for certification is bound up in demonstrating compliance with conditions of the EA (W9).[130]

[70] The engineered backfill zone is 5 metres deep and forms the underside of the landfill liner. The surface of the zone will be dry as it will be elevated above the

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117 Ex.6.001, pp.34 to 35.
118 T25-79, L40.
119 T25-80, L4-9.
120 Ex.9.003, pp.23-24, paras 53-54.
121 Ex.8.002, paras 49 and 50 and Ex.9.009, p.19, s 3.5.
122 Ex.8.002, p.29, para 49.
123 Ex.9.009, p.19, s3.5.
124 Ex.8.002, para 61.
125 T25-70, L29-41 and T27-43, L1-4.
126 Ex.9.013, para 19 and T27-35, L25 to T27-36, L2.
127 Ex.8.002, para 63.
128 T27-36, L9-13.
129 Ex.13.014.
130 T27-36, L20-44.

water remaining within the void. It is the same fill material as that utilised in the general backfill zone.[131] Mr Watson, who is a civil engineer specialising in landfill design,[132] helpfully explained the process for placing and certifying[133] this fill:[134]

> "…material would…be brought in, dumped. If it was brought in by truck, it would be spread in a thin layer, about 150 or 200 millimetres thick. It would be moisture conditioned as required, because that's necessary to achieve optimal compaction, and then would be rolled using a roller compactor…those layers would be continually placed up until the five-metre thickness was achieved. But at each layer, there would be quality assurance, density testing, moisture content testing of that material as it's raised. So you get this continuous…quality control activity…being undertaken.
>
> And what about ultimate certification of that. How does that occur, and by whom? …we call it a GITA, and that's in relation to…the Australian Standard 3798. And the GITA is a geotechnical inspection and testing authority…that's in conjunction with…an engineer that we would have onsite, and…it's a testing authority. Someone would come along…compile the data that they produce. It would be compiled into a report and certified by…[a]…registered professional engineer.
>
> And that certification occurs, do I take it, by necessary implication, before those next layers of the composite…liner that we talked about are done?---Definitely….We have to be confident in terms of the integrity of …that layer before we put the liner on."

[71] The last part of Mr Watson's evidence above refers to the need for confidence in the integrity of the backfill before a liner is placed. Confidence is required to ensure the overall objective for the backfilling process is achieved. The objective is to form a geotechnically competent fill profile over which the landfill liner can be placed. The base needs to provide a smooth, firm and unyielding surface.[135] This is to ensure the liner: (1) can be graded to drain leachate; and (2) is not compromised by excessive strain.[136]

[72] The final step is the placement of a liner system in the void to prevent the migration of contaminants (leachate and subsurface landfill gas) from the landfill into the receiving environment. It also prevents the migration of groundwater into the void, which generates leachate.

[73] Conditions G1 and W8 of the EA require the installation of a landfill liner system.[137] A '*Landfill liner (single)*' is defined in the EA as follows:[138]

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131 Ex.8.002, pp.46-47, para 106.
132 T27-34, L1-7.
133 In the manner provided in Ex.13.014.
134 T27-37, L4-29.
135 T31-53, L37-47.
136 Ex.8.002, para 59.
137 Ex.6.001, pp.21 and 31.
138 Ex.6.001, p.43.

> "Landfill liner (single) means a compacted clay barrier at least 600 mm thickness achieving a maximum permeability of 1 x 10^{-9} metres per second or an alternative barrier such as an engineered geosynthetic liner equivalent in performance and agreed in writing by the administering authority."

[74] The liner proposed for the proposal development is composite in nature. It was uncontroversial that it exceeds the standard required by the above definition. The composite liner, which will sit on the engineered backfill discussed above, comprises more than a compacted clay liner of 600 mm thickness. A typical detail of the liner reveals it comprises (from the bottom up):[139]

(a) a 500mm thick low permeability earthen fill layer;

(b) a geosynthetic clay layer (GCL), which is a pure layer of clay placed between two geotextiles;

(c) a 2mm thick high density polyethylene (HDPE) geomembrane, protected by a geotextile;

(d) a 300mm (minimum) thick aggregate leachate drainage layer; and

(e) a separation geotextile.

[75] Condition W9 of the EA requires the installation of the liner be certified by a qualified person.[140] The process for certification in accordance with this condition is set out in a schedule marked exhibit 13.014.

[76] The liner is not impervious. However, if operating in accordance with the specifications, the flow of groundwater or leachate through the HDPE component would be '*insignificant*'.[141] Mr Tomlin explained what this meant in his oral evidence:[142]

> "…you disagreed with our learned friend that your assumption was that the liner was impervious. You agreed that it had some permeability to it, in effect?---Yes. I agreed; very low.
>
> …And in terms of the way scientists and hydrogeologists talk about very low, can you give us an order of magnitude or a sense of just how low the permeability of the liner in its undamaged state might be, in some way that we might understand it?---Well, if we consider the ability to transmute water …its ability was, essentially, zero. So it's as close to impermeable as we could get whilst not being impermeable."

[77] I accept Mr Tomlin's evidence.

[78] This is complemented by the evidence of Mr Hornsey. He said:[143]

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139 Ex.1.002, p.1, Typical Detail 1; Ex.8.002, para 40 and T31-53, L22-31.
140 Ex.6.001, p.31.
141 T25-25, L33.
142 T25-50, L4-27.
143 T31-62, L26-27.

> "if…you have an intact liner, there is no leakage through that liner. The leakage rates are so small that you're talking about thimblefuls per hectare per year…"

[79] I accept Mr Hornsey's evidence.

[80] The rates of permeability discussed above relate to the HDPE liner. The GCL and compacted clay layer beneath the HDPE liner are also of low permeability. They provide a significant factor of safety that further limits the ability for contaminants to be transported from the void to surrounding groundwater.[144]

[81] Four experts retained by Austin participated in a geotechnical, landfill design and environmental management joint expert report. They agreed:[145]

> "The design of the lower liner (above the backfill and beneath the waste) exceeds best practice in that it includes both a high-density polyethylene (HDPE) liner and geosynthetic clay liner (GCL), with a 2.0mm HDPE specified, rather than the conventional 1.5 mm thickness."

[82] Council's experts participating in the same joint expert report agreed the lower liner exceeds best practice.[146]

[83] Mr Hornsey has extensive experience and knowledge of liners, including how they are manufactured, tested, certified and perform once placed.[147] The extent of his knowledge is reflected in an industry recognised testing method to examine strain on liners. It is the '*Hornsey and Winshaw*' test, based on a paper co-written by Mr Hornsey. In his joint expert report, Mr Hornsey explained what it means for the liner here to be better than best practice:[148]

> "The revised liner design…goes well beyond the world's best practice for a C&D landfill, by incorporating a composite liner system. This is essentially a fail-safe system as it has a secondary liner which ensures ongoing performance of the liner system should a portion of the liner be damaged if for some reason it does not perform adequately. The combination of a protection geotextile, HDP Geomembrane, Geosynthetic Clay Liner and Low Permeability earthen fill in effect therefore creates a fail-safe liner system."

[84] I accept Mr Hornsey's evidence.

[85] The construction of the landfill base includes a groundwater depressurisation system. It is to be installed in the basal liner. The system is intended to avoid hydrostatic heaving of the liner. There is a potential for this to occur before there is sufficient waste placed on the liner to resist upward pressure.[149] Once sufficient

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144 Ex.8.002, p.26, para 39.
145 Ex.8.002, p.2, para 1.
146 Ex.8.002, p.12, para 12.
147 T31-52, L21 to T31-53, L11.
148 Ex.8.002, p.27, para 42.
149 T25-22, L14-20.

waste has been placed to prevent hydrostatic heaving, dewatering of the void, and the operation of the groundwater depressurisation system, can cease.[150] It is expected that groundwater levels will rebound. The final level it will achieve is difficult to forecast. That said, the evidence suggests there are at least two potential outcomes: (1) the water will rebound to a level that is permanently below the liner (RL22m AHD);[151] or (2) the water will rise above the level of the landfill liner to a maximum of RL26m AHD.[152] The transportation of the groundwater into the void will be prevented by the composite liner.

[86] Prior to the deposition of waste, a groundwater monitoring programme will be implemented as required by conditions of the EA.[153] The programme is to include the installation of monitoring bores. Water within the bores is to be sampled and examined against stated parameters.[154] Mr Tomlin, a hydrogeologist, indicated that monitoring would be complex given underlying geological conditions, which include mine workings. He was however of the view that a satisfactory monitoring programme was achievable.[155] I accept Mr Tomlin's evidence.

[87] Non-putrescible waste, comprising either residual material from the processing/recycling area or waste going straight to landfill, will be placed on top of the composite liner and compacted. [156] This will occur in two stages.[157] A staging plan indicates the void will be filled from the shallowest end to the deepest. More particularly, one third of the void will be filled via a series of cells starting at its southern end, heading in an east to west direction (Stages 1A to 1C). After these stages have been completed, the balance of the void will be filled with cells moving from south to north (Stages 2A, 2B and 2C). Stages 2B and 2C are co-incident with the deepest part of the void.[158]

[88] The waste deposited in the void will be covered by an interim, or final cap.[159] The purpose of a cap is to:[160] (1) minimise infiltration of surface water into the underlying fill; (2) assist in the management of stormwater runoff; (3) minimise the release of gas from the waste mass; (4) reduce oxygen ingress during gas extraction; and (5) provide a growing medium for vegetation to stabilise the surface.

[89] The evidence establishes that successful management of landfill gas and water are critical to the environmental performance of the proposed development.

[90] Landfill gas will be managed through the progressive installation of a collection and monitoring system. The collection system will enable gas to be channelled to the surface of the landfill where it is destroyed by high temperature flaring.[161] A leachate and landfill gas management area is to be located below the south-western

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150 Ex.8.006, p.15, para 58.
151 T25-15, L39 to T25-16, L11.
152 Ex.8.006, p.16, para 59.
153 Ex. 6.001 pp. 23, 38-40, Conditions G15, WT9 And WT10.
154 Ex.6.001 pp. 40-41, Condition WT14, Table 9 identifies groundwater monitoring parameters.
155 T25-17, L28-34.
156 T23-14, L34-42.
157 Ex.1.001, p.12.
158 Ex.8.002, p.36, para 73.
159 Ex.8.002, p.38, para 80.
160 Ex.6.001, p.203, s 9.1.
161 Ex.8.011, p.25, para 77(a) and as envisaged by condition W6 of the EA (Ex.6.001, p.25).

corner of the landfill. A gas collection and monitoring system is required by conditions A4 and A5 of the EA.[162]

[91] Gravity dictates that some water falling on the surface of the proposed landfill, or contained within the waste itself, will eventually be transported to the liner at the base of the void. This water is known as leachate. A significant part of the technical evidence was directed to the collection and treatment of leachate, and the separation of surface/groundwater from waste to minimise the generation of leachate. Leachate is, in short, water (groundwater/surface water/rainwater) that has come into contact with waste material.[163] That contact creates a risk of contamination. The risk is not insignificant. Water that comes into contact with waste is unlikely to be suitable for direct discharge from the land to the unnamed drainage channel.[164]

[92] To collect leachate within the landfill, the base of the void is graded from west to east, allowing leachate to drain to, and be collected in, leachate wells along its eastern edge.[165] The collected leachate will be pumped to the surface via riser pipes installed in the basal liner.[166] A number of options are then available to manage the pumped leachate. It can be: (1) recirculated over landfill areas that remain active; (2) transported (by tanker) offsite for treatment; (3) treated via an on-site system and discharged to the unnamed drainage channel; and (4) subject to enhanced evaporation.[167] Mr Dekker's third statement dated 16 July 2021,[168] in conjunction with correspondence dated 11 August 2021,[169] confirm it is accepted that an approval, if granted, should include the following conditions:

> "(a) the leachate storage for the site be provided by way of tanks of a suitable size and designed to manage Mr Tony Marszalek's modelled leachate generation in an extreme weather event;
>
> (b) the leachate pumps and associated piping infrastructure be of a suitable size and designed to manage Mr Tony Marszalek's modelled leachate generation in an extreme weather event; and
>
> (c) a suitably sized and designed leachate treatment system is to be installed on site which is able to treat waters contaminated with PFAS/PFOS."

[93] The '*extreme weather event*' referred to in the above conditions was not defined in Mr Dekker's statement. Based on a proposition put by Mr Holt KC to Mr Collins, Council's stormwater and surface water expert, I have assumed it is a reference to an event akin to that recorded in January 1974.[170]

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162 Ex.6.001, p.32.
163 Ex.10.004, p.10, L93 and T25-72, L15-17.
164 Ex.9.013, para 31.
165 Ex.1.001, p.12.
166 Ex.1.002, p.1, Typical detail 2.
167 Ex.9.013, para 31.
168 Ex.9.019, para 6.
169 Ex.13.023.
170 T26-42, L3-6.

[94] Condition W10 of the EA requires a leachate management system be installed and maintained to collect leachate and convey it out of the landfill to an appropriate storage facility. The EA also requires the height of leachate during the operational phase to not exceed 300mm above the liner system.[171] This depth is equivalent to the drainage layer in the composite liner. This will ensure leachate remains separated from the waste sitting above.[172]

[95] To manage leachate, a proactive approach is to be taken to the management of surface water to minimise the prospect it mixes with waste. Central to that plan is a proposal to divert upslope clean water around the land to avoid contact with waste material.[173] The water, which does not come into contact with waste, will be directed to purpose built stormwater basins for quality testing and controlled release in accordance with the EA. There will inevitably be rainwater falling on the landfill, and surface water that flows into the landfill. This is to be treated as leachate and managed accordingly. To minimise rainwater falling onto the landfill, the area of the working face is to be limited to 100 metres x 100 metres.[174] The working face will also, where practicable, be covered during wet weather conditions.[175]

[96] Condition WT8 of the EA requires the implementation of a surface water monitoring programme. The purpose of the programme is to monitor potential impacts on surface waters, including water in Six Mile Creek.[176]

[97] The final capping system and associated rehabilitation are dealt with in conditions L2 and L3 of the EA.[177] Condition L2 requires the cap to be designed by an appropriately qualified person and installed to: (1) minimise the infiltration of water into the underlying waste mass; (2) minimise water ponding on the surface; and (3) minimise the likelihood of erosion.[178]

[98] The proposed plans reveal a landfill cap has been designed for the development. In short, it is a graded landform that will be vegetated and includes platforms for future land uses. The landform is graded to direct overland flow to the east.[179] The steepest parts of the cap are the northern, eastern and southern edges of the former mining void, having a slope of 4:1.

[99] The detail associated with cap design and rehabilitation can be found in a landform concept rehabilitation plan, read together with the evidence of Dr Rhode. He is an expert in the rehabilitation of landfill sites.

[100] The concept rehabilitation plan divides the land into one of four zones.[180] Zone 1 is the buffer area described above. Zone 2 is an area that wraps around each of the resource recovery and landfill areas. It varies in width (30 metres to 140 metres) and

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171 Ex.6.001, p.31.
172 T26-75, L46 to T26-76, L3.
173 Ex.8.006, p.9, para 15.
174 Ex.9.013, p.14, g (ii).
175 Ex.9.013, p.14, g (ii).
176 Ex.6.001, p.38.
177 Ex.6.001, p.33.
178 Ex.6.001, p.33.
179 Ex.1.001, p.25.
180 Ex.1.001, p.28.

will be vegetated with koala habitat trees. Zone 3 and 4 are located on top of the landfill. Zone 3 is proposed to be vegetated with shrub lines, including koala habitat. Zone 4 comprises 10 metre thick vegetated buffers that screen the eastern edge of three platforms. The platforms are intended to accommodate future light industry uses.

[101] The cap design comprises the following components (from top to bottom):[181]

(a) 300mm thick layer of topsoil;

(b) 2.8m thick layer of subsoil;

(c) a drainage geocomposite;

(d) a Linear Low Density Polyethylene (LLDPE) geomembrane; and

(e) a 500mm thick clay rich layer.

[102] The LLDPE liner will not be included in those parts of the cap where the land has a 4:1 slope.[182]

[103] It was agreed the depth of soil above the liner, and inclusion of the LLDPE liner exceeds best practice.[183] Dr Rhode helpfully explained the reason for this in his oral evidence:[184]

> "In a general sense, can you explain to his Honour, please, in what way it exceeds best practice?---Yes. So if we look at each state's guidelines around landfill capping design, here in Queensland it is purely a risk-based approach. So it is up to the proponent to make decisions around what layers should be included within that cap. … In this case, what has been put forward is that you'll have a liner underneath the cover, plus that compacted layer beneath that again. So it exceeds best practice in that way.
>
> …And I think the point you were making before was that Mr Sutherland, in his evidence, seemed to indicate only that clay liner would be sufficient or appropriate in the design he was proposing?---That's correct.
>
> So what, then, does the geoliner above achieve in that sense? Give us a sense of it in terms of capacity to prevent moisture from going through?---Sure. So the compacted clay might have a saturated permeability, which is the …most amount of water than can start flowing through it of about one by 10 to the minus eight metres per second. The LLDPE liner, the plastic layer, is between three and six orders of magnitude lower again. So it's somewhere between one by 10 to the minus 11 to perhaps one by 10 to the minus 15 metres per second…So in that way, it is a very robust design because it has two

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181 Ex.9.011, para 17.
182 T31-87, L34-38.
183 Ex.8.002, p.13, paras 13 and 14.
184 T31-86, L25 to T31-87, L7.

> layers that can help reduce or if not stop the amount of infiltration into the underlying waste."

[104] Dr Rhode's assessment of the proposed cap, and its ability to achieve the design objective was as follows:[185]

> "…what's your assessment of this design in terms of its capacity to restrict…rainfall infiltration of water into the waste mass below?--Based…on my experience in the industry designing covers, I consider the cover design to be good, if not excellent. If I draw upon my experience within mining, we never, in my experience, have used LLDPE liners, we always rely upon compacted fill material. I would describe to you that that material by comparison and in contrast to what is being proposed here is suboptimal. The proponent has allowed for the risk of having larger vegetation on that cover by increasing the thickness. They have allowed for plant available water by increasing the thickness of that cover."

[105] I accept Dr Rhode's evidence.

[106] Condition L4 of the EA requires the land to be subject to post-closure care. The condition states:[186]

> "Following cessation of deposition of waste in the **landfill unit**, post closure care of the **landfill unit** must be conducted for a period of 30 years or until such time that the operator demonstrates, on the basis of correct information, that the **landfill unit** and surrounding site are stable and that no release of waste materials, **leachate**, **landfill gas** or other contaminants that may cause **environmental harm** is likely.
>
> **Note**: This condition continues to apply after the environmental authority has ended or ceased to have effect pursuant to section 207(3) of the Environmental Protection Act 1994."

[107] Condition L5 gives more definition to the post-closure care programme. It states:[187]

> "The program of post-closure implemented must be effective in preventing and/or minimising the likelihood of **environmental harm** being caused and must achieve the final rehabilitation criteria stated in condition L3. The program must include **measures** to:
>
> 1. maintain the structural integrity and effectiveness of the final capping system;
> 2. maintain and operate the **leachate** collection system;

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185 T31-88, L7-17.
186 Ex.6.001, p.33.
187 Ex.6.001, pp.33-34.

3. maintain the **groundwater monitoring program** and monitor quality of groundwater at a frequency sufficient to detect any release of contaminants to groundwater;
4. monitor long term subsidence and instability using routine GPS survey monitoring, Lidar or equivalent monitoring methods, to provide a means to quantify the occurrence of subsidence and link the results to the groundwater monitoring program;
5. maintain and operate the **landfill gas** monitoring system; and
6. maintain and operate the **landfill gas** collection system.

Note: This condition continues to apply after the environmental authority has ended or ceased to have effect pursuant to section 207(3) of the Environmental Protection Act 1994."

[108] Whilst operational, the proposed land use will see 37 staff employed, of which 20 will be associated with the reprocessing and recycling component.[188]

[109] The proposed operating hours will be 6am to 6pm, Monday to Saturday, and 9am to 4pm Sunday, but by appointment only.[189]

The statutory assessment and decision-making framework

[110] It is common ground that the statutory assessment and decision-making framework for the appeal is prescribed by the PA.[190] This Act requires, inter alia, the development application be assessed in accordance with s 45 and decided in accordance with ss 59(3) and 60.

[111] The clear words of ss 45(3)(a) and 45(5)(a)(i) mandate an assessment of the development application against assessment benchmarks in a categorising instrument. Section 45(7) confirms the reference to an assessment benchmark is to one in effect when the development application was properly made. Here, that captures, inter alia, the planning scheme.

[112] The statutory framework for the impact assessable component of the development application is to be approached consistently with recent Court of Appeal authority, which includes *Brisbane City Council v YQ Property Pty Ltd* [2021] QPELR 987, *Abeleda v Brisbane City Council* (2020) 6 QR 441, *Wilhelm v Logan City Council & Ors* [2021] QPELR 1321 and *Trinity Park Investments Pty Ltd v Cairns Regional Council & Ors; Dexus Funds Management Limited v Fabcot Pty Ltd & Ors* [2022] QPELR 309. Having regard to these authorities, it can be observed that:

(a) the ultimate decision called for when making an impact assessment under ss 45 and 60 of the PA is a '*broad evaluative judgment*';[191]

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188 Ex.8.011, p.27, para 94.
189 Ex.8.011, p.27, para 93.
190 Ex.13.001, para 10; Ex.13.022, para 5; Ex.14.024, para 9(b); Ex.15.001, para 23 to 35.
191 *YQ Property*, per Henry J at [59].

(b) in contrast to its statutory predecessor, the discretion conferred by s 60(3) of the PA admits of more flexibility to approve an application in the face of non-compliance with a planning scheme;

(c) the exercise of the discretion under s 60(3) of the PA is subject to three requirements, including that it be based on the assessment carried out under s 45;[192] and

(d) the PA does not alter the characterisation of a planning scheme – it remains a reflection of the public interest.[193]

[113] In this case, Council submits the planning scheme is a reflection of the public interest, but contends time and circumstances mean it does not paint a complete and contemporary picture. Council, in this context, invites the Court to look at contemporary forward planning and policy. In particular, the Court is invited to have regard to policy promulgated by the State Government in relation to waste management. This policy came into existence well after the planning scheme was adopted in 2006.

[114] It is, as Council submits, correct to say a planning scheme embodies the public interest. It is, in my view, also correct to say a planning scheme is not the only source of information about the public interest. Appellate authority referred to above does not suggest otherwise. In the context of an impact assessable development application, the proposition can be accepted given three matters of statutory context, namely:

(a) the PA, unlike its predecessor, does not mandate refusal of an impact assessable application where there is conflict with a planning scheme – the planning scheme no longer has assumed primacy in the assessment process;[194]

(b) no provision in the PA suggests assessment benchmarks are the only source for discerning the public interest for an impact assessment; and

(c) the assessment and decision-making framework permits the assessment manager to consider a broad range of '*relevant matters*' (s 45(5)(b)) in the exercise of the planning discretion, including matters from which the public interest or planning policy may be discerned – it is an examination of the assessment benchmarks and, where appropriate, relevant matters, that permit the decision maker to reach a balanced decision in the public interest.

[115] I would also add there is appellate support for the proposition advanced by Council. Mason P (with whom Spigelman CJ and Ipp JA agreed) observed in *Terrace Tower Holdings Pty Ltd v Sutherland Shire Council* (2003) 129 LGERA 195 at 209-210, [81]:

> "In any event, matters relevant to the public interest touching a particular application are not confined to those appearing in published environmental planning instruments, draft or final. Obviously such instruments carry great weight and at times

192 *Abeleda*, per Mullins JA (as her Honour then was) at [53] and [58].
193 *Abeleda*, per Mullins JA at [42] and [54].
194 *Abeleda*, per Mullins JA at [53].

> determinative weight, but they are not the only source of information concerning the public interest in planning matters….Nothing in the Environmental Planning and Assessment Act stipulates that environmental planning instruments are the only means of discerning planning policies or the "public interest". For one thing, the government is not the only source of wisdom in this area. A consent authority may range widely in the search for material as to the public interest…"

[116] Whilst Mason P was considering a different legislative regime to the one applying here, his Honour's observations are, in my view, apposite given the statutory context referred to in paragraph [114](c).

[117] Whilst a particular case may call for the public interest to be examined by reference to an adopted planning scheme and other relevant matters, the extent to which the latter informs the outcome of that examination involves matters of fact and degree. The outcome will of course be informed by, inter alia, the knowledge that a planning scheme is a statutory instrument with the force of law. Decision making that maintains confidence in such a document is itself a matter of public interest. For reasons that follow, the facts and circumstances here do not suggest the planning scheme is inconsistent with contemporary expressions of waste management policy or the public interest.

[118] The issues for determination also call for consideration to be given to matters that were the subject of the exercise of referral agency jurisdiction by the Chief executive under the PA. In particular, non-compliance is alleged with *State Code 22: Environmentally relevant activities*.[195] Version 2.1 of the document was in force when the development application was properly made.[196]

[119] It was submitted on behalf of the Chief executive that State Code 22, which forms part of the State Development Assessment Provisions, is prescribed by the *Planning Regulation 2017* (**Regulation**) as a matter which the Court must assess the application against.[197] It was submitted this follows as a consequence of two things:[198] (1) because the Chief executive, when exercising the referral jurisdiction, must assess the application against State Code 22; and (2) the Court in deciding the appeal anew steps into the shoes of the assessment manager and, where relevant, the Chief executive.

[120] I have some misgivings about the submissions made on behalf of the Chief executive in relation to this issue. The schedule and provisions of the Regulation upon which reliance was placed apply to the Chief executive's exercise of the referral jurisdiction, and not the assessment manager. That is important because the appeal before the Court is against a deemed decision of the assessment manager and not that of the referral agency. In this context, I was not taken to any provisions of the PA that directs the assessment manager (or this Court on appeal) to treat the

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195 Ex.15.001, paras 30 and 31.
196 Ex.15.001, para 32.
197 Ex.15.002, para 10; relying upon *Planning Regulation 2017*, Schedule 10, Part 5, Division 4, Table 2, Item 4, which calls up *State Development Assessment Provisions* for an ERA.
198 Ex.15.022, para 11.

State Development Assessment Provisions as assessment benchmarks or mandatory considerations under s 45(5) of the PA.

[121] It is unnecessary to express any concluded view about this point. This is because the list of issues agreed between the parties identify alleged non-compliances with State Code 22. No party contended this document, or any assessment against it, was irrelevant. The issue for Court was whether an assessment against the document establishes a basis for refusal. To consider the reasons for refusal fully, I have therefore undertaken an assessment of the development against the parts of State Code 22 put in issue. That assessment demonstrates compliance, which has been given weight in the exercise of the discretion. It favours approval.

Planning context

[122] The planning scheme is an assessment benchmark against which the development application must be assessed.

[123] The planning scheme was prepared, and took effect, when the *Integrated Planning Act 1997* (**IPA**) was in force. It '*provides a framework for managing development in a way that advances the purpose'* of that Act.[199] For the purposes of this appeal, nothing turns on the differences between the purpose of the IPA and the PA. A review of each purpose statement reveals at the heart of both Acts is an express intention to achieve '*ecological sustainability*'.[200]

[124] The planning scheme is divided into 9 localities.[201] Planning scheme maps reveal the land is included in the Regionally Significant Business Enterprise and Industry Areas locality (**RSBEIAL**). This locality is divided into six zones.[202] The land is included in two of the six zones; partly in the Regional Business and Industry Investigation Zone (**Investigation zone**) and partly in the Regional Business and Industry Buffer Zone (**Buffer zone**).[203] That part of the land included in the Investigation zone is separated from adjoining land by a broken line on the zoning map. This indicates the land is part of an area '*subject to further detailed assessment*'. A note in the planning scheme suggests assessment of this kind occurs as part of the development application process.[204]

[125] Some zones in the planning scheme incorporate Sub Areas and Precincts.[205] A note to the planning scheme indicates the division of zones in this way has a particular purpose. It is to reflect that certain areas have features affecting the application of, inter alia, assessment criteria.[206] That part of the land included in the Investigation zone forms part of Sub Area RBIA2 – Swanbank New Chum (**RBIA2**).

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199 Ex.3.001, p.1-3, s 1.1.

200 s 1.2.1, IPA; s 3(1) and (2), PA. It is a '*balance that integrates*' identical considerations in each Act (s 1.3.3, IPA and s 3(2), PA).

201 Ex.3.001, p.1-11, s 1.11.

202 Ex.3.001, p.1-12, s 1.12(1)(c).

203 Ex.3.001, pp.1-160 and 161.

204 Ex.3.001, p.1-160, note below '*Recorded approvals*' and p.1-66, Note 6.14A(2)(b).

205 Ex.3.001, p.1-14, s 1.13.

206 Note 1.13A.

[126] An initial review of the planning scheme provisions applicable to the RSBEIAL, Investigation zone, Buffer zone and RBIA2 reveals three themes.

[127] First, the planning scheme recognises that parts of the RSBEIAL, Investigation zone, Buffer zone and RBIA2 are degraded and/or contaminated by, inter alia, former mining activities.[207] This is consistent with the evidence.

[128] Second, the planning scheme recognises there is a need to rehabilitate land degraded or contaminated by former mining activities. The rehabilitation is intended to inter alia:[208] (1) enable the land to be used in '*an appropriate manner*'; and/or (2) enable the land to be integrated into a network of green spaces.

[129] Third, in terms of using land in '*an appropriate manner*', the development application seeks approval for a '*special industry*'. This is a defined use in the planning scheme. It includes waste disposal and recycling facilities such as that proposed. A special industry use is anticipated in each of the Investigation and Buffer zones. In each zone it is also a potentially consistent use.[209]

[130] Special industries are supported in RBIA2. Specific Outcome 6.16(2)(a)(iv), which applies to this Sub Area, states:[210]

> "The Sub Area supports uses which –
> …
> (iv) provide more capital intensive, business, industry, recreation and community uses, including some 'difficult to locate' activities,…including…:
>
> (F) special industries;…"

[131] There was no controversy between the parties that the above themes could be discerned from the planning scheme.

[132] There was also no controversy that the proposed development complied with the provisions of the planning scheme with respect to the Buffer zone.[211]

[133] The Buffer zone is located along the western edge of the land and sleeves the Cunningham Highway. The zoning extends in a northerly direction beyond the land until it adjoins an area included in the Regional Business and Industry Zone (Medium Impact Sub Area) to the north. The Buffer zone is '*primarily intended to serve as a buffer to separate business and industry uses from other sensitive uses, particularly residential*'.[212] In addition to its buffering function, land within the

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207 Ex.3.001, p.1-28, s 6.6(2)(g), p.1-37, s 6.7(5)(e)(x); p.1-67, s 6.14(2)(j); p.1-74, s 6.16(2)(a)(i); p. 1-85, s 6.19(2)(e).

208 Ex.3.001, p.1-28, s 6.6(2)(g), p.1-31, s 6.7(4)(a)(i)(G); p.1-33, s 6.7(4)(a)(vi)(D)(ii); p.1-37, s 6.7(5)(e)(x); p.1-67, s 6.14(2)(j); p.1-69, s 6.15(15)(d); p.1-85, s 6.19(2)(e).

209 Ex.3.001, p.1-28, s 6.4(2), read with ss 6.17 and 6.22.

210 Ex.3.001, p.1-74, s 6.16(2)(a)(iv).

211 Council do not allege non-compliance with any provision of the planning scheme that falls in, and between ss 6.17 to 6.22. This is confirmed by Ex.13.021.

212 Ex.3.001, p.1-85, s 6.19(2)(a).

zone is intended to conserve areas or features of ecological or scenic amenity importance.[213]

[134] The need to rehabilitate degraded and contaminated land also has application to the land through its zoning. Rehabilitation of land in the Buffer zone, which includes former mining sites and overburden stockpiles, is expressly promoted.[214] It is also anticipated that rehabilitated land is used in '*an appropriate manner*'.

[135] Section 6.22 of the planning scheme identifies consistent and inconsistent uses, use classes and other development for the Buffer zone.[215] Subsection (2) of this provision provides that 25 identified use classes, and other development, are consistent with the outcomes sought for the Buffer zone, provided a stated qualification is met. The qualification is that development be:

> "…of a type and scale appropriate for the prevailing nature of the area and the particular circumstances of the site and its surrounds…"

[136] One of the uses identified in s 6.22(2) is '*special industry*'. This is a defined use in the planning scheme. It is included in the '*Commercial/Industrial*' use class and captures a broad road of activities such as[216] animal and plant product processing, food processing, wood and paper product processing, chemical manufacturing, metal fabrication and storage of dangerous goods. Notably, the activities captured by special industry also include the operation of a facility for waste recycling, reprocessing and disposal.[217] A development application to start a new use of land for this purpose in the Buffer zone is impact assessable.[218]

[137] I am satisfied there is strong alignment between the proposed development and the provisions of the planning scheme with respect to the Buffer zone. In particular, the matters traversed in paragraphs [54] to [56] comfortably demonstrate:

(a) the proposed development is consistent with the purpose of the Buffer zone, which is to serve as a buffer separating business and industry uses from sensitive uses[219] – here, the sensitive uses to the west will be well separated from the proposed development;

(b) areas of native vegetation within the Buffer zone are to be retained and enhanced with supplementary planting;[220]

(c) the use and works proposed in the Buffer zone will have minimal to low impact and, as anticipated by the planning scheme, will be land extensive, low yield and have minimal building footprint;[221] and

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213 Ex.3.001, p.1-85, s 6.19(2)(g).
214 Ex.3.001, p.1-85, s 6.19(2)(e).
215 Ex.3.001, p.1-88.
216 Ex.3.001, p.1-132 to 136.
217 Ex.3.001, p.1-134, schedule 1 'Special Industry' s (f)(vi).
218 Ex.3.001, p.1-92.
219 Ex.3.001, p.1-85, s 6.19(2)(a).
220 Ex.3.001, p.1-85, s 6.19(2)(b) and (2)(h).
221 Ex.3.001, p.1-85, s 6.19(2)(c).

(d) the use and works proposed in the Buffer zone will achieve a greenspace setting and rehabilitate the land.[222]

[138] Each of these matters support a finding that development proposed in the Buffer zone is of a type and scale appropriate for the prevailing nature of the area and the particular circumstances of the site and its surrounds. This has the consequence that the planning scheme regards the use as consistent with the outcomes sought for the Buffer zone. [223] This is a matter favouring approval.

[139] Council's reasons for refusal direct attention to those provisions of the planning scheme providing qualifications to the themes identified in paragraphs [127] to [130]. Whilst many provisions of the planning scheme are called in aid by Council in this respect, the '*qualifications*' are directed towards: (1) the performance of the proposed development, primarily the landfill component, in environmental and amenity terms; and (2) whether the proposed development rehabilitates the land as anticipated by the planning scheme.

[140] What does the planning scheme require in terms of the management of environmental and amenity impacts?

[141] The planning scheme is an imposing document comprising a number of layers. Each layer exposes what is to be demonstrated by new uses and works in terms of environmental and amenity considerations. The requirements, or tests to be met, are not expressed in identical terms. The provisions of the planning scheme that give a flavour of what is to be demonstrated in terms of environmental and amenity performance include the following.

[142] The broadest expression of planning intent is contained in Part 3 of the planning scheme. It sets out the Desired Environmental Outcomes (**DEO**) for the local government area. Provisions of this kind are a creature of the IPA[224] and form the basis for the measures of the planning scheme.[225] Each DEO is sought to be achieved to '*the extent practicable*', having regard to each other DEO.[226] DEO (3)(b) and (j) are relevant to environmental and amenity impacts of new development. The provisions are in the following terms:

> "(b) adverse effects on the natural environment are **minimised or prevented** with respect to the loss of natural vegetation and associated habitat, soil degradation, air pollution and water pollution owing to erosion, chemical contamination, acidification, salinity, sewage and wastewater treatment, management and effluent disposal and the like;
> …
> (j) the health and safety of people, and the amenity they enjoy, are **maximised**, particularly in the urban and township areas where different types of uses are located close together;"
>
> (emphasis added)

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222 Ex.3.001, p.1-85, s 6.19(2)(d), (e).
223 Ex.3.001, p.1-89, s 6.22(t).
224 s 2.1.3(1)(b), IPA.
225 Ex.3.001, p.1-26, s 3.1(1).
226 Ex.3.001, p.1-26, s 3.1(2).

[143] Beneath the DEOs sit locality provisions.

[144] Overall and Specific Outcomes for the RSBEIAL are set out in Part 6, Division 3 of the planning scheme.

[145] The Overall Outcomes for the RSBEIAL speak of an area having a '*high standard of amenity*'. To manage amenity and environmental impacts, a specific strategy is articulated. It is one involving separation from, and buffers to, sensitive and incompatible uses. Overall Outcomes (2)(d) and (i) relevantly state:[227]

> "(d) A land use pattern is created for each area where there is a transition from lower impact uses on the edge to higher impact activities towards the centre, with buffer areas on the periphery to separate incompatible or sensitive uses."
>
> …
>
> (i) Buffers are created between incompatible uses to ensure that there is no discernible amenity or environmental impacts which affect adjacent sensitive land uses."

[146] I am satisfied the proposed development: (1) positively contributes to the intended land use pattern; and (2) makes appropriate provision for buffers to incompatible uses. The buffers are created by a combination of separation distances and intervening vegetation discussed in paragraphs [56] and [99] to [100].

[147] Two Specific Outcomes for the RSBEIAL provide guidance with respect to environmental management and visual amenity.

[148] Specific Outcome (2)(c) states:

> "Uses and works with the potential for material or serious environmental harm, establish and implement a site specific Environmental Management Plan, which describes the **measures to be used to avoid or minimise adverse impacts**, and how such measures are to be implemented during the life of the development." (emphasis added)

[149] Specific Outcome (3)(a) provides:

> "Uses and works which adjoin a Designated Road, are designed to enhance –
>
> (i) the overall visual impression of the City; and
>
> (ii) the character of the particular area in which the site is located."

[150] A central part of Austin's case is that a site specific management plan can be established and implemented to avoid or minimise adverse environmental impacts. For reasons that follow, I accept this proposition. I also accept that compliance has been demonstrated with Specific Outcome (3)(a). This, in my view, is inevitable once it is appreciated that: (1) the designated road of interest here is the Cunningham Highway; and (2) the proposed development will be well screened from this

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227 Ex.3.001, p.1-28, s 6.6.

Highway in a manner that strongly aligns with the provisions of the planning scheme directed to the Buffer zone.

[151] Figure 1-1 of the planning scheme[228] depicts, inter alia, the localities for the planning scheme. It can be seen from this figure that the RSBEIAL has seven discrete parts. The land is located in the second largest of those parts, being an elongated strip (stretching north-south) situated in the north-eastern corner of the planning scheme area. This area is referred to in other parts of the planning scheme as '*Swanbank New Chum*'. It is surrounded by land in the Urban Areas Locality where, inter alia, residential development is anticipated, and promoted.

[152] The Swanbank New Chum area is given particular attention in two Specific Outcomes for the RSBEIAL.[229] The area to which this planning relates is depicted on Figure 6-7-1. This is a '*Land Use Concept Master Plan*'.[230]

[153] An Overall Outcome for the Swanbank New Chum area provides, as part of a vision statement:[231]

> "Development is of the **highest environmental standards** and occurs in a fully master planned and landscaped setting." (emphasis added)

[154] Guiding principles are stated in the planning scheme to direct new development in Swanbank New Chum. The principles call for new development to, inter alia:

(a) create '*a high quality business park environment that is distinct from traditional industrial areas*';[232]

(b) provide '*a visually appealing backdrop*' to, inter alia, achieve an '*interface[s] with surrounding residential areas to eliminate negative amenity impacts*';[233]

(c) retain '*environmental corridors and buffers*';[234]

(d) rehabilitate and repair the hydrological network and the riparian ecology of Six Mile Creek and, to a lesser extent, secondary tributaries;[235] and

(e) retain '*remnant vegetation where possible*' to buffer future industry uses from nearby sensitive uses.[236]

[155] Specific Outcome (5) deals with the '*preferred pattern of development*' for Swanbank New Chum.[237] In the context of '*development concepts*' for this area, the planning scheme includes the following for new development:

> "(ii) The uses and works within the Swanbank New Chum area are located and relate to each other in ways that-

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228 Ex.3.001, p.1-13.
229 Ex.3.001, pp.1-30 – 1-40, ss 6.7(4) and (5).
230 Ex.3.001, p.1-41.
231 Ex.3.001, p.1-31, s 6.7(4)(a)(i)(D).
232 Ex.3.001, p.1-32, s 6.7(4)(a)(v)(D)(i).
233 Ex.3.001, p.1-33, s 6.7(4)(a)(v)(D)(ii).
234 Ex.3.001, p.1-33, s 6.7(4)(a)(vii)(B)(i).
235 Ex.3.001, p.1-33, s 6.7(4)(a)(vii)(B)(iii).
236 Ex.3.001, p.1-33, s 6.7(4)(a)(vi)(D)(iii).
237 Ex.3.001, p.1-34.

…

(C) **achieve a high standard of amenity** with particular regard **to minimising environmental and amenity impacts on existing and proposed residential areas** and promoting overall visual attractiveness;

(D) protect important areas of ecological significance and develop an overall greenspace setting through the protection of remnant native vegetation and supplementary planting on the visually prominent hillsides, ridgelines and creeklines;…" (emphasis added)

[156] I am satisfied compliance has been demonstrated with the above provisions for the Swanbank New Chum Area. The reasons for this are set out in detail below.

[157] A review of the Land Use Concept Master Plan reveals the land is included in three designations, moving west to east: (1) Buffer/Greenspace, which sleeves the Cunningham Highway; (2) Regional Business and Industry Investigation Areas, which is an elongated strip of land limited to the western edge of the land; and (3) Land-Extensive, Business Enterprises, which consumes the remainder of the land.

[158] Within the Buffer/Greenspace area, it is again recognised that land may be degraded, contaminated and in need of rehabilitation. As to the future use of such land, Specific Outcome (5)(i)(v) relevantly provides:[238]

> "Degraded or contaminated sites are rehabilitated and used for broad hectare recreational, environmental and land extensive business enterprises where there is generally no impact on nearby residential uses."

[159] It is also relevant to note that uses and works within the Buffer/Greenspace area are to be located, designed and managed to, inter alia, '*avoid significant adverse effects on the natural environment*'.[239]

[160] The Buffer/Greenspace area applies to that part of the development discussed in paragraphs [54] to [56]. There is a strong alignment between the proposed development and planning intent identified above for this area, which sleeves the Cunningham Highway.

[161] Little is said in the planning scheme about the area included in the Regional Business and Industry Investigation Areas on the Land Use Concept Master Plan. The reader is directed to provisions of the planning scheme with respect to the Investigation zone.[240] I will turn to these provisions shortly.

[162] The Land-Extensive, Business Enterprises designation applies to the greatest area of the land. Specific Outcomes relevant to the designation require sites to:[241]

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238 Ex.3.001, p.1-38.
239 Ex.3.001, p.1-39, s 6.7(5)(i)(vii)(E).
240 Ex.3.001, p.1-38, s 6.7(5)(g)(i).
241 Ex.3.001, p.1-36, s 6.7(5)(e)(i).

> "…maintain a broad acre, greenspace setting, with the retention, where possible, of remnant native vegetation, together with supplementary planting to enhance visual amenity."

[163] In terms of environmental impacts for land in the same designation, Specific Outcome (5)(e)(ix) states:[242]

> "Uses or works which have significant environmental impacts – including air, water, noise, odour, dust and vibration emissions outside of the designated business and industry areas **are avoided**."

[164] For reasons that follow, I am satisfied compliance has been demonstrated with the above provisions of the planning scheme with respect to the Land-Extensive, Business Enterprises designation.

[165] It is convenient to now turn to the provisions of the planning scheme applying to the Investigation zone and Sub Area RBIA2.

[166] The predominant part of the land is included in the Investigation zone. The land use mix anticipated in this zone comprises '*regional business enterprise and industry employment opportunities*'.[243] This is subject to:

> "…**resolution of applicable constraints** such as potential amenity impacts on nearby residential areas, mining, flooding and availability of services." (emphasis added)

[167] A constraint of relevance here is land degradation. The land is significantly affected by the remnants of mining activities. Overall Outcome (j) for the Investigation zone, consistent with the planning strategy discussed above, promotes the rehabilitation of this land along with its use in an appropriate manner.[244]

[168] Where constraints cannot be resolved appropriately, it does not necessarily follow that land within the zone is unsuitable for development. It is contemplated that new uses or works may still occur in such circumstances, but, again, subject to qualification. Such uses and works are limited to land extensive or low yield activities, which have minimal buildings requirements.[245] They are not to compromise business or industry activities. [246] Nor are they to have significant detrimental amenity impacts on existing or proposed residential areas. [247]

[169] The land use pattern envisaged for the Investigation zone is one of transition. Overall Outcome (2)(d) for the Investigation zone states:[248]

> "A land use pattern is created for each area where there is a transition from lower impact uses on the edge to higher impact

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242 Ex.3.001, p.1-37, s 6.7(5)(e)(ix).
243 Ex.3.001, p.1-66, s 6.14(2)(a).
244 Ex.3.001, p,1-67, s 6.14(2)(j).
245 Ex.3.001, p.1-66, s 6.14(2)(e).
246 Ex.3.001, p.1-66, s 6.14(2)(f)(i).
247 Ex.3.001, p.1-66, s 6.14(2)(f)(ii).
248 Ex.3.001, p.1-66.

> activities towards the centre, with buffer areas on the periphery **to separate incompatible or sensitive uses**." (emphasis added)

[170] This Overall Outcome is complemented by Overall Outcome (2)(k) for the same zone, which states:[249]

> "Buffers are created between incompatible uses to ensure that there are **no discernible amenity or environmental impacts** which affect adjacent sensitive land uses." (emphasis added)

[171] For reasons that follow, I am satisfied the proposed development complies with each of these provisions directed to development in the Investigation zone.

[172] Section 6.17 of the planning scheme identifies consistent and inconsistent uses, use classes and other development for the Investigation zone.[250] Subsection (2) of this provision provides that 25 identified use classes, and other development, are consistent with the outcomes sought for the Investigation zone, provided a qualification is met. It is the same qualification stated in s 6.22(2) and states:

> "…if of a type and scale appropriate for the prevailing nature of the area and the particular circumstances of the site and its surrounds…"

[173] One of the uses identified in s 6.17(2)(t) is '*special industry*'. As I observed earlier, this defined use includes the operation of a facility for waste recycling, reprocessing and disposal. A development application to start a new use of land for this purpose in the Investigation zone is impact assessable.[251]

[174] The zoning maps reveal the Investigation zone in this locality extends, in effect, from the southern end of the land then north and west. The amalgam of land included in this part of the Investigation zone is identified as a Sub Area, namely RBIA2. The provisions of the planning scheme with respect to the Sub Area put some more flesh on the bone for this part of Swanbank New Chum.

[175] The Specific Outcomes for RBIA2 suggest two categories of land use are supported in the Sub Area. The first category is low capital intensive '*interim land uses*', such as agriculture and animal husbandry.[252] The second category are those which:[253]

> "provide more capital intensive, business, industry, recreation and community uses, including some 'difficult to locate' activities…"

[176] The encouragement to be derived from this provision of the planning scheme for each of the identified types of uses is qualified. It is subject to a requirement that an applicant demonstrate:

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249 Ex.3.001, p1-67, s 6.14(2)(k).
250 Ex.3.001, p.1-76 and 77.
251 Ex.3.001, p.1-80.
252 Ex.3.001, p.1-74, s 6.16(2)(a)(iii).
253 Ex.3.001, p.1-74, s 6.16(2)(a)(iv).

> "…the use has no discernible amenity or environmental impacts outside of the Sub Area…"

[177] Other Specific Outcomes within the same part of the planning scheme dealing with RBIA2 highlight the importance of visual amenity considerations. In this regard, it is anticipated that new uses and works will present a high visual quality when viewed from a range of locations, including nearby residential areas.[254] This, in my view, is comfortably demonstrated by the photomontages before the Court.

[178] It is also contemplated that uses supported in the Sub Area: (1) co-exist with the extent and severity of impacts from undermining affecting the land;[255] and (2) are located on areas which, after a detailed assessment, are demonstrated to be geotechnically suitable.[256]

[179] In light of these reasons for judgment, read as a whole, I am satisfied compliance has been demonstrated with these provisions of the planning scheme, which are directed towards development in RBIA2.

[180] Part 12 of the planning scheme includes development specific codes. Division 7 of this part of the planning scheme contains the Commercial and Industrial Code. Council alleges non-compliance with this Code and contends it warrants refusal of the development application.

[181] In terms of environmental and amenity controls, the Commercial and Industrial Code envisages that uses and works, inter alia:

(a) are not to cause nuisance or disturbance of nearby land, particularly residents and sensitive receptors;[257]

(b) are compatible with the physical characteristics of the site and character of the local area; [258]

(c) provide reasonable buffers to incompatible land uses and zones; [259]

(d) maintain a height and scale commensurate with the intent of the zone in which it is located and compatible with the surrounding development; [260]

(e) minimise the risk of exposure to harmful elements, with a particular emphasis on residential areas situated in close proximity; [261]

(f) are developed and managed in accordance with acceptable environmental standards; [262] and

(g) have no significant detrimental effect on the amenity and general well-being of the area. [263]

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254 Ex.3.001, p.1-74, s 6.16(2)(b)(i) and (ii).
255 Ex.3.001, p.1-74, s 6.16(2)(a)(i).
256 Ex.3.001, p.1-74, s 6.16(2)(a)(ii).
257 Ex.3.001, p.1-123, s 12.7.3(2)(a)(i).
258 Ex.3.001, p.1-123, s 12.7.3(2)(a)(ii).
259 Ex.3.001, p.1-123, s 12.7.3(2)(a)(v).
260 Ex.3.001, p.1-123, s 12.7.3(2)(a)(vii).
261 Ex.3.001, p.1-124, s 12.7.3(2)(a)(xii).
262 Ex.3.001, p.1-124, s 12.7.3(2)(b).

[182] In light of these reasons for judgment, read as a whole, I am satisfied compliance has been demonstrated with the Commercial and Industrial Code.

[183] The above provisions of the planning scheme relate to the assessment of environmental and amenity impacts. As I observed earlier, Council also take issue with the notion that the proposed development '*rehabilitates*' the land.

[184] What does the planning scheme require in terms of rehabilitation?

[185] The planning scheme encourages the rehabilitation of degraded land. It does not define '*rehabilitation*'. Its ordinary meaning involves notions of restoration or regeneration.[264] In context, the term suggests degraded areas are to be rehabilitated for use in an appropriate manner. I take this to mean a use anticipated by the planning scheme. Here, that includes industrial uses. It also includes active and passive recreation uses that assist integrating the land into a network of green spaces. This emerges from the following relevant planning scheme context.

[186] The planning scheme encourages the rehabilitation or repair[265] of land included in the Land-Extensive, Business Enterprises designation on Figure 6-7-1. As to what is envisaged for this designation, guidance can be taken from preferred development outcomes for Swanbank New Chum, in particular, Overall Outcomes s 6.7(4)(a)(i)(G), (H) and (I). These provisions state:[266]

> "(G) Development will progressively lead to the rehabilitation of areas degraded by past mining activities and the integration of these areas within a network of green spaces.
>
> (H) Green spaces include environmental buffers and corridors as well as active and passive recreation areas.
>
> (I) The Swanbank New Chum green space network is a regional resource, linking with the green spaces of surrounding communities and offering a wide range of recreation and environmental opportunities."

[187] I am satisfied the proposed development will, if approved, lead to the rehabilitation of the land. In simple terms, this is because, upon completion of the landfill and post-closure period, the land will be suitable for future light industry uses. It will also be revegetated in way that integrates the land within a network of green spaces.

[188] Section 4(d) of the PA provides that Temporary Local Planning Instruments identify planning and development assessment policies to '*protect all or part of a local government area from adverse impacts in urgent or emergent circumstances*'. They may suspend or otherwise affect the operation of another local planning instrument, but do not amend or repeal that instrument.[267] A Temporary Local Planning

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263 Ex.3.001, p.1-124, s 12.7.4(1).

264 *HPC Urban Design & Planning Pty Ltd & Anor v Ipswich City Council & Ors* [2020] QPELR 534 at 551, [86].

265 Ex.3.001, p.1-37, s 6.7(5)(e)(x).

266 Ex.3.001, p.1-31.

267 s 23(3), PA.

Instrument does not create a superseded planning scheme,[268] nor result in an adverse planning change.[269] They do however prevail to the extent of inconsistency with a planning scheme.[270]

[189] A Notice of the making of Temporary Local Planning Instrument No.1 of 2018 (Waste Activity Regulation) was published in the Queensland Government Gazette on 6 April 2018 (**2018 TLPI**).[271] It took effect that day for a period not exceeding two years. Notice of an amendment to the 2018 TLPI was given on 31 August 2018. The amendment did not change the period in which the document would have effect. References made to the 2018 TLPI hereafter are a reference to the amended version of the document.[272]

[190] The 2018 TLPI was not in force when Austin's development application was properly made on 27 February 2018.[273] It is not a document against which the development application must be assessed. This was common ground.

[191] The 2018 TLPI comprises four parts, namely: (1) the text of the TLPI identifying, inter alia, an overview, purpose, Strategic Outcomes, and definitions; (2) a Map (Attachment A) identifying the area to which the TLPI applies; (3) a code in Attachment B titled 'Swanbank/New Chum Waste Activity Code' (**Activity Code**); and (4) a Table of Assessment and Relevant Assessment Criteria.

[192] Section 2.1 of the 2018 TLPI states:[274]

> "This TLPI provides an interim policy response to address concerns raised by Ipswich City Council (the **council**) and the local community in respect to landfill and waste industry uses occurring in the Swanbank/New Chum industrial area."

[193] The area to which the 2018 TLPI applies is depicted in Attachment A.[275] It bears a striking similarity to the area depicted on Figure 6-7-1 of the planning scheme.

[194] The purpose of the 2018 TLPI is stated in s 3.1 as follows:[276]

> "The purpose of the TLPI is to regulate applications for new or expanded waste activities within the Swanbank / New Chum industrial area (located within the Ipswich local government area) to ensure this regionally significant economic area is appropriately regulated to protect existing, approved or planned residential and other sensitive receiving uses, from adverse impacts associated with waste activities."

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268 s 23(7)(a), PA.
269 s 23(7)(b), PA.
270 s 8(4)(d), PA.
271 Ex.3.002, p.2-9.
272 Ex.3.002, p.2-10.
273 This is conceded by Council in its written submissions; Ex.14.024, para 19.
274 Ex.3.002, p.2-10.
275 Ex.3.002, p.2-13.
276 Ex.3.002, p.2-10.

[195] To achieve this purpose, the 2018 TLPI[277] includes Strategic Outcomes, definitions, two waste activity regulation areas, and prescribes categories of assessment and assessment benchmarks. The document also includes a land use code, being the Activity Code.

[196] There are three Strategic Outcomes stated in the TLPI. It is intended they are comparable to the DEOs in the planning scheme[278] and prescribe the type of '*Waste Activity Uses*' in identified waste activity regulation areas.

[197] There are two waste activity regulation areas, namely the '*Swanbank / New Chum Waste Activity Area*' (the **Waste Activity Area**) and '*Swanbank / New Chum Buffer Area*' (the **Buffer Area**). The land straddles both of these areas.

[198] Waste Activity Uses are defined in s 8.6 of the 2018 TLPI as follows:[279]

> ""**Waste Activity Use**" means –
> The use of premises for:
> (a) "Compost Manufacturing Enclosed";
> (b) "Compost Manufacturing Unenclosed";
> (c) "Landfill"; and
> (d) "Rehabilitating a mining void"."

[199] Each of the above uses are in turn defined. Only two are of direct relevance, namely:[280]

> ""**Landfill"** means –
>
> (a) the use of land for the disposal of material such as domestic waste, putrescible waste, organic waste, regulated waste, building waste, commercial and industrial waste or the like, to raise the level of the site, or to fill or partly fill a void on a site.
>
> (b) The term includes the reprocessing of material from landfill on or off site."

And:

> ""**Rehabilitating a mining void**" means –
>
> (a) the filling of a mining void involving only 'clean earthen material'."

[200] The phrase '*clean earthen material*' is defined as follows:[281]

> ""**Clean Earthen Material**" means-
>
> (a) bricks, pavers, ceramics or concrete that does not contain embedded steel reinforcing rods, and no piece has any dimension of more than 100mm; or

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277 Ex.3.002, p.2-10 to 11, s 3.2, items 1 to 5.
278 Ex.3.002, p.2-10, s 3.2, item 1.
279 Ex.3.002, p.2-12.
280 Ex.3.002, p.2-12.
281 Ex.3.002, p.2-11.

(b) clean earth that has trace elements and containment levels within the interim ecologically-based investigation levels for urban use under the document 'Schedule B(1)-Guidelines on the Investigation of Soil and Groundwater', forming part of the National Environment Protection (Assessment of Soil Contamination) Measure 1999."

[201] The proposed development includes Landfill as defined in the 2018 TLPI.

[202] One of the three Strategic Outcomes set out in s 3.2 of the 2018 TLPI provides that '*Landfill*' occurs only in the Waste Activity Area. The footprint of the landfill has been designed to be contained within this area.

[203] Attachment C[282] to the 2018 TLPI provides that an application for Landfill in the Waste Activity Area is impact assessable. Relevant assessment criteria for such an application is prescribed to include the Activity Code. Compliance with this code is achieved through consistency with identified Overall Outcomes and Specific Outcomes.[283] Development that is inconsistent with the Activity Code is said to be '*undesirable development*' and '*unlikely to be approved*'.[284]

[204] The Overall Outcomes and Specific Outcomes for the Activity Code confirm two things. First, Landfill uses are directed to the Waste Activity Area. Outside of this area, Landfill is regarded as an '*inconsistent use*'.[285] Second, there are five topics that call for close examination when assessing the merits of an application for Landfill as defined in the 2018 TLPI. The topics are identified in Overall Outcome 3(2)(b) of the Activity Code, which states:

"Waste Activity Uses:

(i) do not have a detrimental impact on the amenity of the surrounding area, particularly on existing, approved or planned residential areas or other sensitive receiving uses; and

(ii) do not have a significant impact on visual amenity from residential and other sensitive receiving uses; and

(iii) do not have a detrimental impact on the environment; and

(iv) are designed, operation and maintained to avoid potential nuisance impacts on existing, approved, or planned residential and other sensitive receiving uses; and

(v) achieve appropriate rehabilitation outcomes for land affected by former mining activities."

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282 Ex.3.002, p.2-16.
283 Ex.3.002, p.2-14, s 2(1).
284 Ex.3.002, p.2-14, s 3(2)(a).
285 Ex.3.002, p.2-14, ss 3(2)(a) and 4(2) and p.2-16, Column 1, Buffer Area.

[205] There is alignment between Overall Outcome 3(2)(b) and the planning scheme. Both expressly recognise the need for rehabilitation. They also require the amenity and environmental impacts of uses such as that proposed to be carefully examined.

[206] Each of the matters identified in Overall Outcome 3(2)(b) are expanded on in Specific Outcomes of the Activity Code. Specific Outcomes s 4(4) to (7) inclusive are directed towards applications for new uses. Specific Outcome 4(8) is directed at applications seeking approval to change or expand an existing Waste Activity Use.

[207] Specific Outcome 4(4) is relevant to rehabilitation, and provides:[286]

> "(4) Waste Activity Uses achieve appropriate rehabilitation outcomes for land affected by former mining activities that:
>
> (a) add to a network of green spaces, environmental corridors and active and passive recreation areas; and
>
> (b) do not prejudice or compromise the future rehabilitation, use, repair or maintenance of the land; and
>
> (c) includes appropriate landscaping and revegetation strategies appropriate for the long-term use of the rehabilitated land."

[208] Specific Outcome 4(5) is relevant to the overall height of Waste Activity Uses, particularly those involving the filling of former mining voids and having the potential to give rise to adverse visual amenity impacts. The provision states:

> "(5) Filling and earthworks associated with Waste Activity Uses:
>
> (a) do not extend beyond the top of former mining voids, except for approved minor contouring, that improves stormwater management and drainage outcomes; and
>
> (b) are designed, operated and maintained so that exposed waste is not visible from surrounding residential and other sensitive receiving uses at any time."

[209] In relation to (5)(a), it was Council's case that this aspect of the 2018 TLPI introduced a '*line in the sand*',[287] which seeks to limit the height and scale of filling and earthworks for particular activities. This proposition can be accepted. It does not, however, mean that an assessment against (5)(a) is determinative. Such an assessment needs to be considered in the context of the whole document, which includes (5)(b). An assessment against this provision may lead to a circumstance, such as here, where filling and earthworks may project above the top of a former mining void but are not visible from, nor have an adverse impact on, other sensitive uses.

[210] Specific Outcome 4(6) deals with a range of issues, but principally environmental impacts. The provision states:

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286 Ex.3.002, p.2-14 to 15.

287 Ex.14.024, p. 65, para 111(c).

> "(6) Waste Activity Uses are developed in a manner that:
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> (a) establishes and maintains native vegetation buffers to improve amenity or environmental impacts particularly where situated close to residential areas or riparian corridors; and
>
> (b) retains and maintains significant existing vegetation, particularly remnant native vegetation and areas of environmental significance; and
>
> (c) does not adversely affect surface or ground water quality, including through storm water runoff or the dewatering of former mines, and where possible, improves the quality of nearby surface and ground water; and
>
> (d) does not adversely affect stormwater management and where possible, improves the management of the catchment."

[211] Specific Outcome 4(7) calls for an examination of amenity impacts. The provision states:

> "(7) Waste Activity Uses are designed, operated and maintained so that:
>
> (a) no nuisance or disturbance is caused to the amenity of surrounding and nearby residential and other sensitive receiving uses; and
>
> (b) airborne emissions, including odours, dust or substances harmful to public health, do not cause nuisance or harm to surrounding and nearby residential and other sensitive receiving uses; and
>
> (c) the generation of noise or light overspill does not cause nuisance or disturbance to surrounding and nearby residential and other sensitive receiving uses."

[212] The 2018 TLPI was repealed in late March 2020.

[213] On 1 April 2020, a Notice was given by the Minister in the Queensland Government Gazette of Temporary Local Planning Instrument No.1 of 2020 applying to the Ipswich City Council Local Government Area (**2020 TLPI**).[288] The 2020 TLPI is, for all intents and purposes, identical to the 2018 TLPI.

[214] By the date these reasons were finalised, the 2020 TLPI had been repealed.

[215] Council relies upon non-compliances with the 2020 TLPI to warrant refusal. It does so on the footing that an assessment of the development application against the

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[288] Ex.3.002, p.2-25.

document should be given weight under s 45(8) of the PA.[289] This provision of the PA assumes the TLPI has the force of law.

[216] Given the delay in delivering these reasons, and so as not to visit this delay upon Council, I have assessed the development application on the basis the 2020 TLPI (and Activity code) should be given weight in the assessment of the development application as a relevant matter under s 45(5)(b) of the PA. To ensure there is no doubt, I pause to record that the weight given to the assessment against the 2018 and 2020 TLPIs (and associated Activity code) has not been reduced by reason these documents have now been repealed.

[217] It was submitted on behalf of Council that the planning scheme, and TLPIs, confirm landfill uses are contemplated in this locality.[290] It was further submitted that this confirmation was: (1) qualified by the need to resolve constraints to the highest standard; and (2) to be viewed through the prism of a '*preference*', namely that mining voids are to be filled with '*clean earthen fill*'. Item (1) can be readily accepted having regard to the plain words of the planning controls set out above.

[218] To establish the item (2), Council's written submissions included footnotes referring to provisions of the planning scheme and the TLPIs.[291] The footnotes read:

> "11 See for example Exhibit 3.001, p.1-28, s 6.6(2)(g) and p.1-124, s 12.7.3(2)(xii).
>
> 12 See for example Exhibit 03.002 p.2-22 s 3(2)(b)(iii); pp.2-19 to 2-20 (definitions of Clean Earthen Material," "Rehabilitating a mining void" and "Waste Activity Use")."

[219] Footnote 11 references the following provisions of the planning scheme:

> "(g) Degraded or contaminated sites (including former mining sites and overburden stock piles) are rehabilitated and used in an appropriate manner."

And:

> "(xii) minimise the risk of exposure to harmful elements, or harmful concentrations of elements which may be produced as a result of Commercial and Industrial activities, with a particular emphasis on the protection of residential areas situated in close proximity to Commercial and Industrial activities;"

[220] Footnote 12 calls in aid provisions of the 2018 and 2020 TLPI set out in paragraphs [198] to [200].

[221] I have difficulty accepting the '*preference*' to which Council refers manifests itself in the planning scheme. It is not evident on the face of the planning scheme provisions cited as '*examples*'. Nor is evident when the planning scheme is

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289 s 45(7) and (8), PA.
290 Ex.14.024, para 12(a).
291 Ex.14.024, Footnotes 11 and 12.

considered as a whole. In my view, relevant context suggests there is no such preference. In this regard, the planning scheme: (1) does not define '*rehabilitation*'; (2) does not speak of clean earthen fill being used to rehabilitate degraded land; and (3) as discussed above, a special industry as defined in the planning scheme is anticipated on the land and is not subject to a qualification directed towards, inter alia, the use of any particular type of fill material in a landfill.

[222] The TLPIs are in a different position. Unlike the planning scheme, they provide, in express terms, for rehabilitating a mining void by filling with clean earthen fill. Rehabilitation of this kind is a Waste Activity Use. It is code assessable in the Buffer Area and Waste Activity Area of the TLPI. This can be contrasted with Landfill. It too is defined. It is a Waste Activity Use that is impact assessable in the Waste Activity Area. In the Buffer Area, Landfill is an inconsistent use and impact assessable.

[223] Against the background of the TLPIs, I can accept, as a general proposition, there is a preference for mining voids to be filled with clean earthen material. That said, it does not follow the preference is anything more than a statement of preference, such as a statement of limitation or exclusion. In my view, the preference identified by Council, in and of itself, says nothing about the appropriateness of the development proposed. It is necessary to look beyond the preference and consider the TLPIs as a whole to ascertain the extent to which development is supported by the document. When that exercise is undertaken by reference to the 2018 and 2020 TLPIs, it can be seen that 'Waste Activity Uses', such as Landfill, are anticipated in specific areas. These uses are to achieve '*appropriate rehabilitation outcomes for land affected by former mining activities*'. The intended outcomes are identified in Specific Outcome (4) of the Code, which is quoted above in paragraph [207]. The stated outcomes do not discourage Landfill in the Waste Activity area. This point can also be made for Specific Outcomes (5), (6) and (7), which are set out at paragraphs [208] to [211].

[224] As a consequence of the above, the preference to which Council refers does not advance the determination of this appeal. It is the tests prescribed by the Activity Code in terms of environmental and amenity controls that are of importance. These tests are not made more, or less difficult, because the landfill is located in a part of the TLPI area where that use is anticipated along with uses that result in former mining voids being filled with clean earthen material.

[225] The final piece of planning context of interest arises from a Statement of Proposals promulgated by Council in 2019.[292] It represents a very early step towards the preparation of a new planning scheme. The document includes a draft Strategic Framework for a new planning scheme. In terms of the planning scheme preparation process, the document is not a draft planning scheme. There are many steps to go before the document can be said to be a draft planning scheme, let alone reached a stage where it is ready for public notification on this basis.

[226] A review of the draft Strategic Framework reveals four things. First, the document reflects, and seeks to respond to, contemporary waste management principles espoused in the Queensland Government's Waste Management and Resource

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292 Ex.3.003.

Recovery Strategy.[293] Second, the document recognises there is an ongoing need to rehabilitate contaminated or degraded land in Swanbank New Chum. Third, Waste Activity Uses, which include Landfill, are anticipated in the same area captured by the 2018 and 2020 TLPIs.[294] Fourth, Landfills are anticipated where there is a demonstrated need for the '*additional landfill capacity above that already approved*'.[295] Five, the environmental and amenity tests to be met to secure approval for a Landfill bear a striking similarity to the Specific Outcomes of the Activity Code set out above.

[227] It was not in dispute that the Statement of Proposals, and the draft Strategic Framework fall well short of a document that is a draft planning scheme. This, in my view, means it is not a document to be considered in a '*Coty*' sense.[296] The existence of the document is, however, entitled to consideration in the assessment of the development application. This is not by reason of an assessment against the document for compliance. Rather, it allows the strategies espoused in the planning scheme and TLPIs to be examined for consistency with contemporary planning and waste management policy.

[228] What does the Statement of Proposals, and draft Strategic Framework, say about the planning strategies espoused in the planning scheme and TLPIs?

[229] The content of the Statement of Proposals, more particularly the draft Strategic Framework, in my view, is consistent with the planning scheme and TLPIs. All of the documents taken as a collective indicate the land may be used for an integrated waste facility such as that proposed, subject to an examination of environmental and amenity impacts. When this is appreciated, neither the Statement of Proposals, nor the draft Strategic Framework suggest the planning scheme and 2018 and 2020 TLPIs are out of date, overtaken by events, or unsoundly based. Put another way, the draft Strategic Framework does not immediately suggest that compliance with the planning scheme and TLPIs will lead to development that is incongruous with contemporary planning, or contemporary expressions of the public interest. This informs the weight to be given to compliance with the planning scheme and TLPIs in the exercise of the discretion in this appeal.

[230] Council, and its planner Mr Perkins, emphasised that the draft Strategic Framework introduces a new test for landfill facilities; it calls for a need to be demonstrated for additional landfill capacity above that already approved. I accept this is a new test. It has a purpose. In my view, one purpose is to ensure the supply and demand balance for landfill facilities strikes an appropriate balance between two competing considerations, namely: (1) to make provision, in a land use sense, for important and necessary pieces of infrastructure (paragraph [10]); as against (2) avoidance of an oversupply of landfill capacity, which may lead to adverse impacts. Item (2) is advanced by Council in this appeal as a reason for refusal. It asserts the proposed development exacerbates an already existing oversupply of landfill airspace capacity. The oversupply is said to lead to an adverse impact on the circular

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293 Ex.3.003; p.3-20, s 3.5.4.4 – referring to '*circular economy*' and the waste management hierarchy where landfill is a measure of last resort.

294 Compare Ex.3.003, p.3-34 with Ex.3.002, p.2-13 and p.2-21.

295 Ex.3.003, p.3-21, s 3.5.4.4(5)(a)(i).

296 *Nerinda Pty Ltd v Redland City Council* [2019] 1 Qd R 523, [10]-[12] and footnote 9.

economy; Council contends an approval would act as a disincentive for investment in the resource recovery and recycling industry.

[231] I am satisfied an approval in this case will strike the right balance. An approval would lead to the addition of non-putrescible landfill airspace capacity for the benefit of South East Queensland in circumstances where: (1) available landfill airspace capacity of this type is nearing exhaustion; and (2) to allow this type of landfill airspace to exhaust in the next 15 to 20 years is not without adverse consequence. To this it can be added (for reasons that follow) that an approval will not result in an oversupply of landfill capacity, which manifests in adverse impacts on the waste management industry.

[232] Given the matters traversed in paragraphs [225] to [231], the Statement of Proposals is not a feature of this appeal that advances the refusal case.

The properly made submissions

[233] An assessment manager (and this Court on appeal) is required to take into account properly made submissions in an impact assessment. Here, the development application was the subject of public notification and attracted 137 properly made submissions and 16 informal submissions that were not properly made.[297] The submissions were put before the Court in three volumes and marked exhibits 2.001 to 2.003 inclusive.

[234] I have reviewed the submissions. The overwhelming substance of them, both formal and informal, call for refusal of the development application based on a number of subjective opinions. The submissions assert refusal should follow because: (1) there is non-compliance with TLPIs; (2) of proximity to, and unacceptable impacts on, residential communities (by reason of noise, dust and odour omissions); (3) approval would lead to destruction of visual amenity; (4) approval would lead to unacceptable environmental damage; (5) approval would lead to traffic issues; (6) development would not rehabilitate the land; (7) of geotechnical stability issues; and (8) there is insufficient technical detail.

[235] A further theme is difficult to ignore in the submissions. It is to the effect that the proposal should be refused because it serves to perpetuate, wrongly, the notion Ipswich is a dumping ground for waste generated by, and for the benefit of, other communities. The further point is also made that this occurs in circumstances where the communities who stand to benefit from waste disposal facilities, such as that proposed, are well removed from them and, as a consequence, do not experience the real impact they can have on the daily lives of a residential community.

[236] There is no doubt weight can be given to subjective opinions or desires articulated in submissions in the exercise of the discretion. The more pressing issue is how much weight they should be given in the circumstances of any particular case.

[237] Here, the substance of the submissions are a feature of the evidence that does not support approval. Taken collectively, they strongly suggest the proposed development will have an impact on amenity, particularly in an intangible sense. It

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297 Ex.8.011, pp.23-24, para 68.

does not however follow this impact is unacceptable or warrants refusal. It is necessary to examine the asserted impacts against the evidence and the planning scheme.

[238] When this exercise is undertaken here, I am not prepared to act on the submissions on the basis they assert impacts on amenity and the environment will be unacceptable and warrant refusal of the development application. This follows, in my view, once it is appreciated that: (1) emissions with respect to noise, dust and odour are matters that can be dealt with appropriately by conditions; (2) the proposed development will not have any unacceptable visual amenity impacts (for reasons set out below); and (3) the submissions:

(a) are not directed towards the same version of the development application that is before the Court – the development application has been changed since the public notification process to ameliorate the impacts of the proposed development and to address the reasons for refusal;

(b) are difficult to reconcile with the planning scheme and later expressions of planning intent, all of which anticipate waste disposal facilities and promote the rehabilitation of degraded sites such as the land;

(c) do not appear to take into account the character of the locality as described in paragraphs [28] to [32] and [37] to [39] above – the character and amenity of the locality is already influenced by existing development of the kind proposed; and

(d) are founded on the proposition the development will give rise to adverse impacts (in terms of hard amenity and environmental issues) in circumstances where the alleged impacts do not find support in the evidence I accept.

The disputed issues

[239] The disputed issues to be determined are identified in a consolidated issues document. The document, which was tendered after the close of evidence, was agreed[298] and described as '*Proposed Questions for Determination*' (**list of issues**).[299] The list of issues comprises 48 questions and identifies the '*focal*' provisions of planning documents relied upon by the refusing parties to allege '*non-compliance*'.[300]

[240] A copy of the list of issues is attached to these reasons as **Annexure A**. These reasons for judgment do not answer the questions in the order they appear in the list of issues.

[241] The list of issues is an imposing document. It reveals two things:

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298 Save for one minor qualification identified on behalf of the Chief executive, the agreement appears at T33-55, L10 to T33-56, L46.

299 Ex.14.024, para 17 and Ex.13.022, para 14, both referring to Ex.13.021.

300 The list of issue categorises the provisions as focal or contextual. Council confirmed in its written submission (Ex.14.024, para 5) that only focal provisions are relied upon to allege non-compliance, with the remainder of the provisions providing context.

(a) first, unlike earlier documents prepared for the appeal, it does not assert that ecology, aquatic ecology, koalas, air quality, noise and traffic warrant refusal; and

(b) second, when the list is considered in conjunction with Council's written opening[301] and closing submissions,[302] there is an identifiable structure to the refusal case. The case has two parts, each of which are focused on the landfill component of the proposed development.

[242] The two parts of the refusal case are as follows.

[243] The first part involves asserted non-compliance with planning controls. More particularly, non-compliance is alleged with: (1) assessment benchmarks in force at the time the development application was treated as being properly made; (2) instruments that must be considered by operation of the Regulation; and (3) documents that were not in force at the time the development application was treated as being properly made. Austin and the Chief executive[303] contend for the contrary position.

[244] The second part of the refusal case calls in aid a range of considerations said to militate against approval. Having regard to the list of issues, and Council's written submissions, the matters said to militate against approval can be identified as follows:

(a) the proposed development is contrary to a guideline promulgated by the Queensland Department of Environment and Science, titled '*Guideline – Landfill siting, design, operation and rehabilitation*';

(b) the proposed development does not comply with the 2018 and 2020 TLPIs;

(c) an approval of the development is inconsistent with the purpose of the PA;

(d) the proposed development is inconsistent with Council's draft Statement of Proposals for a new planning scheme;

(e) there is a lack of need for additional landfill airspace;[304]

(f) an approval would act as a disincentive to recycling and resource recovery;[305]

(g) the proposed development is contrary to the planning principle that resource recovery should be promoted with landfill used as a '*last resort*';[306]

(h) the proposed development is contrary to the planning principle that development should not compromise the future capacity of land to be re-used in a way that is compatible with the surrounding area, or uses promoted in the adopted planning controls; and

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301 Ex.14.001.
302 Ex.14.024.
303 Limited to the scope of the referral jurisdiction.
304 Ex.14.024, paras 2(a), 12(c)(i), 47 and 51.
305 Ex.14.024, para 12(c)(iii).
306 Ex.14.024, para 12(c)(ii).

(i) the proposed development is contrary to the planning principle that development should not cause, or have potential to cause, contamination or other adverse environmental impacts.

[245] Save for one exception, Council did not contend each and every matter listed above was decisive or warranted refusal in its own right. The considerations raised attract different weight and, depending upon the circumstances, I apprehended were to be taken in combination. The exception is environmental risk. Council contends the extent of environmental risk in this case warrants refusal in its own right.[307]

[246] Haenke supports Council in both parts of the refusal case.

[247] Austin joins issues with both parts of the refusal case and relies upon a number of relevant matters said to be supportive of approval. Central to its case is the notion that the public interest would be well served by an approval. It is contended the development, if approved, would deliver a number of community benefits of an economic, ecological and town planning character.

[248] With the approval and refusal cases in mind, the issues to be examined can, in my view, by reduced to 11 topics. They are as follows:

1. Whether the land is appropriate for a waste landfill, assessed on a first principles basis?

2. Whether the proposed development is inappropriate in terms of landfill design?

3. Whether the proposed development is inappropriate in terms of environmental performance?

4. Whether the proposed development will have unacceptable amenity impacts?

5. Whether the development complies with the planning scheme?

6. Whether the development complies with the Activity Code in the 2018 and 2020 TLPI?

7. Whether the development complies with State Code 22?

8. Whether there is a need for additional landfill airspace?

9. Whether the proposed development would act as a disincentive to recycling and resource recovery?

10. Whether there are further matters supportive of an approval?

11. Whether the development application should be approved or refused in the exercise of the discretion under s 60 of the PA?

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307 Ex.14.024, para 76.

A first principles assessment

[249] Council contends the land is not an appropriate site for the proposed development having regard to a '*first principles*' assessment.[308] This criticism was directed towards the landfill component, which involves the placement of waste within a former mining void that cannot gravity drain.

[250] In support of its first principles case, Council relies upon, and invites the Court to accept, the evidence of Mr Amaral and Mr Sutherland.

[251] Before examining the first principles assessment, it can be observed the Court was also invited to accept the evidence of Mr Donegan in relation to this point, and related engineering design and management issues. Mr Donegan is a mining engineer called by Haenke.

[252] A review of Mr Donegan's written and oral evidence reveals:

(a) his contribution to the body of evidence in relation to landfill design and management issues is reflected in a limited number of assertions, which are not supported by the same level of detailed technical analysis as that provided by Mr Amaral and Mr Sutherland;

(b) his opinions, overall, are consistent with the evidence of Mr Amaral and Mr Sutherland; and

(c) his opinions do not advance an assessment of the development beyond the evidence of Mr Amaral and Mr Sutherland.

[253] In these circumstances, I will deal with the first principles assessment and related issues on the footing that the primary technical evidence advanced in support of refusal is that led by Council. It is unnecessary to give Mr Donegan's evidence separate consideration.

[254] Returning to the first principles assessment, Mr Amaral identified a number of '*fundamental flaws*' in the landfill component of the development.[309] The flaws can be identified in this way, namely the landfill:

(a) involves the placement of contaminated waste up to 8 metres below the regional groundwater level of RL30m AHD;[310]

(b) involves the placement of waste within a void where the host geological structure has a series of aquifers (coal seams), some of which are likely to be interconnected due to mine subsidence;[311]

(c) involves the placement of waste on a substandard sub-base with no natural unsaturated attenuation layer; [312]

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308 Ex.14.024, para 75(a).
309 Ex.8.002, p.119-122, repeated in different terms at Ex.10.005, pp.3-4 and T32-23, L27-39.
310 Ex.8.002, p.119.
311 Ex.8.002, p.119.
312 Ex.8.002, p.119.

(d) involves the placement of waste in a very large void from which there can be no gravity drainage, leading to an increased risk of co-mingling between leachate, groundwater and surface water;[313]

(e) design includes a basal liner, part of which will be placed near a persistent high temperature combustion zone adjoining the landfill footprint;[314] and

(f) design provides for the liner to be placed on a sub-base constructed from backfill with material sourced from, inter alia, an unstable eastern high wall, which will interfere with the safe placement of a controlled, certifiable sub-base for the liner.[315]

[255] Having regard to these matters in conjunction with standard landfill selection protocols, Mr Amaral said the land is not a suitable site for landfill.[316] In this context, he made specific reference to three landfill selection guidelines:[317]

> "This position is fundamentally supported by:
>
> 1. The Queensland DES (2018) which states that an environmental assessment outcomes needs "to identify and rank those sites that require the fewest engineering and management controls to meet the objects of all State environmental protection policies".
>
> 2. The NSW EPA Guidelines (2016) advice that "judicious location of a landfill is the single most effective environment management tool".
>
> 3. The Victoria EPA BPEM (2016) advises that "the first and most important consideration in the prevention of environmental impacts from landfill is selection of an appropriate site",
>
> As stated above, this site fails the siting recommendations of each of these Governmental Bodies."

[256] The points identified in paragraphs [254] (c), (e) and (f) do not support a first principles assessment. In relation to sub-paragraph (c) and (f), these points assume Mr Amaral's criticisms about the general filling zone (including criticisms of the method of construction and method for obtaining backfill material) are accepted. For reasons given later, I do not accept Mr Amaral's opinions about these matters. In relation to subparagraph (e), the point assumes the liner is at risk of damage due to its proximity to combustible material. I am satisfied this can be addressed by conditions. A condition can be imposed requiring the combustible material to be removed and then submerged in that part of the void which will not be dewatered.[318]

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313 Ex.10.005, p.4, section 2(g).
314 Ex.10.005, p.3, section 2(f).
315 Ex.10.005, p.4, section 2(h).
316 Ex.8.002, p.5, para 1.
317 Ex.8.002, p.122.
318 Ex.8.002, pp.27-28, para 43; pp.28-29, paras 45 and 47. See also Ex.9.009, pp.14-17, s 3.3.3 and T32-67, L36 to T32-68, L3.

[257] Mr Sutherland considered the land poorly suited to landfill having regard to first principles or '*ideals*'.[319] As I understood his evidence-in-chief,[320] there were three matters that led Mr Sutherland to reach this conclusion: (1) the void cannot gravity drain, which increases leachate generation and creates an operational constraint that must be managed; [321] (2) the development involves the placement of waste beneath or proximal to the water table, which is not best practice and, at this site, in this landform, should be avoided having regard to the risk of groundwater recharge;[322] and (3) there is no natural unsaturated groundwater attenuation zone between the proposed liner and groundwater in circumstances where there is uncertainty about the final groundwater level relative to the base of the void.[323] Mr Sutherland indicated the '*fundamental*' siting issue was item (2).[324] He said the placement of waste in a void below, or proximal, to the groundwater table should not occur unless there is '*no alternative*'.[325] The failure to adhere to this was said to fail '*a principal site selection criterion*'.[326] Like Mr Amaral, Mr Sutherland found support for his view in published guidelines, including one promulgated by the Queensland Department of Environment and Science (**the DES guideline**).[327]

[258] After examining a large body of technical evidence, I am not persuaded the first principles assessment, supported by the evidence of Mr Amaral and Mr Sutherland, should be accepted as a reason for refusal. This is because the evidence of these witnesses starts on an unsound footing; the evidence assumes the risk associated with groundwater contamination in the circumstances of this case is materially greater than what should have been assumed. This difficulty is further compounded by the repeated, and inflexible, reliance by these experts on 'guidelines' said to be adverse to the proposal. These points can be demonstrated having regard to: (1) the evidence with respect to groundwater rebound levels; (2) the weight Mr Amaral and Mr Sutherland gave to context that informs the assessment of risk and the application of relevant guidelines; and (3) the substance of the DES guideline and other guidelines called in aid to buttress the opinions expressed.

[259] I will deal with each of these matters in turn.

[260] Mr Amaral and Mr Sutherland placed considerable emphasis, and weight, in their respective assessments on the fact that waste would be placed beneath, or proximal, to the groundwater table. As to the depth of waste below the regional groundwater level, Mr Amaral pointed out in a joint expert report, and in his statement of evidence, that the proposed development would involve the placement of waste up to 8 metres below the regional groundwater level. This necessarily assumes groundwater will rebound to RL30 m AHD, which is about 8 metres above the base of the landfill.

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319 Ex.10.006, p.4, s 2, L10-13.
320 Ex.10.006 and T26-73, L41 to T26-80, L20.
321 Ex.10.006, p.4, s 2.1 d).
322 Ex.8.002, p.6, para 1.
323 Ex.8.002, p.20, L12-13.
324 Ex.8.002, p.16, L24 and Ex.8.006, p.51, para 222.
325 Ex.10.006, p.4, s 2.1 c) and p.22, summary.
326 Ex.8.002, p.6, para 2 and Ex.8.006, p.51, para 222; T26-75, L1-11.
327 Ex.10.006, pp.16-21, Appendix 2.

[261] If the proposal was to be assessed on the footing that waste would be placed up to 8 metres below the groundwater level, the assessment would proceed on a wrong footing. The evidence does not suggest it is safe to assume, without significant qualification, that waste would be placed 8 metres below the groundwater, or at all. It was a point of agreement between Mr Sutherland, Mr Tomlin and Dr Johnson that groundwater levels will rebound after the void is partly dewatered and construction is completed.[328] The following point of agreement is recorded in their joint expert report:[329]

> "…The long term equilibrium level for groundwater is difficult to forecast accurately, but despite this inherent uncertainty it is agreed there is potential the groundwater level **will either remain permanently below the level of the landfill liner** (RL 22m AHD), **or** potentially **rise above the level of the liner** up to a maximum level of around RL 26m AHD." (emphasis added)

[262] I accept this evidence. It is based on modelling undertaken by Mr Tomlin.[330] The modelling was not challenged in cross-examination. Mr Sutherland was satisfied the modelling was '*sound and thorough*'.[331]

[263] If it is assumed groundwater rebounds to:

(a) RL22m AHD, the lowest level of the waste will, contrary to the assumption made by Mr Amaral, sit below the level of the liner as agreed by the experts; and

(b) RL26m AHD, which Mr Tomlin explained was the '*worst case scenario*', waste would sit above 10% of the landfill footprint.[332]

[264] These facts paint a very different picture to the one that emerges from Mr Amaral's first principles assessment.

[265] The joint expert report goes on to record:

> "…Under extreme conditions, it is agreed the groundwater levels could rise to 30 m AHD."

[266] Mr Sutherland clarified in cross-examination that the '*extreme conditions*' referred to above involve one, or a combination, of the following: [333] (1) a large catchment inflow into the void; and/or (2) groundwater rebound from the former mining depression not having fully recovered.

[267] The joint expert report indicates Mr Tomlin took issue with the proposition that groundwater may rebound to RL 30 under '*extreme conditions*'.[334] The following is

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328 Ex.8.006, p.16, para 59.
329 Ex.8.006, p.16, para 59.
330 T26-88, L43-47.
331 T26-89, L1.
332 T25-21, L1-9.
333 T26-89, L35-42.
334 T25-33, L8-10.

attributed to Mr Tomlin immediately after the above point of agreement is recorded:[335]

> "…JT says this is improbable as the catchment currently allowing rainfall runoff to enter the open void and enhance groundwater levels will be diverted during construction significantly reducing the volume of water entering the void."

[268] Mr Tomlin was cross-examined about groundwater rebound levels.[336] He carefully explained why, in his view, groundwater is unlikely to rebound to RL30m AHD. He also explained why a contrary view was founded on an improbable extreme. It was characterised in this way to reflect the combination of conditions needed for the improbable extreme to occur. Mr Tomlin identified the '*conditions*' in the following exchange with Mr Hughes KC:

> "For the…groundwater levels to rebound to that level, what conditions would need to occur?---Well, the work I've conducted reviewing the water levels in…that area has led me to conclude that the water levels wouldn't be able to fill to that level. Currently, the …void is getting a …very large amount of run-off filling the void, and that's overfilling the void and mounding up the levels. When we start pumping down and draining out the excess water, then that water will be disposed of and there'll be no potential to rise to the…extreme heights…"

[269] I accept Mr Tomlin's evidence that RL30m AHD represents an improbable extreme for groundwater rebound. To achieve this, or a similar level, would require the void to fill and overflow with the water. This could only occur in the rarest of circumstances. It involves a combination of: (1) an extreme weather event creating a very large amount of run-off in the catchment; and (2) a failure of engineering works undertaken to divert surface flow away from the void. It can be observed that Mr Sutherland did not explain why it was appropriate to assume these conditions may occur, either individually or in combination. This, in my view, was because the prospect that either, or both, of these conditions would occur is, at best, extreme or remote.

[270] Mr Tomlin's evidence as to the anticipated groundwater rebound level provides relevant context. It is context to which Mr Amaral and Mr Sutherland failed to give sufficient weight in their assessment. They chose to focus on an extreme rebound level to frame their respective views. Such an approach led to the risk of groundwater contamination being materially overstated by Mr Amaral and Mr Sutherland.

[271] Mr Tomlin's evidence about the groundwater rebound level is not the only part of the evidence (and context) that Mr Amaral and Mr Sutherland appeared to give too little weight in their '*first principles assessment*'. It is tolerably clear their respective assessments gave insufficient weight to the following matters, each of which are directly relevant to the acceptability, or otherwise, of the proximity of waste to the groundwater level here, namely:

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335 Ex.8.006 p.16, para 59.
336 T25-33.

(a) waste will be separated from the groundwater by a composite liner system exceeding the standard required by the DES guideline conditions imposed on the EA – it will be '*better than best practice*';

(b) the experts agreed the flow of groundwater or leachate through the liner separating waste and groundwater would be insignificant, provided it was operating in accordance with specification;

(c) the insignificant amount of leachate leaking through the liner would be diluted by uncontaminated groundwater;[337] and

(d) Council does not contend the development should be refused because it will have adverse environmental impacts on the water quality and aquatic ecology of Six Mile Creek and the unnamed drainage channel.

[272] Further to (c) above, it can be observed that the mixing of leachate and groundwater does not necessarily lead to contamination of the latter. It will depend on the quantity of leachate, which may be small and diluted by the groundwater. Here, it also needs to be borne steadily in mind that contaminated groundwater can be removed by the proposed groundwater depressurisation system.[338] As Dr Johnson explained, this system allows contaminated groundwater to be pumped back into the void. The water pumped back into the void would be managed and treated as leachate.

[273] The above analysis leads me to conclude that: (1) the fundamental flaw stated in paragraph [254](a) was not made out; (2) the fundamental flaws stated in paragraphs [254](b) and (d) cannot be accepted absent significant qualification; and (3) items (2) and (3) in paragraph [257] cannot be accepted absent significant qualification.

[274] Mr Amaral and Mr Sutherland both cited the DES guideline, and similar guidelines from New South Wales and Victoria, to buttress opinions expressed about the suitability of the land for landfill. Each gave particular attention to those parts of the guidelines dealing with the proximity of waste to the groundwater level and the need for a natural attenuation zone between waste and groundwater. Based on these guidelines, Mr Sutherland said: '*the basic premise of all the guidance outlined above is that waste should not be placed below the water table, unless there is no alternative*'.[339] This was a fundamental issue for Mr Sutherland.

[275] The guidelines to which Mr Amaral and Mr Sutherland referred are not assessment benchmarks. They do however fall within the ambit of '*relevant matters*' for the purpose of s 45(5)(b) of the PA. This means they may be considered in the impact assessment.

[276] Does the DES guideline assist the impact assessment here?

[277] The answer to this question is yes. The document provides contemporary technical guidance for the design and operation of landfill facilities. The substance of the document confirms the obvious: the assessment of the landfill component of the

337 T25-26, L25-28.
338 T26-20, L11-16.
339 Ex.10.006, p.22.

proposed development involves a careful examination of the engineering controls and measures proposed to manage the risk of adverse environmental impact.

[278] Whilst the DES guideline can assist the assessment, it needs to be approached with the following in mind, namely:

(a) the document is a '*guideline*';

(b) the document does not purport to prescribe one solution for landfill design and operation from which there can be no departure;

(c) the document is not an assessment benchmark; and

(d) the document is not expressly reflected in the provisions of the planning scheme or TLPIs – by way of example, neither the planning scheme or TLPIs provide, let alone suggest, an application for landfill will be refused because it makes no provision for a natural attenuation zone or would involve placement of waste beneath the regional groundwater table.

[279] In support of the views he expressed, Mr Sutherland cited four passages from the DES guideline. He placed particular emphasis on the following two passages:

> "…Maintain an adequate separation between the base of the liner and the highest expected groundwater level."[340]

And:

> "…A preferred site for a landfill is one that minimises the risk of groundwater pollution by providing a natural, unsaturated attenuation layer beneath the liner for contaminants that may leach through it…"[341]

[280] Neither passage supports the proposition that waste should not be placed below the groundwater table unless '*there is no alternative'*. This is clear when the second emphasised passage is given its plain and ordinary meaning. It speaks of a preference. That it is intended to be no more than a stated preference is clear when the DES guideline is considered as a whole.

[281] The DES guideline applies to existing landfill facilities and operators seeking to develop new facilities.[342] A review of the document indicates it addresses '*site selection, development, design, construction, operation, rehabilitation, and aftercare management of all landfill sites*'[343] and provides guidance for '*how landfill operators can meet the environmental protection outcomes*'.[344] The guideline expects environmental protection outcomes will be achieved to '*ensure the protection of the environment from all waste disposal activities*'.[345]

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340 Ex.10.006, p.18.
341 Ex.10.006, p.19.
342 Ex.4.001, Tab 5, p.125.
343 Ex.4.001, Tab 5, p.125.
344 Ex.4.011, Tab 5, pp. 125-126.
345 Ex.4.001, Tab 5, pp.125-126, section 1.1.

[282] 'Outcomes' and 'suggested measures' for each relevant aspect of environmental management are identified in the guideline.[346] As to their status, the document states:

> "The outcomes must be achieved for each element of the landfill operation. An outcome may be achievable in different ways and it is the responsibility of the applicant/operator to ensure that a proposed methodology will achieve the desired outcome…"

And:

> "The suggested measures represent some of the acceptable methods to aid in achieving the required outcomes… Suggested measures may not necessarily be appropriate for every landfill site. Where landfill sites are located in particularly sensitive environments, the outcome of the risk assessments for the landfill site may indicate alternative measures to those suggested in order to achieve the required outcomes.."

[283] The first of the two provisions cited in paragraph [279] is a '*suggested measure*' in section 5 of the DES guideline.[347] This section deals with '*siting and design*'. Table 1 contains the stated '*Outcomes*' for Siting and design. They include the following:[348]

> "Landfill siting
>
> To identify and rank those sites that require the fewest engineering and management controls to meet the objects of all State environmental protection policies."

[284] The suggested measures for this Outcome include:[349]

> "Ensure that the landfill is sited to protect groundwater, surface waters and flora and fauna."

[285] Section 5.2 of the DES guideline provides commentary directed towards the Landfill Siting Outcome. More particularly, the objective of the section is to '*establish the criteria for identifying and ranking sites when locating a proposed landfill*'.[350] One of the matters to be considered when screening for candidate landfill sites is '*groundwater*'. Section 5.2.3 provides commentary directed to groundwater. The section states, in part:[351]

> "Release of leachate, together with landfill gas migration, poses the greatest hazard and the most severe consequences for a landfill operation. All groundwater must be considered a valuable resource

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346 Ex.4.001, Tab 5, p.126.
347 Ex.4.001, Tab 5, p.132.
348 Ex.4.001, Tab 5, p.132.
349 Ex.4.001, Tab 5, p.132.
350 Ex.4.001, Tab 5, pp.133-134.
351 Ex.4.001, p.135.

> (whether it is currently used or not) and therefore must be protected from contamination by pollutants from the landfill."

[286] The second passage cited in paragraph [279] immediately follows the commentary above.

[287] Section 5.2.3 of the DES guideline continues:

> "Regardless of the location, landfill should only be sited in areas where the potential impacts on groundwater have been properly assessed. Part of this assessment involves development of a hydrogeological risk assessment. The outcomes from the hydrogeological risk assessment are expected to outline the potential risks to groundwater and the engineering controls that will provide protection of the groundwater. This may include (but not limited to) the following:
>
> - required separation from groundwater and attenuation layer
> - groundwater recovery system
> - containment barrier design
> - design and management practices to protect groundwater quality.
>
> Landfills that are, or have the potential to be, below the water table must ensure that the engineering controls to manage the potential impact of leachate on the groundwater (and vice versa) are implemented and managed/reviewed until it is demonstrated that the risk of pollutants migrating from the landfill has ceased…"

[288] Contrary to Mr Sutherland's view, the above provisions of the DES guideline do not suggest there is a clear statement of policy to this effect: waste should not be placed below the water table unless there is no alternative. At its highest, the provisions cited reflect a preference. These provisions also identify an alternative to the preference. The alternative is to provide '*engineering controls to manage the potential impact of leachate on groundwater*'.

[289] That section 5.2.3 of the DES guideline[352] admits of the prospect that engineering controls may be used to manage the impact of leachate on groundwater was readily conceded by Mr Sutherland in cross-examination. He was pressed about this by Mr Holt KC in cross-examination:[353]

> "…why didn't you include 5.2.3 in your report, given that you were trying to say that this project fails a siting criteria?---No, no…I wrote appendix 2 to provide a summary of the recent evolution of the Queensland guidelines and the protection of groundwater resources. I

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352 Ex.10.006, pp.17-19

353 T26-99, L1 to T26-100, L28.

> …have acknowledged in the JER, fairly and squarely, that engineering solutions are available.
>
> What you say repeatedly, Mr Sutherland, is that this site fails a "basic siting criteria or first"…"or first principles of landfilling."?---…I stand by that because what the…ongoing problems that we see in my firm with landfill management is that when this site criteria, principle criteria, has failed, we end up with odour issues and odour issues associated with leachate and leachate management issues…and …the reason that I'm saying this is that the Queensland guidelines have changed, but the 2010 guideline talks about…avoiding the need for perpetual pumping, and that's what would be required here….
> …
> But the guidelines acknowledge, as we've said, that there may be an engineering solution to that?---I do, and I've accepted that."
>
> …And that engineering solution is made up of a number of factors, the basal liner that we've already talked about. That's a really important one, right?---Yes. Yes.
>
> The cap, really important one as well?---Yes. Yep.
>
> The…groundwater depressurisation system of the kind we've talked about?---Yes.
>
> And the leachate collection and pumping treatment, yes?---Yeah.
>
> …Are there others, please?---There are…there's another one which is to maintain, on an ongoing basis, the leachate level at a level no greater than 300 millimetres above the liner.
> …
> So your view is the guideline, to the extent that it recognises that you could have a landfill below the water table with an engineering solution, is wrong?---I'm not saying that it's wrong. I say that it fairly …points out…that management solutions are available. What I'm saying is that the very specific problems that we see on a weekly basis in our firm where leachate management…can be avoided to a large degree by siting of the water table."

[290] It is difficult to reconcile Mr Sutherland's evidence in cross-examination with the assertion in his statement of evidence that the basic premise to be drawn from a series of guidelines, including the DES guideline, is that '*waste should not be placed below the water table, unless there is no alternative*'. As he conceded, engineering solutions may be adopted to manage leachate impacts on groundwater. This evidence, in my view, does no more than confirm that the outcome of this appeal turns largely on the acceptability, or otherwise, of the proposed engineering and operational controls for the landfill. Issues of this kind are not, in my view, resolved by reference to first principles alone. Nor are they resolved by reference to passages of the DES guideline (and State equivalents) to which Mr Sutherland and Mr Amaral referred. Rather, the issues, as I have already said, require the details of the proposed engineering and operational controls to be carefully examined.

[291] Both Mr Amaral and Mr Sutherland repeatedly pointed out that the proposed development is contrary to this principle: a natural unsaturated groundwater attenuation zone should be provided between the base of the landfill and groundwater. As I understood their evidence, this was a matter of particular concern here given: (1) there is uncertainty around the level to which groundwater will rebound; and (2) the nature of the host geology. The points raised in relation to this issue find support in section 5.2.3 of the DES guideline, which expresses the '*preference*' discussed above.

[292] Mr Sutherland explained the purpose of the attenuation zone in his oral evidence. He said it provides a zone within the landform to absorb metals and other contaminants in the event of liner failure.[354] Mr Tomlin added to this explanation. He pointed out that leachate will flow through an attenuation zone.[355] This is because it is not impermeable; it will retard flow through the strata. The rate at which contaminants will be absorbed and flow through the strata depends on the nature and permeability of the attenuation zone[356] and the material to be absorbed.[357]

[293] Against this background, the issue to be examined is this: whether the composite liner, which is proposed to sit on a 5 metre thick engineered base, will perform the same function as an unsaturated natural attenuation zone. Mr Tomlin answered this question in his oral evidence:[358]

> "…if I can put it in simple terms, which is better: a composite liner of the kind that we've got here, or an unsaturated attenuation zone?---A composite liner is certainly better. There's no guarantee an attenuation zone will attenuate contaminants.
>
> Even at its most basic level, which has lower permeability, that is…a better capacity to prevent leachate from getting into the water table?---In that circumstance, then, there may be some attenuation, but we can't guarantee that that will…sufficiently attenuate and manage contaminants, like a composite liner would."

[294] I accept Mr Tomlin's evidence. It comfortably establishes the composite liner will separate waste from groundwater and retard the transportation of contaminants from the base of the void to the surrounding groundwater. Mr Tomlin's evidence suggests the composite liner will, in fact, be superior to an unsaturated natural attenuation zone. I accept this evidence. This was conceded by Mr Sutherland in cross-examination.[359] His concession, in my view, means the first principles assessment summarised in paragraph [257], particularly in so far as it relies upon item (3) in that same paragraph, cannot be accepted as a reason for refusal.

[295] The DES guideline is precisely as it is described; it is a guideline. It should not be applied as if it contains statements of preference rising to the level of inflexible

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354 T27-14, L32-40.
355 T25-23, L30-32.
356 T27-15, L29.
357 T27-15, L4-23.
358 T25-23, L34-44.
359 T27-15, L39-43.

standards. When approached in this way, the DES guideline (and similar guidelines) leaves open for consideration an alternative solution to all of the first principles issues raised by Mr Sutherland and Mr Amaral. The alternative involves engineering and operational controls. Whether those controls will, in theory and practice, manage the risk of adverse of environmental impacts is a complex issue. What can be said with confidence however is that the issue is not resolved in this appeal by reference to a first principles assessment of the kind relied upon by Council. Nor is it resolved by reference to the DES guideline (or other State equivalent).

[296] For the above reasons, I am satisfied the first principles assessment does not call for refusal of the development application.

Landfill design

[297] There is no dispute the composite liner system proposed for the landfill is better than best practice. Issue was however taken with the integrity of the backfilling proposed to create the sub-base beneath the liner.

[298] The base for the composite liner comprises two filling zones; they are identified at paragraph [68] as the general zone and engineered zone. The second zone is the uppermost part of the sub-base and is intended to provide a smooth, hard and unyielding surface for the liner. This is required to ensure: (1) leachate drains to the sumps in the base of the void; and (2) the integrity of the liner is not compromised by excessive strain. Here, drainage provided at the base of the void is critical given the absence of gravity drainage. All leachate will filter to the bottom of the void and drain to a sump, where it is then pumped to the surface. Absent proper drainage and pumping, the void would function as a basin for leachate.

[299] It is necessary to design and construct a sub-base to limit long term total and differential settlement within the backfill profile.[360] Mr Amaral was of the opinion this will not be achieved here because the sub-base will be incompetent. The sub-base to which he referred is the general filling zone.[361] This part of the filling profile is about 77 metres in height and comprises unconsolidated fill beneath the engineered zone.

[300] Mr Amaral identified a number of reasons in support of the view that the sub-base for the liner is unsuitable. He started by pointing out that the backfill to be used was less than ideal, being a heterogeneous mix of variable material. This, he suggested, was problematic because of the proposed method of placement. This material is to be end dumped, in an uncontrolled way, into a void partially filled with water. The method of placement was criticised because:[362] (1) the end result cannot be certified; (2) the material cannot be placed in layers; (3) the material cannot be compacted in layers; (4) the material cannot be inspected or tested to ascertain its density; and (5) the material will not be seen until it has emerged from the water,

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360 Ex.8.002, pp.31-32, para 59.
361 Ex.10.005, p.4, Line 185.
362 T32-23, L46 to T32-24, L9.

some 70 metres above the base. These difficulties were said to manifest in this way:[363]

> "…the result…is that this uncontrolled, heterogenous mix of variable material will end up differentially settling for various reasons, and whatever shape it takes under eventual loading will be reflected into the material above it including the five metres compacted zone and the liner."

[301] In Appendix A4 of his joint expert report, Mr Amaral calculated the total and differential settlement expected to occur in the sub-base. It ranges from +1.09 metres to +5.74 metres.[364] Settlement in this range would, in Mr Amaral's view, be reflected in the liner above and lead to liner failure. He explained in his oral evidence how this would occur:[365]

> "…Well, the effect of any movement underneath the liner is going to be reflected precisely in the liner. That is particularly because it is going to be loaded…with in excess of 500 kPa… And with that sort of pressure, any movement, any deflection, any waviness, any local depression that occurs beneath it – under that pressure, it'll reflect it directly. And the reflection of that, particularly in a three-dimensional depression case for instance – multiaxial strain – in my opinion, the liner will fail."

[302] Following this explanation, Mr Amaral was asked whether the liner would fail by strain or rupture. To say the liner would fail by '*strain*' I understood to be a reference to stress cracking. Stress cracking will lead to a hole in the liner after it has been under constant load for an extended period of time.[366] In contrast, '*rupture*' is a reference to a break in the liner.[367] Returning to the question asked of Mr Amaral, he said:[368]

> "…Well, it's hard to say. If …it happens to occur where there's a weld joint, I'd say it'll fail by rupture because most failures where you have a combination of the sheeting and the – a weld join – Dr Scheirs advises most failures occurs along the weld join. So I'd say in that circumstance, it would be rupture. If it's the sheet alone, it's more likely to be – in multiaxial, you would...go above the point where it's elastic and it has a continuous stress on it and you're more likely to get stress cracking over a period of time. So I think there will be whole variation of types of movements and types of failures because of the great difference of what's going to happen on the surface beneath the liner. So it's very hard to say precisely which one will occur most, but I think there'll be several types of failure."

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363 T32-24, L9-13.
364 Ex.8.002, p.133; Ex.10.005, p.5.
365 T32-27, L47 to T32-28, L8.
366 T31-58, L33-38.
367 T31-58, L7-13.
368 T32-28, L11-20.

[303] Mr Amaral was not confident the fill material and placement method would achieve its intended purpose. This lack of confidence, as I understood the evidence, was, in part, because Mr Amaral had not seen a sub-base constructed with mine spoil to the depth proposed. Having regard to Mr Amaral's professional qualifications and extensive experience, that he had not seen a design of the kind proposed gives pause for thought, particularly when coupled with the following evidence of Mr Watson.

[304] Mr Watson is a civil engineer retained by Austin as an expert witness. He has experience with at least 50 landfill projects and has specialised in landfill engineering and design for more than 30 years.[369] Mr Watson was involved in the design of the proposed development.[370] In this context, the following interchange occurred with Mr Hughes KC:[371]

> "…And have you ever designed a base liner to be supported on up to 80 metres of unconsolidated mine spoil?---Not 80 metres; …No.
>
> And have you ever designed a base liner to be put on mine spoil that's been dumped into about 70 metres of water?---Not to that extent. …As I say, I was a designer at Stapylton and that was a similar approach, but not the same magnitude.
>
> …And what about…the 30 metre high cliff face being…controlled collapse…by drilling and blasting to form part of the base and dewater, that's new for you, I take it?--- [yes]…in this direct application, but I've been involved in a number of projects where drill and blast activities [have been used]…it's a controlled placement."

[305] Appendix A3 of the geotechnical, landfill design and mining and environmental management joint expert report was prepared by Mr Amaral. It sets out his views with respect to the suitability of the '*existing end dumped mine spoil and proposed collapsed high wall as a base for an engineered landfill liner*'.[372] In this context, Mr Amaral referred to independent research about the impact of strain on liners.[373] By reference, predominantly, to the work of Dr John Scheirs and international regulators, Mr Amaral pointed out that the reference material suggests:

(a) liners need protection from relatively minor disruptions to the smooth, unyielding subgrade on which they sit;

(b) the allowable multiaxial strain for a HDPE liner is '*commonly*' 3%;

(c) the design basis for geomembranes such as HDPE liners generally dictates that strains should not exceed 3% in order to reduce the likelihood of creep, rupture and environmental stress cracking; and

(d) at least one international regulator set a '*maximum global strain*' of 1%, which is far below yield strain.

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369 T27-34, L4-33.
370 T27-34, L39-47.
371 T27-55, L3-16.
372 Ex.8.002, p.124.
373 Ex.8.002, p.126.

[306] In the joint expert report, Mr Amaral calculated total differential settlement in the sub-base at 12 locations. The locations are identified on two cross-sections through the landfill. The analysis starts with the calculation of a figure for '*estimated settlement*' (**ES**) for each of the 12 locations.[374] To arrive at a figure for ES, Mr Amaral applied settlement rates reported in a Masters' thesis (2015, Mostofa) and took into account '*initial settlements*' occurring prior to the installation of the liner.[375]

[307] After calculating ES, Mr Amaral considered what, if any, additional settlement should be accounted for to arrive at an estimate of '*total settlement*' for each of the 12 locations. In this regard Mr Amaral:

(a) quantified, and made specific allowance, for '*additional settlement as a result of reduced submerged unit weight*' (**SUW**) at each of the 12 locations; and

(b) considered an allowance should be made for hydroconsolidation (**HS**) (where the groundwater table falls then rebounds to saturate the fill material) but was unable to quantify the allowance to be made for each of the 12 locations.

[308] The total estimated settlement figure calculated by Mr Amaral is the sum of ES and SUW. The estimate excludes HS.

[309] A review of Mr Amaral's figures for total settlement reveals 59 to 77% of the total estimated settlement is attributable to ES.[376]

[310] The sum of ES and SUW is not a measure of liner strain. To measure strain, a further calculation is required, of which total estimated settlement between two points is one integer. The second integer is the horizontal distance between the same points.

[311] The joint expert report does not include the calculations performed by Mr Amaral for liner strain. Despite this, the joint expert report records he concluded the '*liner will be subjected to strains several times greater than the commonly used limit of 3%... for the HDPE and also in excess of a much more lenient level of 6%*'.[377] Mr Amaral was pressed about the absence of strain calculations in his cross-examination.[378] He was unsure whether he had set out the calculations in the joint expert report, but in any event referred to calculations for local strain in his further statement of evidence. In that report he calculated local strain for two examples. The calculations resulted in local strain of 4% and 8%. Local strain is different to global strain. Local strain involves shorter distances, such as localised depressions in the surface of the liner caused by waste placed in the landfill. Mr Amaral did not calculate global strain prior to his oral evidence.

[312] Mr Amaral was cross-examined about global strain.[379] This commenced with Mr Holt KC confirming the correct inputs for the calculation.[380] Mr Amaral readily

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374 Ex.8.002, p.133.
375 Ex.8.002, p.134.
376 Ex.8.002, p.134.
377 Ex.8.002, p.136; see also Ex.10.005, p.5.
378 T32-44, L40-42.
379 T32-44, L45 and onwards.
380 T32-43, L10 to T32-44, L7.

agreed the calculation has the following inputs: the difference in settlement between two points divided by the horizonal distance between the points. The product of this calculation is expressed as a percentage. The percentage is a measure of global strain on the liner.

[313] Mr Holt KC invited Mr Amaral to calculate global strain on the liner as distinct from local strain. Mr Amaral did so by reference to: (1) his estimates for total settlement;[381] and (2) his measurements of the horizontal distance between the points where total settlement was estimated. After completing two calculations of this kind, Mr Amaral conceded the resulting strain on the liner was 2%. Self-evidently, this is less than the 3% strain referred to in the technical literature relied upon by Mr Amaral.

[314] Mr Amaral's evidence in this part of his cross-examination was inconsistent with opinions attributed to him in a joint expert report. In particular, the evidence was inconsistent with the view that liner failure would be inevitable and widespread. The evidence was also difficult to reconcile with the following opinion attributed to Mr Amaral in a joint expert report:[382]

> "Global strains exceeding 10% cannot be discounted and local strains will also likely to be greater than 10% in the most vulnerable areas."

[315] Despite calculating liner strain in the order of 2%, Mr Amaral remained entrenched in his view that '*rupture of the lower liner will be inevitable and widespread, beyond the practicable ability to repair after filling commences*'.[383] His reason for doing so emerges from two passages of the cross-examination.

[316] First:[384]

> "…What do you actually say the number is?---It can be anywhere up to more than 75 per cent of the total settlement.
>
> No, no…the strain, the percentage we can compare – the percentage that we can compare to…what the liner can take…– because I can't see it anywhere in your report other than in generalities… What do you actually say the number is?---I say the number can be anything above 75 per cent of the total settlement.
>
> And from what universe do you get the 75 per cent?---University of Toronto, Canada….Master degree in soil mechanics and foundation engineering.
> …
> …Can you tell me what the basis is for that claim of 75 per cent in total?---My studies in soil mechanics and foundation engineering in University of Toronto. …Which fundamentally is based on foundation engineering, settlement, differential settlement, and what settlements you can expose, and what loads you can place on material. And on fill,

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381 Ex.8.002, p.133, Section A, Locations 2 and 3 (T32-45, L30).
382 Ex.8.002, p.23, para 29.
383 Ex.8.002, p.14, para 4.
384 T32-48 L36 to T32-49 L33.

> you normally don't put more than 100 kPa on fill. For a building this is, of course. But you can put five, 10 tonne per square foot or 1000 kilopascals on rock. We're talking about something which is totally substandard. And most soil mechanics and duel technical engineers would be abhorrent at something…relying upon 84 metres of unconsolidated material.
>
> …The 75 per cent number …Where does it come from? What is the basis of it?---Well, it comes from foundation engineering where, not only do you design a foundation, you design a foundation so it is less than 25 per cent settlement."

[317] This reasoning suggests settlement could be as high as 75% of the calculations Mr Amaral set out in the joint expert report for total estimated settlement. This response does not explain Mr Amaral's reasons for maintaining, in the face of Mr Hornsey's unchallenged evidence, why 2% strain on the liner would lead to widespread and inevitable failure.

[318] Second:[385]

> "So on your numbers, applying the equation that we've been discussing…we get to two per cent on that - - -?---Yes.
>
> …And that's actually – just so we're just crystal clear about this – that's a strain number – that is, a number which is comparable to the percentage strain that the liner can take?---Assuming that global strain we just calculated between two remote points– that it's a straight line in between, that is correct.
> …
> … Could you, please, show me where that is explained anywhere in your joint or individual report – that way of bigging up or making bigger the two per cent number that one would otherwise get applying an orthodox calculation?---…my potholes show that in between those two points there can be variations in a straight line between those two because it won't be a straight line…– if it's a wavy line, that means the liner will be stretched not in a straight line, but it will be a wavy line…
> …
> …So your issue here is not actually about differential settlement…– it all comes down to your assumption that there will be these great potholes on the surface of the five-metre engineered fill zone. Is that right?---No. The great potholes can be about 35 millimetres deep. And I've done the calculations on that and presented it. It can be 35 millimetres deep. Not a great pothole. It can be a relatively small pothole …And that calculation has been done."

[319] These responses do not explain why 2% strain on the liner would lead to widespread and inevitable failure. Rather, the responses introduced for the first time the proposition that the base of the liner would be wavy. It was said to find its origin in

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385 T32-45, L32 to T32-47, L9.

the calculations to which Mr Amaral referred as '*example*' calculations of local strain.[386] The calculations are based on two sketches, which are random shapes with dimensions. Neither calculation, nor shapes and dimensions, bear any relationship to site specific data.[387] They are theoretical examples of what liner failure may look like.[388]

[320] Mr Amaral said the shapes illustrated in his statement of evidence were not the only examples of liner failure that could occur. In a colourful way, he said:[389]

> "Look, when you've got a moving base, none of us know…the shapes it will take, but I can assure you on…84 metres of mine spoil which is moving, you are going to get many shapes. And…none of us will ever know precisely what individual shapes are, but these are extremely plausible, and I fully expect them to occur."

[321] Mr Amaral confirmed the shapes illustrated in his statement of evidence were used to calculate local strain, which was expected to occur at the top of the general filling zone.[390] The mechanism by which this strain would occur was not identified by Mr Amaral. This was a matter of import given: (1) an engineered fill zone is to be placed over the general fill zone criticised by Mr Amaral; and (2) any imperfections/waviness or the like anticipated by Mr Amaral would need to reflect through the general and engineered fill zone in circumstances where the latter is to be constructed in layers, compacted, and certified.

[322] Mr Amaral's conclusion that rupture of the lower liner would be '*inevitable and widespread*' informs an issue raised in relation to leachate management. As I have already observed, the EA requires the height of leachate during the operational stage of the landfill to not exceed 300mm above the liner. This is to separate the waste from leachate below.

[323] To achieve 300mm, the base of the landfill is graded, causing leachate to drain to wells along the eastern edge. The collected leachate is pumped to the surface. If, as Mr Amaral concluded, there is inevitable and widespread failure of the liner, this would disrupt drainage paths for the leachate; it would not drain to the wells where it is to be removed by pumping.[391] It was pointed out that it was '*almost impossible*' to correct this operational difficulty by digging further wells in the base of the void.[392] If it cannot be corrected, leachate is unable to drain to the wells and will build up to a height exceeding 300mm. This would not comply with the EA.

[324] Mr Sutherland was firm in his view that compliance with this aspect of the EA would be '*almost impossible to achieve*' at times.[393] The times where it could not be achieved are:[394] (1) during periods of extreme weather conditions; and (2) where

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386 Ex.10.005, p.5.
387 T32-47, L23.
388 T32-47, L25-26.
389 T32-47, L42-46.
390 T32-48, L1-2.
391 T32-31, L20-30.
392 T32-32, L25.
393 Ex.10.006, p.12, L16 and T26-81, L19.
394 T26-81, L21-32.

there are elevated levels of leachate as a consequence of groundwater ingress through the liner. Item (1) involves a large catchment inflow into the void causing groundwater to rise and/or the groundwater to rebound from the former mine depressurisation to RL30m AHD.[395] For the reasons given in paragraph [269], the circumstances that must combine to give rise to item (1) represent an improbable extreme. Item (1) should not be used as a basis to examine whether compliance with EA will be '*impossible*'. Item (2) is in a different position. It assumes there is liner failure, which, in turn, facilitates the transportation of groundwater through the liner.[396]

[325] Mr Sutherland explained that non-compliance with the EA condition would not be without consequence. The consequence, in simple terms, sounds in the generation of further leachate at the base of the void, which must be removed and treated. As Mr Sutherland explained:[397]

> "…300 millimetres generally matches the depth of the drainage layer. So that way, any leachate is kept separate from the waste…the reason that that is important is that you do not want the leachate…remixing with the waste and liberating contaminants within the waste. And you do not want anaerobic conditions developing in large parts where there…has been waste placed, and you do not want…an increasing leachate level.
>
> … the situation with anaerobic conditions is… without oxygen, and the situation with aerobic conditions is with oxygen. It's a different type of bacteria. It's a different type of action. But in landfills, large depths of landfills under anaerobic conditions, particularly as a result of rainfall events, can cause significant generation of landfill gas, particularly H2S…Rotten egg gas…
>
> …Eventually under packing down and the weight of more waste on top, anaerobic conditions will develop. But the key is to try and maintain the leachate at that low level so contaminants aren't remobilised, you don't have this generation of leachate. But also that you want the moisture content of the waste to be below field capacity…"

[326] Mr Sutherland also pointed out that non-compliance with the 300mm requirement was relevant to an assessment of impacts on groundwater. In the case of liner breach, the inflow, or outflow, of water through the liner is a product of the '*driving head*'(hydraulic gradient).[398] In circumstances where the level of groundwater sits at a higher elevation than the leachate in the void, groundwater may by transported through the liner into the void, generating more leachate for removal and treatment. In circumstances where the level of water at the base of the void is higher than surrounding groundwater level, the driving head may lead to leachate at the base of

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395 T26-89, L35-42.
396 T26-82, L1-2.
397 T26-75, L46 to T26-76, L29.
398 T23-76, L36-39; and T26-77, L9-30.

the void being transported through the liner and into the groundwater. This has the potential to contaminate groundwater.

[327] Dr Williams and Mr Watson did not share Mr Amaral's view that rupture of the lower liner will be '*inevitable and widespread*'. Nor did they share his view that the sub-base beneath the liner is unsuitable.[399]

[328] Mr Watson explained the construction and certification process to be adopted for backfilling the void.[400] He readily acknowledged the process does not permit compaction of material in the general fill zone because it would be end dumped into water.[401] That is not to say there is no engineering control at all. Mr Watson explained the process would include: (1) proof rolling the surface of the general fill zone to ensure it is a competent surface to receive the engineered fill above;[402] (2) testing by observation and survey to have confidence in the integrity of the backfill;[403] and (3) certification by a '*CQA Engineer*', who is a Registered Practicing Engineer Queensland (RPEQ).[404] The certification and testing information will inform the detailed design for each stage of the landfill. It would also be used to demonstrate compliance with condition G12 of the EA, which states:[405]

> "Prior to the construction of every landfill stage, a detailed underground stability and subsidence analysis must be undertaken to determine the ranges and limits of long term subsidence and strain acting on the liner. This analysis must include:
>
> a) All mine void and geotechnical data on which the assessments are based;
>
> b) The analytical, empirical or numerical methods used for the assessment;
>
> c) the material properties utilised in the analysis, for all relevant sequences, in particular the uncontrolled backfill located beneath the liner; and
>
> d) An assessment of the potential stability impact on the base liner design as a result of the estimated subsidence and strains acting on the liner, as well as preventative measures introduced to the landfill design to achieve acceptable long term performance; and
>
> e) A report on the detailed underground stability and subsidence analysis must be submitted to the **administering**

399 T31-25, L20-33; T31-60, L20–34.
400 T27-35, L28 to T27-36, L2.
401 T27-44, L3-9.
402 T27-36, L9-13.
403 T27-44, L17 to T27-46, L18; Ex.13.014.
404 Ex.13.014.
405 Ex.9.009, p.6, para b) and Ex.6.001, pp. 22-23.

> **authority** prior to the construction of the first and each subsequent stage of the landfill."

[329] Dr Williams is a geotechnical engineer who has focused most of his career on mine waste. This experience has included projects involving the backfilling of open pits in the Ipswich coal fields.[406] Dr Williams is well published. The evidence included papers he co-authored. One of the papers, which was published in 1996, is titled '*Simulation of open-cut coal mine back-fill behaviour*'.[407]

[330] A review of Dr Williams' evidence reveals he accepted, without qualification, that the fill and waste placed in the void would undergo total and differential settlement. He explained that:[408]

(a) '*total settlement*' is a function of the depth and density of backfill and compacted waste, giving rise to '*differential settlement*' and '*tilt*'

(b) '*differential settlement*' is the settlement between points with different depths of backfill and waste; and

(c) '*tilt*' is the differential settlement between any two points.

[331] Dr Williams identified the key geotechnical issue in this case in these terms:[409]

> "The key geotechnical aspect to be addressed by the proposed development is the magnitude and rate of total and differential settlements (sic) of the backfill and compacted waste placed before and after placement of the (lower) liner between the backfill and waste, which will dictate the integrity of this liner."

[332] Annexure B1 to the geotechnical, landfill design and mining and environmental management joint expert report[410] contains Dr Williams' calculations with respect to maximum total settlement and maximum post-placement tilt. He calculated maximum total settlement to be 2.163 metres. He then reduced this figure to reflect that a significant proportion of estimated settlement was the product of self-weight settlement occurring during the 12 to 18 month construction period for the general fill zone. This settlement would occur before the engineered fill zone and liner is placed. The remaining settlement, which was equivalent to about 1 metre, will occur after the liner is placed. This is the extent of settlement the liner will need to accommodate.

[333] As to maximum differential settlement, Dr Williams said this would occur towards the crest of the deepest end of the void. He calculated the maximum post-placement tilt at this point to be 0.019 (less than a 2 percent slope). This is a measure of strain on the liner.[411]

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406 T31-11, L14-26.
407 Ex.8.002, p.102, following Figure 1.
408 Ex.9.008, p.5, para 15.
409 Ex.9.008, p.5, para 14.
410 Ex.8.002, pp.102-105.
411 T31-14, L10-13.

[334] Dr Williams was asked to explain his strain calculations in oral evidence. The explanation was given by reference to a cross-section through the void. To understand this important part of the evidence, it is necessary to identify the meaning of two phrases used by Dr Williams. First, he spoke of the '*left hand side*', which is a reference to the western edge of the void where there is landfill to a maximum depth of 45 metres. Second, he spoke of the '*right hand side*', which is a reference to the eastern edge of the void where the depth of fill below the liner is 83 metres, overlaid with 38 metres of compacted landfill:[412]

> "…So backfilling…will take place…it will actually, I think, take place on the left-hand side moving towards the right. As you …increase your depth of backfill…you are going to get more settlement. So it's almost a linear function, so that's why we express the settlement as a percentage of the backfill height. So as you progress from left to right…you've got a slope there, so there's an increase in the waste height or the waste depth, so there'll be an increase in settlement. That will give rise to a tilt, if you like, from the left towards the right as you go down that slope, and a little bit more as you go to the right-hand side. But the biggest differential is actually on the right-hand side of that section where you've got a very steep slope. So you go from no backfill on the extreme right-hand side to the deepest backfill at the deepest point of the pit. So your biggest tilt, if you like, in settlement of the backfill, will be from the…extreme right-hand side to the deepest point of the pit. And…you can express that differential, or tilt, if you like, as …the amount of settlement you expect at the deepest point of the waste divided by the horizontal distance between that deepest point back to the right-hand side of the pit, the edge of the pit. And we normally express that as a percentage, so that's that two per cent that I refer to. So I'm estimating that the amount of settlement you'll get at the deepest point of the pit after backfilling will be of the order of one metre, and you divide that one metre by the horizontal distance between the deepest point of the pit and the right-hand edge of the pit and express that as a percentage, and that's that two per cent I'm talking about."

[335] Dr Williams said his calculations were reflective of the worst case scenario. In this regard, he explained:[413]

> "…that is definitely the worst point because you've got the biggest change in the depth of the waste between two…points separated horizontally. Obviously, on the left hand side, it's a much flatter slope, so…the difference in waste thickness over a horizontal distance is less. So the strain will be much less on the left-hand side. It will be quite low between the end of the slope on the left-hand side and the deepest point of the pit because that's a flatter surface. So the differential across that width will be least, and the worst case would be the right-hand side."

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412 T31-13, L33 to T31-14, L8.

413 T31-14, L15-23.

[336] With the benefit of Dr Watson's strain assessment, Mr Hornsey examined whether the basal liner would fail, or rupture. He concluded that rupture of the liner was not inevitable and, in fact, extremely unlikely.[414]

[337] Mr Hornsey explained that the maximum allowable strain in a smooth HDPE geomembrane such as that proposed is 6%. This figure does not represent the point at which rupture, or failure, will occur.[415] Based on hundreds of tests conducted by Mr Hornsey,[416] he said that an allowable strain of 6% is a conservative figure, providing a level of redundancy or factor of safety in the design.[417] This is made good having regard to the testing process for yield strain.

[338] Strain in a HDPE liner is ascertained by placing a specimen in a constant rate of extension and measuring the resisting force. When subjected to a test of this kind, yield strain for HDPE is between 16% to 22%. Mr Amaral did not cavil with this suggestion. He said it was '*perfectly correct*'.[418]

[339] Mr Hornsey explained that stress cracking is likely to occur when the geomembrane reaches the yield point. A maximum allowable strain of 6% is 2.3 to 3.5 times less than yield strain of 16 to 22%.

[340] Mr Hornsey did not accept that an allowance of 3% for maximum allowable strain represented contemporary practice. He explained the reason for this in his oral evidence:[419]

> "…Mr Amaral, in his written material, refers to a three per cent threshold of that kind, effectively referring to Dr Scheirs' 2009 book?--Yes. That's primarily come from the German industry, and…that was developed back in the late 1990's. Stress crack resistance of the geomembranes back then was around the 200 hour mark,…and these days, it's 500 and above. So…stress crack resistance has more than doubled since that three per cent number was used, and hence, the modern level of six per cent now adopted for stress cracking."

[341] I accept Mr Hornsey's evidence. It was not challenged and, in any event, was conceded by Mr Amaral as correct.[420]

[342] For the purposes of this appeal, I accept the work reported by Dr Scheirs is no longer consistent with contemporary thinking. In particular, it can be observed that the report: (1) is now 13 years old and refers to liners of lower quality than that proposed here; and (2) the statement in the report about the failure of weld joints is itself based on outdated information, being a paper published in 1989.[421] Contrary to

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414 Ex.9.011, p.3, para 4 a.
415 Ex.9.011, p.4, para 8.
416 T31-59, L1-2.
417 Ex.9.011, p.4, para 8.
418 T32-52, L33-36
419 T31-59, L17-25,
420 T32-50, L11-20; T32-53, L31-36.
421 Ex.14.016, p.28.

Mr Amaral's assertions, welds have been the subject of development and improvement since this time.[422]

[343] By reference to the strain calculations prepared by Dr Williams and Mr Amaral, Mr Hornsey expressed the view that:

(a) strain of less than 2%, as calculated by Dr Williams, has a safety factor in the order of 8 to 10 times before yield strain[423] and a considerably greater safety factor before yield strain leads to rupture, which is 790% strain;[424]

(b) a strain of up to 8%,[425] as calculated by Mr Amaral, exceeds the maximum allowable strain value of 6%, but does not result in stress cracking or rupture of the liner – the result is a reduction in liner redundancy or the safety factor, which is reduced to between 2 and 2.75 times before yield strain.[426]

[344] There was no direct counterpart to Mr Hornsey. He is a very experienced witness in his field of endeavour. There was no direct challenge to the opinions he expressed. There was, however, an attempt to attack Mr Hornsey's professional credentials and ethics in cross-examination.[427] This was unfortunate. The basis for doing so was underwhelming and unpersuasive. It certainly did not dissuade me from concluding that Mr Hornsey, who is one of a very limited number (may be 3 or 4) of experts in his chosen field of endeavour, did anything other than express genuinely held views to assist the Court. I was grateful for Mr Hornsey's evidence.

[345] I accept Mr Hornsey's evidence. It goes a long way to resolving the landfill design issues in this appeal. This is because taking Mr Amaral's calculations (in his cross-examination) for strain and combining them with Mr Hornsey's evidence establishes that liner failure will not occur, let alone be inevitable and widespread. To suggest otherwise in my view is akin to catastrophising.

[346] Mr Hornsey's opinions assume the evidence of Mr Watson and Dr Williams is accepted.

[347] Mr Watson, as I have said, is an experienced civil engineer. He readily acknowledged there are design and construction challenges for the proposed landfill. With this in mind, it can be said that Mr Watson gave particular and careful attention to the following matters: (1) the sources of fill material proposed; (2) the method to obtain a source of fill by blasting the eastern wall of the void to achieve a maximum particle size of 300 mm; (3) the process for filling a partially dewatered mining void; (4) that fill material placed in void water cannot be compacted and tested in the same way the engineered fill zone can be; (5) that it would be very difficult, if not impossible, to repair the engineered fill layer and composite liner once waste was placed in the void; and (6) technical guidance provided for the design and operation of new landfill facilities in the DES guideline. Fully cognisant of these matters, and based on his significant experience, Mr Watson was confident

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422 T32-60, L31 to T32-61, L13.
423 Ex.9.011, p.5, paras 8 b. and c.
424 T31-57 to T31-58, read with Ex.9.011, p.5.
425 Ex.10.005, p.5.
426 T31-59, L46 to T31-60, L2.
427 T31-67, L32 to T31-69, L9.

the design and construction process proposed for the landfill here is appropriate and can achieve a suitable base for the composite liner. I did not observe Mr Watson's confidence to be shaken in cross-examination, which was based on his extensive experience and professional judgment. It finds some support in real world experience at a BMI Group facility at Stapylton (albeit not to the same depth as proposed here). I accept Mr Watson's evidence.

[348] In so far as Mr Amaral was the counterpart to Mr Watson, Mr Amaral adopted an overly pessimistic view of the design and construction process to fill the dewatered void. This was on display during Mr Amaral's cross-examination. During this part of his oral evidence, Mr Amaral's demeanour and responses to questions were unnecessarily combative. Further, his responses were, at times, unnecessarily colourful. Unfortunately, combative, and colourful responses tended to coincide with questions that raised valid contrary indicators to the opinions expressed by Mr Amaral. This is demonstrated by two examples. The examples are by no means exhaustive; they are merely parts of the evidence that stood out to me during the cross-examination.

[349] First, Mr Amaral said the general filling zone cannot be compacted or tested. It was put to him that the surface of this fill could be tested by using a settlement plate. Mr Amaral described this form of compaction testing as '*useless*'.[428]

[350] To describe this well-known testing method as useless was unnecessarily colourful, and, in my view, unhelpful. It is a known testing method, which can produce data for consideration, and analysis, prior to the construction of the engineered fill zone. This information can form part of the material relied upon to demonstrate compliance with condition G12 of the EA. Once these matters are appreciated, it is difficult to see how the testing results are fairly described as useless. To the contrary, I am satisfied the testing, in combination with observations by an engineer and survey information will be sufficient to enable certification by a CQA engineer.[429]

[351] Second, the material used to fill the dewatered void will include material blasted from the high eastern wall. This wall is 700 metres long and forms the eastern edge of the void.[430] Its crest has a maximum level of RL50m AHD, which is about 22m above the water level in the void.

[352] It is intended the particle size blasted from the eastern wall will not exceed 300 mm. Mr Amaral said, emphatically, this was '*impossible*'.[431] The explanation he gave was to the effect that the wall was too unstable, with unstable material requiring removal prior to blasting.[432] Mr Amaral's opinion was based on '*observation*'. In terms of unstable material, he had observed '*something the size of a double-decker bus that's already slipped down the face*' of the wall.[433]

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428 T32-39, L7.
429 Consistent with Ex.13.014 and Mr Watson's evidence.
430 Ex.6.003, Tab 13, p.1061.
431 T32-40, L37-40.
432 T32-41, L2-7.
433 T32-41, L11-16.

[353] In expressing his view, Mr Amaral, who is not a blasting expert, did not appear to take into account part of Mr Dekker's unchallenged evidence. Mr Amaral's attention was drawn to this evidence during cross-examination, which is supported by a proposal submitted to Austin by a blasting contractor. The evidence is in the following terms:[434]

> "So that we can ensure the material blasted from the highwall is able to be compacted to meet type 1 certification standards, we will engage a highly experienced blasting contractor who has already blasted an area of the highwall. This contractor has indicated that a blast pattern incorporating 89mm holes in a 2-2.5m pattern will generate a rock grading generally <300mm, suitable for backfilling purposes…."

[354] This evidence suggests the blasting programme for the high eastern wall will be difficult but can, with appropriate expertise, be undertaken. Contrary to Mr Amaral's view, the exercise is not an impossible one.

[355] I accept Mr Watson's evidence. I am satisfied his evidence establishes there is a sound basis for confidence in the design, construction and testing proposed for the general fill zone beneath the composite liner. This confidence is reinforced when consideration is given to Dr Williams' evidence (which I also accept) and the requirements of condition G12 of the EA. The latter requires each stage of the landfill to be preceded by a geotechnical engineering study to monitor circumstances that may adversely impact on, or potentially lead to an adverse impact on, the integrity of the liner. An analogous condition should form part of any town planning approval for the proposed development.

[356] Turning to Dr Williams' evidence, I prefer his evidence to that of Mr Amaral. This is so for a number of reasons.

[357] First, Mr Amaral's evidence with respect to estimated strain on the lower liner was opaque.[435] He expressed strong views about strain and rupture in the joint expert report and statement of evidence. The cross-examination skilfully revealed that the views expressed were not, in fact, supported by the calculations necessary to derive a measure of stress, strain or rupture. The necessary calculations were undertaken in cross-examination, and did not exceed 2%. This is significantly less than the 16-22% required for stress cracking to occur. It is also orders of magnitude less than the strain required for rupture to occur. Faced with these difficulties, Mr Amaral sought to change tack (see paragraphs [316] to [321]). The change was unpersuasive. The rationale underpinning the change was not particularly cogent. That it lacked cogency meant the evidence could not be properly tested by the cross-examiner, or this Court.

[358] Second, Mr Amaral indicated in a joint expert report that his settlement estimates did not include '*initial settlements as they should have largely occurred prior to installation of the liner*'.[436] How much settlement had '*largely occurred*' was not defined by Mr Amaral. This made it difficult to test this part of his evidence. The allowance made for settlement of the fill under self-weight or as initial settlement is

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434 Ex.9.002, para 81.
435 Ex.13.022, para 167.
436 Ex.8.002, p.134.

central to the differences between Dr Williams and Mr Amaral. Unlike Mr Amaral, Dr Williams clearly explained the basis for this aspect of his evidence.

[359] Dr Williams explained in the joint expert report, and in his oral evidence, that he calculated a figure for maximum total settlement for the landfill and then reduced it by 50%[437] to reflect the fill material would undergo significant settlement by self-weight before the liner is placed.[438] It is the settlement occurring after this time that must be accommodated by the liner and leads to strain.[439]

[360] As I understood his evidence, Dr Williams adopted the figure of 50% having regard to: (1) research papers, which included a number of which he was a co-author;[440] (2) a real world example (Murrarie) where post-construction settlements of construction and demolition waste where measured over a 3 year period; (3) the construction period for the sub-base, in the order of 18 months;[441] and (4) that an engineered fill layer is to be placed and compacted in layers under the liner, which will further compact the underlying general fill material. This was helpfully explained by Dr Williams in his oral evidence:[442]

> "…So Ali Naderian was a PhD student of mine in the early 90s, and these papers are the result of that PhD work. And we looked at both laboratory testing of spoil to see how much settlement you might get under load, and we also did some numerical analysis to try and simulate that amount of settlement. And you need to make a distinction between doing a laboratory test where you have a sample that's …not very high, so…you build it very quickly; and then to simulate more and more backfill going on top, you increase the load on the sample. So…in that case, you get the total settlement, because it takes a …very quick time to prepare the sample and then you add more load to it. So that's different from what you get in the field, because in the field you are building up the…backfill over time. And during that time – it takes months or years to complete the backfill – the settlement becomes locked in. You don't see it. What you see is when you get to the final level and you start measuring how much further settlement you might get after that time…the key figure… How much more settlement will you get, which is really the relevant figure…So rapid settlement initially, levelling off after a number of years, and the settlement is expressed in terms of a percentage relative to the initial height of backfill…the worst case where it's uncompacted is around about 1.5 per cent of that fill height, so 100 metres would settle about one and a-half metres…this is really the key figure that I use as a basis for estimating my settlement in this case because it relates to actual backfill situations…"

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437 Ex.8.002, p.104, para 5.
438 Ex.8.002, p.102; T31-15, L46 to T31-16, L2.
439 T31-12, L39-45.
440 Ex.8.002, pp.102-103.
441 T31-21, L39.
442 T31-12, L8-36.

[361] Given the general fill zone involves placement into void water, Dr Williams made clear that his calculations took into account saturation settlement as part of self-weight settlement.[443] He explained that he took this into account by allowing for '*wetting up*'. This concept, and how it informed his calculations, was explained by Dr Williams as follows:[444]

> "Is wetting up in any sense relevant to the subgrade we're talking about in this case?---Yeah… if you placed spoil into a dry pit and then, subsequently, the groundwater or surface water wetted up, then you would get subsequent saturation settlements, the settlement due to saturation would occur later. In this case, spoil has been placed in the pit that's already flooded, so you're doing the two together in a way, you've got the self-weight effect and you've got the wetting up at the same time. The wetting up will cause some material to breakdown because…it's bonded…by clay particle bonding, really relatively weak. The same sort of thing happens …if you put that material out in the weather, you'd see the same sort of effect, the material would breakdown."

[362] As I have already observed, Dr Williams' evidence with respect to initial settlement, unlike Mr Amaral's, was clearly explained and transparent. The evidence is consistent with field results and results derived from research; they each support a self-weight settlement allowance in the order of 80%. This figure was not however adopted by Dr Williams; a lesser figure was adopted here to reflect that self-weight settlement would be reduced as a consequence of the wetting up process discussed above.

[363] Dr Williams' evidence in relation to settlement under self-weight was challenged in cross-examination.

[364] Dr Williams was taken to a paper he co-authored with Kho in relation to '*Settlement and shear strength of uncemented coal mine overburden materials placed loose under dry and wet conditions*'.[445] The paper discusses samples taken from Ipswich coalfields, in particular Jeebropilly Coal mine.[446] Dr Williams accepted the paper, and its findings, were relevant to the development application.[447] The findings to which he was referred included:

> "…Jeebropilly weathered rock is extremely prone to breakdown in the presence of water, dominated by the gravel fraction breaking down to sand-size, with no appreciable generation of silt and clay fines."[448]

And:

> "Based on the results of the laboratory testing, the self-weight settlement of initially relatively dry, loose-dumped, uncemented

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443 Which can be seen in the calculations at Ex.8.002, p.104, para 4.
444 T31-50, L17-26.
445 Ex.14.015.
446 Ex.14.015, p.1, s 2.
447 T31-41, L20-22.
448 T31-42, L10.

> Jeebropilly weather rock spoil under 500 kPa (equivalent to a spoil height of about 30 m) could amount to about 15% of the initial spoil height, of 6% (20% of this) would likely occur post-construction. Wetting-up of loose dumped, uncemented Jeebropilly weathered rock spoil could cause collapse settlement of a further 15% of the initial spoil height. Degraded-induced settlement of loose, uncemented Jeebropilly weathered rock spoil could be 15 to 25% of the initial height, although this might only occur to limited depth. Overall, the combined settlement of a 30 m high pile of loose-dumped, uncemented Jeebropilly weathered rock spoil, also subjected to collapse and degradation on wetting-up to 36 to 46% of the initial loose spoil height."

And:

> "Coal mine open pits up to 500 m deep are being planned in the Hunter Valley Coalfields of New South Wales, Australia, which would result in spoil piles up to 600 m high. These could settle about 40% of the initial loose spoil height, resulting in a net bulking of the order of 12% relative to the initial *in situ* dry density of about 1.87 t/m^3."

[365] It was put to Dr Williams that the findings of the Kho paper suggest mine spoil used to partially fill the void here will settle more dramatically after placement than he assumed.[449] This was not accepted by Dr Williams. He pointed out that the findings discussed in the paper are based on laboratory, rather than field, testing.[450] The former he said does not reflect reality.[451]

[366] I accept this point of distinction. It is a valid and important one having regard to this part of Dr Williams' oral evidence, which I accept:[452]

> "…there was a reference by Mr Amaral to a number of papers that [suggested] laboratory testing [had] indicated large amounts of settlement, and that's because…you've got a…small sample…– you place it loose deliberately, so…it's undergone no compression at all, and then you put load on it to simulate the build-up …of waste on top. And in all of those cases, you're going to have percentage settlements that are huge because you've started off from a very…loose state. That never happens in practice because you build it up in layers, you're sequentially adding more weight to the materials, so…it's actually compressing as you're doing it. So by the time you get to the top and you start measuring settlements then, the amount of settlement you have, residual settlement you have, is…a much smaller proportion compared with doing a lab test."

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449 T31-44, L32-36.
450 T31-42, L42-43; T31-43, L44-47.
451 T31-51, L7.
452 T31-50, L35-45.

[367] The second, and related, point made by Dr Williams about the Kho paper was that settlement percentages stated in the document, given they are based on laboratory testing, should be treated with caution. The percentages reported in the paper reflect total settlement rather than settlement after a considerable period, such as the 18 month construction period for the fill beneath the liner. Dr Williams explained:[453]

> "…And your starting point for measuring settlement is not from the very loose state when you've got just a little pile. It's from when you've got to the…top of the…spoil pile. So most of the settlement is actually locked in to the…spoil as you're building it. And what appears at the end is a relatively small amount compared with these large percentages."

[368] I accept this evidence.

[369] The two points addressed by Dr Williams in relation to the Kho paper are sufficient to establish it does not provide a sound basis to assume the percentage of settlement, pre-liner placement, will be in the order 40% in this case, as suggested by Mr Hughes KC.

[370] For completeness, it can be observed that Dr Williams explained why the figure of 40% for settlement has no application here:[454]

> "…the 40 per cent represents what you might go from, from a loose little pile, if you like. But by the time you got to…the top of the backfill…or the spoil pile, you've now got several hundred metres of material that you've built up over time. And your starting point for measuring settlement is not from the very loose state when you've got just a little pile. It's from when you've got to the…top of the…spoil pile. So most of the settlement is actually locked in to the…spoil as you're building it. And what appears at the end is a relatively small amount compared with these large percentages."

[371] I accept this evidence. It establishes the figure of 40% is an estimate of total settlement, which is inclusive of initial settlement under self-weight. This leads to a further question: how much of the 40% is to be attributed to initial settlement under self-weight? This question is not answered by the Kho paper.

[372] Third, there are a number of assumptions underpinning Mr Amaral's calculation for total settlement that I accept should not, based on Dr Williams' evidence, be adopted.

[373] Mr Amaral's calculation for total settlement assumed the extent of compression of the fill dumped into the void will be less than usual, taking into account a number of factors, including:[455] (1) settlement rates identified in a Masters' thesis prepared by Mostofa in 2015; (2) that the fill/spoil will be submerged in water; (3) that settlement will be variable based on spoil/fill depth and the average loading at mid depth of the spoil/fill; (4) that the fill/spoil material will degrade over time; (5) there

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453 T31-45, L29-33.
454 T31-45, L20-33.
455 Ex.8.002, pp.131-132.

will substantial, but indeterminate, hydroconsolidation settlements; and (6) there will be inundation settlement as a consequence of the groundwater table rebounding to a level exceeding RL30m AHD.[456]

[374] I do not accept item (1) is a sound assumption.

[375] Mr Amaral's estimates of likely settlement applied the findings in the paper published by Mostofa.[457] Mostofa measured laboratory settlements in mine spoil over 180 days under loadings of 300, 600 and 900 kPa.[458] Reference to Mr Amaral's calculations reveal his application of the results from this work accounted for a significant part of the total settlement estimated. More particularly, in 12 of the locations within the fill considered by Mr Amaral, the application of the Mostofa work accounts for more than 70% of the estimated settlement for 9 locations.

[376] The Mostofa paper is not directly applicable to the circumstances of this case. The findings in that paper: (1) as conceded by Mr Amaral, are the product of laboratory tests that do not produce a result comparable to one where there has been a period of 18 months of settlement prior to placement of a liner;[459] and (2) do not replicate a circumstance such as here where the material tested for compaction has a five metre thick engineered fill layer sitting above it, which, in turn, assists with further compaction.[460] Mr Amaral did not take issue with these differences.

[377] That the findings in the Mostofa paper were not directly applicable here meant that an adjustment was required to Mr Amaral's calculations. Alternatively, it meant that an explanation was required as to why the results stated in the paper, despite the above matters, have application here. As I understood his evidence, Mr Amaral made no adjustment to his figures to reflect the matters in paragraph [376]. Rather, he explained that the density of the material in the Mostofa test was equivalent to, or better than the fill material to be placed here.[461] This, he said, was a consequence of the method proposed to place the fill, and that the fill would be submerged in water.[462] These factors led Mr Amaral to conclude, unlike Dr Williams' assessment, that settlement under self-weight will not be '*very high*'. Mr Amaral did not identify the precise value he allowed for settlement under self-weight but said it was unlikely to exceed 40%.[463] I understood Mr Amaral to regard the 40% estimate as conservatively high given the fill, which he said will be saturated, is to be loaded and subject to degradation.[464]

[378] After examining Mr Amaral's evidence in detail, I was not satisfied his explanation about the Mostofa figures ought be accepted. His explanation wrongly assumed groundwater would rebound to a level of RL30m AHD. For reasons already given, this is an improbable extreme. His explanation also wrongly assumed the fill material would be saturated when placed, and then undergo a process of drying and

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456 Ex.10.005, p.5, L200.
457 Ex.13.017, confirmed at T32-55, L30-43.
458 Ex.13.017 and Ex.8.002, p.132.
459 T32-56, L8-15.
460 T32-56, L46 to T32-57, L2.
461 T32-62, L19-21.
462 T32-56, L17-44.
463 T32-63, L42-46.
464 T32-64, L41-47.

re-saturating (in part) as the groundwater table reduced and then rebounded to RL30m. This approach, in my view, meant Mr Amaral double counted the impact of saturation or hydro consolidation settlement. This is not, however, the primary reason why I did not accept Mr Amaral's justification for using the Mostofa figures.

[379] The principal difficulty is that the figures do not include an allowance for settlement under self-weight. This is due to the fact they reflect the outcomes of laboratory rather than field testing. The former cannot sensibly be thought to include self-settlement caused by: (1) an 18 month construction process; and (2) the additional benefit of a 5 metre thick compacted engineered fill layer above the general fill zone. The allowance made by Mr Amaral in his calculations for these particular features cannot be ascertained. Mr Amaral's figures are, in my view, too opaque. This has the consequence that Mr Amaral's assumption with respect to the extent of settlement prior to the placement of the liner ought not be accepted.

[380] All of this has led me to prefer the approach adopted by Dr Williams. His approach is consistent with published research and makes an appropriate allowance for the fact the fill material here will be placed under water. When these figures are utilised to assess potential strain or rupture of the liner, it is comfortably demonstrated the integrity of the liner will not be compromised. This is confirmed even by taking Mr Amaral's estimated figures for total settlement and adjusting them to reflect compaction under self-weight (assuming 50%). The resulting figures demonstrate that global strain will not exceed 6%, let alone reach the point of yield strain at 16-22%.

[381] Fourth, a further area of difference relates to the mechanism by which liner failure could occur in the catastrophic manner suggested by Mr Amaral. It was not until his cross-examination that the mechanism he had in mind was the subject of particular focus. Importantly, the evidence reveals the mechanism has nothing to do with global strain; this is not the determining factor in this case.[465] Mr Amaral's concern related to local strain, that is strain caused by '*waviness*' and potholes in the liner. Strain of this kind was said to be caused by underlying settlement reflected in the compacted engineering fill zone, which, in turn, reflects in the liner.

[382] I do not accept Mr Amaral's evidence in relation to this point. It necessarily assumes two things are present: (1) there is significant settlement in the general fill zone after the liner is placed above it; and (2) the placement of the engineered fill zone beneath the liner will not achieve a smooth, hard and unyielding surface for the liner above. These assumptions are reflected in two figures of Mr Amaral's statement of evidence discussed above.[466]

[383] These underlying assumptions are not, in my view, valid. I would also add that the figures prepared by Mr Amaral to represent local strain are unhelpful. As Mr Holt KC exposed in cross-examination, they are an arbitrary depiction of a 'possible' void that may occur in the liner in certain circumstances. Dr Williams could not identify the mechanism by which the hypothetical local strain depicted in the figures could occur.

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465 T32-46, L31-34.

466 Ex.10.005, p.5.

[384] For the above reasons, I prefer the evidence of Dr Williams, Mr Watson and Mr Hornsey. Their evidence, taken collectively, establishes the design of sub-base beneath the composite liner will be appropriate. It will not compromise the integrity of the better than best practice liner placed above it. The evidence also establishes, on the balance of probabilities, that there will not be widespread failure of the liner. Global strain on the liner will not exceed 6% and, even if it reached 8% as calculated by Mr Amaral, this falls well short of the point of maximum yield strain, which is 16% to 22%. A significant factor of safety will still be provided.

[385] All of this is relevant to condition G12 of the EA, which requires leachate not to exceed a height of 300mm above the base of the liner. Mr Amaral and Mr Sutherland were adamant the condition could not be complied with given there would be widespread liner failure. I do not accept this a reasonable assumption in this case. Nor do I accept it would be impossible to comply with condition G12.

[386] For completeness, I accept the following submission made on behalf of Council:[467]

> "There are a range of landfill design (and related geotechnical engineering) matters that are in issue. Ultimately, they can be surmised as having their genesis in one issue, being the ability of the proposed development to contain (or not contain) the waste including the contaminants within the waste that it will bring onto the land that are, at present, absent from the land. The Court would accept that such containment is crucial and, in effect, is a fundamental necessity of the proposal that would not readily (if at all) be overcome by any other factor that may weigh in favour of approval in this case."

[387] I am satisfied the proposed development will contain the waste and contaminants within the waste placed in the void. It will do so through the provision of the better than best practice composite liner system. There is, on the balance of probabilities, no reason to conclude there will be widespread and comprehensive failure of this liner. It is a liner that would facilitate, at best, insignificant leakage. It is a liner that has an inbuilt failsafe system.

Environmental performance

[388] Council put a number of environmental design, operation and legacy matters in issue. Each issue can, as Council submitted come to back one principle question: Will the proposed development contain the waste, including contaminants within the waste?[468] To resolve this question it is necessary to examine landfill design issues. It is also necessary to examine the manner in which the proposed development will manage leachate, surface water, stormwater and potential impacts on groundwater. Central to the successful management of each of these constraints is: (1) the integrity of the basal liner; (2) the successful adoption, implementation and ongoing execution of proposed mitigation measures; (3) the need for the operator to successfully manage the facility to preclude adverse environmental impact in extreme weather events or in times of system failure; and (4) the integrity of the landfill cap and associated rehabilitation to starve the waste of water.

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467 Ex.14.024, p.26, para 66.
468 Ex.14.024, p.26, para 66.

[389] I will now turn to deal with the issues raised by Council with respect to surface water and stormwater, groundwater, cap design and rehabilitation more generally. Bound up in the examination of surface water, stormwater and groundwater is a need to consider this issue: whether the proposed development can appropriately separate these sources of water from leachate and waste. Leachate management is considered contemporaneously with each of these topics.

[390] For the reasons that follow, I am satisfied the proposed development can be conditioned to successfully manage adverse environmental impacts on surface water, stormwater, groundwater and the receiving environment to a high standard. I am also satisfied the issues raised with respect to the cap design and rehabilitation more generally do not warrant refusal.

Surface water and stormwater

[391] To manage environmental impacts, the proposed development includes an '*integrated surface water management system*'. It deals with four types of water: (1) clean stormwater; (2) site stormwater; (3) void water; and (4) leachate/contact water.[469] The primary objective of the system is to avoid clean water coming into contact with waste/leachate. Where contact does occur, the '*contact water*' is managed as leachate. The generation, and management, of excess leachate are key operational constraints for a landfill.

[392] The stormwater and surface water elements of the integrated water management system were discussed by Mr Marszalek in his statement of evidence.[470] The system, which was described as robust,[471] includes three sediment basins sized to accommodate runoff from a 10% AEP 24-hour rainfall event. The basins collect site stormwater that has not come into contact with waste/leachate,[472] including stormwater that has been pumped. This water will be held in the basins, allowing gravity settlement of solids. Testing (as required under the EA) would be carried out on the water prior to a controlled release. Water quality is to be compliant with the EA prior to its release.

[393] Mr Marszalek identified a number of potential water related risks requiring the provision of mitigation measures. The risks he identified, excluding those associated with dewatering, were as follows:[473]

(a) the potential for interaction, or co-mingling, between stormwater and contact water following extreme rainfall events;

(b) fires in the waste leading to contamination of stormwater by firefighting processes;

(c) the contamination of stormwater drainage from activities in the resource recovery area;

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469 Ex.9.013, p.7, para 26.
470 Ex.9.013, pp.7-8.
471 Ex.9.013, p.18, para 39.
472 Ex.9.013, p.16, para 41.
473 Ex.9.013, p.9, para 34.

(d) spontaneous combustion within former mine overburden, which could adversely impact on the integrity of the composite base liner and lead to leachate seepage to the groundwater;

(e) damage to the composite base liner by reason of differential settlement, leading to increased leachate seepage to the groundwater;

(f) generation of excess volumes of leachate/contact water and uncontrolled discharge off site;

(g) contaminated site water following landfilling and rehabilitation;

(h) whether it is feasible to re-direct the unnamed drainage channel around the southern boundary of the void and consequential effects on the void water; and

(i) impacts on the integrity/erosion stability of the reinstated unnamed drainage channel.

[394] The integrated water management system includes multiple layers of mitigation measures to manage each of these risks. Ultimately, the key objective is to protect the downstream receiving environment. This objective, in my view, will be achieved having regard to three features of the evidence I accept, namely: (1) Mr Marszalek's detailed discussion of the mitigation measures in his further statement of evidence;[474] (2) further conditions of approval recommended by Mr Marszalek in relation to risk mitigation;[475] and (3) Ms Thorburn's unchallenged evidence about compliance with a draft REMP, which will ensure the proposed development will not have an adverse impact on the aquatic ecology of Six Mile Creek (paragraph [66]).

[395] With respect to item (2), Mr Marszalek in his further statement of evidence stated:[476]

> "A number of potential surface water related risks have been identified in relation to the proposed development…These are all considered adequately managed and mitigated by the proposed development methodology, work and assessments undertaken to date or proposed, the proposed integrated water management system and multiple layers of protection… **Risk would be further mitigated by conditioning the proposed development approval to include**:
>
> a. a site operations plan to formalise site operating procedures in the event of extreme rainfall, including triggers and processes for operating the landfill, the management/receipt of water material, triggers for additional water monitoring and adaptive measures;
>
> b. the installation of a suitably sized and designed leachate treatment plant onsite, in the event that it is required to secure compliance with EA conditions;

474 Ex.9.013, pp.10-16, para 35.
475 Ex.9.013, p.17, para 45.
476 Ex.9.013, p. 17, para 45.

c. an operations plan to manage waster material within the resource recovery area; and

d. limiting the landfill open area to 100 metres x 100 metres in line with landfill hydrologic modelling.

These would provide conditions for the proposed development that would further address the deemed reasons for refusal." (emphasis added)

[396] An approval should include conditions of the kind recommended by Mr Marszalek, subject to one modification. Any condition of approval with respect to leachate treatment should not be inconsistent with the correspondence referred to at paragraph [92]. This would require the words after the comma in subparagraph b. above to be deleted.

[397] Dr Johnson, who was retained by the Chief executive, supported the integrated water management system proposed.[477] Conscious of the complexity of the development,[478] he described the system as sound.

[398] Mr Collins, who was retained by Council, did not share the views of Mr Marszalek and Dr Johnson. The reasons for this were identified in a joint expert report, along with Mr Collins' statement of evidence and oral evidence. Taken collectively, it is clear Mr Collins raised the following issues for consideration:

(a) whether there is a risk to the receiving environment in the event of liner failure?

(b) whether the time to dewater the void is unacceptable?

(c) whether the risks associated with extreme weather events can be managed?

(d) whether questions regarding the water balance modelling are resolved?

(e) whether the adopted discharge criteria appropriately addresses the risk of '*pollutant load accumulation*' in the receiving environment?

(f) whether contaminants of concern can be mobilised from the overburden material, mine walls or in groundwater drawn into the void during the dewatering process?

(g) whether further conditions need to be imposed with respect to the capacity of sediment basins and discharge testing criteria?

(h) whether the risk of erosion in the unnamed drainage channel can be conditioned?

(i) whether the proposed development will have unacceptable impacts in the event it is not completed?

(j) whether critical assumptions identified by the surface water experts in their joint expert report have been established?

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477 Ex.8.006, pp.17-18, para 68.

478 T26-5, L15 and T26-18, L1-10.

[399] Before dealing with each of these issues, it can be observed that Council's refusal case in relation to surface water and stormwater was not a particularly strong one. In simple terms, the points advanced in favour of refusal did not sit comfortably with the position Council adopted in relation to ecological impacts on the unnamed drainage channel and Six Mile Creek. The two points are inextricably linked. The absence, or otherwise, of an adverse impact on these features of the receiving environment is an indicator of the acceptability of the proposed development in terms of stormwater and surface water management. That there was an absence of impact on the ecological values of Six Mile Creek and the unnamed drainage channel was uncontroversial.

[400] There was no controversy between the surface water and stormwater experts that a key environmental objective involved the protection of the receiving environment, which Mr Collins described as the unnamed drainage channel and Six Mile Creek,[479] located between 900 and 1200 metres from the void.[480] As to the impact on this receiving environment, Mr Collins quite properly deferred to '*the ecologists*'.[481] There was only one aquatic ecologist called to assist the Court, namely Ms Thorburn. Her evidence was unchallenged and establishes that the ecological values of Six Mile Creek, and the unnamed drainage channel, will be protected, provided the draft REMP is implemented and complied with as part of the proposed development. I accept Ms Thorburn's evidence.

[401] That the proposed development, if approved subject to conditions (including a condition requiring the implementation of the draft REMP) would not have any adverse ecological impacts on Six Mile Creek and the unnamed drainage channel is important context. It suggests the matters raised by Mr Collins with respect to surface water and stormwater management do not call for refusal. This is reinforced, in my view, when consideration is given to the prospect that stormwater or surface water management may lead to adverse impacts on the receiving environment in circumstances of extreme weather (leading to surface water entering the void) and/or liner failure. In this regard, I am satisfied the evidence establishes the risk of adverse impact in these circumstances can be managed appropriately, particularly once it is appreciated that:

(a) the prospect of widespread failure of the composite base liner by reason of differential settlement has been excluded on the balance of probabilities;

(b) there are three levels of redundancy in the composite base liner system that must be bypassed for leachate to transport to the groundwater, one of which includes a liner with low permeability – the volume of water transported through the liner would be small, with contaminants diluted in a comparatively large volume of groundwater;

(c) the depressurisation system would allow groundwater contaminated with leachate as a consequence of a breach of the liner to be pumped to the surface and treated;[482]

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479 T26-50, L41-42.
480 T26-44, L1-2.
481 T26-50, L46 to T26-51, L11.
482 T26-20, L11-16.

(d) the three levels of redundancy in the composite liner mean it is unlikely there will be a substantial breach with leachate transporting to the groundwater, even allowing for liner failure;[483]

(e) the likelihood of water escaping the void at surface level, given its depth below natural ground level is unlikely[484] - Mr Tomlin described the circumstances that must occur for water to overtop the void as an improbable extreme;

(f) water falling on the void in extreme weather conditions is, on Dr Johnson's calculations, unlikely to lead to a circumstance where the extent of inundation in the void exceeds 300 millimetres[485] – even assuming the level of inundation was 3 or 4 times this estimate, the capacity of the leachate treatment system, including storage tanks, can be designed to accommodate this volume of water for storage, treatment and disposal;

(g) in extreme weather events, contaminants that may impact the receiving environment will in any event be diluted - as Dr Johnson explained:[486]

> "…If you're talking about an extreme rainfall event where 300 millimetres of rain approximately is falling in a day, then I would contend that the amount of surface water runoff occurring during that event is likely to be extreme. For example, the maximum rainfall during the '74 event, which Mr Collins has referred to, was about 300 millimetres on…two of those days. So those of us who were around at that stage know how much it affected the local creek systems in Brisbane, so it would be my opinion that the amount of contamination which might or potentially leach – will leak from the pit under that scenario, would be more than adequately handled by dilution in respect of the waste stream."

[402] I will now turn to deal with specific issues raised for consideration by Mr Collins' evidence.

[403] Mr Collins' assessment of the proposal proceeded on the assumption the base liner could fail for a range of reasons, which could not be readily controlled or managed. This led him to conclude that the proposal represented an unacceptable environmental risk.[487]

[404] Three mechanisms for liner failure were identified by Mr Collins. They were: (1) inevitable and widespread liner damage due to subsidence and differential settlement; (2) liner damage due the nature of the underlying backfill; and (3) damage to the liner in the event the void fills (partially or fully) with water following an extreme rainfall event.

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483 T26-8, L5-7.
484 T26-6, L31-33.
485 T26-6, L1-7.
486 T26-7, L4-12.
487 Ex.10.004, p.13, L170.

[405] Items (1) and (2) can be dealt with quickly. They both assume Mr Amaral's evidence is accepted.[488] For reasons given above, I prefer the evidence of Dr Williams, Mr Watson and Mr Hornsey. Items (1) and (2) do not represent valid reasons to assume liner failure will be inevitable and widespread.

[406] Mr Collins discussed the impact of liner breach on the receiving environment. He spoke of a preferential pathway between the void water and groundwater/surface water regimes. They are connected via a '*tongue of alluvium*'.[489] Item (3) above relies upon the existence of this pathway. It was said the pathway could lead to extensive contamination escaping the land, assuming the water level in the void reaches the height of the alluvium.[490]

[407] I am satisfied the alluvium providing the preferential pathway will sit beneath the liner.[491] The liner would need to fail for leachate to transport through this pathway. For reasons already given, it should not be assumed there will be liner failure.

[408] Item (3) also assumes there is underlying system failure. Mr Collins referred to the leachate treatment plant being overwhelmed; it is a situation where pumps, which would be installed to remove leachate from the bottom of the void, failed in an extreme weather event. In these circumstances, it was said there is a risk the void would overtop with water.[492]

[409] Putting to one side that this assumed scenario represents an improbable extreme, if it did occur (partially or fully), water would collect in the bottom of the void as if it were a basin. It does not follow this would lead to any adverse impacts. The water would be collected in the base of the void and be removed by the leachate management system. The volume of water to be pumped and treated would be more than usual but will have no adverse impact. At its highest, circumstances of this kind would interrupt the operator's ability to receive and deposit further landfill material in the void. If this arises, there is a commercial imperative for the operator to remove the water in the void as soon as practicable so it can return to business. None of this sounds in adverse impacts.

[410] If, as Mr Collins assumed, there is liner failure in addition to system failure, I am far from persuaded this would give rise to adverse impacts on the receiving environment in any event.

[411] I accept it is relevant to consider the risk of adverse impacts in the event of liner failure; however, this does not mean it should be assumed failure will be inevitable and widespread failure. There is a spectrum of failure; minor to extreme (widespread and catastrophic). The assessment here should focus on the middle to lower end of that spectrum given the findings I have made in relation to the landfill design evidence.

[412] Mr Hornsey's evidence assists with an examination of the middle to lower end of the risk spectrum. He gave unchallenged evidence about leakage rates through a

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488 Confirmed at T26-58, L29 to T26-59, L37.
489 Ex.10.004, p.13, L196-199; T26-42, L10-12.
490 Ex.10.004, p.13, L200.
491 T26-42, L26-27.
492 T26-43, L4-7.

HDPE liner that is not intact. This evidence included discussion about a recognised method for measuring leakage – it is referred to as the '*Rowe method*'.[493] It was described as the '*worst case scenario*', being a hole in a wrinkle in a liner that spreads over a large area. The application of the Rowe method to that assumed circumstance results in a leakage rate of 8.7 litres per hectare per day.

[413] Helpfully, Mr Tomlin explained what this meant in practical terms. His evidence, which I accept, was in the following terms:

> "…you could collect the leakage from the base of the liner in two to four 10-metre buckets from Bunnings each year, if it performs according to those estimates. So the total volume is very small, even with some defects, and when you compare those to the volume of groundwater moving through the system, they're insignificant."[494]

And:

> "…[The] leakages would be diluted in uncontaminated groundwater."[495]

[414] The above evidence does not suggest system failure in conjunction with liner failure necessarily leads to adverse environmental impacts.

[415] To this I would add that the risk examined, such as it is, is further reduced once it is appreciated there are a number of mechanisms that will mitigate the prospect of adverse impacts to groundwater and the receiving environment. They are: (1) the existence of the groundwater monitoring system; (2) the groundwater depressurisation system, which can remove contaminated groundwater; and (3) the requirement to comply with the terms of the draft REMP.

[416] The final point to be made about this aspect of Mr Collins' evidence is that he drew the Court's attention to the weight of water sitting in the bottom of the void after an extreme rainfall event. This, he said, may occur as consequence of rainfall on the working face of the pit where waste is placed.[496] As I understood his evidence, Mr Collins calculated the level of inundation in the void. He said it could rise to some 7 or 8 metres of additional water depth above the liner[497] in a rainfall event exceeding 1 in 20 years.[498] Mr Collins selected this rainfall event because it was used by designers to size the proposed stormwater pumps.

[417] The evidence does not disclose precisely how Mr Collins calculated the figure of 7 or 8 metres. Whilst I have little doubt he undertook the necessary calculations to arrive at these the figures, Mr Collins' calculation could not be tested. For this reason, I decline to act on this part of his evidence.

[418] If a different view was taken and this part of Mr Collins' evidence was acted upon, it does not advance the matter in any event. As Mr Collins conceded, an extreme

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493 Ex.9.011, p.6, para 15 and T31-62, L24-36.
494 T25-25, L19-34.
495 T25-26, L25-28.
496 T26-33, L38 to T26-34, L10; T26-66, L5-14.
497 T26-60, L45 to T26-61, L2.
498 T26-34, L25-30.

rainfall event of the kind he based his calculation on could be managed by the proposed leachate treatment plant.[499] It should also be said that Mr Collins deferred to the landfill design experts as to whether the weight of the water siting in the void would, in fact, damage the liner.[500] There is no suggestion by any of those experts that the level of inundation calculated by Mr Collins would damage the liner.

[419] The issues raised by Mr Collins, which assume liner failure and extreme weather conditions, do not cause me to alter my view in relation to stormwater and surface water impacts. The proposed development can be conditioned to appropriately manage stormwater and surface water.

[420] In a joint expert report, Mr Collins recorded that he regarded the dewatering of the void as unacceptable, having regard to the length of time required to complete the process.[501] The length of time take to dewater the void will be influenced by two factors:[502] (1) the time taken to treat the water before it is suitable for discharge under the EA conditions; and (2) the extent to which there will be an inflow of groundwater into the void, adding to the total volume of water to be treated and discharged.

[421] Mr Marszalek estimated it would take 12 to 18 months to complete the dewatering.[503] Mr Collins disagreed; he estimated it would take in the order of 2.5 years.[504] The point made by Mr Collins was that the extended period for dewatering would increase the risk of impact to the ecological values of Six Mile Creek, to the extent those values are dependent on a seasonal wetting and drying cycle.[505]

[422] The impact about which Mr Collins gave evidence in this regard is an ecological one. Mr Collins quite properly deferred to experts in this field. Turning to that evidence, it is unchallenged. The evidence of Ms Thorburn is that the proposed dewatering program will not give rise to adverse ecological impacts, providing the development is conditioned to comply with the draft REMP. This document calls for an adaptive management approach during, inter alia, the void dewatering process.[506] This will involve regular monitoring of flows and habitat characteristics of the unnamed drainage channel and Six Mile Creek.

[423] I am satisfied the risk to the ecological values of Six Mile Creek and the unnamed drainage channel, to the extent they are dependent on a seasonal wetting and drying cycles, will not be unacceptable.

[424] Mr Collins pointed out a number of shortcomings in the water balance modelling undertaken in support of an approval. In his view, the shortcomings had not been resolved and give rise to adverse implications for water quality issues.[507]

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499 T26-42, L1-6.
500 T26-60, L7-9.
501 Ex.8.006, p.20, para 83.
502 Ex.10.004, p.20, para 4).
503 T25-54, L8-9.
504 Ex.8.006, p.10, para 23.
505 Ex.10.004, pp.19-20, para 2) and p.20, para 4).
506 Ex.9.003, p.11, para 25.
507 Ex.10.004, p.21, s 33.8.

[425] With respect to the stormwater sediment ponds water balance modelling, Mr Collins was of the opinion that:[508] (1) there was unsatisfactory ambiguity with respect to demand assumptions for dust suppression; and (2) information provided with respect to '*spillway discharge*' suggested discharges would be relatively frequent.

[426] Water collected on site will be used as part of a dust suppression strategy. Mr Marszalek's modelling assumed there would be a demand for dust suppression 365 days of the year. Mr Collins did not accept this was realistic. Mr Marszalek conceded Mr Collins' criticism was valid because the proposed use would not operate every day of the year. As a consequence, further modelling was undertaken. The water balance model was adjusted to reflect a demand for dust suppression on five and a half days per week, excluding Christmas and Easter.[509] Mr Marszalek indicated this change to the model made '*no discernible difference to the results*'. I accept this evidence.

[427] Spillway discharge is in a different position. Mr Collins' concern relates to a risk that overflow from the sediment basins may mix with waste or leachate and will not be sufficiently diluted. Mr Collins' evidence in this regard was as follows:[510]

> "…I think there needs to be more stringent conditioning of some specific aspects that go beyond environmental authority. I don't agree that the 10 year 24 hour sediment basins, for example, are adequate for something where you're dealing with contaminants because it assumes that larger events, dilution is going to be sufficient. And you would need to do a lot of work to prove that that's the case and it hasn't been done. I think because of the risk inherent with…landfills, there should be a tougher standing..."

[428] I accept this evidence. In the absence of modelling to prove dilution will be sufficient, the size of the sediment basins needs to be revisited. They should be sized to accommodate the concern raised by Mr Collins. This is a matter for conditions.

[429] With respect to void water balance modelling, Mr Collins took issue with two aspects of the model, namely:[511] (1) it did not account for significant events such as the 1974 flood; and (2) it adopted '*realisations*', which were not defined, explained or justified.

[430] Mr Marszalek did not accept Mr Collin's criticism that the model failed to account for significant events, such as the 1974 flood. In his evidence-in-chief, Mr Marszalek explained how the modelling was undertaken to simulate '*every possible different combination of climate, including the 1974 flood*':[512]

> "…So I initially set up a void water-balance model that simulates the historical period from 1997 to 2020, and I did that in order to calibrate my model against observed water levels….I adjusted…the

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508 Ex.10.004, p.22, paras 3) and 4).
509 T25-61, L20-25.
510 T26-37, L7-17.
511 Ex.10.004, p.21, paras 1) and 2).
512 T25-60, L25 to T25-61, L6.

> groundwater inflow rate and outflow rate in my water balance model …so that my predicted water levels matched as very closely the observed water levels in the void. So that was a calibration period, nothing more. I then took that calibrated model and I married it up with 132 years of climate data in order to predict the future behaviour, assuming that the climate data…replicate[s]…what's going to happen in the future….I ran several different simulations in order to predict different things; but they varied in duration…from nine years to 14 and a-half years in order to simulate what might happen in the future in terms of spill risk and the ability to keep the water level down at RL15….I took the first nine years in the historical period around the model for that, and I advanced one year at a time, basically moving a nine-year window along the 132 years, and I was able to simulate combinations of climate, and that's called the method of realisations. And I did the same thing for the 14 and a-half year simulation…so I was able to simulate every possible different combination of climate, including the 1974 flood."

[431] Mr Collins' criticism is that the approach adopted for the modelling is not industry standard, with the model outputs lacking specifics. In this regard, Mr Collins explained how the model converts significant rainfall events into '*percentage compliance*', such as the 95th percentile. This, he said, has the consequence that the effect of any individual event is masked.[513] As I understood the point made, in short, it was to the effect that the results of the model cannot be interrogated to examine the precise impact of any one event, in particular, an event equivalent to the 1974 flood.

[432] Mr Marszalek maintained that the modelling was appropriate despite Mr Collins' criticism. In direct respect to the 1974 flood issue, he pointed out that the 95th percentile year used in the modelling translated to the year 1927, which had a recorded annual rainfall of 1350 millimetres. This can be compared to recorded rainfall in 1974, which was 1550 millimetres. Mr Marszalek pointed out that the 200mm difference equates to an eleven percent difference on an annual basis. If attention was given only to the January 1974, Mr Marszalek said the difference is in the order of 22%. Mr Marszalek explained, from a modelling perspective, how these percentage differences were small and would '*hardly change the…overall result*'.[514] He was confident about this given the modelling undertaken is, in any event, highly conservative. I accept this is the case once it is taken into account that the model[515] is based on an earlier iteration of the development proposal, which was a larger three-stage landfill, and assumes a larger working face than that which will be employed and limited by condition.

[433] Mr Marszalek was of the opinion that a 1974 flood event could be managed through appropriate conditions. He said:[516]

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513 T26-63, L4-21.
514 T25-62, L25-41.
515 T25-62, L37 to T25-63, L3.
516 T25-63, L5-17.

> "…the additional rainfall resulting from 1974, if we were to run that through the model, I can't see that that would make a material change to the outcome. And it would be able to be managed."

[434] I accept this evidence. In doing so, I take comfort from Mr Tomlin's evidence. He modelled the extent of leachate generation in extreme weather conditions. The modelling indicated Austin may need to remove excess leachate from the landfill, and tanker that leachate offsite, about 10% of the time. This is a conservative estimate given Austin has confirmed it will agree to a condition requiring the provision of a leachate treatment plant. This plant would alleviate the need for leachate to be tankered offsite.[517]

[435] Subject to the imposition of a condition to address what is said in paragraph [428], I am satisfied the issues raised by Mr Collins about the water balance modelling have been satisfactorily addressed.

[436] An important component of the mitigation measures adopted to deal with environmental impacts is the draft REMP. Mr Collins was concerned the adopted discharge criteria in the document, and ultimately the EA, do not appropriately address '*pollutant load accumulation*' in the receiving environment. Pollutant loads have the potential to accumulate in downstream waterways, resulting in a worsening of water quality.[518]

[437] This point was explored with Mr Collins in cross-examination. Mr O'Brien KC drew Mr Collins' attention to the ANZECC water quality guideline and the applicable target set out therein. This target informed the draft REMP and EA conditions.[519] In response to this guideline and specific targets Mr Collins said:[520]

> "…If you meet the 95 percentile, you'll meet the ANZECC water quality milligrams per litre targets. But what that doesn't take account of…is the other way pollutants are assessed is in terms of annual average loads in kilograms. …Whether that could be conditioned is a matter for further consideration, particularly in relation to PFAS. But the only point I was making is that it must have an increase in the actual volumetric load. It will meet the ANZECC guidelines…if you're meeting the 95 percentile, you get a tick. But, sometimes, there is a further requirement to actually monitor the loads. And a good example of that is sediment and nutrients. These days you don't normally set sediment and nutrients as milligrams per litre; you set it for tons per year, and what's allowable. So that's an example of where some different standards might need to apply."

[438] I accept Mr Collins' evidence. The discharge criteria in any town planning approval should impose an additional requirement over and above the EA conditions to ensure pollutant load is tested and monitored. Based on Mr Collins' evidence, this should include a measure suitable to assess sediment, nutrient loads and

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517 T25-25, L40 to T25-26, L2.
518 Ex.10.004, pp.14-15.
519 This standard is adopted in the Queensland water quality guideline: T26-71, L9-13.
520 T26-70, L39 to T26-71, L7.

PFAS/PFOS. Consequential amendments should also be made, or required by condition, to the REMP to reflect this requirement. The changes, including consequential changes to the REMP, do not however stand in the way of an approval. They are a matter for conditions.

[439] Mr Collins was not prepared to assume there are no contaminants of concern, which can be mobilised from the overburden material, mine walls or in groundwater drawn into the void during the dewatering process.[521] This, in my view, was a fair position to adopt. There is no testing to confirm otherwise in circumstances where: (1) there is a genuine prospect that contaminants are present at the base of the void and may be agitated during the dewatering process;[522] and (2) contaminants have been measured in groundwater bores around the periphery of the void.[523]

[440] The point made by Mr Collins is a valid one. It does not however, in and of itself, cause me to conclude the proposed development will have an unacceptable impact on the receiving environment. A condition of the EA contemplates that no contaminants are to be released, '*other than permitted within th[e] environmental authority*'.[524] This is complemented by condition WT1. It provides that '*contaminants must not be released to waters in a manner that causes or is likely to cause environmental harm*'. This is subject to '*other than as permitted within this authority*'. As to what is otherwise permitted, condition WT2 provides, in part:[525]

> "The only contaminants to be released from the existing mining void to surface waters described as the unnamed tributary which flows to Six Mile Creek must be in accordance with *Table 6 – Surface water release limits from mining void releases*"

[441] Condition WT2 is complemented by condition WT3, which includes Table 7. It prescribes surface water release contaminant trigger investigation levels. The requirements of conditions WT2 and WT3 also involve monitoring to ensure compliance with, inter alia, Tables 6 and 7.

[442] Compliance with this regime, and the requirements of the draft REMP recommended by Ms Thorburn, will address Mr Collins' concern in relation to the mobilisation of contaminants during the dewatering process.

[443] Mr Marszalek identified two features of the proposed development that could lead to erosion in the unnamed drainage channel. First, erosion could occur as a consequence of the 70 litre per second discharge to the channel during the dewatering process. Second, it could occur by reason of the re-direction of surface flow around the void into the drainage channel.[526]

[444] Flood modelling for the unnamed drainage channel revealed that:[527]

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521 Ex.10.004, p.14.
522 T25-71, L25-29; T26-33, L24-36.
523 T26-32, L45to T26-33 L22.
524 Ex.6.001, pp. 33-34, Conditions L1 and WT1.
525 Ex.6.001, pp.34-35.
526 T25-61, L32-36.
527 T25-61, L36-47; T25-78, L17-20.

(a) discharge to the channel during the dewatering process would not adversely impact its stability, meaning the risk of erosion is low;

(b) flow diverted around the void to the channel, in the long term, may result in a small percentage of the channel experiencing increased erosion, described as hot spots; and

(c) erosion hotspots referred to in (b) are expected to occur beyond the boundaries of the land.

[445] Mr Marszalek explained how the risk of erosion, namely hotspots, could be reduced through a simple change to the design. He said drainage can be designed to detain more water on the land to delay its release to the drainage channel.[528] This would reduce the risk of hotspots. I accept this evidence. Mr Marszalek's evidence should be reflected in the conditions of approval.

[446] Mr Collins raised an issue with respect to the risk of erosion during the dewatering process. He said:[529]

> "I'm probably content that there would be an engineering solution to actually be able to put armouring in place if needed in those hotspots. The only concern that I have left is if they're beyond the property boundaries, how you would actually do that, and whether that's feasible."

[447] I am satisfied a condition reflecting Mr Marszalek's evidence above addresses this concern.

[448] Both Mr Collins and Mr Sutherland quite properly identified there is a genuine risk of adverse environmental impacts in circumstances where the proposed development commences but is not completed. Mr Collins made the following point in his statement of evidence:[530]

> "If the use ceases before the void is filled, it may require pumping and treatment of surface water out of the pit in perpetuity. If the pumping is not undertaken, the risk of untreated and uncontrolled discharges in perpetuity could be expected. Ending the use prematurely would also result in significant risks to the environment."

[449] In the same vein, Mr Sutherland said:[531]

> "Once begun, the landfilling activity at this site would need to be completed to the top of the void to avoid ponding waters on top of waste, which would seriously risk generating leachate. If, for any reason, the landfill activity was interrupted or ceased, the rehabilitation outcome would be worse than under the current mine rehabilitation requirements. This is because surface and groundwater

528 T25-62, L1-6.
529 T26-36, L14-19.
530 Ex.10.004, p.23, Line 573.
531 Ex.10.006, p.8, Line 34.

> inflow could collect on the landfill surface, creating a driving head for leachate by infiltration into the waste."

[450] The starting premise for this evidence is an assumed risk. There is a risk the use, if approved, will commence but cease (temporarily or permanently) before the void is filled and capped. I am satisfied the large body of need and waste industry evidence establishes this starting premise is not of concern here. The underlying reasons for this are discussed later in this judgment. In short, I am so satisfied because: (1) the circular economy anticipates that waste will continue to be directed to landfill, albeit in smaller quantities to what occurs today; (2) the demand for the deposition of non-putrescible waste to landfill will continue for the life of the development; and (3) the demand for the deposition of non-putrescible waste to landfill is unlikely to reduce to a level that would cause the use to cease, temporarily or permanently.

[451] If, contrary to my view, the landfill was not completed, I am satisfied having regard to the evidence of Dr Rhode this does not lead to a circumstance where there should be concern about adverse environmental outcomes.

[452] Dr Rhode specialises in the closure of mining voids. He explained that landfill does not need to be completed to final capping because interim cover, and water management, can be used to maintain the landfill until filling recommences.[532]

[453] Orthodox landfill management techniques can be used to maintain the partially completed landfill until it commences. This involves the ongoing separation of groundwater, leachate and stormwater to ensure there is no unacceptable environmental impact. To achieve this, Dr Rhode spoke of landform contouring and the continued operation of the leachate management system. He said:[533]

> "Should it be required the landfill could be operated as an interim landform that is below natural ground level. Because the void will remain for most of the landfill operational life, any incomplete cells could be graded towards the void and covered with an interim cap. The interim cap would separate clean runoff and direct it to the void. Any percolation (this will become leachate) would be managed within the leachate management system."

[454] Dr Rhode was not cross-examined about this evidence. I accept his evidence.

[455] An approval should be conditioned to reflect the substance of Dr Rhode's evidence.

[456] It can also be observed there is a further layer of protection that will be in place to ensure a partially filled void is appropriately managed. Dr Rhode correctly pointed out that condition G8 of the EA requires the giving of financial assurance. This assurance could be called upon to ensure the partially filled void landform is appropriately managed to ensure environmental impacts are managed prior to the placement of the final cap.[534]

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532 Ex.9.010, pp.7-8, s 4.1.2.
533 Ex.9.010, p.8, para 27.
534 Ex.9.010, p.8, para 30.

[457] To manage leachate generation, Austin accepts a condition should be imposed limiting the open working face of the landfill to 100 metres x 100 metres. Mr Collins did not take any comfort from this condition because, in his view, it would be difficult to enforce.[535]

[458] This was explored with Mr Collins in cross-examination. As I understood his explanation, he accepted compliance with the condition could be monitored remotely in a number of ways but was concerned it placed an enforcement burden on the Department of Environment & Science and/or the Council. He described the position as akin to monitoring compliance with '*a moving target*'. In this respect Mr Collins said:[536]

> "Well, as I said in my evidence-in-chief, you can get all the drone footage, all the CCTV footage in the world. What is the Department actually going to do with that? Because are they actually going to watch it every day? Or is council expected to have a compliance officer on that site, watching that footage, every day? It's impossible. They don't have that sort of manpower. The department doesn't have that manpower. That is the problem.
> …
> …[there is a]…Big difference between saying thou shalt build footings of this size in this location to this drawing, to saying that a moving target that moves all the time across this site as the face progresses can be monitored on a continuous basis to ensure that, at all times, there's compliance with that open-face limit."

[459] The point made by Mr Collins is not without merit. A condition of the kind proposed may, not must, place a burden on authorities, such as Council, to monitor and enforce. The issue however loses potency once it is appreciated that: (1) as Mr Collins conceded, the area of the workface can be monitored remotely, including by CCTV footage; and (2) the limit on the workface area is a condition (G3) of the EA in circumstances where any breach of the EA is required to be reported by the operator to the administering authority in a timely way.

[460] Condition G3 of the EA states:[537]

> "Any breach of a condition of this environmental authority must be reported to the administering authority as soon as practicable within 24 hours of becoming aware of the breach. Records must be kept including full details of the breach and any subsequent actions undertaken."

[461] Given the purpose for limiting the area of the working face is to assist in the management of leachate production, a condition of an approval should be imposed akin to G3 on any town planning approval. Like the EA, a condition should be imposed requiring the Council to be notified of any breach of such a condition. A condition of this kind addresses the issue raised by Mr Collins.

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535 T26-68, L26-31.
536 T26-69, L20-33.
537 Ex.6.001, p.21.

[462] The final point raised by Mr Collins that calls for specific consideration appears in the joint expert report in which he participated. The report reveals it was agreed '*the Appellant's proposed surface water management system (including stormwater management) is adequate if a number of assumptions are made*'.[538] The assumptions are as follows:

(a) the basal liner remains intact for the life of the facility and post-closure period specified in the EA;

(b) there are no contaminants of concern that can be mobilised from one of three sources, namely the overburden material, the existing mine void walls and the groundwater drawn into the pit during dewatering;

(c) waste fires and spontaneous combustion are managed so there is no liner breach or release of contaminated water or stormwater;

(d) groundwater is adequately managed without the release of contaminants including environmentally significant PFAS/PFOS chemicals to surface waters;

(e) environmentally significant PFAS/PFOS chemicals with the landfill material and in the leachate are effectively managed to ensure the excessive build-up of leachate does not occur and that the risk of leachate comingling with groundwater and surface water is appropriately managed;

(f) under severe to extreme rainfall events, excess pondage that will occur in the landfill area can be adequately managed to maintain separation of the landfill material from the stormwater to avoid it coming into contact with water/leachate.

[463] Mr Collins was not satisfied the underlying assumptions had been demonstrated.[539] The reasons for this were developed in his further statement of evidence.[540] The executive summary to this statement reveals Mr Collins' principal concern was uncertainty as to this issue: whether surface water and stormwater could be separated from groundwater and leachate to avoid contamination and release to the receiving environment.[541]

[464] For reasons given above, I am satisfied each of the assumptions identified in paragraph [462] have been demonstrated. This leads to the conclusion that the point of agreement stated in the joint expert report about surface water and stormwater can be acted on without qualification – it has been established the '*Appellant's proposed surface water management system (including stormwater management) is adequate*.'

[465] I am satisfied the issues raised with respect to stormwater and surface water management do not warrant refusal.

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538 Ex.8.006, p.14, para 45.
539 Ex.8.006, p.17, para 65.
540 Ex.10.004, pp.2-3, paragraph numbers (1) to (10).
541 Ex.10.004, p.2.

Groundwater

[466] Council submits the risk of unacceptable groundwater impacts now and into the future, as a result of the proposed development, are unacceptable. It is further contended this is a reason for refusal in its own right.[542]

[467] To discharge its onus, Austin relied on the evidence of a hydrogeologist, Mr Tomlin. He participated in joint meetings with a number of experts, including Mr Sutherland. A preliminary joint expert report records that a model of the groundwater regime was required to examine how the proposal would interact with, and impact on, groundwater. In response, Mr Tomlin prepared a conceptual model,[543] which Mr Sutherland accepted was sound and thorough.[544]

[468] The conceptual model, and associated reporting, is comprehensive. It supports the following opinion attributed to Mr Tomlin in the joint expert report:[545]

> "…The analysis by AGE (2021) shows that the volume of leakage moving through a properly functioning and undamaged liner is insignificant when compared to the volume of groundwater flowing through the underground systems at the…site, and in this circumstance unacceptable impact was not considered a plausible outcome degradation of the groundwater regime will not occur. Therefore placing contaminated material below the water table does not result in significant interaction of waste with the groundwater regime when the liner is performing according to specification."

[469] The importance of the liner in terms of groundwater management is reflected in the following opinion attributed to Mr Tomlin in the joint expert report:[546]

> "The volume of leakage through a properly functioning and undamaged liner is insignificant when compared to the volume of groundwater flowing through the underground systems at the site, and in this circumstance significant short or long term environmental impact in relation to water quality will not occur…"

[470] The joint expert report records Mr Sutherland accepted the basis of Mr Tomlin's assessment, namely that significant interaction between the waste and groundwater could be prevented. His acceptance was, however, subject to two qualifications: (1) the liner is functioning according to specification; and (2) '*all systems are working correctly*'.[547] The joint expert report goes on to attribute the following opinion to Mr Sutherland:

> "…My problem remains that the operator, the regulator and community would not necessarily know that systems have failed for many years."

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542 Ex.14.024, p.59, para 98.
543 T25-18, L12-21.
544 Ex.8.006, p.12, para 39.
545 Ex.8.006, p.58, para 268.
546 Ex.8.006, pp.60-61, para 274.
547 Ex.8.006, pp.58-59, para 268.

[471] Mr Sutherland also accepted the opinion set out at paragraph [469] was correct, but again subject to a qualification. The qualification being that the liner cannot be damaged for this opinion to hold.

[472] The qualifications to Mr Sutherland's opinion can be sourced to the evidence of Mr Amaral. This is confirmed by the following passage of Mr Sutherland's cross-examination:[548]

> "…I'm faced with the advice from the geotechnical expert, Mr Amaral, that there will widespread failure of the liner. Not only of the liner, but also of the groundwater depressurisation system and the leachate collection system because they go hand in hand."

[473] It is Mr Amaral's view that differential settlement will occur as a consequence of the inappropriate sub-base, leading to widespread liner failure and failure of groundwater and leachate management systems. I do not accept this evidence. The groundwater assessment should proceed contrary to Mr Amaral's evidence. When approached in this way, I am satisfied there is no valid reason to reject Mr Tomlin's evidence. It comfortably establishes that the level of leakage through the liner will be insignificant (measured in thimbles) and will pale in comparison to the volume of groundwater into which it has moved. The comparative differences in concentration will be such that to say the leakage will be diluted by groundwater is a significant understatement.

[474] I take comfort from other features of the evidence, which demonstrate there are sufficient measures proposed to ensure groundwater is protected even in the event of liner failure.

[475] First, the composite liner has a number of inbuilt safeguards that will come into play in the event of failure. These safeguards, in conjunction with Mr Tomlin's evidence, puts the risk of adverse impact into perspective. Mr Tomlin pointed out in his oral evidence, which I accept, that "*you could collect the leakage from the base of the liner in two to four 10-metre buckets from Bunnings each year*". This volume of water is insignificant in comparison to the volume of surrounding groundwater.[549]

[476] Second, the evidence establishes there is capacity to monitor: (1) groundwater quality; and (2) the head of leachate on the inside of the liner. Whilst the former would be engaged after a leakage has occurred, they both provide a trigger for the groundwater depressurisation system to be utilised. This system can remove contaminated groundwater. In this circumstance, water would be pumped into the void and treated as leachate. Leachate is pumped from the base of the void to the surface. Both the groundwater depressurisation and leachate management systems will be in place for the life of the landfill.

[477] Third, the implementation of the draft REMP, as required by the EA, will ensure potential impacts on the aquatic ecological values of Six Mile Creek and the unnamed drainage channel and protected. Council did not suggest otherwise.

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548 T27-13, L9-12.
549 T25-25, L19-34.

[478] A review of Mr Sutherland's evidence as a whole reveals there are a number of issues he raised with respect to the proposed development, all of which have informed his assessment of impacts on groundwater. The issues can be identified as follows:

(a) the design does not allow for the separation of the base of the landfill from the permanent water table;

(b) the design does not include an allowance for an unsaturated natural attenuation zone;

(c) past mining activities have left a legacy of known and unknown workings, fractures, connections and potential flow paths, predisposing the site to unwanted interaction between, inter alia, surface waters and groundwaters;

(d) once completed, the landfilling must be completed to the top of the void;

(e) protection of the groundwater turns on compliance with conditions of the EA, which will be almost impossible;

(f) the landform is unsuited to landfill and presents a significant constraint that requires ongoing adaptive management;

(g) the systems and measures to manage the risk of groundwater contamination, individually and collectively, are complex, require careful attention and are susceptible to human error and failure; and

(h) the proposed development will create a legacy issue, with a need to maintain leachate levels in perpetuity.

[479] The issues identified in (a) and (b) are related. They can be sourced back to Mr Sutherland's opinion that: (1) the placement of waste proximal to, or beneath the water table is not best practice and should be avoided; and (2) a natural unsaturated attenuation zone between the liner and the groundwater has not been provided, thereby failing a principal site selection criterion. I have dealt with both points above. For reasons already given, I am comfortably satisfied they do not suggest the proposed development will have unacceptable impacts on groundwater, or the receiving environment.

[480] The issue identified in (c) is a valid one to raise. Indeed, it was uncontroversial that past mining activities have left a legacy of known and unknown workings, predisposing the site to the risk of unwanted interaction between groundwater, waste and leachate. This is one of many risks to be considered. That it is a risk does not, however, warrant refusal. It is necessary to look at the measures proposed to preclude adverse consequences in the event of interaction between groundwater and waste.

[481] The measures proposed to mitigate preclude adverse consequences are: (1) the provision of a better than best practice composite liner, with a number of levels of redundancy; (2) a groundwater monitoring regime; and (3) the installation and operation of the groundwater depressurisation system, which can be deployed to remove contaminated groundwater. In the event these mitigation measures are unsuccessful, the evidence establishes that the consequences of the interaction between groundwater, waste and leachate will not be significant. The volume of contaminated water transported to the groundwater will be small given the low

permeability of the liner. The volume of contaminated water would be small by comparison to the volume of groundwater with which it will mix – dilution will be inevitable. That the contaminants will be diluted and lead to no adverse impact on the receiving environment is confirmed by the position adopted by Council in relation to the aquatic ecology values of Six Mile Creek and the unnamed drainage channel. These values will not be adversely impacted.

[482] I do not accept the point stated in (d) is a reason for refusal given paragraphs [451] to [455] above.

[483] The issues identified in (e), (f) and (g) are related. They are part and parcel of a key issue for Mr Sutherland. The issue can be put in these terms: whether the proposed development can be conditioned to successfully manage leachate where there is an absence of gravity drainage in the void? I accept this is a key issue, and constraint, for the proposed development. I also accept it will be difficult to manage this constraint. It will require ongoing monitoring and management. Management of the kind required is susceptible to human error and system failure.

[484] Despite Mr Sutherland's view, I am satisfied having regard to the evidence of Mr Tomlin, Mr Marszalek and Dr Johnson there is good reason to have a high degree of confidence that groundwater management measures will be successful. This is not to say there is no risk of human error, or a need to adapt management techniques to respond to, inter alia, extreme weather events. These matters are important but do not stand in the way of an approval here once it is appreciated that: (1) the management measures proposed include an appropriate response to circumstances of this kind; and (2) the environmental consequences flowing from such circumstances will not be unacceptable or adverse.

[485] I apprehended from Mr Sutherland's oral evidence that many of his objections to the proposed development, including those identified in subparagraphs (e), (f) and (g) are informed, in a material way, by his experience with existing landfill operations. This was revealed particularly in the following passage of his oral evidence:

> "What you say repeatedly, Mr Sutherland, is that this site fails a "basic siting criteria…"or first principles of landfilling."?---I …I stand by that because…ongoing problems **that we see in my firm** with landfill management is that when this site criteria, principle criteria, has failed, we end up with odour issues and odour issues associated with leachate and leachate management issues."[550] (emphasis added)

And:

> "So it's your assumption that you think the court should work on, that because there was three metres or eight metres in [anonymised], no one else can ever comply with the 300 millimetre condition?---I think that's…one of the factors. If I could go further and say this, that …this problem with maintaining 300 millimetres over the liner is a common

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[550] T26-99, L28-36.

> problem, in my experience. And…**we're involved in landfills that have this problem often**." [551] (emphasis added)

[486] The '*problem*' to which Mr Sutherland referred was not an insignificant one. It involved up to 7 metres of leachate over the base of an existing landfill for an extended period. Mr O'Brien KC explored this matter with Mr Sutherland in cross-examination:[552]

> "And you're aware from your involvement in that case, aren't you, that leachate had built up over an extensive period of time?---Yeah. I'm just not sure what that period of time was. They had trouble with accuracy of measuring it and I'm not sure over which period of time it was. I know that they agreed that surface water and groundwater were mixing.
>
> Well, we do know that even though it's built up to seven metres, we do know, and you agreed in that case, that there's no evidence of any substantial breach of the liner?---Apart from where they drilled through it."

[487] It was, in my view, legitimate for Mr Sutherland to take into account his own professional experience of existing landfill operations. The more important issue was whether that experience, which is evidence of past performance, can be used as an indicator of future performance for this development. In my view, the evidence does not fairly permit such an approach.

[488] In short, Mr Sutherland's evidence does not disclose the reasons why he regarded the existing landfill facilities to which he referred as comparable to the proposed development. This had the consequence, in my view, that his evidence on this topic took the form of generalised concerns, mixed with a generous helping of pessimism. Such an approach was not helpful. Mr Sutherland needed to explain his reasoning and disclose the basis for his opinion. Absent an explanation, the evidence cannot be properly tested.

[489] It can also be observed there is a difficulty undermining this part of Mr Sutherland's evidence in any event. The extent to which it does so is significant once it is appreciated that one of the existing facilities to which reference was made is appreciably older and inferior (in environmental management terms) to the proposed development. The existing facility did not have, from its inception, a leachate treatment system. Nor did it have a composite liner of the kind proposed here. These differences are material. They are directly relevant to the ongoing management of risk associated with leachate.

[490] The issue stated in subparagraph (h) assumes there will be migration of groundwater into the void once filled and capped. In this circumstance, the water becomes leachate and, as a consequence of coming into contact with waste in the void, has the potential to mobilise further contaminants. The mechanism by which Mr Sutherland assumed this would occur involved: (1) groundwater rebounding to

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551 T27-20, L16-21.
552 T27-31, L43 to T27-32, L3.

RL30m; (2) the landfill cap failing to function as intended; and (3) groundwater levels rebounding to the point where a hydraulic gradient is created favouring the migration of groundwater into the void and through the liner.

[491] For reasons already given, I do not accept it is sound to proceed on the footing that the mechanisms identified in items (1) to (3) will in fact occur.

[492] Overall, I prefer Mr Tomlin's evidence to that of Mr Sutherland in relation to groundwater. Mr Tomlin took into account the issues raised by Mr Sutherland. With knowledge of these issues, his evidence represented a balanced approach to groundwater and leachate management constraints. Unlike Mr Sutherland's evidence, Mr Tomlin's views were not coloured by: (1) at times, slavish adherence to isolated statements in the DES guideline; (2) notions of widespread liner and system failure; and (3) '*experience*' at an existing landfill facility, which has inferior liner and water management systems. In terms of item (3), this proposal includes a leachate treatment system that will be in place from the commencement of the use and will be designed to accommodate an extreme rainfall event, such as that in January 1974.

Rehabilitation: trees v grass

[493] The purpose of the cap placed on top of the waste is to act as an 'umbrella'. It starves the waste of moisture that would drive it above field capacity. To drive the waste above field capacity means it has gone beyond saturation point, and unable to hold excess moisture. The excess moisture, in such a case, would drain towards the bottom of the void and be treated as leachate.[553]

[494] It is uncontroversial the cap (umbrella) proposed here exceeds best practice.[554] This is because it includes the LLDPE liner. This liner has very low permeability, measured as 5×10^{-15}. In practical terms, assuming the liner is intact, Mr Sutherland said it would take '*something in the order of 1.8 million years for anything to get through*' the LLDPE liner.[555] Once this is appreciated, it is difficult not to conclude the proposed cap will achieve its intended purpose, being an '*umbrella*'.

[495] Mr Amaral and Mr Sutherland did however take issue with one particular aspect of the cap design. They were of the view that the cap should be covered with grass rather than trees. In the joint expert report dealing with geotechnical, landfill design and mining and environmental management (including rehabilitation) issues:

(a) Mr Amaral recorded that no trees and shrubs should be planted on the cap as they will interfere with the long term inspection and maintenance of the final cover;[556] and

(b) Mr Sutherland recorded that he did not favour shrubs or trees because they can mask soil erosion and increase the risk of root penetration and rainfall infiltration.[557]

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553 T27-23, L19-29.
554 T27-23, L36-41.
555 T27-24, L1 to 2. Expressed as 5×10^{-15}.
556 Ex.8.002, p.6, para 9.

[496] Mr Amaral confirmed his issue with the trees and shrubs proposed for the cap was not related to erosion.[558] Rather, he was concerned trees and shrubs would, unlike grass, interfere with the operator's ability to inspect and maintain the cap.[559] The cross-examination of Mr Amaral exposed that his views in this regard were the product of long held professional practices, which, no doubt, have stood him in good stead. They however leave little room for advantages that modern technology has to offer.[560] One such advantage is the use of an All-Terrain Vehicle (ATV) or drone to inspect the cap. As Dr Rhode said in his oral evidence:[561]

> "…I think that it's fair to say that if you wanted to go into that site with your land cruiser that it might be difficult. But there are other options. You can simply use a small ATV which would allow you to move in amongst the trees. Or you could use drone technology that's common and off the shelf."

[497] When considered broadly and fairly, Mr Amaral's view in relation to the use of trees and shrubs on the cap is, in my view, the expression of a preference. Whilst I accept it is a valid preference, I do not accept it follows that the trees and shrubs proposed for the cap here are unacceptable. Indeed, Dr Rhode's evidence, which I do accept, establishes to the contrary.

[498] Mr Sutherland helpfully summarised his position in relation to the trees versus grass issue in the following passage of his evidence-in-chief:[562]

> "…But my view remains strongly that in terms of maintaining a landfill…cap that's expected to limit rainfall infiltration overtime that a grass sward, which is mulched regularly and is available for grazing if that's one of the land uses proposed, is a better outcome than having any shrubs or trees or drainage structures on top of it which may be subject to differential settlement and ponding, allowing for the increased infiltration of rainwater."

[499] This evidence needs to be qualified in one respect. There are no drainage structures proposed on top of the cap.[563]

[500] Mr Sutherland's reasoning for his strongly held view is exposed in Annexure B5 to exhibit 8.002.[564] The annexure records that the use of trees and shrubs would:

(a) increase the risk of root penetration;

(b) increase the risk of concentration of flow on the landfill cap surface;

(c) mask areas of differential settlement and ponding;

(d) increase the difficulty of repairs of any ponded areas;

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557 Ex.8.002, p.6, Neil Sutherland's summary, para 6.
558 T32-71, L28-35.
559 T32-71, L37-42.
560 T32-72, L6-26; Ex.9.010, p.9, para 37.
561 T31-91, L35-38.
562 T26-79, L8-14.
563 T27-28, L28-36.
564 Commencing at p.160.

(e) expose preferential pathways through root channels for the release of uncontrolled LFG emissions;

(f) mask the early seeding and growth of unwanted trees and shrubs; and

(g) expose the capping system to the risk of localised soil erosion.

[501] It can be observed that Mr Sutherland's opinions were not supported by reference to any specific studies or research. As I understood his evidence, Mr Sutherland's strongly held view was based on his professional experience and direct observation.

[502] I accept Mr Sutherland's criticisms of the proposed trees and shrubs here are not without merit on face value. Before accepting them however, it needs to be acknowledged they are generalisations. It is necessary to examine whether the general statements have direct application to this case. The reason for this arises particularly in this case given the design of the landfill cap.

[503] Relevant features of the cap design and proposed maintenance here are as follows: (1) the cap includes a three metre thick layer, which is better than best practice, and provides a deep rooting zone for vegetation; (2) beneath the rooting zone is an LLDPE liner which, again, is better than best practice, and is of very low permeability; (3) for moisture to infiltrate the cap, tree and shrub roots would need to damage the liner; and (4) the cap surface would be the subject of routine inspection and maintenance. This design and maintenance regime is superior to a landfill cap Mr Sutherland had in mind for the assessment of a cover comprising trees or grass. The design underpinning Mr Sutherland's assessment did not include items (1) and (2).

[504] Once items (1) and (2) are taken into account in the design, I am satisfied the general risks identified by Mr Sutherland are precisely that; they are generalised risks. Specific elements of this proposal respond appropriately to these risks.

[505] Further, it can be observed that item (3) above can be managed through conditions. A planting list, which excludes species known for deep roots, can be the subject of a condition. If this condition is complied with, it is not the depth of tree roots or 'nicking' of the surface that will be problematic. The only risk remaining is one that involves a tree or shrub heaving three metres of soil away from the liner, exposing it to the elements. This likelihood this risk comes to pass is remote

[506] In relation to matters of rehabilitation, I prefer the evidence of Dr Rhode to that of Mr Sutherland.

[507] Dr Rhode's evidence takes into account the specific design of the proposed cap and the risks associated with the design. His analysis with respect to erosion risk was also superior to that undertaken by Mr Sutherland.

[508] It was Dr Rhode's view that '*a diverse planting of trees, shrubs and grasses will provide the best chance of establishing a groundcover greater than 50%*'.[565] This represents an appropriate cover to manage the surface of the cap. This view was

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565 Ex.9.010, p.11, para 48 c.

supported by studies undertaken for the mining industry.[566] By reference to that work, Dr Rhode demonstrated how '*larger cover elements*' do not, contrary to Mr Sutherland's view, increase the rate of erosion; research suggests the risk decreases with trees.[567] Mr Lyons, who cross-examined Dr Rhode, did not challenge his reading of, and reliance upon, research to which reference was made. As against this, Mr Sutherland could not recall whether he had read the studies relied upon by Dr Rhode, let alone taken them into account. [568]

[509] These features of the evidence, combined with Dr Rhode's practical evidence about the way in which the cap could be inspected and maintained, satisfies me the cap design is acceptable. It will be far superior to standard industry practice. In such circumstances, there is good reason to be confident, on the balance of probabilities, that the legacy issues discussed by Mr Sutherland are unlikely to arise.

[510] For completeness, I reject Council's attempt to colour the use of trees on the cap here as an attempt to hide the landfill from view. This was conveyed in a submission to this effect: '*Dr Rhode identified that the reason for preferring trees to shrubs on this landfill is related to screening*'.[569] This is too narrow a view of Dr Rhode's evidence. This is clear from the following passage of cross-examination:[570]

> "Now, in the joint expert report, it's a point of agreement between the BMI experts, if I can call them that, that the reason for wanting trees and shrubs is for screening purposes; that's correct?---That is not the only purpose, no. It is to create connectivity between remnant vegetation areas across that rehabilitated landfill to other remnant areas, in addition to screening as you described"

[511] The ecological benefits derived from the remnant vegetation areas proposed across the landfill here are not in issue. They represent tangible and genuine benefits flowing from the rehabilitation proposed. In this regard, I accept the submission made on behalf of Austin[571] – the capping system is one part of an overall rehabilitation plan designed to create a mosaic of different areas. It will result in a net improvement to koala habitat. That this is contributed to by planting the cap with trees, rather than grass, is but a further reason to conclude the proposed development is meritorious.

Rehabilitation: potential for future industry uses

[512] The list of questions for determination in this appeal include the following: Whether the proposed development is consistent with the rehabilitation obligations under Environmental Authority EPMP02454414 (and in particular Schedule F- Land) which requires the land be made suitable for industrial uses. [572] A further question to be determined, which raises a similar issue is as follows: whether the proposed

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566 Ex.9.010, pp.10-11, para 47.
567 Ex.9.010, p.11, para 48; Ex.13.003 and T31-90 to T31-91.
568 T27-28, L1-13.
569 Ex.14.024, p.59, para 100(a)(v).
570 T31-92, L42-46.
571 Ex.13.022, p.86, para 327.
572 Ex.13.021, p.10, para 39.

development can accommodate future land uses consistent with the planning scheme. [573]

[513] The examination of these issues commences from the footing that Council made the following concession in its written submissions:[574]

> "There is no dispute that the proposed development is industrial in nature and after rehabilitation, the subject land is intended to be able to facilitate future uses consistent with the planning scheme…"

[514] Despite this concession, Council maintained the questions identified above are resolved in the negative for three reasons. First, having regard to the evidence of Mr Amaral. His evidence was said to '*place[s] serious doubt on the ability of the landfill…to accommodate the industrial style of development that is suggested…and supported by the planning scheme*'.[575] Second, having regard to the evidence of Mr Perkins, it was asserted there was insufficient material to establish the final landform was suitable for industrial development.[576] Third, it was contended the proposed development is akin to an interim use, which delays the ultimate rehabilitation of the land for its intended final use.[577]

[515] For reasons given above, I am satisfied the first of the three reasons relied upon should not be accepted. I prefer the evidence of Austin's experts to that of Mr Amaral. In particular, I prefer the evidence of Dr Williams. He was an impressive witness. He explained, in a cogent way, why the land would be '*entirely suitable for future light industrial type uses*'.[578] I accept Dr Williams' evidence in this regard.

[516] Contrary to Mr Perkins' assessment, I am satisfied there is an abundance of evidence, which establishes the final landform will be suitable for industrial development. The evidence is that of Dr Williams, Dr Rhode and Mr Watson. This body of evidence establishes the completed landform will be suitable for future light industrial uses. Uses of this kind are anticipated on the land by the planning scheme.

[517] As I have already observed, the land is partly included in the Investigation zone. Sections 6.17(1) and (2)[579] of the planning scheme identify consistent, and potentially consistent uses in the zone. Potentially consistent uses on the land include business uses and service trades use, both of which are defined.[580] The latter includes a number of uses that qualify as candidates for light industry, namely '*builder's depot*', '*repair station*', '*warehouse or storage*'. To suggest the land, once rehabilitated, cannot be put to such a purpose is wrong and cannot be accepted.

[518] The '*interim use*' point advanced by Council does not, in my view, advance the refusal case. As a starting point, the planning scheme does not speak in terms of

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573 Ex.13.021, p.9, para 33.
574 Ex.14.024, p.65, para 114.
575 Ex.14.024, p.66, para 114.
576 Ex.14.024, p.66, para 114(a) and (b).
577 Ex.14.024, p.66, para 115.
578 T31-27, L27 to T31-28, L10.
579 Ex.3.001, pp.1-76 to 77.
580 Ex.3.001, pp.1-131 and 132.

'*interim uses*'. Rather, it speaks of '*temporary uses*', which are defined.[581] A temporary use, by definition, does not exceed 4 weeks duration over a 12 month period. Self-evidently, this is not apt to describe the proposed development.

[519] Putting this to one side, the point made is that the proposed development delays the ultimate rehabilitation of the land for its intended use. I have difficulty accepting this is a reason for refusal in this case. The proposed development, if approved, would progressively rehabilitate the land. It would do so by filling an existing mining void and by rehabilitating the land such as to improve its environmental value overall. This would be achieved in circumstances where:

(a) the proposed development (comprising landfill and resource recovery) is an industrial use contemplated on the land by the planning scheme;

(b) the planning scheme does not identify a time by which the land, and surrounding area, is to be rehabilitated for industrial purposes; and

(c) the planning scheme does not prescribe how the land, and degraded sites generally, are to be rehabilitated so they may be used in an '*appropriate manner*' or contribute to the network of green spaces.

[520] The proposed development, in my view, frees two birds with one key. If approved, it would rehabilitate a degraded site. The rehabilitation would be achieved through an industrial use promoted by the planning scheme for a small Sub Area, which includes the land. That this will take, in the order of 20 years is, in my view, of little significance under the planning scheme. The planning scheme suggests sites will be progressively rehabilitated but is otherwise silent about the time taken to achieve such an end. An available inference is that the planning scheme is silent about the time to rehabilitate degraded and contaminated sites because Council, as the planning authority, sought to confer upon itself, through silence, flexibility to consider each rehabilitation proposal on its merits. When the merits assessment is carried out here, it confirms the proposed development, inclusive of its rehabilitation strategy, is a meritorious proposal.

Rehabilitation: inconsistency with mining EA

[521] The list of questions for determination include the following: Whether landfilling is consistent with the existing mining rehabilitation requirements for the site under Environmental Authority EPMP02454414.[582] The obligation to rehabilitate the land under this authority is discussed in general terms at paragraphs [33] and [34]. In short, the authority requires the mining void and spoil stockpiles to be rehabilitated. Rehabilitation is achieved when the land is stabilised and does not, or will not, have potential to cause environmental harm. The rehabilitation outcome intended for the void and spoil stockpiles is stated as '*Industrial*'.

[522] Council's written submissions[583] with respect to this particular point were unhelpful.

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581 Ex.3.001, p.1-138.
582 Ex.13.021, p.6, para 26(b).
583 Ex.14.024, p.59, para 99.

[523] As a starting point, I was confused about Council's position. It conceded '*there is no dispute that the proposed development is industrial in nature and after rehabilitation…is intended to facilitate future uses consistent with the planning scheme*'.[584] The future uses anticipated by the planning scheme are industrial in nature. This concession sits uncomfortably with the proposition that the proposed development will not achieve a rehabilitation outcome for 'industrial' as anticipated by the EA.

[524] The balance of Council's written submissions did not improve the position.

[525] Those parts of Council's written submissions dealing with the '*obligations*' arising under the authority and inconsistency[585] simply quote large portions of the document and emphasise particular words in bold. The reasoning for the emphasis, and what it was said to establish, was not developed. Moreover, it was not submitted how, and why, inconsistency between the proposal and quoted passages, or emphasised words, arose in the circumstances.

[526] Adding to the confusion was the following submission made on behalf of Council. Armed with a concession from Austin's town planning witness it was asserted:[586]

> "Put simply, if the development application the subject of this appeal is refused, that does not mean the "*end of the line*" in terms of achieving suitable rehabilitation. In that event Austin BMI will have to come up with a suitable alternative, which would be assessed against the applicable assessment benchmarks in force at the time. Such assessment benchmarks would obviously include a raft of requirements to ensure appropriate mitigation of impacts. In other words, approval of this landfill is not necessary to achieve rehabilitation."

[527] Council's submission does not establish, let alone assert, the proposed development is inconsistent with the existing mining authority. Taken at its highest, the above submission, if accepted, advances the matter no further than this: if the application is refused, Austin will need to find an alternative means to rehabilitate the land in accordance with the mining authority. This is obvious and begs the question: how does it call for refusal? It does not. The point does not advance this appeal.

[528] It might be thought that other aspects of Council's case, if accepted, may lead to a finding that the proposed development is inconsistent with the mining authority in three respects. First, Council contends the development will not stabilise the land, which is required by the authority. Second, Council contends the land, both during and after the use, will have the potential to cause environmental harm. Third, Council contends the final landform will not be suitable for industrial uses.

[529] Council's case in each respect assumes the evidence of Messrs Amaral, Sutherland and Collins is accepted. For reasons given above, I prefer the evidence of Austin's experts. Collectively, this evidence demonstrates that compliance with Condition

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584 Ex.14.024, p.65, para 114.
585 Ex.14.024, pp.62-64, para 105.
586 Ex.14.024, p.64, par 106.

F2-1 of the environmental authority can be achieved. This condition is in the following terms:

> "Subject to conditions (F2-2), (F2-3) and (F2-4), disturbed land nominated for the industrial rehabilitation outcome will be considered rehabilitated when the land is stabilised and does not, or will not have potential to cause environmental harm to the environmental values."

[530] For completeness, it can be observed that detailed submissions were made on behalf of Austin in relation to alleged inconsistency with the mining authority.[587] I accept the submission made at paragraph 336 of those submissions. The submission commences in this way: "*…it is difficult to ascertain what facts inform Council's argument…having regard to the words of the document, and in light of the following…*". What follows are eight points highlighting the deficiencies in Council's case. The points, which I accept, are as follows (footnotes omitted):

> "(b) financial assurance obligations do not require any particular rehabilitation outcomes on the land in and of themselves, but are properly considered as a security; and in any event
>
> (c) the financial assurance obligations and ability to progressively discharge the financial assurance paid are linked to the Plan of Operations, which specifically envisages rehabilitation being achieved by landfilling, in anticipation of approval of the current application;
>
> (d) landfilling below natural ground surface ("Waste disposal") was a generally acceptable rehabilitation strategy under the DES guideline "Rehabilitation requirements for mining resource activities";
>
> (e) the most detailed obligation for rehabilitation of the land is that the mine void and stockpiles be rehabilitated to achieve an 'Industrial' outcome, which is not defined;
>
> (f) the proposed development is accepted by the town planners as being an industrial use, and would therefore satisfy Condition F2-2 in the event of an approval by this Court;
>
> (g) Condition F2-1 of the mining EA will be achieved by the proposed development for the reasons set out above in response to Questions 16-32;
>
> (h) DES is the entity that will assess the surrender application for the mining EA in the event of approval of the proposed development. That entity accepted the rehabilitation outcomes by way of landfilling the void as proposed in the Plan of

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587 Ex.13.022, pp.86-91, paras 329 to 337.

> Operations and (consistently with that conclusion) issued the EA for the proposed development."

[531] The above matters comfortably establish that inconsistency between the mining EA and the proposed development does not warrant refusal.

General environmental risk

[532] It is uncontroversial the proposed development involves inherent environmental risk. That risk does not cease after the deposition of waste. It continues for decades after. This is reflected in condition L4 of the EA, which prescribes the requirements for post-closure care of the landfill.

[533] Sensibly, Council does not contend the development application should be refused because it carries inherent risk.[588] This approach is consistent with *Lane v Gatton Shire Council & Anor* [1988] QPLR 49 at 51 where Judge Quirk observed:

> "The attractions of avoiding responsibility for allowing any proposal which has an element of serious risk, while only too obvious, must be resisted. As Carter J. when constituting this Court in *Davjan v Noosa Shire Council* 1981 QPLR 69 observed, when a similar situation arose, "such an approach would be superficial and an abrogation of my judicial function". He went on to point out that the standard to which a tribunal must be satisfied that a development will not of itself be a source of risk… is the "civil standard", namely "a degree of persuasion of the mind according to the balance of probabilities"."

[534] *Lane* was cited by Judge Quirk in *GFW Gelatine International Ltd v Beaudesert Shire Council & Ors* [1993] QPLR 342 at 352-353. His honour said:

> "In this case, the Court is once more faced with a proposal which, if not properly considered, planned and executed has a potential to pose a serious threat to the environment and in particular to water quality in the Logan River. The way in which the Court should approach a case of this kind is well established by decisions of this and other Courts in comparable situations (*Rejfek v McElroy* (1965) 112 CLR 517; *Davjan v Noosa Shire Council* (1981) QPLR 69; *Esteedog Pty Ltd v Maroochy Shire Council* (1991) QPLR 7), the Court must be careful to resist the attractions of avoiding responsibility for allowing a proposal which has been demonstrated to have its risks if not handled carefully and which has been the subject of considerable public attention and feeling (*Lane v Gatton Shire Council* (1988) QPLR 49). Justice must be done for all interested parties and this calls for a fair-minded assessment of the proposal on the evidence given free from any emotive influences which matters of this kind are prone to attract."

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588 Ex.14.024, p.24, para 61.

[535] Since *Lane* and *GFW Gelatine*, a body of jurisprudence has developed with respect to the precautionary principle. This principle has received statutory recognition. As Judge Rackemann observed in *Clermont Quarries Pty Ltd v Isaac Regional Council & Ors* [2021] QPELR 65 at [12], the precautionary principle does not call for intolerance to risk under any circumstance (footnotes omitted). His Honour said:

> "The case involves a consideration of the risk, in particular to human health and/or the environment, potentially associated with a proposal. That is not unusual. Whilst the submissions for the appellant pose the question "why take the risk?", the Court has long resisted the attractions of avoiding responsibility for allowing a proposal which has been demonstrated to have some risk unless handled appropriately. Consideration needs to be given to the nature and extent of the risk and to the ways and means by which it is proposed to be addressed or managed. Whilst, in more recent times, the precautionary principle has received statutory recognition, that principle (which the appellant did not invoke) does not call for a nervous approach, or one which is intolerant of any risk under any circumstances. Further, in addressing risk, it must be remembered that…the standard of proof remains the civil standard."

[536] The *Clermont Quarries* decision, with which I respectfully agree, makes two points of application here. First, the mere presence of risk does not, in and of itself, call for a nervous approach or intolerance. Second, an assessment of risk, and its acceptability, requires an examination of: (1) the nature and the extent of the risk; and (2) the means by which it is to be addressed. Such an approach is entirely consistent with the following observation in *GFW Gelatine* (at 353):

> "The onus of showing that the application for town planning consent should be approved of course rests with the Applicant, but this is not to say that in a proposal yet untried, the complete absence of any likely future difficulty must be demonstrated. It is essential that it be shown that the relevant procedures and their likely impact on the environment are properly understood by the Appellant and its expert consultants and that there is a capacity to deal with any difficulty that might arise in a way which will preclude unacceptable results.
>
> The results that are achieved are all important and the means whereby these results are achieved are less so. While there should be no uncertainty at all about the standards that are called for, there is more room for flexibility regarding the way in which these results are attained. Lessons will be learned in practice and there will, no doubt, be advances in technology…"

[537] Council submitted that its approach to this case is '*consistent*' with this reasoning.[589] Particular emphasis was placed on the words: "*It is essential…that there is a capacity to deal with any difficulty that might arise in a way which will*

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589 Ex.14.024, p.24, para 61.

preclude unacceptable results." With these words in mind, the following point was made at paragraph 62 of Council's written submissions:

> "Given the issues identified below (particularly the issues that would arise from constructing the landfill on a "poor foundation", namely mine spoil in a waterbody that is part of a former mining void, which will then be overlain with waste) there are significant difficulties for Austin BMI in demonstrating that there is capacity to deal with the issues likely to arise."

[538] I do not accept this submission. It assumes '*issues likely to arise*' cannot be dealt with. This issues to which reference is made relate to geotechnical and landfill design considerations, stormwater and surface water impacts, groundwater impacts and rehabilitation design considerations. For the reasons given above, I am satisfied it has been demonstrated there is a capacity to deal with difficulties that arise in a way which precludes unacceptable impacts on the environment. I take particular comfort in this regard from the Council's own case. It conceded impacts with respect to noise, dust, odour and impacts on the aquatic ecology of Six Mile Creek are matters for conditions rather than reasons for refusal.

[539] Austin, and its experts, were prepared to consider, and respond, to criticisms of the proposed development. This included exploring weaknesses in the proposal and identifying solutions or modifications, if required. Overall, the rigour brought to the examination of the development by Dr Williams, Dr Rhode and Messrs Tomlin, Marszalek, Watson and Hornsey was appropriate and consistent with the nature, complexity and environmental risk of the proposal. Their evidence confers a high degree of confidence that the environmental risk here can be appropriately managed to preclude adverse impacts and outcomes. This is so even in circumstances of rare weather events, system failure and liner failure.

[540] This is not to suggest Council's experts, namely Mr Amaral, Mr Sutherland and Mr Collins, were not rigorous. I was grateful for their assistance. The difficulty I have with their evidence, and the submissions advanced by Council in reliance upon their evidence, is not dissimilar to *GFW Gelatine* where at 346 Judge Quirk said:

> "The desirability of a very careful appraisal of the proposal is obvious but, in many instances in the Respondents' case, the making of necessary assumptions in an overly conservative manner and a lack of preparedness to see the proposal as something dynamic and capable of adaptation was evident."

[541] The approach adopted by Council's experts to the assessment of environmental impact and risk was, in my view, conservative and, in my view, overly so. This caused too greater emphasis to be placed upon extreme events, such as widespread and catastrophic liner failure, extreme weather events and system failure during extreme weather events. It goes without saying that careful consideration of the proposal called for an examination of, inter alia, the risk, likelihood and consequences associated with liner failure and extreme events. However, repeated reliance upon these events with metronomic consistency was cause for concern. It had the very clear tenor of alarmist or catastrophic reasoning. This was not assisted by the reticence on the part of Council's experts to accept that: (1) liner failure was far from inevitable by reason of strain; (2) the rainfall events about which there was

concern are precisely as described – they are extreme events; and (3) the likely environmental consequences here, even on Council's case, will not sound in unacceptable aquatic ecological impacts on Six Mile Creek and the unnamed drainage channel.

[542] None of this is to suggest environmental risk is of little importance in this appeal. It is important. I have taken that risk into account. More particularly, I have taken into account the likelihood and consequences of identified events that could lead to environmental impact. The evidence establishes, in this context, that *'there is a capacity to deal with any difficulty that might arise in a way which will preclude unacceptable results*'. I do not accept the contrary view.

[543] Council's case in relation to general environmental risk also involved reliance upon an asserted planning principle. The principle was stated in these terms: development should not *'cause (or have the potential to cause) contamination or other adverse environmental impacts*'.[590] No authority from this Court, or any other, was cited as authority for the principle. Nor was any reference made to the PA to found a basis for the asserted principle.

[544] The absence of any reference to the PA was unfortunate. The reason for this is a simple one; there is no statutory recognition of the principle. Moreover, the principle as stated appears to sit uncomfortably with the notion that the purpose of the PA, and provisions going to its advancement, admit of the prospect development may cause (or have the potential to cause) adverse environmental impact. That impact is to be avoided if practicable or is to be minimised. So much is clear from the purpose and s 5 of the PA.

[545] The stated purpose of the PA is, in short, to '*facilitate the achievement of ecological sustainability*'. This concept, by definition, calls for a balance integrating three considerations. They are environmental, economic and community/public interest considerations. The purpose of the PA does not suggest primacy is given to any one of these considerations over another. Nor does it found a basis to establish the planning principle asserted by Council.

[546] Section 5(2) of the PA provides for how the purpose of the PA is to be advanced. The provision includes the following:[591]

> "avoiding, if practicable, or otherwise minimising the adverse environmental effects of development (climate change, urban congestion or declining human health, for example)."

[547] This provision contemplates the purpose of the PA will be advanced where adverse environmental effects of development are avoided, if practicable, or minimised. Taking this provision, it can be asked: how does it assist the assessment here? In isolation, the provision provides little assistance. In truth, the provision begs more questions than it provides answers. For example, it raises two questions: (1) what is an environmental effect of the development? and (2) what does it mean to avoid, if practicable, or minimise such an effect? In my view, both questions are not

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590 Ex.14.024, p.24, para 61.
591 s 5(2)(j), PA.

answered by the planning principle relied upon by Council. Rather, the questions are resolved by reference to the evidence, and importantly, the adopted planning controls. The reason for this is made clear in the following passage of *Sincere International Group Pty Ltd v Council of the City of Gold Coast* (footnotes omitted):[592]

> **"…**an owner of land is entitled to use that land as he or she wishes, and is under no obligation to consider the desirability of conserving its existing environment. This is of course subject to existing town planning and other statutory controls. In this context, in *Liongrain Pty Ltd v Council of the Shire of Albert* [1995] QPLR 353, his Honour Judge Quirk said at 355:
>
> > From the point of view of environmental protection, the best result would be that all land remain undeveloped and the more of this site that remains undisturbed, the better. That the retention of fifty hectares of the eastern bushland (rather than thirty-six hectares) would be preferable could not be disputed.
> >
> > However if these considerations are to be at all relevant to the determination of an appeal of this kind, they must be kept in perspective. We are not here involved in an inquiry as to whether the environmental attributes of the land as such has (sic) to justify its acquisition as an environmental preserve. ***This Court has no plenary power to do whatever may be seen to be of environmental advantage to the community. It must exercise the jurisdiction which it is given***…The subject land is privately owned. That its owners should expect to be able to develop it in accordance with relevant instruments of statutory planning control is fundamental to proper and fair town planning." (emphasis added)
>
> **[58]** Whilst some care needs to be taken with his Honour's observation…, I adopt the reasoning to the extent it confirms the Court does not have a plenary power to do whatever is seen to be in the public interest for the benefit of environmental conservation purposes. The extent to which development of privately owned land should be permitted to impact on its existing environment is influenced substantially by the formal instruments of planning control. It is the planning authorities who accept responsibility for the identification of areas where environmental conservation is appropriate. The identification of such areas is contained in the formally adopted planning controls. Where there is to be a balance struck between environmental considerations, and the entitlement of private ownership, as would be expected, the planning controls are to be closely examined…."

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592 [2019] QPELR 247, [57] – [58].

[548] The planning principle relied upon by Council, if it in fact be one, does not assist in the resolution of the issues in this appeal.

Amenity

[549] It was uncontroversial, as a general proposition, that an integrated waste facility has the potential to cause significant impacts on residential amenity for a long period of time.[593] The nature of those impacts can be tangible and intangible. The former captures impacts engaging the senses and lend themselves more readily to identification; such as noise, odour and visual impacts. The latter is associated with subjective notions of perception, sense of place and the feel/air/character of an area.[594]

[550] It is contended that impacts on amenity properly stand against approval of the development application.[595] In support of this contention, five propositions are relied upon, namely:

(a) the proposed development involves the placement of fill beyond the top of the mining void;[596]

(b) the proposed development will be visible to sensitive receptors during the operational phase of the landfill and following completion, leading to unacceptable impacts on visual amenity, perception and sense of place;[597]

(c) the proposed development is not of a type and scale appropriate for the prevailing nature of the area and particular circumstances of the land and surrounds;[598]

(d) the proposed development would likely have a significant and extended detrimental effect on residents (in nearby residential areas) and their perceptions of the amenity of their neighbourhood;[599]

(e) the proposed development by reason of the above matters does not comply with:[600]

(i) 18 focal provisions of the planning scheme; and

(ii) 8 focal provisions of the Activity Code.

[551] Sub-paragraph (a) has its foundation in a provision of the Activity Code. It is common ground this code was not in force when the development application was properly made. It provides that Waste Activity Uses, which are found to have a detrimental impact on amenity or significant impacts on visual amenity, constitute undesirable development in the TLPI area. Development of this kind is unlikely to be approved.[601]

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593 T33-18, L5-15.
594 *Broad v Brisbane City Council* [1986] 2 Qd R 317.
595 Ex 14.024, para 129.
596 Ex 13.021, para 41 and Ex 14.024, paras 125(f), 126 and 128(b).
597 Ex.13.021, para 44.
598 Ex.13.021, para 45.
599 Ex.13.021, paras 46 and 47 and Ex.14.024, para 128(b)(ii).
600 Ex.13.021, para 48; Ex.14.024, para 125.
601 Ex.3.002, p.2–6, ss 3(2)(a), 3(2)(b)(i) and (ii).

[552] A Specific Outcome of the Activity Code relevant to an assessment of the visual impacts of Waste Activity Uses is s 4(5) of the 2018 TLPI, which states:[602]

> "(5) Filling and earthworks associated with Waste Activity Uses:
>
> (a) do not extend beyond the top of former mining voids, except for approved minor contouring, that improves stormwater management and drainage outcomes; and
>
> (b) are designed, operated and maintained so that exposed waste is not visible from surrounding residential and other sensitive receiving uses at any time."

[553] Subsection (5) is repeated in identical in terms in the 2020 TLPI.[603]

[554] Subsection (5)(a) includes the phrase '*top of former mining voids*'. This is not defined in the Activity Code or the balance of the 2018/2020 TLPIs. As a consequence, the phrase is to be given its plain and ordinary meaning.

[555] The phrase calls for two things to be identified: (1) a void created by a former mining activity; and (2) the top, or highest part, of the void.

[556] To assist in the identification of items (1) and (2), Ms Morrissy, Austin's town planning witness, included a plan and number of cross-sections in her further statement of evidence.[604] Collectively, these documents assist in identifying a number of features, namely: (1) the location of the void created by former mining activity on the land; (2) the aerial extent of the void or airspace; (3) the level of the land in 1972 prior to the commencement of mining activities; (4) the extent of land disturbed by mining activities generally; (5) the mining disturbed surface levels; (6) the level to which coal was extracted within the void; and (7) the proposed finish levels of the land, assuming the proposed development is approved.

[557] A review of the cross-sections reveal the extent to which mining activities have altered the topography of the land. The activities, which were undoubtedly land transformative, did so in two ways. First, the activity created a large open pit. This, as would now be obvious from these reasons, created a large man-made depression in the land. Second, mining involved moving large volumes of over-burden and soil to areas outside of the man-made pit. In combination, these activities created a void, which is not uniform in height, or width. The activities also increased the elevation of land, particularly on its western side. The extent of modification to the landform can be discerned from comparing the disturbed surface levels with the 1972 pre-mining levels.[605] A comparison of these levels confirms the obvious - the extent of modification of the land and its topography by mining activities has been significant.

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602 Ex.3.002, p.2–7.
603 Ex.3.002, p.2-23.
604 Ex.9.017, pp.17-21.
605 Ex.14.021.

[558] Council, consistent with the evidence of its town planning witness, Mr Perkins, submits the top of the void for the purpose of Specific Outcome 4(5)(a) is defined by the 1972 pre-mining levels. If this approach is adopted, it means the '*green line*' in the cross-sections to Ms Morrissy's further statement of evidence represent the level not to be exceeded by filling or earthworks. A document prepared by Mr Perkins suggests the final landform proposed here will exceed the 1972 contour levels, in the central part of the landfill cap, by more than 30 metres.[606] This exceedance reduces in height moving from the centre of the cap to its edge.

[559] I have difficulty accepting this is the correct approach.

[560] To focus on registered levels that pre-date mining activities does not appear to sit comfortably with the plain and ordinary meaning of the phrase '*top of former mining voids*'. The pre-mining levels have nothing to do with the void. They represent historical levels that have been modified by mining activity.

[561] In my view, the phrase '*top of former mining voids*' is clear on its face. It requires the identification of a former mining void, which is a three-dimensional space. To create the three-dimensional space there is a base, a side and a top. The top of the airspace here is open and not uniform in level. The top has, in essence, a profile which slopes from west to east and north to south. The top can be identified in the cross-sections attached to Ms Morrissy's further statement of evidence as the uppermost surface of the airspace. It is wedged between the blue coloured areas described as '*disturbed land from mining activities*'.

[562] The cross-sections establish that the filling proposed in the void will not exceed the top of the former mining void for the purposes of Specific Outcome 4(5)(a). Overall, there is strong alignment between the '*proposed design finish surface*' (red line) and the top of the white space representing the void airspace. I take comfort in this regard from Mr Perkins' evidence. He conceded that a comparison of the kind demonstrates compliance with Specific Outcome 4(5)(a).[607]

[563] For these reasons, I am satisfied the evidence establishes compliance with Specific Outcome (5)(a) of the Activity Code.

[564] Notwithstanding the findings above, an alternative view may be taken in relation to the construction of Specific Outcome 4(5)(a). That is, it may be thought that the 1972 levels define the top of the former mining void. If such a view is taken, I am satisfied the refusal case is not advanced in any event. For the reasons that follow, this is because the exceedance of the 1972 pre-mining contours will not sound in any adverse town planning consequence.

[565] The Specific Outcome, in my view, has at least two purposes. First, it seeks to control the scale of filling and earthworks in a former mining void in the Waste Activity Area by limiting the vertical height of those works. Second, it is a control that works hand-in-hand with an overarching intention of the 2018 and 2020 TLPIs. These documents seek to regulate applications for new waste activities. They do so

606 Ex.14.021.
607 T33-44, L44 to T33-45, L4.

to, inter alia, protect residential and sensitive uses from adverse impacts.[608] The impacts of concern are related to general amenity and visual amenity considerations. By ensuring filling and earthworks remain within an existing void, save for minor contouring, is, as a matter of practicality, an intention to limit its visibility to sensitive receptors. In limiting its visibility, it can be said the prospect of Waste Activity Uses giving rise to unacceptable visual impacts on residential neighbourhoods is materially reduced. When visibility of the Use is reduced or completely obscured, it is less likely to be perceived as something adversely impacting upon sense of place and community perceptions of their neighbourhood.

[566] This Specific Outcome is also complemented by subsection (b) of the same provision. It contemplates a barrier is required to screen operations from view. This provision self-evidently seeks to ensure that no waste is visible from residential uses.

[567] Here, the evidence establishes the land is visible from sensitive receptors to the north-east, east, and south-east. There is no suggestion the proposed development will be visible to residential communities located to the west.

[568] To assess the visual acceptability of the proposed development, I had the benefit of a series of photomontages prepared by Mr Elliott[609] and evidence of two experts, Messrs Powell and Curtis.

[569] Photomontages were prepared for seven viewpoints.[610] The viewpoints are located to the north-east, east and south-east of the land. The closest viewing point is VP02, which is about 1.2 kilometres to the east of the land. All of the viewpoints give an appreciation of public and private views from existing, and future residential areas, towards the land and surrounding locality.[611]

[570] For each viewpoint, a series of photomontages were prepared at two focal lengths, 28 millimetres and 50 millimetres (equivalent). For each focal length, an image depicts:

(a) the existing view;

(b) a view of the recycling sheds and Zone 1 rehabilitation after five years' growth;

(c) a view of the post-settlement profile prior to vegetation, but with grass; and

(d) a view of the post-settlement profile with rehabilitation vegetation after five years of growth.

[571] Starting with the photomontages for the existing views, they confirm the topography of the land and locality has been significantly disturbed by mining activity. The disturbance is obvious from the steep and unvegetated benches and stockpiles of

608 Ex.3.002, p.2-18, s 2.3.
609 Ex.10.001, pp. 18-74 and Ex.1.001, pp 31 – 86.
610 Ex.1.001, p 30 and Ex.7.002, p 4, para 15.
611 Ex.7.002, p 4, para 13.

overburden. These features are prominent and unattractive features of the skyline. Mr Powell and Mr Curtis described them as a scar on the landscape.[612]

[572] The photomontages prepared for the existing views confirm the land is in need of rehabilitation. In the context of visual impacts, this need is existing and of considerable force. Present circumstances are such as to give rise to an adverse impact that would be readily perceived at residential areas to the north-east, east and south-east. The impact is a visual one. There is also an adverse impact in general amenity terms. In simple terms, the visual impact does little for the general amenity, character and sense of place for residential areas from where the scarring on the landscape is visible.[613]

[573] An objective reading of the planning scheme confers an expectation for existing, and future residential areas, that this position will change. It promotes rehabilitation of land in this locality. It also promotes industrial uses, such as that proposed on the land. This is of course subject to meeting particular requirements of the planning scheme. In terms of visual acceptability, the planning scheme calls for a number of requirements to considered.

[574] Note 6.16F of the planning scheme describes Sub Area RBIA2, in which the land is included, as significant in a townscape context.[614] The note goes on to recognise the potential for RBIA2 to have '*significant*' impacts on the visual amenity of, inter alia, Cunningham Highway and nearby residential areas. With this context in mind, the planning scheme provides guidance in relation to visual/aesthetic considerations for new development in RBIA2. Specific Outcomes particular to RBIA2 require:

(a) industry, including '*difficult to locate activities*', demonstrate it will have no discernible impacts outside of RBIA2;[615]

(b) new uses and works are to have buildings of a high visual quality when viewed from, inter alia, Cunningham Highway and nearby existing and planned residential areas;[616] and

(c) buildings and outdoor areas used for plant, equipment and storage to be screened with appropriate landscaping when viewed from Cunningham Highway and nearby existing and planned residential areas.[617]

[575] In the Investigation zone, of which RBIA2 forms part, a number of provisions guide visual and aesthetic considerations for new development in the zone. The provisions envisage a '*high standard of amenity*' in Regionally Significant Business and Industry Areas;[618] maintenance of a green space setting;[619] landscaped buffers

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612 Ex.8.010, para 9; Ex.10.001, pp 19, 36 and 52; T32-99, L17-19.

613 This paragraph takes into account the natural topography of the site and surrounding area, than the current unrehabilitated state of the land and that it is visible to sensitive visual receptors.

614 Ex.3.001, p.1-74.

615 Ex.3.001, p.1-74, s 6.16(2)(a)(iv).

616 Ex.3.001, p.1-74, s 6.16(2)(b)(i).

617 Ex.3.001, p.1-74, s 6.16(2)(b)(ii).

618 Ex.3.001, p.1-66, s 6.14(2)(c).

619 Ex.3.001, p.1-66, s 6.14(2)(h). See also Ex.3.001, p.1-36, s 6.7(5)(e)(i) of the Locality provisions.

which ensure no discernible amenity impact for adjacent sensitive uses;[620] and landscaping that softens the view to hard stand areas, storage or work areas.[621]

[576] The Buffer zone is well removed from the residential areas to the east and is to be rehabilitated. This area is intended to serve as a buffer to separate business and industry uses from sensitive uses. For that zone, guidance is provided with respect to visual and aesthetic considerations in s 6.20(2) of the planning scheme. Council does not suggest this is a focal provision with which there is non-compliance. In any event, s 6.20 of the planning scheme makes clear that land in the zone will function primarily as a buffer and be landscaped with existing and new vegetation.[622] Built form is also anticipated in the zone. It must protect important townscape and landscape features of the zone.[623] Any new uses are to be landscaped to soften the view to hard stand areas, storage or work areas.[624]

[577] Swanbank New Chum is an area specifically identified, and planned for, at the RSBEIAL level provisions of the planning scheme.[625] The area is mapped in Figure 6-7-1.[626] This area, of which the land forms a small part towards its northern end, is intended to be a '*flagship example of effective sustainable development integrated into the surrounding emerging communities of Ipswich*'.[627] Land degraded by former mining activities within the area is encouraged to progressively rehabilitate and integrate within '*a network of green spaces*'.[628] Green spaces include environmental buffers, corridors and recreation areas.[629] New development within Swanbank New Chum is to be located, and to relate to other development in a way that creates a sense of place; achieves a high standard of amenity; and promotes visual attractiveness.[630] Consistent with the Sub Area provisions, plant and equipment is be screened and impacts contained within the business and industry area.[631]

[578] With respect to visual amenity, landscape character and placemaking, particular guidance is given in the planning scheme for Swanbank New Chum. Section 6.7(4)(a)(v)(D) states, in part:[632]

> "***(v) Visual Amenity, Landscape Character and Placemaking***
>
> ...
>
> *(D) Guiding principles for visual amenity, landscape character and placemaking are that development:*

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620 Ex.3.001, p.1-66, s 6.14(2)(d); V1-67, s 6.14(2)(k); V1-67, s 6.15(2)(b)(iv) and (2)(c).
621 Ex.3.001, p.1-67, s 6.15(2)(c).
622 Ex.3.001, p.1-86 s 6.20(2)(e).
623 Ex.3.001, p.1-85, s 6.19(2)(g)(v) and (h)(iii); V1-86 s 6.20(3)(a).
624 Ex.3.001, p.1-86 s 6.20(3)(c).
625 Ex.3.001, pp.1-30 to 1-42.
626 Ex.3.001, p.1-41.
627 Ex.3.001, p.1-30, s 6.7(4)(a)(i)(A).
628 Ex.3.001, p.1-31, s 6.7(4)(a)(i)(G).
629 Ex.3.001, p.1-31, s 6.7(4)(a)(i)(H).
630 Ex.3.011, p.1-34, s 6.7(5)(a)(ii)(B) and (C).
631 Ex.3.001, p.1-36, s 6.7(5)(e)(v).
632 Ex.3.001, pp.1-32 to 1-33.

> *(I) creates a high quality business park environment that is distinct from traditional industrial areas;*
>
> *(II) provides a visually appealing backdrop to the Ripley Valley Urban Core, Ripley Valley Secondary Urban Centre East, Redbank Plains residential areas and all other interfaces with surrounding residential areas to eliminate negative amenity impacts (e.g. noise, odour, etc.);*
>
> ...
>
> *(IV) acknowledges the inherent values of surrounding natural environments and do not adversely impact on them; and*
>
> *(V) enhances the existing and future green space environments*."

[579] I am satisfied compliance has been demonstrated with the above planning scheme provisions. This is revealed when the development is considered having regard to three points of reference. First, having regard to its general layout and design standard. Second, having regard to potential operational impacts. Third, having regard to the impacts of the final landform beyond the boundaries of the land.

[580] I am satisfied the general layout and design of the development will achieve the high standard of amenity, sense of place and character contemplated by the planning scheme for the Swanbank New Chum area. This is, in large measure, due to the proposed landscaping and rehabilitation of the land, limited built form and intended function of the buffer area. The proposed plans, read together with the photomontages, establish the development will be appropriately landscaped. The landscaping will ensure the development achieves, to an appropriate extent, a greenspace setting. This greenspace setting is achieved, in part, through the provision of the buffer area. This area '*buffers*' the proposed use from Cunningham Highway, and, in addition, provides a meaningful link to, and integration with, the greenspace network. The extent of built form will also be minimal. It has been designed and sited to ensure, in combination with the vegetated screen, that it will blend in with the backdrop. As the photomontages demonstrate, this will be an acceptable visual amenity outcome. They also make good that the proposed development will significantly improve the visual appearance of this locality when viewed from residential areas to the east.

[581] With respect to operational impacts, it is clear the experts retained by Austin have given careful consideration to the management of amenity impacts. Impacts of this kind are to be managed by a combination of measures, namely: (1) processing activities will be carried out in the sheds located in the recycling and processing area thereby screening those activities from view; (2) the processing sheds will be constructed generally in accordance with the proposed plans, and in a colour that will assist to blend them with a vegetated screen; (3) the recycling and reprocessing area will be enveloped by a vegetated screen; (4) the landfill will be progressively rehabilitated in stages and substages, repairing the land; and (5) the placement and

compaction of fill within the void can be screened with a mobile barrier chasing the fill as it is placed, thereby screening the use from view.

[582] Section 6.7(4)(a)(v)(D) of the planning scheme identifies a guiding principle in relation to visual amenity and place making. It requires new development to contribute to a visually appealing backdrop for existing and future residential uses. The photomontages establish this will be achieved when seen from seven viewpoints. In this regard, I take comfort from the evidence of Mr Powell and Mr Curtis who agreed the proposed development (as depicted in the photomontages) will be visually acceptable.[633]

[583] The evidence of the visual amenity experts provides a high degree of confidence the proposed development will not have unacceptable amenity impacts.

[584] Mr Curtis, who was called by Council, was cross-examined about the visual acceptability of the proposal. He conceded:

(a) the proposed development would provide an attractive background and merge '*really well*' into the background area;[634]

(b) the proposed development would be compatible with the character of the local area;[635]

(c) when compared to existing circumstances, the proposed development would provide an improved visual backdrop;[636]

(d) the proposed development would assist in providing an improved sense of place and not have any unacceptable impacts on the sense of place;[637]

(e) from a sensitive receptor's perspective, the proposed development would appear as a restored landform commensurate with pre-mining levels;[638]

(f) the proposed development would be well landscaped in comparison to the surrounding area;[639] and

(g) the proposed development would provide an enhanced skyline compared to existing circumstances and conceal scarring to the landscape.[640]

[585] The overwhelming impression to be taken from Mr Curtis' evidence is that the proposed development, as depicted in the photomontages, is not only visually acceptable, it represents a marked improvement from existing circumstances. In visual terms, the proposed development represents an opportunity to improve the situation for existing residential neighbourhoods and any future residential neighbourhoods that would enjoy the same, or similar, view to one of the seven viewpoints depicted in the photomontages.

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633 Ex.8.010, paras 43, 47 and 87(b).
634 T33-5, L1-10.
635 T33-5, L20-21.
636 T33-4, L5-22.
637 T33-4, L41-44 & T32-98, L21-22.
638 T32-98, L45-47.
639 T32-93, L13-36.
640 T32-99, L1-3 & L11-19.

[586] In fairness to Mr Curtis, it can be observed he did raise matters for consideration that are adverse to the development.

[587] In the joint expert report, Mr Curtis expressed reservation about the reliance placed upon nominated stages and sub-stages of the development. He also pointed out that the vegetated screen proposed for the recycling and processing area would take time to mature before the built form is screened from view. I am satisfied these concerns can be addressed through conditions of approval.

[588] A condition will be required to ensure the staging and sub-staging of the development occurs in the manner assumed by the visual amenity experts.

[589] Detail will no doubt emerge in time that informs the staging and operation of the mobile noise barrier/screen. Conditions of approval should reflect the intention that, irrespective of the detail that emerges, the operational aspects of the use are to be screened to limit visual impacts beyond RBIA2.

[590] It can be accepted that the vegetation proposed to screen the recycling and reprocessing area will take time to mature and achieve the intended screening function. Mr Powell suggested this would take in the order of 5 years. I accept his evidence; however, to ensure this objective is achieved in practice, and not just theory, a condition will be imposed requiring the vegetation to be of a maturity beyond tube stock at the time of planting. This does not mean the vegetation has to have reached maturity, or close to it, at the time it is planted. The vegetation need only have reached a stage where there is genuine confidence (held by an appropriately qualified expert) the screen will be achieved no later than 5 years after planting commences.

[591] A final matter to observe in relation to visual amenity relates to an assumption made by Mr Curtis. He assumed the land could be rehabilitated as proposed; that is, he assumed the landfill cap could be planted with trees. Mr Curtis pointed out that his opinion changes if the surface of the landfill was finished with grass rather than trees.

[592] As I understood his evidence, Mr Curtis accepted that a grass cap would represent an improvement over and above existing circumstances but was not in favour of it as a satisfactory visual outcome. This was because, in his view, the grass surface would have an unnatural appearance – it would appear as an area that was subject to anthropogenic interference. I accept Mr Curtis' evidence in this regard. It does not however advance the assessment of the development application. The proposal can be approved as proposed, that is, finished with a cap planted with trees and shrubs.

[593] With these matters in mind, I accept the visual impacts of the proposed development will not be unacceptable. This, in combination with the absence of adverse hard amenity impacts (noise, light, odour and dust), leads me to conclude the proposed development will not have any unacceptable impacts on visual amenity, perception and sense of place. This is so even assuming the filling extends beyond the top of the mining void for the purposes of the Activity Code. This was readily, and fairly, conceded by Mr Curtis in any event.

[594] As a consequence of the above, I do not accept the first proposition underlying Council's amenity case is one that should be accepted as warranting refusal.

[595] The above matters also satisfy me that, whilst the land may be visible to sensitive receptors, the proposed development will not have an unacceptable impact on visual amenity, community perception or sense of place by reason of that visibility. The use, waste and its associated activities, will be well screened from view. As a consequence, I am satisfied paragraph [550](b) is not a valid reason for refusal.

[596] With respect to paragraph [550](c), the contention identified requires consideration to be given to whether the proposed development is of a type and scale appropriate for the prevailing nature of the area, and particular circumstances of the land and surrounds. There are a number of matters, taken in combination, that establish this issue is resolved in favour of the proposed development.

[597] First, the use proposed is supported in the Sub Area where the land is located.

[598] Second, the proposed development strongly aligns with the purpose of the Buffer zone.

[599] Third, the proposed development, in amenity terms, will not have any unacceptable impacts by reason of noise, air quality, dust or other hard amenity impacts that one may readily expect, and associate with, a Waste Activity Use.

[600] Fourth, it can be said the proposed development will not have an adverse visual impact. Nor will it have an adverse impact by reason of its visibility on community perception or sense of place. This, in combination with paragraphs [597] to [599], is compelling. It is indicative of development, from an amenity perspective, that is appropriate having regard to its type, scale and surrounding circumstances.

[601] Paragraph [550](d) has in mind that the proposed development, by its very existence will have a significant and detrimental effect on how residents of nearby residential areas perceive the amenity of their neighbourhoods. This contention is consistent with the tenor of properly made submissions. It is not however a matter that militates against approval given: (1) the evidence of Mr Curtis and Mr Powell; (2) relevant planning context traversed earlier in these reasons for judgment, which convey an expectation that the land may be developed with a use of the kind proposed; and (3) the reasons traversed at paragraph [238]. In short, whilst the proposed development will have an impact, that impact cannot be characterised as adverse or unacceptable in all of the circumstances here.

Compliance with the planning scheme

[602] Council contends the proposed development does not comply with the planning scheme. A total of 25 non-compliances were asserted with "*focal provisions*".[641] Council made clear that non-compliance need only be considered for provisions characterised in this way. The specific submission made in this regard was as follows:[642]

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641 Identified in Ex.13.021.

642 Ex.14.024, p.3, para 5.

> "The Court need only consider whether there is compliance or non-compliance with the identified "*focal*" provisions, while other provisions in the issues provide important context."

[603] Before examining each of the asserted non-compliances, it can be observed that Council's case in relation to this aspect of the case assumes the evidence of Messrs Amaral, Collins and Sutherland is accepted in preference to Austin's experts. For the reasons given above, I have formed a different view.

[604] It can also be observed that Council's submissions with respect to non-compliance with the planning scheme are replete with the following assertions, namely the proposed development:

(a) will not rehabilitate the land;

(b) will not rehabilitate the land so it can be used for a purpose consistent with the forward planning articulated in the planning scheme;

(c) will not contain environmental impacts within the business and industry area;

(d) will not contain amenity impacts within the business and industry area; and

(e) has not addressed, nor resolved applicable constraints;

(f) will not adequately screen the use, works and activities from view, particularly for existing and future residential areas.

[605] Having regard to the reasons set out above, I am satisfied the evidence demonstrates that submissions founded on the above assertions should be rejected. In my view, the evidence demonstrates, to a high degree, there is good reason to be confident the proposed development will rehabilitate the land so it can be used in an appropriate manner; it will contain environmental, and amenity impacts within the business and industry area; has been designed and can be executed to resolve applicable constraints; and can be conditioned to screen the use, works and activities from view for existing and future residential communities. The environmental and amenity evidence, taken in combination with the evidence touching upon resource recovery and recycling, also demonstrates the proposed development will contribute positively to Swanbank New Chum, which is planned to be a flagship example of sustainable development.

[606] I will now turn to examine each alleged non-compliance with focal provisions of the planning scheme. The focal provisions are identified in exhibit 13.021.

Overall Outcomes for the Regionally Significant Business and Industry Areas

[607] Council alleges non-compliance with s 6.6(2)(g)[643] of the planning scheme, which states:

> "Degraded or contaminated sites (including former mining sites and overburden stock piles) are rehabilitated and used in an appropriate manner."

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643 Ex.3.001, p.1-28.

[608] This Overall Outcome applies to the all of Regionally Significant Business and Industry Areas identified on Figure 1-1 of the planning scheme.[644]

[609] The provision is raised by Council in two respects. First, as one of a number of '*example*' provisions said to establish the planning scheme, when read together with the 2018 and 2020 TLPIs, has a preference for filling mining voids with '*clean earthen fill*.[645] Second, Council referred to the provision for the purposes of emphasising the importance the planning scheme places upon the rehabilitation and the re-use of degraded sites.[646] I am satisfied neither of these matters gives to rise to non-compliance with the planning scheme here.

[610] For the reasons given above, the planning scheme does not express a preference for mining voids to be filled with clean earthen material. Even if it did by implication, I cannot accept a departure from this preference works non-compliance with the planning scheme. A preference, by definition, is no more than a greater liking for one alternative over another. Here, approval is sought on Council's case for an alternative. The alternative is a use, which is expressly supported in RBIA2. In that Sub Area, constraints are well-known and the need for rehabilitation of degraded land or former mining land is promoted. The proposed development will progressively rehabilitate the land in the manner promoted by the planning scheme.

[611] The importance the planning scheme attaches to the rehabilitation of degraded sites is clear. For the reasons set out above, I am satisfied the proposed development complies with s 6.6(2)(g) of the planning scheme. It will do so in the circumstances described earlier these reasons - the development will free two birds with one key. It involves the use of the land for a purpose envisaged by the planning scheme, and, while doing so, facilitates its rehabilitation so as to be suitable for future industrial uses anticipated in the Investigation and Buffer zones of the planning scheme. This, in my view, is precisely what s 6.6(2)(g) has in mind.

[612] For these reasons, I am satisfied compliance has been demonstrated with s 6.6(2)(g) of the planning scheme.

Specific Outcomes for the Regionally Significant Business and Industry Areas

[613] Council alleges non-compliance with ss 6.7(2)(a)[647] and 6.7(2)(b)(ii)[648] of the planning scheme, which state:

> "The quality of stormwater runoff from a use or site is similar to or better than the established water quality standards for the receiving waters or lawful point of discharge."

And:

> "Uses and works are designed to support integrated catchment management, including-

644 Ex.3.001, p.1-13.
645 Ex.14.024, p.6, para 12(a)(ii), and footnote 11.
646 Ex.14.024, p.65, para 111(a) and footnote 330.
647 Ex.3.001, p.1-29.
648 Ex.3.001, p.1-29.

…

(ii) environmentally acceptable effluent and runoff management systems or techniques which prevent pollution of water sources; and"

[614] These Specific Outcomes apply to all Regionally Significant Business and Industry Areas identified on Figure 1-1 of the planning scheme.[649]

[615] In the context of '*environmental outcomes*', it was submitted on behalf of Council that focal provisions of the planning scheme emphasise the importance of '*appropriate design and management*'. It was said this must be positively resolved in order for the development to be approved.[650] This can be accepted.

[616] The Specific Outcomes set out above are two of four provisions relied upon to support this contention.[651] The submission made on behalf of Council was to this effect: '***s.6.72(a)*** *and* ***(b)(ii)*** *relate to stormwater quality and runoff management*'. This submission states the obvious; that the provisions relate to stormwater is clear enough from their terms. The more important question is: why is there non-compliance with each provision?

[617] Unfortunately, Council's submissions do not address this point directly in circumstances where:

(a) water on the land may not be discharged to the unnamed drainage channel and Six Mile Creek unless and until it complies with stated water quality objectives (paragraphs [65], [66], and [96]);

(b) the proposed development can be conditioned to require the implementation of the integrated water management system as described by Mr Marszalek (paragraphs [392] and [394] to [395]), which will operate in conjunction with the draft REMP to protect the values of the receiving environment;

(c) the surface water and stormwater experts agreed it had been demonstrated the proposal will, if approved, result in site discharges similar to pre-mining levels, which is a '*a major improvement over the existing situation*';[652]

(d) the EA includes conditions that require the implementation of a surface water monitoring programme (WT2 and WT3), a purpose of which is to monitor potential impacts on the receiving environment; and

(e) Council does not contend impacts on the aquatic ecology of the unnamed drainage channel and Six Mile Creek call for refusal of the proposed development.

[618] Each of the above matters, taken in combination, establish the proposed development can be conditioned to ensure: (1) the quality of stormwater runoff complies with recognised and appropriate standards; and (2) the proposed

649 Ex.3.001, p.1-13.
650 Ex.14.024, p.24, para 63.
651 Ex.14.024, p.25, para 63(i).
652 Ex.8.006, p.14, para 42.

development will protect, rather than unacceptably pollute, the downstream receiving environment.

[619] I am satisfied the proposed development can be conditioned to comply with ss 6.7(2)(a) and (b)(ii) of the planning scheme.

Swanbank New Chum – Preferred development outcomes

[620] Council alleges non-compliance with 6.7(4)(a)(i)(A)[653] of the planning scheme, which states:

> "Swanbank New Chum is a flagship example of effective sustainable development integrated into the surrounding emerging communities of Ipswich City."

[621] This provision is part of the '*Overall vision*' for entirety of the Swanbank New Chum area identified on Figure 6-7-1 of the planning scheme.[654] It is referred to on two occasions in Council's written submissions, namely:

(a) as a focal provision relevant to '*Resource recovery and Sustainability*';[655] and

(b) as a focal provision relevant to amenity considerations in that it manifests an intention for '*this area*' to be a flagship example of effective sustainable development '*integrated into the surrounding emerging communities of Ipswich City*'. [656]

[622] With respect to resource recovery and sustainability, this issue is considered in detail below. For the purposes of examining non-compliance with the planning scheme, it is necessary to consider three propositions central to this part of Council's case, namely that: (1) the proposed development disincentivises resource recovery and the achievement of recovery goals and targets; (2) the resource recovery component of the proposed development does not justify the landfill component; and (3) the landfill component is not sustainable development.[657] Item (3) was developed in Council's written submissions with respect to the common issues of waste and need. It was also developed from paragraph 41 and onwards of its site specific submissions.

[623] Council's submissions in relation to sustainability, in so far as they call on resource recovery and recycling, cannot be accepted.

[624] Section 6.7(4)(a)(i)(A) of the planning scheme is describing the overall vision for an area that includes, but is not limited to, the land. It is this area which is intended to be a '*flagship example*' of '*effective sustainable development*'. Neither phrase is defined. The manner in which development on any given site will to contribute to these ideals is also not fixed by the planning scheme. Compliance is a matter of fact and degree.

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653 Ex.3.001, p.1-30.
654 Ex.3.001, p.1-41.
655 Ex.14.024, p.11, para 31 and footnote 24.
656 Ex.14.024, p.69, para 125(a), and footnote 338.
657 Ex.14.024, p.11, para 30 and onwards.

[625] In my view, the flagship example of '*sustainable development*' is to be taken as a reference to future development in the area depicted on Figure 6-7-1 of the planning scheme. That area is intended to be developed to achieve the preferred development outcomes (as a whole) stated in s 6.7(4). For reasons given above, and to follow, I am satisfied compliance has been demonstrated with this part of the planning scheme. In this sense, the proposed development will positively contribute to the vision for Swanbank New Chum.

[626] I do not accept the overall vision for the Swanbank New Chum Area as stated in the planning scheme requires, let alone promotes, development that positively contributes to recycling and resource recovery. As Council conceded in its written submissions, this concept is not a feature of the planning scheme.[658] If, however, a contrary view is taken, I am satisfied the proposed development will contribute to the overall vision for Swanbank New Chum in a positive way. It will contribute in that the proposed development: (1) includes a meaningful resource recovery component; (2) will rehabilitate a degraded site concurrent with its use for an industrial purpose anticipated in the Swanbank New chum area; (3) will rehabilitate a degraded site such that it can be used in an appropriate manner in the future for a planned purpose, namely light industrial uses; (4) will rehabilitate the land such that green spaces and buffers will be enhanced, providing a link with surrounding green spaces; (5) will be of the highest environmental standard having regard to the evidence of Dr Williams, Dr Rhode and Messrs Marszalek, Tomlin and Hornsey, which I accept; and (6) will provide employment opportunities as anticipated by the planning scheme.

[627] This does not mark the end of asserted non-compliance with s 6.7(4)(a)(i)(A) of the planning scheme.

[628] The second aspect of Council's case relates to an issue of integration. Section s 6.7(4)(a)(i)(A) speaks of development being integrated into the surrounding emerging communities. This is, in my view, a prospective description of the Swanbank New Chum Area as a whole. That said, I am comfortably satisfied the proposed development will be well integrated with surrounding residential communities. This is evident from: (1) the extent of separation from those communities; (2) the strong alignment demonstrated with the Buffer zone provisions of the planning scheme; (3) the extent of buffering provided by distance and vegetation to sensitive land uses to the east, as required by the planning scheme; and (4) the absence of any unacceptable amenity impacts for existing and future residential communities.

[629] I am satisfied compliance has been demonstrated with s 6.7(4)(a)(i)(A) of the planning scheme.

[630] Council alleges non-compliance with a further part of the overall vision statement for Swanbank New Chum, namely 6.7(4)(a)(i)(G)[659], which states:

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658 Ex.14.024, p.13, para 37.
659 Ex.3.001, p.1-31.

> "Development will progressively lead to the rehabilitation of areas degraded by past mining activities and the integration of these areas within a network of green spaces."

[631] This provision is raised in Council's written submissions in the context of rehabilitation.[660]

[632] I am satisfied compliance has been demonstrated with this provision of the planning scheme, particularly having regard to the evidence of Dr Rhode and the strong alignment demonstrated with the Buffer zone provisions of the planning scheme.

[633] Council alleges non-compliance with s 6.7(4)(a)(v)(C)[661], which has application to visual amenity, landscape character and placemaking for Swanbank New Chum. The provision states:

> "The built form, private landscaping, streetscape design and green spaces, enhance the character and contribute to the creation of a safe healthy and attractive employment environment that caters to a range of business and industrial uses."

[634] Council's written submissions raise this as a focal provision in the context of amenity. The submissions emphasise the phrase '*enhance the character*'.[662]

[635] For reasons given above, I am satisfied the proposed development involves built form, landscaping, design and green spaces that will enhance the character of Swanbank New Chum. It will also enhance the visual character of the area, particularly from the vantage points depicted in the photomontages.

[636] I am satisfied compliance has been demonstrated with s 6.7(4)(a)(v)(C) of the planning scheme.

[637] Finally in this part of the planning scheme, Council alleges non-compliance with s 6.7(4)(a)(v)(D)(II)[663], which provides guiding principles for visual amenity, landscape character and placemaking for Swanbank New Chum. The provision states:

> "(D) Guiding principles for visual amenity, landscape character and placemaking are that development-
>
> …
>
> (II) provides a visually appealing backdrop to the Ripley Valley Urban Core, Ripley Valley Secondary Urban Centre East, Redbank Plains Residential areas and all other interfaces with surrounding residential areas to eliminate negative amenity impacts (e.g. noise, odour etc.);"

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660 Ex.14.024, p.65, para 111(a) and footnote 330.
661 Ex.3.001, p.1-32.
662 Ex.14.024, p.69, para 125(b) and footnote 340.
663 Ex.3.001, p.1-33.

[638] Council's written submissions address this provision in the context of amenity considerations.[664] The submissions emphasise the words '*visually appealing backdrop*' and point out that the reference to surrounding residential areas includes the road network.

[639] Not all of the provision is applicable to this case; Ripley Valley and Redbank Plains are not relevant to this case. The issue to be examined is whether the development provides a visually appealing backdrop to '*other interfaces with surrounding residential areas*'. The stated purpose of this is to '*eliminate negative amenity impacts*'.

[640] For reasons already given, the evidence demonstrates compliance with this provision of the planning scheme.

Swanbank New Chum – Preferred pattern of development

[641] The preferred pattern of development for Swanbank New Chum is depicted in a Land Use Master Concept Plan. This concept plan is Figure 6-7-1 of the planning scheme. It indicates the land is designated '*Land-Extensive, Business Enterprises*'.

[642] Specific Outcomes for the Swanbank New Chum area are set out in s 6.7(5)(a) of the planning scheme. Council alleges non-compliance with s 6.7(5)(a)(ii)(C), which states:

> "(ii) The uses and works within the Swanbank New Chum area are located and relate to each other in ways that –
>
> …
>
> (C) achieve a high standard of amenity with particular regard to minimising environmental and amenity impacts on existing and proposed residential areas and promoting overall visual attractiveness."

[643] For reasons already given, I am satisfied the proposed development will be located and relate to other uses in a way that achieves a high standard of amenity. It will also minimise environmental, and amenity, impacts on existing and future residential communities.

[644] Specific Outcomes that relate to the Land-Extensive, Business Enterprises designation are contained in s 6.7(5)(e) of the planning scheme. Council alleges non-compliance with Specific Outcomes 6.7(5)(e)(v)(A) & (B),[665] which state:

> "(v) Plant, equipment and storage areas are located and screened so that –
>
> (A) materials and products are not visible from a road or public right of way or nearby residential area (either existing or proposed); and

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664 Ex.14.024, p.69, para 125(c) and footnote 341.

665 Ex.3.001, p.1-36.

(B) environmental and amenity impacts are contained within the designated business and industry area."

[645] Whilst no specific submission was made about this focal provision, I understood Council to be emphasising: (1) the need for containment of amenity impacts within the business and industry area; [666] and (2) the importance attached to screening uses.[667]

[646] I am satisfied the evidence establishes compliance with this provision of the planning scheme. In particular, the evidence establishes that:

(a) the proposed development will be separated and screened from viewpoints located to the west (Cunningham Highway and residential development);

(b) plant, equipment and storage areas will be located within sheds, which have been designed and located so as to be sited behind a vegetated buffer (30 to 40 metres deep) – this will screen activities and materials when viewed from the east;

(c) the proposed development can be conditioned to require the provision of a mobile screen to restrict views from the east to the working face of the landfill;

(d) the proposed development will not have unacceptable visual impacts on existing and future residential areas, particularly areas located to the east;

(e) the proposed development can be conditioned to appropriately manage noise, dust and odour impacts – these impacts will be contained within the business and industry area; and

(f) the proposed development can be planned and executed in accordance with a raft of conditions intended to ensure its environmental impacts will not be unacceptable, let alone extend beyond the business and industry area.

[647] Non-compliance is also alleged with Specific Outcome 6.7(5)(e)(x),[668] which states:

"Degraded lands are rehabilitated or repaired."

[648] Council rely upon this Specific Outcome as a focal provision in the context of rehabilitation. That rehabilitation of degraded sites is an important objective for the planning scheme can be accepted without qualification.[669]

[649] For reasons already given, the land is degraded. The evidence establishes it will be progressively rehabilitated and repaired by the proposed development. Compliance has been established with this Specific Outcome of the planning scheme.

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666 Ex.14.024, p.69, para 125(a) and footnote 339.
667 Ex.14.024, p.70, para 125(g) and footnote 347.
668 Ex.3.001, p.1-37.
669 Ex.14.024, p.65,para 111(a) and footnote 330.

Investigation zone, Overall Outcomes

[650] Council alleges non-compliance with three Overall Outcomes for the Investigation zone. These provisions are identified as focal provisions.

[651] Overall Outcome 6.14(2)(a)[670] states:

> "Uses and works within the Regional Business and Industry Investigation Zone provide regional business enterprise and industry employment opportunities subject to resolution of applicable constraints such as potential amenity impacts on nearby residential areas, mining, flooding and availability of services."

[652] This Overall Outcome requires uses to provide, inter alia, employment opportunities within the Investigation Zone. The evidence comfortably establishes, and it was not suggested otherwise, that this part of the Overall Outcome will be achieved by the proposed development. It is, as a consequence, the latter part of the provision that gives rise to controversy. The latter part requires an examination of this issue: has it been demonstrated that constraints have been resolved, bearing in mind the potential for the proposed development to give rise to serious adverse environmental and amenity impacts?

[653] Council relied upon Overall Outcome 6.14(2)(a) as a focal provision to:

(a) contend approval will always be subject to the '*highest standards of the resolution of applicable constraints*', which, here, involves considerable risks to the environment and amenity over many decades;[671]

(b) to emphasise the intention of '*this area*' to be a flagship example of effective sustainable development and one integrated into surrounding emerging communities of Ipswich City;[672] and

(c) to emphasise the importance the planning scheme places upon the rehabilitation of degraded sites.[673]

[654] The evidence, in my view, demonstrates the environmental and amenity constraints, of which there are many, have been resolved to a high standard. Indeed, the evidence left me with a high degree of confidence that site constraints are well understood; were the subject of careful examination; and the subject of considered professional recommendations. The recommendations of the experts will be adopted and, if implemented and executed, engender confidence that the proposed development, in environmental and amenity terms, will not give rise to unacceptable impacts.

[655] Against this background, I am satisfied compliance has been demonstrated with Overall Outcome 6.14(2)(a). This is not displaced or eroded by the points identified in paragraph [653](b) and (c). These matters have already been the subject of consideration and compliance has been demonstrated with these points of emphasis.

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670 Ex.3.001, p.1-66.
671 Ex.14.024, p.6, para 12(a)(i) and footnote 10; p.65, para 111(b) and footnote 331.
672 Ex.14.024, p.69, para 125(a) and footnote 338.
673 Ex.14.024, p.70, para 125(h) and footnote 348.

[656] Overall Outcome 6.14(2)(f)(ii)[674] for the Investigation zone states:

> "(f) Such activities-
> …
>
> (ii) should not have a significant detrimental amenity impact on nearby existing or proposed residential areas; or"

[657] Council relies upon this Overall Outcome in the context of, again, emphasising the need to contain impacts with the business and industry area.[675] For reasons already given, I am satisfied compliance has been demonstrated with this Overall Outcome.

[658] I pause to observe that the Overall Outcome speaks of '*significant detrimental*' impact on nearby existing or future residential areas. In planning terms, the use of this phrase conveys, in my view, something about the extent of the impact anticipated and accepted as being compliant with the planning scheme. Here, the evidence comfortably establishes the impacts of the proposed development are not fairly characterised as '*detrimental*', let alone approaching '*significantly detrimental*'.

[659] Overall Outcome 6.14(2)(j)[676] for the Investigation zone states:

> "Degraded or contaminated sites (including former mining sites and overburden stockpiles) are rehabilitated and used in an appropriate manner."

[660] This Overall Outcome is relied upon as a focal provision by Council to emphasise the importance of rehabilitation in the planning scheme.[677] The provision is a repeat of s 6.6(2)(g). I am satisfied compliance has been demonstrated for the same reasons as those applying to s 6.6(2)(g) and Specific Outcome 6.7(5)(e)(x) of the planning scheme.

Investigation zone, Effects of development

[661] Section 6.15 of the planning scheme contains Specific Outcomes for the Investigation zone in terms of the '*effects of development*'. Under this heading is subsection (15), which deals with '*Integrated Planning, Uses and Works*'. Council asserts non-compliance with Specific Outcomes (15)(c) and (d),[678] which state:

> "Uses and Works within the Regional Business and Industry Investigation Areas occur within a comprehensive planning framework that-
> …
> (c) provides suitable building sites and methods of construction, having particular regard to geotechnical constraints;

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674 Ex.3.001, p.1-66.
675 Ex.14.024, p.69, para 125(a) and footnote 339.
676 Ex.3.001, p.1-67.
677 Ex.14.024, p.65, para 111(a) and footnote 330.
678 Ex.3.001, p.1-69.

(d) provides for rehabilitation, repair and reuse of former mining lands;"

[662] Council's written submissions emphasise this provision in relation to: (1) the need for appropriate design and management;[679] and (2) the importance the planning scheme attaches to rehabilitation.[680]

[663] I am satisfied the evidence demonstrates compliance with subsections (c) and (d) above. In particular, the evidence of Dr Williams, Mr Watson and Dr Rhode demonstrates the proposed development has been designed, and can be conditioned, to ensure the footprint of the proposed buildings (and the associated methods of construction) are responsive to the geotechnical constraints of a former mining site. Further, the evidence establishes the land will be rehabilitated in the manner anticipated by the planning scheme.

Effects of development within Sub Areas

[664] Swanbank New Chum is identified as a Sub Area, RBIA2, in the Investigation Zone. The planning scheme identifies Specific Outcomes for RBIA2. Council asserts non-compliance with three such Outcomes.

[665] Specific Outcome 6.16(2)(a)(iv)[681] sits beneath a heading of '*Land Use Mix*', and states:

"The Sub Area supports uses which-
…
(iv) provide more capital intensive, business, industry, recreation and community uses, including some 'difficult to locate' activities, where the use has no discernible amenity or environmental impacts outside of the Sub Area, including-
…
(F) special industries; and"

[666] Council's written submissions emphasise this Specific Outcome for two reasons. First, to emphasise the need for development to resolve applicable constraints.[682] Second, to emphasise the need for impacts to be contained within the business and industry area.[683]

[667] I am satisfied the evidence demonstrates the constraints have been resolved and impacts will be contained within the business and industry area. Compliance is, as a consequence, demonstrated with the Specific Outcome.

[668] The Specific Outcome, rather than calling for refusal, supports the proposed development. The proposed development is a '*difficult to locate*' use that will have no discernible amenity or environmental impacts outside the Sub Area. In circumstances such as this, the Specific Outcome makes clear that the development,

679 Ex.14.024, p.25, para 63(a)(ii).
680 Ex.14.024, p.65, para 111(a) and footnote 330.
681 Ex.3.001, p.1-74.
682 Ex.14.024, p.65, para 111(b) and footnote 331.
683 Ex.14.024, p.69, para 125(a) and footnote 339.

which is a '*special industry*', is '*supported*' in the Sub Area. This support is not without significance. It is support gained for the proposed use at a level of the planning scheme which reflects, in my view, deliberate and particular forward planning decisions. That the planning is particular and deliberate is clear once it is appreciated it applies to a small Sub Area depicted on the zoning map. The planning purpose for a Sub Area within a zone is explained in note 1.13A of the planning scheme, which states:[684]

> "Some zones are further divided into areas having certain features (e.g. related to use or physical character) that affect the application of assessment categories or assessment criteria."

[669] Specific Outcomes 6.16(2)(b)(i) & (ii)[685] sit beneath a heading that reads '*Streetscape and Visual/Aesthetic considerations*', and state:

> "(i) New uses and works present buildings of a high visual quality when viewed from the Cunningham Highway, Old Ipswich Road, Redbank Plains Road, the Centenary Highway, the Ipswich to Springfield Public Transport Corridor and nearby existing or planned residential areas.
>
> (ii) Buildings and any outdoor areas used for plant, equipment and storage are screened with appropriate landscaping particularly when viewed from the Cunningham Highway, Old Ipswich Road, Redbank Plains Road, the Centenary Highway, the Ipswich to Springfield Public Transport Corridor and nearby existing or planned residential areas."

[670] Council's written submissions emphasise the above Specific Outcomes on the footing they call for development to provide a '*visually appealing backdrop*' to surrounding residential development, including the road network.[686] I am satisfied the photomontages, together with the evidence of Mr Powell and Mr Curtis, comfortably establish the proposed development will provide a visually pleasing backdrop to surrounding residential development, including the road network.

[671] The same body of evidence also demonstrates: (1) the uses, works and buildings will be well screened with landscaping when viewed from the Cunningham Highway, existing and future residential areas to the west and existing and future residential areas to the east; and (2) the landscaping and built form has been designed, and sited, so that components of the use blend into the backdrop from distant viewpoints, rather than draw attention to high quality built form. In this way, the development, taken as a whole, will be of '*high visual quality*', commensurate with the kind development anticipated by the planning scheme. The end result is a development that appreciably improves the visual presentation of the land and surrounding locality, particularly when viewed from existing residential communities to the east.

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684 Ex.3.001, p.1-14.
685 Ex.3.001, p.1-74.
686 Ex.14.024, p.69, para 125(c) and footnote 341.

Consistent and inconsistent uses

[672] Section 6.17(2)(t)[687] of the planning scheme provides that a special industry may be consistent in the Investigation zone where a qualification is satisfied. The provision states:

> "The following uses, use classes and other development categories are consistent with the outcomes sought for the Regional Business and Industry Investigation Zone if of a type and scale appropriate for the prevailing nature of the area and the particular circumstances of the site and its surrounds-
> …
> (t) special industry;"

[673] Council's written submissions draw upon the above provision in two ways. First, to emphasise '*approval will always be subject to the highest standards of resolution of applicable constraints*'.[688] Second, to emphasise it must be demonstrated the use proposed is of a '*type and scale appropriate for the prevailing nature of the area and the particular circumstances of the site and its surrounds*'

[674] I am satisfied the evidence establishes the site constraints are well known and have been the subject of careful examination by a significant number of experts. The same body of evidence establishes the development has been designed, and can be conditioned, to ensure there is a high degree of confidence that the land constraints will be appropriately addressed. This is clear from two parts (the base and upper liner) of the proposal, both of which are directed towards the management of constraints and, without controversy, will be of a standard that is better than best practice.

[675] For reasons already given above, I am satisfied the evidence establishes the development can be conditioned to comply with s 6.17(2)(t) of the planning scheme. This evidence also demonstrates the use will be of a '*type and scale appropriate for the prevailing nature of the area and the particular circumstances of the site and its surrounds*'. This finding is inevitable once it is appreciated the proposed development will not give rise to unacceptable environmental and amenity impacts beyond the business and industry area.

[676] In my view, s 6.17(2)(t) provides support for the proposed development rather than calls for refusal. The significance of that support should not be understated.

[677] Whilst not a particularly common practice in modern planning controls, planning schemes in Queensland have, in the past, articulated deliberate forward planning decisions through the identification of consistent and inconsistent uses. The importance of such a planning decision is more commonly a feature of cases where development is found to be '*inconsistent*'. In cases of this kind, inconsistency has been pressed (with varying degrees of success) to establish serious, if not decisive, non-compliance with a planning scheme.

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687 Ex.3.001, p.1-77.

688 Ex.14.024, p.6, para 12(a)(i) and footnote 10; p.65, para 111(b) and footnote 331.

[678] I have significant difficulty accepting that the characterisation of a use as consistent or inconsistent under a planning scheme alone will be decisive in the PA assessment and decision making regime; however, that a use is characterised in this way calls for careful consideration of the adopted planning control. It needs to be examined to ascertain what significance, if any, should be attributed to such a characterisation.

[679] Here, it is my view that the identification of the proposed use as potentially consistent in the zone is a matter of significance for this planning scheme. This is because the planning scheme reflects three deliberate planning decisions. They are entitled to recognition and ought be given their full force and effect. First, the planning scheme reflects that a deliberate decision was made to identify special industry as a potentially consistent use in the Investigation zone. Second, the planning scheme reflects that a deliberate decision was made to curtail the type and scale of special industries, which may be appropriate in the zone. This is achieved through a stated qualification. Third, the planning scheme reflects that a special industry is given express support in Sub Area RBIA2, subject to meeting a qualification.

[680] The proposed development is a special industry that meets the stated qualifications. This is entitled to significant weight in the exercise of the discretion, particularly when it is taken in combination with compliance demonstrated with: (1) the Overall and Specific Outcomes for the Investigation zone;[689] (2) the RBIA2 specific provisions in the Investigation zone;[690] and (3) provisions with respect to the Buffer zone. There are, in my view, no sound town planning reasons to adopt a different course.

Commercial and Industrial Code, Overall Outcomes

[681] The Commercial and Industrial Code is contained in Part 12, Division 7 of the planning scheme. It applies to development of a stated type. [691] It is not location specific. It applies throughout the entire planning scheme area.

[682] Council asserts non-compliance with three Overall Outcomes of the Code.

[683] Overall Outcomes 12.7.3(2)(a)(i) & (ii)[692] of the planning scheme state:

> "(2) The overall outcomes sought for the Commercial and Industrial Code are the following –
>
> (a) commercial and industrial uses and works-
>
> (i) are undertaken in a manner which does not cause a nuisance or disturbance to the occupiers or users of other nearby land, particularly nearby residents and other sensitive receptors;

689 Ex.3.001, p.1-66 to 1-70, ss 6.14 and 6.15.
690 Ex.3.001, p.1-73 to 1-75, s 6.16(2).
691 Ex.3.001, p.1-23, s 1.17(1)(b).
692 Ex.3.001, p.1-123.

> (ii) are compatible with the physical characteristics of the site where they are located and the character of the local area;"

[684] Whilst the list of issues identifies subsection (a)(i) as a focal provision, it was not addressed in Council's written submissions. The same cannot be said for (a)(ii). This provision was addressed in Council's written submissions. It was relied upon to emphasise the need for development to demonstrate compatibility with the '*physical characteristics of the site*'.[693]

[685] I am satisfied the evidence demonstrates compliance with subsections (a)(i) and (a)(ii) above. I would add that the evidence demonstrates the development can be approved, subject to conditions, and it will be compatible with the physical constraints of the site and the character of the local area. The character of the local area, as envisaged by Council's own forward planning, incorporates development of the kind proposed.

[686] Overall Outcome 12.7.3(2)(b)[694] states:

> "Commercial and industrial uses and works are developed and managed in accordance with acceptable environmental standards."

[687] Council asserts non-compliance with this Overall Outcome. It was a provision emphasised as being supportive of the proposition that 'design and management' are key issues to be addressed.[695]

[688] The combined evidence of Dr Williams, Dr Rhode, Messrs Tomlin, Marszalek, Watson and Hornsey and Ms Thorburn, establishes the proposed development has been designed, and can be conditioned, to ensure it is managed in accordance with acceptable environmental standards. It has also been demonstrated that the development can be successfully managed in times of extreme weather events or system failure, to preclude adverse environmental impacts. Compliance has, as a consequence, been demonstrated with this Overall Outcome.

Commercial and Industrial Code, Effects of development

[689] Section 12.7.4 of the Commercial and Industrial Code deals with the '*Effects of development*'. The provisions that sit beneath the heading are described as '*General provisions*'.[696]

[690] Council asserts non-compliance with the only Specific Outcome in this part of the Code that follows the heading '*Effects on Amenity and Public Utilities*'. Section 12.7.4(1)[697] states:

> "The establishment of a commercial or industrial use has no significant detrimental effect on the amenity and general well-being of

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693 Ex.14.024, p.69, para 125(e) and footnote 345.
694 Ex.3.001, p.1-124.
695 Ex.14.024, p. 25, para 63(a)(iii).
696 Ex.3.001, p.1-124.
697 Ex.3.001, p.1-124.

> the area and does not impose a load on any public utility beyond its capability to service the use or works."

[691] Council's written submissions advance this Specific Outcome in the context it calls for the containment of amenity impacts within the business and industry area.[698]

[692] The '*area*' can be assumed to include the land depicted on Figure 6-7-1 of the planning scheme, and residential areas (future and existing) to the west and east. Taking this as the relevant area, the evidence establishes that the amenity of this '*area*' will not be unacceptably impacted by the proposed development. I am comfortably satisfied the impacts will be appropriately managed. This will ensure the use will not have a '*significant detrimental effect*' on the amenity, general well-being and sense of place of the area.

[693] Given this finding, and given it is not suggested the proposed development will impose a load on any public utility beyond its capability, I am satisfied compliance has been demonstrated with this provision of the Commercial and Industrial Code.

Commercial and Industrial Code, Specific industrial uses

[694] Section 12.7.8 of the Commercial and Industrial Code deals with the effects of '*Specific industrial uses*'.[699] One such use is '*Recycling Premises*'. Council asserts non-compliance with a Specific Outcome in this part of the Code dealing with '*Site Appearance*'. Specific Outcome (2)(a) states: [700]

> "Recycling Premises are designed to minimise possible adverse visual and noise impacts on local amenity."

[695] Council's written submissions about this Specific Outcome were not helpful. The provision was relied upon to emphasise that development is to '*promote overall visual attractiveness*'.[701] The submissions do not explain why, or how, non-compliance arises with the provision.

[696] In any event, I am satisfied the proposed development has been designed, and can be conditioned, to comply with s 12.7.8(2)(a) of the planning scheme. In so far as this involves visual considerations, I am satisfied this flows from the evidence of Mr Powell and Mr Curtis. In relation to noise considerations, Council accepted they are a matter for conditions.

Conclusion: alleged non-compliance with the planning scheme

[697] I am satisfied Austin has demonstrated the proposed development complies with the planning scheme. In addition, for reasons given above, it can be said there is strong alignment with particular parts of the planning scheme in circumstances where it positively supports approval in this case. Given it is not suggested the planning scheme is unsoundly based or overtaken by events, compliance with the planning

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698 Ex.14.024, p.69, para 125(a) and footnote 339.
699 Ex.3.001, p.1-129.
700 Ex.3.001, p.1-129.
701 Ex.14.024, p.69, para 125(d) and footnote 342.

scheme is a matter, which attracts significant weight in the exercise of the discretion.

Compliance with the 2018 and 2020 TLPIs

[698] Council contended the proposed development does not comply with the Activity Code forming part of the 2018 and 2020 TLPIs. It will be recalled that neither TLPI was in force when the development application was treated as being properly made. The Activity Code, and any assessment against is therefore, at best, a relevant matter, which may be given weight in the assessment.

[699] A total of 14 non-compliances are asserted with "*focal provisions*" of the Activity Code.[702]

[700] Like the alleged planning scheme non-compliances, it can be observed that Council's case in relation to the Activity Code (save for one point) assumes the evidence of its experts is accepted in preference to Austin's. For reasons given above, I have formed a different view.

[701] Again, like alleged planning scheme non-compliances, it can be observed that Council's submissions with respect to non-compliance in relation to the Activity Code are replete with a number of themes. It is asserted the proposed development:

(a) will have a detrimental impact on the amenity of the surrounding area;

(b) will have a significant impact on visual amenity;

(c) will have a detrimental impact on the environment;

(d) is not designed, nor can be operated or maintained to avoid actual or potential nuisance impacts on residential/sensitive uses; and

(e) will not achieve an appropriate rehabilitation outcome for the land.

[702] Having regard to the above reasons, I am satisfied the evidence demonstrates that submissions founded on the above themes should be rejected.

[703] I will now turn to examine each alleged non-compliance with the focal provisions of the Activity Code. The focal provisions are identified in exhibit 13.021.

[704] It is convenient to deal with the Specific Outcomes of the Activity Code first.

Activity Code, Specific Outcomes

[705] The Activity Code contains seven Specific Outcomes. Council's reasons for refusal put in issue compliance with four, namely Specific Outcomes 4(4), (5), (6) and (7). Each of these provisions are set out at paragraphs [207] to [211] of these reasons. They have not been repeated here.

[706] Specific Outcome 4(4)[703] is relevant to rehabilitation. It requires Waste Activity Uses, as defined, to achieve appropriate rehabilitation outcomes on land affected by

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702 Identified in Ex.13.021.

former mining activities. In this regard the intended rehabilitation outcomes are, inter alia, those that: (1) add to a network of green spaces, environmental corridors and recreation areas; and (2) include appropriate landscaping and revegetation strategies.

[707] For the reasons identified at paragraphs [54] to [56] and [99] to [100], I am satisfied the proposed development complies with items (1) and (2) above.

[708] I am also satisfied, particularly having regard to the evidence of Dr Rhode and Dr Williams, the proposed development will rehabilitate the land in a manner that does not prejudice or compromise the future use, repair or maintenance of the land.[704]

[709] Compliance has therefore been demonstrated with Specific Outcome 4(4) of the Activity Code.

[710] Specific Outcome 4(5)[705] of the Activity Code is relevant to the elevation of filling and earthworks associated with a Waste Activity Use and consequential impacts. The provision requires filling and earthworks to not extend beyond the top of former mining voids. It also requires Waste Activity Uses to be designed, operated and maintained so that '*exposed waste*' is not visible from surrounding residential /sensitive receiving uses.

[711] I am satisfied the evidence of Mr Powell and Mr Curtis demonstrates the development can be conditioned to achieve compliance with Specific Outcome 4(5)(b). Exposed waste will not be visible from residential or sensitive uses.

[712] I have dealt with Specific Outcome 4(5)(a) above. I have reached two conclusions in relation to this provision. First, assuming the top of a former mining void is a reference to the top of the void on the land, the evidence demonstrates compliance with this part of the Activity Code. Second, if it is assumed the top of a former mining void is a reference to the 1972 pre-mining levels, the proposed development does not comply with the Specific Outcome 4(5)(a). This non-compliance is, however, one without substance; it does not sound in adverse planning consequences, such as impacts on visual amenity, character and sense of place. This is a matter of significance given the stated purpose of the 2018 and 2020 TLPIs of which the Activity Code forms part. The stated purpose of the 2018 and 2020 TLPIs is set out at paragraph [194], but bears repeating:[706]

> "The purpose of the TLPI is to regulate applications for new or expanded waste activities within the Swanbank/New Chum industrial area (located within the Ipswich local government area) **to ensure this** regionally significant economic **area is appropriately regulated to protect existing, approved or planned residential and other sensitive receiving uses, from adverse impacts associated with waste activities**." (emphasis added)

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703 Ex.3.002, p.2-6 and 7.
704 Ex.3.002, p.2-7, s 4(4)(c).
705 Ex.3.002, p.2-7.
706 Ex.3.002, p.2-2.

[713] Council submitted Specific Outcome 4(5)(a) '*represents a line in the sand*'.[707] It is emphasised as a provision that identifies a point of planning intent, namely, any new landfill is not intended to extend beyond the top of a former mining void. With this intention in mind, and the evidence establishing the filling will extend, in part, up to 33 metres beyond pre-mining levels, Council submitted:[708]

> "…on this basis, the Council contends there is non-compliance with the provision of the TLPI which seek to ensure that such a use does not extend beyond the top of a "former mining void". In other words, a fundamental quantitative design input (directed to both visual amenity and the 'scale of landfill') sought by the TLPI is not achieved."

[714] On the footing that Specific Outcome 4(5)(a) of the Activity Code prescribes a test against which the height of filling proposed for a Waste Activity Use can be measured, I accept the provision can be regarded as a quantitative control. I also accept it can be regarded as a fundamental control for visual impacts and the scale of Waste Activity Uses. These matters, however, do not advance the matter very far. The photomontages demonstrate that the height of filling, and the scale of the use, will not sound in any adverse planning consequences.

[715] In circumstances such as this, the end result is either: (1) a conclusion there is compliance with Specific Outcome 4(5)(a); or alternatively (2) a conclusion there is technical non-compliance with Specific Outcome 4(5)(a), which does not sound in adverse impacts of the kind the provision is intending to avoid. Irrespective of which conclusion is adopted, neither warrants refusal of the development application.

[716] Specific Outcome 4(6) of the Activity Code is set out at paragraph [210]. It calls for a Waste Activity Use to be examined by reference to four tests. The first two are directed towards buffers and vegetation. Council did not press these as focal provisions. This, in my view, was sensible given the findings at paragraphs [54] to [56]. Council does however assert non-compliance with subsections (c) and (d) of the Specific Outcome. These provisions state:[709]

> "(6) Waste Activity Uses are developed in a manner that:
>
> …
>
> (c) does not adversely affect surface or ground water quality, including through storm water runoff or the dewatering of former mines, and where possible, improves the quality of nearby surface and ground water; and
>
> (d) does not adversely affect stormwater management and where possible, improves the management of the catchment."

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707 Ex.14.024, p.65, para 111(c) and footnote 332; p.69, para 125(f) and footnote 346.
708 Ex.14.024, p.70, para 126.
709 Ex 3,002, p.2-7.

[717] The evidence demonstrates the integrated water management system proposed will achieve compliance with subsections (c) and (d). The system, overall, will ensure the development does not adversely affect surface or groundwater quality through storm water runoff or dewatering. This will be complemented by the works undertaken to divert surface water around the void. These combined measures represent an improvement for the catchment. In conjunction with a requirement that water is tested and treated (if required) before release, these measures will lead to an improvement of the quality of water directed from the land to the receiving environment.

[718] Specific Outcome 4(7)[710] calls for an examination of potential impacts on amenity. The provision is set out in paragraph [211]. It has 3 subsections. Council asserts non-compliance with only subsection (a), which states:

> "(7) Waste Activity Uses are designed, operated and maintained so that-
>
> (a) no nuisance or disturbance is caused to the amenity of surrounding and nearby residential and other sensitive receiving uses;"

[719] The proposed development, in my view, complies with subsection (a). This is in large measure because: (1) the Cunningham Highway, in combination with the vegetated buffer area, provides a significant separation distance to existing and planned residential uses to the west; (2) existing and planned residential development to the east are well separated from the land in circumstances where the development will be screened from their view by vegetation; (3) the development can be conditioned to limit the hours of operation to those identified in paragraph [109]; and (4) the development can be conditioned to manage odour, noise, and dust emissions.

Activity Code, Overall Outcomes

[720] The Overall Outcomes stated in the Activity Code are the purpose of the Code.[711] Two Overall Outcomes are put in issue. Council alleges they are focal provisions.

[721] It is convenient to deal with the second of the two Overall Outcomes first. This is Overall Outcome 3(2)(b).[712] The provision is set out at paragraph [203]. In short, it requires a Waste Activity Use (which is defined to include Landfill) to: (1) not have a detrimental impact on the amenity of the surrounding area; (2) not have a significant impact on visual amenity; (3) not have a detrimental impact on the environment; (4) be designed, operated and maintained to avoid potential nuisance impacts on residential/sensitive uses; and (5) achieve an appropriate rehabilitation outcome for land affected by former mining activities.

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710 Ex.3.002, p.2-7.
711 Ex.3.002, p.2-6, s 3(1).
712 Ex.3.002, p.2-6.

[722] Having regard to the reasons set out above, I am satisfied the proposed development complies with each subparagraph of Overall Outcome 3(2)(b). The evidence, which I accept, establishes this to a high degree.

[723] Overall Outcome 3(2)(a) states:[713]

> "Applications involving new or expanded waste activities that are inconsistent with the outcomes sought by the Swanbank / New Chum Waste Activity Code, constitute undesirable development and are unlikely to be approved."

[724] The proposed development is a new waste activity. To avoid characterisation as '*undesirable development*', it must be demonstrated the development complies with the '*outcomes*' sought by the Activity Code. Assuming the word '*outcomes*' is to be treated as reference to Overall Outcomes and Specific Outcomes and, putting to one side Specific Outcome 4(5)(a), I am satisfied the proposed development should not be characterised as undesirable.

[725] The question is whether this position is altered when the assessment against Specific Outcome 4(5)(a) is taken into account. In my view, the position does not change. The assessment does not suggest non-compliance, even if established, leads to a position where there are identifiable adverse town planning consequences of the kind the Activity Code seeks to avoid or minimise.

[726] In my view, the proposed development complies with the Overall Outcomes of the Activity Code.

Conclusion: Activity Code

[727] Section 2(1) of the Activity Code identifies how compliance is demonstrated with the Activity Code.[714] To comply, development is to be consistent with the Overall and Specific Outcomes of the Code. This has been demonstrated.

Compliance with State Code 22

[728] Council put in issue compliance with two Performance Outcomes in State Code 22.[715] The provisions are in the following terms:[716]

> **"PO4** Development is suitably located and designed to avoid or mitigate **environmental harm** to the receiving waters **environment**."

And:

> **"PO5** Development is designed to include elements which:

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713 Ex.3.002, p.2-6.
714 Ex.3.002, p.2-6.
715 Ex.13.021, p.7, question 32, Table, Focal provisions.
716 Ex.4.001, pp.73-74.

1. prevent or minimise the production of **hazardous contaminants** and **waste** as by-products; or

2. contain and treat **hazardous contaminants** on-site rather than releasing them into the **environment**; and

3. provide secondary containment to prevent the accidental release of **hazardous contaminants** to the **environment** from spillage or leaks."

[729] Performance Outcome PO4 requires development to be located and designed to avoid or mitigate environmental harm to receiving waters. Environmental harm is defined in the *Environmental Protection Act 1994*. Council's written submissions did not address this definition. Nor did it address the issue of non-compliance in circumstances where: (1) Council did not contend impacts on aquatic ecology of the unnamed drainage channel and Six Mile Creek warrant refusal; and (2) Ms Thorburn, the only aquatic ecologist to give evidence in the case, was not challenged about the opinions expressed in two statements of evidence. Her evidence, in conjunction with the evidence of Mr Tomlin and Mr Marszalek, comfortably establishes compliance with PO4 of State Code 22.

[730] Council's written submissions did not address PO5 of State Code 22.

[731] Little needs to be said about the provision. In short, the integrated water management system as explained by Mr Marszalek and Mr Tomlin demonstrates compliance with PO5 of State Code 22. Part and parcel of this system will be the leachate treatment system, which will be required by a condition of approval. It will be recalled that Mr Dekker indicated Austin is prepared to accept such a condition of approval. The system will have capacity to deal with extreme rainfall events identified by Mr Collins, including an event akin to that in January 1974.

[732] State Code 22 does not stand in the way of an approval in this appeal. Rather, compliance favours approval.

[733] In the case of the ERAs taken in isolation, which are code assessable, it is difficult to see what if any basis can be relied upon to resist s 60(2)(a) of the PA. This provision requires a code assessable application to be approved to the extent it complies with the assessment benchmarks.

Town planning need

[734] The planning scheme does not require Austin to prove there is a need, in a town planning sense, for the proposed development.

[735] The existence, or absence of need was, however, advanced in this appeal as a relevant matter, and for two different purposes. Council advanced the absence of need as a reason for refusal.[717] Austin advanced the existence of need for the proposed development as a matter supportive of approval.

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[717] By way of example, Ex.14.024, paras 47 and 58(a).

[736] An examination of need starts from the classic expression taken from *Indooroopilly Golf Club v Brisbane City Council* [1982] QPLR 13 at 32-35 and *William McEwans Pty Ltd v Brisbane City Council* [1981] 1 QPLR 33 at 35. Both of these decisions suggest the demonstration of need, in a town planning sense, involves the identification of a latent unsatisfied demand, which is either not being met at all or is not being adequately met by the planning documents in their present form.

[737] Jurisprudence of the Court has built upon this stated assumption. For example, it has been said that:[718] (1) need in the town planning sense does not mean a pressing need or a critical need or even a widespread desire; (2) a thing is needed if its provision, taking all things into account, improves the physical well-being of the community; (3) need does not connote a pressing urgency but relates to the well-being of the community; (4) a use is needed if it would, on balance, improve the services and facilities available in a locality. It must always be remembered that statements of this kind inform an assessment of need. They are not to be treated as a checklist to be considered, and favourably answered, in every case.[719]

[738] As a matter of general principle, need involves an assessment of public interest and public benefit. It is to be examined from the perspective of a community and not that of the applicant, commercial competitor, or objectors.

[739] The weight to be given to need in an assessment is not fixed and turns on the circumstances of the case. This was recently confirmed in *Yorkeys Knob BP Pty Ltd v Cairns Regional Council* [2022] QCA 168, [30], where Bowskill CJ observed:

> "As the authorities make clear, the assessment of "need" in this context is a flexible process, informed by the principles discussed in cases like *Isgro v Gold Coast City Council* [2003] QPELR 414 (referred to by the primary judge at [34]), but not constrained by those principles as though they were a "checklist" that must be ticked off by a decision-maker in every case. As the court said in *Intrafield Pty Ltd v Redland Shire Council* (2001) 116 LGERA 350 at [20], "need is a relative concept to be given a greater or lesser weight depending on all of the circumstances which the planning authority was to take into account."

[740] A significant part of the evidence before the Court was directed towards an examination of town planning need and associated waste industry considerations. This was no doubt informed by my reasons in *HPC Urban Design & Planning Pty Ltd & Anor v Ipswich City Council & Ors*,[720] [149] to [195]. In that case, I held there was sufficient landfill airspace capacity for South East Queensland, assessed between 10 to 19 years supply. This finding, and evidence consistent with it, were relied upon by Council to contend there is no latent unsatisfied demand for additional landfill airspace capacity in South East Queensland.

[741] To state a truism, all cases turn on their own facts and circumstances. This applies equally to the decision in *HPC* when compared to the evidence in this appeal.

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718 *Isgro v Gold Coast City Council* [2003] QPELR 414.
719 *Yorkeys Knob BP Pty Ltd v Cairns Regional Council* [2022] QCA 168, [30].
720 [2020] QPELR 534.

[742] Unlike *HPC*, the evidence in this appeal establishes a different context. Here, there is an application for development that: (1) will rehabilitate degraded land so it is suitable for use in an appropriate manner;[721] (2) will not give rise to adverse environmental or amenity impacts;[722] (3) complies with the planning scheme;[723] and (4) will, if approved, make a meaningful contribution to the capacity of non-putrescible landfill airspace capacity in South East Queensland.[724]

[743] In addition to this context, there are particular aspects of the evidence that suggest the findings made in *HPC* (in relation to need) should not be adopted in this appeal.

[744] The evidence and findings in *HPC* assessed landfill supply on the footing there is essentially one market. That is to say, when non-putrescible landfill airspace capacity is exhausted it assumed this waste stream will be redirected to putrescible landfill facilities – this amounts to forced market substitution. With the benefit of evidence from a number of waste industry experts for this appeal, such an assumption is problematic for two reasons.

[745] First, the existing supply of landfill airspace capacity identified in *HPC* drew no distinction between public and private landfill facilities. For reasons given later in relation to recycling and recovery considerations (paragraphs [783] and [820] to [821]), such a distinction should have been drawn to exclude public putrescible landfill airspace capacity from the assessment. When this is excluded, there is, unsurprisingly, a material reduction (35%) in the available airspace capacity for landfill in South East Queensland. Put another way, 35% of the assumed landfill airspace capacity in *HPC* should have been excluded as an appropriate candidate for the deposition of non-putrescible waste.

[746] Second, the evidence before the Court in this appeal establishes there are capital cost, and operational cost, differences between putrescible and non-putrescible waste facilities. This was not the subject of attention in *HPC*.[725] These differences explain why forced substitution is not realistic in the next 10 years, if not 15 to 20 years. Forced substitution would have adverse consequences.

[747] Messrs Schliebs, Kosciusko and Haywood explained that, whilst there was no regulatory impediment to sending non-putrescible waste to putrescible landfills, it cannot be assumed one was seamlessly substitutable for the other without consequence.[726] Having regard to their evidence, along with the economists and Mr Harris, this can be accepted in light of two points, namely that: (1) non-putrescible landfill facilities play an important role in the waste industry - they preserve putrescible landfill airspace, which is more costly and difficult to locate; and (2) it is more cost effective to the community to dispose non-putrescible waste in a non-putrescible waste landfill. To force substitution in this context will give rise to adverse consequences.

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721 *cf HPC*, [128] and [133].
722 *cf HPC*, [109] – [128] and [138].
723 *cf HPC*, [123], [125] and [128].
724 *cf HPC*, [190].
725 Ex.8.001, paras 32-42 and 263-289; Statement of Mr Joel Harris – LAN.009.002 (Ex.9.002 in the *Lantrak* proceedings).
726 Ex.8.001, p.11, para 32.

[748] An adverse consequence that is readily identifiable as a result of forced substitution is economic in nature; to dispose non-putrescible waste in a putrescible waste facility would be more costly. That cost would be borne, in the first instance, by the construction industry, and in all likelihood passed on to the community. In circumstances where the differences in gate fees between putrescible and non-putrescible landfill facilities are considerable,[727] the potential economic cost to the community by reason of substitution gives considerable pause for thought.

[749] A further adverse consequence relates to the consumption of putrescible landfill airspace capacity with non-putrescible waste. The evidence establishes it is unrealistic to assume operators of putrescible waste landfill facilities will allow airspace capacity to be reduced at an accelerated rate by non-putrescible waste in the absence of an economically viable and sustainable alternative for dealing with putrescible waste. The alternative scenario adopted by Council's waste industry expert, Mr Perryman, assumed putrescible waste will be diverted from landfill to energy for waste facilities at high rates with a decade. This is in circumstances where facilities of this kind do not yet exist in South East Queensland.

[750] The evidence of Mr Harris and Mr Haywood demonstrates why it is unlikely energy for waste facilities will exist in South East Queensland within the next decade, let alone be of sufficient capacity to achieve a significant level of waste diversion from landfill. Absent significant public and/or private intervention, the scenario Mr Perryman has in mind is a longer term prospect, more likely in the order of 15 to 20 years from now.

[751] For these reasons, the findings in *HPC* with respect to need may represent a starting point. Beyond this, they do not assist in the determination of the need issue. In any event, there are important contextual differences which, in my view, mean it cannot be accepted need has little, if any work, to do in the exercise of the discretion in this appeal.

[752] That need has little work to do in this appeal is clear once the following matters are appreciated.

[753] If, for present purposes, it is assumed there is no need for additional landfill airspace capacity, it is necessary to examine all of the circumstances informing the weight to be given to this aspect of the case in the exercise of the discretion.

[754] The circumstances of this case include the following matters:

(a) the land is degraded and in need of rehabilitation;

(b) the planning scheme recognises there is a need for degraded land, such as the subject, to be rehabilitated and makes express provision for that need to be met in, inter alia, the Buffer zone and Investigation zone where the land is included;

(c) the planning scheme, consistent with the South East Queensland Regional Plan 2017 (**SEQRP 2017**), includes the land in a Regionally Significant Business and Industry Area where, inter alia, special industries are anticipated and

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[727] Statement of Mr Joel Harris – LAN.009.002 (Ex.9.002 in the *Lantrak* proceedings), pp.12-13.

supported, subject to meeting stated qualifications – the stated qualifications do not include a requirement to prove need for the proposed development; and

(d) there is a clear policy directive underpinning an extant need for considerably more waste recycling and recovery uses in South East Queensland.

[755] To these matters can be added the following further circumstances that flow from findings made in this appeal; they all combine to establish compliance with the planning scheme and the Activity Code:

(a) the proposed development will meet a need to rehabilitate the land;

(b) the proposed development involves the rehabilitation of the land while conducting an industrial use, all of which is consistent with the underlying zoning intent for the land to be used in an '*appropriate manner*';

(c) the proposed development will rehabilitate the land in a manner that renders it suitable for future industrial uses, again consistent with the underlying zoning; and

(d) the environmental and amenity impacts from the proposed development can be conditioned so as to be acceptable, and contained within the business and industry area.

[756] Paragraphs [754] and [755] establish, in my view, that the planning scheme makes express provision for a town planning and community need. The need is for land to be rehabilitated so it can be reused in an appropriate manner. The planning scheme makes provision for this need to be met, subject to stated criteria, on the land. This is to achieve Council's forward planning intent; namely, that the land forms part of an area of regional importance in terms of economic growth – it is to be developed to achieve the status of a Regionally Significant Business and Industry Area.

[757] Here, compliance with the planning scheme has been demonstrated. It establishes that the proposal meets the need identified by the planning scheme in an appropriate manner. This is a matter in the public interest and complemented by the fact the use includes a resource recovery and recycling component for which there is also a need in South East Queensland. In combination, these factors are supportive of approval and, when balanced against an asserted absence of need for landfill airspace, still paint, in my view, a picture which, overall, favours approval.

[758] To support a different conclusion, Council invited the Court to act on two points: (1) that a decision to refuse the development application does not equate to the '*end of the line*'; and (2) an approval would result in a significant oversupply of landfill airspace capacity.[728]

[759] With respect to item (1), the Court was invited to take into account extant rehabilitation obligations for the land, which must be complied with. As I understood Council's case, existing obligations applying to New Hope were relied upon to suggest the need for rehabilitation here will be met another way.[729] I do not

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728 Ex.14.024, p.64, para 106; p.68, para 123; pp.19-20, para 51.

729 Ex.14.024, p.2, para 2(a).

accept this submission requires a different view to be adopted to that expressed in paragraph [757].

[760] In my view, a review of the existing rehabilitation obligations demonstrates three things, namely: (1) the very existence of the obligations serve to reinforce there is a community need to rehabilitate the land for future uses; (2) the method for rehabilitating the land is not prescribed or limited to filling the void with clean earthen material; and (3) further town planning approvals will be required to rehabilitate the land irrespective of the method adopted.

[761] These matters are relevant because they confirm there is an extant need to rehabilitate the land, for which town planning approval is required. That further town planning approvals are required is implicit in Council's own case. It asserts the void should be filled with clean earthen material. This would, like the subject proposal, require an approval under the planning scheme. Filling the void with clean earthen material would, at the very least, require a development permit for operational works. When in force, Attachment C to the Activity Code also made clear an approval was required for '*Waste Activity Uses involving Rehabilitating a Mining Void*'. A use of this kind, when located in the Buffer Area and Waste Activity Area, triggers code assessment.[730]

[762] Turning to the oversupply point, I am not persuaded this part of Council's case can be accepted in the short to medium term, being a period that is 15 to 20 years from now. This is because the point relies upon the Court accepting the outputs of a mathematical construct, namely an economic model founded on a number of assumptions, each having a compounding effect on its outputs.

[763] As I have already said, this appeal was heard, in part, with two others. This was the common need and waste hearing. The hearing focused on the evidence of eight experts[731] (4 waste industry experts and 4 economists) who prepared a common need and waste joint expert report.[732] The purpose of the joint expert report was to examine two issues, namely:[733]

> "i. Whether the proposed development (in the common sense rather than the site specific sense) sufficiently promotes resource recovery in line with local, regional, and state policies which aim to increase resource recovery and reduce waste disposal to landfills.
>
> ii. Whether there is sufficient existing landfill capacity in the region to meet the future economic need for waste disposal."

[764] The mathematical construct to which I have referred is the model, and underlying assumptions, prepared for and discussed at length in the common waste and need joint expert report.

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730 Ex.3.002, p.2-8; 2-16; 2-24.
731 Messrs Haywood, Behrens, Schliebs, Lee, Kosciuszko, Stephens, Perryman and Lassen.
732 Ex.8.001.
733 Ex.8.001, p.8, para 14.

[765] A review of this joint expert report reveals the experts agreed on a study area, namely South East Queensland.[734] It was said there is a high degree of movement of waste materials within, and received by, this region.[735] As each of the proposed landfill facilities the subject of the combined hearing would receive non-putrescible waste, the particular waste streams of interest to the experts were:[736] (1) construction and demolition (C&D) waste; (2) the non-putrescible portion of commercial and industrial (C&I) waste; (3) soil, including contaminated soil; and (4) asbestos.

[766] Armed with confidential information, the experts, to varying degrees, set about preparing a model to answer whether there is sufficient existing landfill capacity in the region to meet the future economic need for waste disposal. The model forecasts landfill airspace capacity to the year 2046. It has a number of key variables. They are:[737]

(a) an assessment of the remaining capacity of existing landfills to accept future waste – whilst it was noted there is no '*definitive source of information*'[738] about existing airspace capacity, the experts agreed their 'best estimate'[739] was as follows: [740]

> "The agreed airspace supply within each category of landfill is summarised in Table 8.3, which shows that total airspace associated with private non-putrescible landfills is estimated at 7.14 million m^3 out of a total landfill airspace across all categories of 105.02 million m^3."

(b) an assessment of future waste generation rates per capita – there was disagreement between the experts about this input;

(c) an assessment of future resource recovery rates (diversion from landfill) – there was disagreement between the experts about this input;

(d) an assessment of future interstate waste flows and the ability for resource recovery to be undertaken for this waste – there was disagreement between the experts about this input;

(e) an assessment of compaction rates for waste disposed in landfill – there was disagreement between the experts about this input.

[767] The modelling does not include a measure, be it empirical or otherwise, for the public benefit (and interest) attributable to rehabilitation of the land, assuming the void is filled with non-putrescible waste and capped.

[768] Helpfully, the points of disagreement in relation to the model inputs were reduced materially by the experts retained by the applicants for approval in each appeal. Those experts were able to discuss and agree common inputs amongst themselves.

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734 Ex.8.001, p.28, para 113.
735 Ex.8.001, p.28, para 114.
736 Ex.8.001, p.28, para 119.
737 Ex.8.001, p.74, para 355.
738 Ex.8.001, p.122, para 585.
739 Ex.8.001, p.122, para 585.
740 Ex.8.001, p.122, para 589.

Based on their agreed inputs, a model was prepared and described as Scenario 1. The outcomes of this scenario suggest landfill airspace at existing private non-putrescible facilities will be exhausted in and around 2023.[741] If it is then assumed no further non-putrescible landfill facilities are approved, and the non-putrescible waste stream is diverted to remaining landfills, total landfill airspace supply was forecast to be exhausted in or around 2038.[742]

[769] Council's experts, Mr Lassen and Mr Perryman, did not agree with the assumptions and outputs for Scenario 1. Based on Mr Perryman's views, Scenario 2 was prepared. The outputs of this model indicate, by the end of the modelling period (25 years), there will be around 50 million m^3 of landfill airspace to service South East Queensland.

[770] The outputs for Scenarios 1 and 2 can be regarded as two opposite ends of a broad spectrum. They are the direct product of the underlying assumptions.

[771] Scenario 1, which results in landfill airspace being exhausted, is underpinned by four key assumptions: (1) there are separate markets for the disposal of putrescible and non-putrescible waste; (2) the separate markets will persist given putrescible waste facilities seek to preserve their air capacity to ensure reliable ongoing supply to meet the demands associated with the disposal of municipal waste; (3) the rate per capita for waste generation in the region will increase to the national average and then remain constant; and (4) the provision of energy for waste facilities will be slow, as will likely increases to resource recovery rates – the recovery rates will be less than the stretch targets identified in the Queensland Government's Waste Management and Resource Recovery Strategy.

[772] Overall, it can be said that Scenario 1 represents a cautious approach to the modelling exercise undertaken.

[773] Scenario 2 is underpinned by five key assumptions. As I understand Mr Perryman and Mr Lassen's evidence, they can be summarised as follows: (1) when existing airspace is exhausted, non-putrescible waste will be directed to facilities that receive putrescible waste (market substitution); (2) despite significant levels of projected population growth, which will generate a demand for infill housing and infrastructure, there will be a drastic reduction in the rate of waste generation per capita; (3) within 10 years, significant facilities that convert municipal waste to energy will be planned, funded, constructed and commissioned for operation; (4) energy for waste facilities will divert waste streams from landfill, creating an environment where existing landfill facilities that receive putrescible waste will be forced to take non-putrescible waste to remain viable; and (5) it is reasonable to assume that the recovery rate targets identified in the Waste Management and Resource Recovery Strategy will be achieved.

[774] Overall, it can be said that Scenario 2 represents an optimistic approach to the modelling exercise undertaken.

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741 Ex.8.001, p.132, para 627 and Figure 8.40.

742 Ex.8.001. p.132, para 627 and Figure 8.40.

[775] The outputs of the model for Scenarios 1 and 2, along with the oral evidence of the economists, expose how sensitive the model is to changes in underlying assumptions. The sensitivity of the model is a direct product of the fact that the inputs have a cumulative effect. This cumulative effect over a 25 year period, as the model outputs demonstrate, results in very different outcomes.

[776] Whilst the outputs of the two scenarios are very different, it can be observed they both confirm, to different degrees, three things, namely that: (1) non-putrescible waste will be generated by the community for the entirety of the modelling period; (2) there will be a demand for landfill facilities that can receive non-putrescible waste for the life of the proposed development;[743] and (3) private non-putrescible landfill facilities will cease to exist in South East Queensland absent any further approval within a relatively short period of time.

[777] As a mathematical construct, neither model, in my view, represents reality. They are each, at best, indicative of what may happen when particular facts are assumed. What can be said with confidence is that the facts assumed to arrive at an outcome where there is a considerable oversupply of airspace capacity during the life of the proposed development are too optimistic. I am not prepared to act on Scenario 2 in this appeal.

[778] For reasons traversed in paragraphs [818] to [836] below, particular assumptions underlying Scenario 2 require significant changes to occur in the waste industry over a short period of time, principally in the area of energy for waste. This is in circumstances where the evidence provides little confidence that the funding, investment and re-structuring required to achieve the changes Mr Perryman speaks of will occur in the short term. Absent significant public or private intervention, the evidence suggests a more realistic view is that the change Mr Perryman has in mind is more likely a 15 to 20 year prospect, representing a point in time coinciding with the latter part of the proposed landfill use and post-closure period.

[779] Once it is accepted that: (1) Scenario 2 of the common waste and need evidence should not be acted upon in this appeal; (2) the models, which are mathematical constructs, say little about the need (and public interest) associated with the rehabilitation of the land; and (3) on both modelling scenarios, all private non-putrescible landfill facilities in South East Queensland will be exhausted in circumstances where the demand for these facilities will continue for the life of the proposed development; Council's asserted oversupply point does not cause me to adopt a different view to that expressed in paragraph [757].

[780] That the outputs of both models do not suggest there is anything other than an extant town planning and community need to rehabilitate the land is a matter of public interest and import in my view. This was not lost on Mr Stephens and Mr Behrens. In the common waste and need joint expert report, section 9 deals with '*other economic issues*'. In this part of the report, Mr Stephens and Mr Behrens jointly observed that '*site remediation offers the potential of the existing currently underutilised, or unutilised, land to be put to better economic use in the end*

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[743] This is evident from Figures 8.30 and 8.31 at pp.117-118, and Figures 8.34 and 8.35 at pp.121-122 of Ex.8.001.

state'.[744] This proposition can be accepted. This benefit forms no part of the modelling exercise undertaken to examine landfill airspace capacity.

[781] In the circumstances of this appeal where: (1) the planning scheme recognises, and makes provision for, the need to rehabilitate degraded sites such as the subject; (2) the proposed development complies with the planning scheme, including provisions that promote rehabilitation; (3) there is no suggestion the planning scheme is overtaken by events or unsoundly based; and (4) there will be an ongoing demand to dispose of non-putrescible waste in landfill during the life of the proposed development; there was little to be gained in this appeal from the very detailed and lengthy assessment of landfill airspace capacity in South East Queensland.

[782] This is ultimately for one reason: the mathematical models relied upon could not change the fact there is a clear need to rehabilitate the land in a manner compliant with the planning scheme. That the proposed development meets this need is subsumed by demonstrated compliance with the planning scheme. It is compliance that attracts significant weight in the exercise of the discretion in this appeal.

Resource recovery and sustainability

[783] Council's refusal case was advanced on the footing that the landfill component of the proposed development is not sustainable development and further, is not consistent with contemporary waste planning principles and practice.

[784] The issue of sustainability can be dealt with quickly. As a reason warranting refusal, it is without merit.

[785] Council's notified reasons for refusal in the appeal allege:[745]

> "…the landfill component is not sustainable development having regard to:
>
> (A) its adverse impacts on the natural environment for this and following generations;
>
> (B) its requirement for ongoing monitoring and active management in perpetuity, or at least until the waste mass becomes biologically and physically stable;
>
> (C) its increasing risk to the natural environment as time goes on; and
>
> (D) the difficulty of managing events and risks below the landfill surface;"

[786] In light of the evidence I accept with respect to environmental performance and associated risk, I am satisfied items (A) to (D) above do not lead to a conclusion that the proposed development is anything other than '*sustainable development*' in the sense alleged.

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744 Ex.8.001, p.138, para 654.
745 Ex.5.001, p.12-13, para 1(a)(ii).

[787] I apprehended that Council, through the list of disputed issues and its written submissions,[746] sought to expand the '*sustainable development*' point beyond that articulated in its notified reasons for refusal. It did so by embracing 5(2)(c) of the PA. This provision is said to be a '*focal*' provision and is in the following terms:

> "(2) Advancing the purpose of this Act includes –
>
> …
>
> (c) promoting the sustainable use of renewable and non-renewable natural resources, including biological, energy, extractive, land and water resources that contribute to economic development through employment creation and wealth generation;"

[788] The particulars provided by Council do not suggest s 5(2)(c) of the PA is a focal provision with which an approval would not comply. Rather the provision appears to have been raised as a 'relevant matter'.[747] In any event, I am satisfied the proposed development, to the extent it is able, promotes the sustainable use of a resource. That resource is waste, which will be recovered in the resource recovery component of the development. The recovered waste will be capable of being reused, repurposed, or recycled in the manner anticipated by a '*circular economy*'. A circular economy is described in this way:[748]

> "…one in which products and materials keep circulating within the economy at their highest value for as a long as possible, through reuse, recycling, remanufacturing, delivering products as services, and sharing."

[789] The BMI Group, which includes Austin, is an operator with recognised experience and expertise in resource recovery.

[790] Council's refusal case sought to unfairly downplay the significance of the resource recovery component of the proposed development. Contrary to the pejorative statements, questions and submissions made at various points in the hearing on behalf of Council, the resource recovery component is an integral part of the proposed use. It is co-located with the landfill, which has recognised benefits and represents a significant investment in resource recovery and recycling (in the order $19 million). This investment is not tokenistic. The facility, in combination with the experience and expertise of Austin, will, in my view, make a positive contribution to the achievement of resource recovery targets in South East Queensland.

[791] Council contended the '*inappropriateness of the proposed development is reinforced*' by, inter alia:[749] (1) contemporary planning policy, which seeks to encourage recycling and resource recovery with landfill as a last resort; and (2) the likelihood that an approval here would act as a disincentive to recycling and resource recovery. The second of these points was put as highly in Council's submission as follows:[750]

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746 Ex.14.024, p.13, para 37 and p.14, para 41.
747 Ex.5.001, p.13, para 1(b)(iii).
748 Ex.4.001, p.156.
749 Ex.14.024, p.6, para 12(c)(ii) and (iii).
750 Ex.14.024, p.18. para 45.

> "…the substantial nature of the landfill component of the proposed development will adversely and unacceptably impact on the resource recovery sector as a whole."

[792] Central to this part of Council's refusal case is an assertion that the proposed development will not contribute to '*zero net waste*'. The reason for this was explained in Council's written submissions as follows:[751]

> "In simple terms, the more landfill capacity approved:
>
> (a) the more the opportunity and likelihood that operators will prioritise dumping to landfill over recycling as an increase in supply will, as a matter of economics, drive down the cost to dump; and
>
> (b) the less likely the industry will invest in resource recovery."

[793] Evidence in support of subparagraph (a) can be seen in the opinions expressed by Mr Lassen. He is an economist who gave the following oral evidence in the common need and waste hearing:[752]

> "…The way I try and think about this is we have an existing supply of landfill and we have a demand for landfill. The development of these projects will increase the supply of landfill, assuming no change in demand….That will lower the price of landfill and a lower price of landfill will have some – will create a disincentive or less – disincentive for recycling to some degree."

[794] I am satisfied the alleged inconsistency with contemporary waste management planning, and any alleged impact on the resource recovery industry as a whole, do not warrant refusal here. This is so for the following reasons.

[795] First, as I have said, Council's case does not give sufficient weight to the fact the proposed development includes a substantial resource recovery component. Mr Kosciusko described it as significant in scale.[753] This was not challenged. The investment in this part of the proposed development is also significant.

[796] Second, the proposed development is consistent with contemporary planning in relation to waste. This contemporary planning recognises the ongoing importance of landfill, even as a last resort. Its importance is to be found in the support it provides to the resource recovery industry. In this regard, I accept the evidence of Messrs Schliebs, Kosciusko and Haywood who agreed in their joint expert report:[754]

> "…landfills have a specific role to play in the broader waste management supply chain. Landfills provide a safe place to dispose of wastes which are not able to be recycled, and in doing so support resource recovery facilities to manage their residual wastes…"

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751 Ex.14.024, p.14, para 39.
752 T6-44, L37-48.
753 Ex.8.004, p.29, para 83.
754 Ex.8.001, p.9, para 19.

[797] Turning to contemporary waste planning documents, in 2018, the Queensland Government promulgated a '*Waste Management and Resource Recovery Strategy*' (**the Waste Strategy**). The overview of this document states, in part:

> "The Strategy presents a strategic plan for a better way of managing waste in Queensland, by harnessing the potential value of resources that have traditionally been discarded. The Strategy's three strategic priorities will guide the transition to a more circular economy, reduce the amount of waste disposed to landfill, or illegally, and provide a more sustainable source of end-of-life products and materials to create new products."

[798] Having regard to this overview, three points can be identified for this appeal, namely: (1) the Waste Strategy involves three strategic priorities; (2) the strategic priorities are intended to guide a transition to '*a more circular economy*'; and (3) the strategic priorities are intended to reduce the amount of waste disposed of in landfill.

[799] The three strategic priorities articulated in the Waste Strategy are broadly stated objectives. Priority 1 is '*Reducing the impact of waste on the environment*'. Priority 2 is '*Transitioning to a circular economy for waste*'. Priority 3 is '*Building economic opportunity*'. Each of these priorities are supported by '*Outcomes*'. Relevantly for this case, an outcome for Priority 1 is a '*Reduction in the amount of waste that goes to landfill, is littered or illegally dumped*'.

[800] None of the stated priorities or supporting outcomes suggest no new landfills will be approved. Nor do they suggest landfills are contrary to the strategy as a whole.

[801] In my view, an informative part of the Waste Strategy is the '*Vision*'. It is in the following terms:

> "Queensland will become a zero-waste society, where waste is avoided, reused and recycled to the greatest extent possible. Strategic investment in diverse and innovative resource recovery technologies and markets will produce high-value products and generate economic benefits for the state."

[802] The Vision, like the Strategy overview, has in mind a transition. It is a transition from where Queensland is now, to a zero-waste society. A society of this kind is defined in a footnote of the Waste Strategy as follows:

> "What does zero-waste mean? The only waste that goes to landfill is waste for which there is no alternative environmentally, socially or economically viable solution."

[803] Self-evidently, a zero waste society still has need for landfill. It provides support to resource recovery facilities. It provides an appropriate place to dispose of waste that has reached the end of its economic life or is otherwise unsuitable for recovery/recycling.

[804] To support the Vision, the Waste Strategy includes targets for the year 2050, representing a 30 year planning horizon. With respect to reducing waste going to landfill the Waste Strategy states:

> "In 2017-18, more than 50 per cent of Queensland's waste was sent to landfill. To drive the growth of recycling markets, the Queensland Government will introduce a waste disposal levy in July 2019 to provide a clear price signal to divert valuable material away from landfill. The levy will be accompanied by a series of companion measures that will subsequently create an alternative pathway for these materials to be recycled or recovered. There are a number of wastes, such as asbestos, for which landfill is unavoidable and these have been accounted for in the long-term targets. The targets reflect that overall diversion rate for all material diverted from landfill. The ninety percent target for 2050 reflects only ten percent of waste going to landfill."

Table 2 – Waste diversion landfill targets (recovery rate as a percentage of total waste generated)

Stream	Baseline (2018)	2025	2030	2040	2050
MSW	32.4%	55%	70%	90%	95%
C&I	47.3%	65%	80%	90%	95%
C&D	50.9%	75%	80%	85%	85%
Overall	45.4%	65%	80%	85%	90%

[805] Table 2 above indicates C&D and C&I waste diversion (away from landfill) targets are forecast to increase during the 30 year planning horizon. The proposed development, assuming it has a life of 20 years, would enter the post-closure period sometime after 2043, which is the last decade of the planning horizon. In that decade, Table 2 does not anticipate any further increase in the diversion target for C&D waste. It does however anticipate not all waste can be diverted from landfill.

[806] It should be borne steadily in mind that the above targets do not represent a threshold which is easily crossed. The Waste Strategy indicates that, in setting these targets, consideration was given to the '*reasonableness, appropriateness, compatibility and achievability of the targets*'. Notwithstanding this, they are described in this way:

> "Ambitious stretch targets, supported by nearer-term interim targets have been developed to support the Strategy's vision."

[807] In circumstances where:

(a) the Waste Strategy has in mind a transition to a zero waste society;

(b) the zero waste society anticipated by the Waste Strategy will continue to rely upon landfill, even after a thirty year transition period and allowing for ambitious stretch landfill diversion targets;

(c) the proposed landfill would be commenced and completed (save for the post-closure phase) before the end of the 30 year planning horizon for the Waste Strategy; and

(d) the proposed development involves the co-location of a resource recovery facility and landfill, which represents a step consistent with the transition to a zero waste society;

it is difficult to accept an approval would be contrary to the achievement of zero net waste, or would compromise the transition to a zero net waste society. In my view, the proposed development is an example of the Waste Strategy being put into action.

[808] In a similar vein, I am also satisfied an approval would not be inconsistent with the SEQRP 2017. Theme four of that document was relied upon by Council. It has in mind that in 50 years (2067) '*SEQ will be carbon neutral and have zero net waste*'. For the same reasons set out above, an approval will not, in my view, cut across this broadly stated planning objective.

[809] Third, to assert the new landfill facility proposed is inconsistent with zero net waste and a circular economy sits uncomfortably with Council's Statement of Proposals promulgated in 2019. This document foreshadows a new planning scheme for Ipswich. It includes a draft Strategic Framework.

[810] An examination of the draft Strategic Framework reveals[755] that consideration has been given to contemporary waste management principles, such as '*zero net waste*' and the '*circular economy*'. With knowledge of these principles, the draft Strategic Framework indicates that former mining voids within a designated '*Waste Activity Areas*' may be filled with, inter alia, non-putrescible waste, provided environmental and amenity impacts are managed appropriately.[756] Relevantly, the land is included in the Waste Activity Area.[757] The evidence demonstrates there is good reason to be confident that environmental and amenity impacts of the proposed development can be managed appropriately.

[811] In fairness, it should be observed that s 3.5.4.4(5) of the draft Strategic Framework has in mind that landfills may only be developed where there is '*a demonstrated need for the additional landfill capacity above that already approved*'. This test does not detract from the proposition that landfills are anticipated by the planning scheme in the context where particular attention has been given to, inter alia, the circular economy model and the waste management hierarchy. The practical effect of the need test, in my view, is to: (1) provide a control for the timing and provision of new or expanded landfill facilities; and (2) provide a measure of the impact, if any, for new or expanded landfill facilities.

[812] Having regard to the discussion in relation to need above, and the disincentive point discussed below, I am satisfied the evidence does not suggest items (1) and (2), assuming they are given weight, stand in the way of an approval here.

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755 Ex.3.003; particularly the draft Strategic Framework attached to the document.
756 Ex.3.003, pp.3-21 to 3-22, subsection (5); p.3-25 to 3-26, Subsection (8), (9) and (10).
757 Ex.3.003, p.3-34.

[813] Fourth, Council's case in relation to the disincentive point and alleged impacts on the resource recovery industry are underpinned by: (1) the Scenario 2 modelling discussed above; and (2) reliance upon findings made in *HPC*, at paragraph [166] and onwards. The output of the Scenario 2 modelling and the decision in *HPC* suggests there is, and will continue to be, more than sufficient landfill airspace supply for South East Queensland. The ongoing sufficiency of supply is relied upon to contend an approval will lead to an oversupply of airspace, with consequential impacts on the resource recovery sector.

[814] Will an approval have consequential impacts on the resource recovery sector?

[815] In my view, the answer in this case is no.

[816] At the outset, it is my view the evidence before the Court does not suggest existing landfill airspace capacity in South East Queensland is inhibiting investment in the resource recovery industry. Indeed, the facts of this case suggest otherwise. The proposed development, if approved, involves a significant investment in the very kind of resource recovery facilities required despite, on Council's case, a substantial oversupply of landfill airspace.

[817] As to the findings in *HPC*, for reasons already given, I do not intend to act on the findings in that decision with respect to the supply of landfill airspace capacity in South East Queensland.

[818] Turning to the Scenario 2 modelling, I was persuaded the outputs of the model are not reliable for examining available airspace capacity for the life of the landfill facility proposed here. This is based on the evidence of Mr Harris (which I accept) and an examination of the evidence of Council's waste industry and need experts about the assumptions underpinning Scenario 2.

[819] Mr Harris, who is a financial modelling expert, examined the inputs and outputs for the Scenario 1 and 2 models. I was grateful for his evidence. He helpfully explained (in a supplementary statement) that two points underpinning the outcomes of the Scenario 2 model should not be adopted. The first was the amount of assumed available airspace, being in the order of 105 million m^3. The second related to the waste generation and resource recovery rates applied, both of which are critical to the outputs of the model.

[820] In relation to assumed available airspace, Mr Harris said[758]:

> "7.…Scenario 2 uses 105.02Mm^3 of total airspace available, which comprises putrescible and non-putrescible landfills. Local government landfills comprise 36.9Mm^3 and, in my opinion, should be excluded from the modelling as they focus on conserving airspace for putrescible waste generated from within their region to ensure security of local disposal and to mitigate significant increases in waste utility rates charged to ratepayers…

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758 Exhibit FG-12 in the *Lantrak* proceedings, p.3.

> 8. Excluding the local government airspace from the Scenario 2 modelling reduces available airspace by 35 per cent and brings forward the complete exhaustion of current approved non-putrescible and private putrescible capacity."

[821] I accept this evidence.

[822] Mr Harris was also critical of the waste generation and resource recovery assumptions adopted for scenario 2. In this regard he said:[759]

> "10….Scenario 2's waste generation and resource recovery assumptions underpin an argument that 55Mm^3 of existing approved airspace capacity will still be available in 2046, and consequently there is no need for additional non-putrescible capacity. However, a major driver of the airspace consumption forecasting is MSW (putrescible waste). Under Scenario 2, in 2021, MSW comprises 48% of the total waste stream consuming airspace, reducing to 40% by 2030 and 16% by 2040. This is based on improving resource recovery of the MSW stream, from a baseline of 31.2% in 2020 to 75% by 2030 and 90% by 2040. To achieve the 2030 targets, this would require an increase in resource recovery capacity of 773,998 tonnes pr annum, an increase of 127 percent of the current resource recovery capacity.
>
> 11. In practical terms, this would require investment in a waste to energy facility capable of processing over 700,000 tonnes per annum and a commitment from the majority of local government across SEQ to supply to a waste to energy facility. There is no current waste to energy facility, although Remondis is proposing a 500,000 tonnes per annum facility that would require immediate commencement of approvals and procurement to achieve processing capacity by 2030.
> …
> 13. In the absence of waste to energy process capacity, even with the full introduction of FOGO, the resource recovery assumptions for MSW in Scenario 2 may be overstated by over 500,000 tonnes per annum from 2029."

[823] I was not persuaded the evidence provided any real basis for confidence that: (1) there will be investment in waste to energy facilities capable of processing over 700,000 tonnes per annum in the next 15 or so years; and (2) the majority of local governments across South East Queensland will agree to supply waste to an energy facility. As a consequence, Mr Harris' criticism of Scenario 2 is not without considerable merit.

[824] Mr Holt KC pressed Mr Lassen, Council's economist, about the assumptions underpinning Scenario 2. The cross-examination revealed Scenario 2 assumes there will be, over time, dramatically less[760] construction and demolition waste, and putrescible waste (**MSW**) generated in Queensland. These assumptions foreshadow

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759 Exhibit FG-12 in the *Lantrak* proceedings, pp.3-4.
760 T6-55, L14-22.

significant changes to waste generation rates and the management of waste in South East Queensland.

[825] The assumed industry changes in relation to construction and demolition waste need to be put into context. In this regard, Scenario 2 has in mind that less construction and demolition waste will be generated in circumstances where:

(a) South East Queensland will be rapidly growing to accommodate a forecast population increase of 41.1 per cent between 2021 and 2041;[761] and

(b) contemporary planning anticipates that at least 60% of all new dwellings will represent infill urban consolidation development.[762]

[826] Forecast population growth of 41.1% over 20 years, which is to be accommodated by infill development, does not, in my view, readily lend itself to an assumption that less construction and demolition waste will be generated in South East Queensland over time. It is counterintuitive. That a counterintuitive assumption was adopted was explained by Mr Perryman's oral evidence. He was responsible for the waste generation assumptions underpinning Scenario 2. Mr Perryman did not appreciate the extent of population growth forecast into the future. When the forecast population growth was pointed out to him, the response was telling. Mr Perryman responded with '*Wow*'.[763]

[827] Scenario 2 also assumes MSW is diverted from landfill to energy for waste facilities, leaving putrescible waste and non-putrescible waste facilities competing for the same waste stream to remain viable. In this regard, Mr Perryman assumed that, within a decade, 950,000 tonnes of waste per year would be combusted in energy for waste facilities and diverted from landfill.[764] This is in circumstances where there are no existing facilities of this kind, let alone approved facilities, in Queensland. Further, the evidence establishes that it takes at least 10 years to develop a large-scale energy for waste facility.[765] The period required to develop such a facility is sufficient to cast doubt on Mr Perryman's assumptions in relation to energy for waste facilities.

[828] That Mr Perryman's assumption should not be acted upon is further confirmed by the evidence of Mr Haywood, which I accept. He pointed out that:[766] (1) significant investment is required to process in the order of 650,000 tonnes of waste, in the order of $600-$700M; (2) there is very little, if any, social licence from communities to support the construction of energy for waste facilities; and (3) the delivery of 950,000 tonnes of energy for waste capacity within 10 years has not been achieved in any other state on the eastern seaboard of Australia.[767]

[829] When Scenario 2 is considered in light the evidence of Mr Harris and Mr Haywood, I am not prepared to act upon it as an appropriate forecast for available landfill airspace in South East Queensland for the next 15 to 20 years. The model: (1)

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761 Ex.8.001, p.30, para 123.
762 Ex.8.001, p.31, para 131.
763 T4-55, L28.
764 Ex.8.001, p.44, para 195.
765 Ex.8.001, pp.12-13, para 44.
766 Ex.8.001, p.46, para 209.
767 Ex.8.001, p.44, para 196.

materially overstates available supply over time; and (2) assumes unrealistic changes will occur in the waste industry in a short period of time. This is not to say I accept Scenario 1 as correct. It has its own shortcomings, which are unnecessary to explore in this appeal.

[830] Finally in the context of Scenario 2 and its reliability, as I have already observed, Council's case in relation to available landfill airspace in South East Queensland turns on the Court accepting that the exhaustion of non-putrescible landfill facilities is of little moment because waste will be diverted to putrescible waste facilities. That waste streams can, theoretically, be re-directed in this way can be accepted. However, for reasons already given, it is not without consequence – there are economic disbenefits.

[831] To allow the exhaustion of non-putrescible waste facilities to occur in South East Queensland would lead to the following:

(a) it would result in the loss of a service – not all landfills are the same;

(b) it would reduce competition for the disposal of non-putrescible waste;

(c) it would expose non-putrescible waste to higher dumping fees in comparison to those charged at putrescible landfill waste facilities; and

(d) would result in the consumption of a valuable community asset – putrescible landfill airspace would be consumed more rapidly than it could be replaced by viable alternatives, such as energy for waste.

[832] An issue raised in this case is whether these disbenefits should be visited on the community in order to achieve compliance with a recently promulgated waste management policy. The policy makes clear that disposing waste in landfill is a matter of last resort.

[833] In my view, there is a sweet spot. The sweet spot is hit where two things can be demonstrated: (1) the proposed development addresses, to the extent it is able, the economic disbenefits identified in paragraph [831]; and (2) the life of the development is such that it will not cut across the achievement of waste management policy, where landfill is seen as a matter of last resort.

[834] I am satisfied the evidence establishes that (1) would be achieved by an approval here.

[835] As to (2), there can be little doubt the future for waste generation and waste management practices will change. As experts participating in the common waste and need joint expert report recognised, it is not '*if*', but at what rate the change foreshadowed by policy documents, and Mr Perryman's evidence, occurs. Having regard to the body of common waste and need evidence, it is my view that significant change in the industry anticipated by Scenario 2 is unlikely to occur before 2030. The timeline for change, or for the transition to a zero waste society, is uncertain. It is a timeline that will, in many respects, be the product of advances in technology and the rate at which public and private investment in significant infrastructure is secured.

[836] The evidence I accept suggests this is not a short term prospect. It is a 15 to 20 year prospect, coinciding with the end of the landfill use and post-closure period.

[837] In these circumstances, I am satisfied an approval will strike the right balance as envisaged in paragraph [833]. This finding is consistent with the evidence of Mr Perkins. He made the following concession in cross-examination:

> "But what I'm suggesting to you is to go a step further;… do you agree with me that this proposal, noting that…it's a hard to locate use, approvals are obviously not easy to get, all of those things; that this proposal, in your opinion as a planner, strikes an appropriate balance between providing a meaningful supply…without being so long that it's there forever and, effectively, can't take the benefit of new technologies, changes in planning frameworks, all those sorts of things…---Yes, I agree – okay, I agree with that as a concept."[768]

[838] For these reasons, I am satisfied an approval of the landfill component would not act as a disincentive for investment in the resource recovery and recycling industry. Rather, the proposed development will make a meaningful contribution to resource recovery. In simple terms, its co-location with landfill represents a final opportunity to recover waste that would otherwise be destined for disposal in landfill.[769]

[839] The issues raised in relation to sustainability and resource recovery do not stand in the way of an approval.

Relevant matters said to be supportive of approval

[840] The 'relevant matters' relied upon by Austin in support of approval were identified in a document dated 3 August 2020.[770] This document was included in the town planning joint expert report and marked '*Attachment K*'.[771] The matters relied upon can be identified, in summary form, as follows:

(a) the proposed development includes a substantial resource recovery component;[772]

(b) the proposed development will have an operating life that is shorter than any new planning scheme, which anticipates Waste Activity Uses of the kind proposed on the land;[773]

(c) the proposed development is well located;[774]

(d) the proposed development will achieve positive rehabilitation outcomes for the land, which would not be achieved absent an approval;[775]

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768 T33-47, L33-40.
769 AFG-12, p.29, para 83.
770 Ex.5.001, pp.31-36.
771 Ex.8.011, pp.233-239.
772 Ex.5.001, p.32, paras 2-3.
773 Ex.5.001, p.32, para 4(a).
774 Ex.5.001, p.32, para 5 and p. 35, para 20.
775 Ex.5.001, p.33, paras 6 and 7.

(e) absent the proposed development, the land will remain visually unattractive and not be developed in a way that achieves the most beneficial land use and rehabilitation outcomes;[776]

(f) the proposed development will significantly improve long term visual amenity outcomes for surrounding residential uses;[777]

(g) the proposed development will not have any unacceptable amenity impacts;[778]

(h) an approval will ensure rehabilitation of the landform;[779]

(i) the proposed development will not have any unacceptable environmental impacts;[780]

(j) the proposed development will provide employment and economic growth in the Swanbank New Chum Area;[781]

(k) the proposed development will meet a need in this location (for special industry of the kind proposed), with associated improvements for convenience, choice and competition;[782]

(l) an environmental authority has been issued for undertaking the proposed development;[783] and

(m) the proposed development will, if approved, result in the upgrade of the road network, which will benefit industrial operators in the New Chum area.[784]

[841] I accept (a) has been established based on the evidence of Council's expert, Mr Perryman, and is entitled to weight in the exercise of the discretion.

[842] I accept (b), to a point. I accept the life of the use is, on the balance of probabilities, likely to enter the post-closure period well before 2048 (Waste Strategy) or 2067 (SEQRP 2017). This is the end of the planning period for Queensland to transition to a 'zero net waste' society. This is relevant to the exercise of the discretion, but not a matter to which significant weight attaches.

[843] I accept (c), (d), (f), (g), (h), (i) and (j) have been established. Whilst they support an approval, they are ultimately matters subsumed by compliance with the planning scheme. In this context, they add little to the exercise of the discretion.

[844] The matter identified in (e) involves speculation as to what may, or may not, happen in the event the development application is refused. As speculation, I give the matter no weight in the exercise of the discretion.

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776 Ex.5.001, pp.33-34, para 8.
777 Ex.5.001, p.34, para 9.
778 Ex.5.001, p.34, para 10.
779 Ex.5.001, p.34, para 11.
780 Ex.5.011, pp.43-44, paras 12-13.
781 Ex.5.011, p.35, para 14.
782 Ex.5.011, p.35, para 15 –17.
783 Ex.5.011, p.35, para 18.
784 Ex.5.011, p.35, para 19.

[845] Given what I have said in relation to need, the exercise of the discretion will proceed on the footing that (k) is subsumed by planning scheme compliance.

[846] I accept (l) is correct as a statement of fact. When viewed in this way, it is not a factor that advances the exercise of the discretion. The more important point is what the EA demonstrates; it demonstrates how the proposed development can be conditioned to appropriately address environmental impacts. This is a matter which is relevant and entitled to weight. That said, it is part and parcel of demonstrating compliance with the planning scheme and the TLPIs. Given it is subsumed in this way, it adds little to the exercise of the discretion beyond compliance with the planning scheme and TLPIs.

[847] I accept (m) is relevant and points in favour of approval. As to the weight to be attributed to it in isolation, it is not a particularly potent matter. This, in my view, is because the evidence suggests an upgrade is required to the road network to facilitate the development. That the development triggers the requirement for the upgrade materially reduces the weight the point attracts in the exercise of the discretion.

[848] Ms Morrissy, who is the town planner retained by Austin, adopted the '*relevant matters*' and added four further points for consideration.[785] The points, which are not already dealt with above, can be summarised as: (1) the appellant has acknowledged experience and expertise in resource recovery, along with a track record of high percentage diversion of waste from landfill; (2) the proposed design for the liner and capping design exceeds best practice; and (3) waste recovery is a significant driver of the proposed development.

[849] Mr Dekker's evidence, which I accept, establishes item (1).

[850] For reasons given above, I accept item (2).

[851] Based on Mr Kosciusko's evidence, I accept item (3).

[852] Each of these matters are relevant. Whilst it can be said they assist Austin's case in favour of approval, they do not attract any significant weight in isolation from compliance with the planning scheme.

Exercise of the discretion

[853] During oral submissions Mr Holt KC submitted this case required the Court to '*roll up its sleeves*' and consider a very large volume of technical evidence to resolve the disputed issues. The time taken to write these reasons, in conjunction with their size, confirms this submission was entirely accurate.

[854] After carrying out the assessment urged upon me by Mr Holt KC, I am satisfied it has been established an approval, granted subject to conditions, aligns with the planning scheme. This attracts significant weight in the exercise of the planning discretion under ss 60(2) and (3) of the PA. It is a compelling feature of the case in favour of approval.

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785 Ex.8.011, p.136, para 410.

[855] Relevant matters in favour of approval have been considered in paragraphs [840] to [852]. To the extent those matters favour approval they have been taken into account. Overall, they do not add in any material way to the case in favour of approval. The case for approval is a strong one, founded on compliance with the planning scheme.

[856] The development has been assessed against the Activity Code forming part of the 2018 and 2020 TLPIs. This assessment demonstrates compliance. In the alternative, the assessment demonstrates that any non-compliance with Specific Outcome 4(5)(a) of the document is technical in nature and does not sound in any adverse town planning consequences. This means, irrespective of the final position adopted, compliance or substantial compliance with the Activity Code does not stand in the way of an approval.

[857] As against this, Council pressed the Court to consider the planning scheme differently in this case.[786] Council contended it was '*necessary*' for the planning scheme to be considered in light of: (1) its age; (2) changes in State Government planning and policy; (3) changes in community attitudes; and (4) changes in the treatment of waste management, which have occurred since 2006.[787]

[858] I accept it is appropriate to have regard to these considerations. An examination of the planning scheme with these matters in mind does not suggest the former is overtaken by events or out of step with contemporary planning. This, in my view, means there is no reason to conclude compliance with the planning scheme ought not be given the weight it deserves.

[859] The attempt by Council to diminish the force of compliance with the planning scheme was, at first blush, attractive given the age of the document; however, on close examination, this aspect of the refusal case did not withstand scrutiny. This, in my view, was inevitable once it was appreciated that:

(a) in a planning sense, it is notorious that land in Swanbank and New Chum is affected by former mining activities – this is recognised in the planning scheme as well as an implementation guideline[788] (published by Council in January 2012 under s 2.3(2) of the planning scheme), the 2018 and 2020 TLPIs and the draft Strategic Framework attached to the Statement of Proposals;

(b) contemporary planning in Queensland does not turn its cheek against new landfill facilities – the SEQRP 2017 reflects there will be a transition to '*zero net waste*' between now and 2067, and at that time, some waste (despite all the best will in the world) will still need to be directed to landfill;[789] and

(c) an integral part of the proposed development is a resource recovery and recycling facility, representing a significant ($19 million) investment in the very facilities required to transition towards a zero net waste society as

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786 Ex.14.024, p.5, para 10.
787 Ex.14.024, p.5, para 11.
788 Ex.3.001, p.1-193 to 1-206.
789 Ex.4.001, p.80, Theme 4 and *HPC Urban Design & Planning Pty Ltd & Anor v Ipswich City Council & Ors* [2020] QPELR 534, [76].

envisaged in the SEQRP 2017 and the Queensland State Government's Waste management and resource recovery strategy.

[860] The case for refusal was not advanced by an assessment against the draft Strategic Framework attached to the Statement of Proposals promulgated by Council as a step towards the preparation of a new planning scheme.[790] This Statement represents the most recent expression of planning intent and reflects contemporary waste management principles, such as '*zero net waste*' and the notion of the '*circular economy*'. With these contemporary planning principles in mind, the document admits of the prospect that former mining voids within a 'Waste Activity Area' may be filled with non-putrescible waste, provided environmental and amenity impacts are managed appropriately.[791] The land is included in the Waste Activity Area. The evidence also demonstrates there is good reason to be confident that the performance of the development in environmental and amenity terms will be consistent with the tests prescribed in the draft Strategic Framework regulating impacts of this kind.

[861] Judge Quirk said some thirty years ago that '*one would need strong reasons for refusing a development application which on its face is consistent with the intent and requirements of the relevant provisions of the Town Plan*'.[792] I agree with his Honour's observation. It is a point that arises for consideration in this appeal.

[862] I am satisfied the matters discussed in paragraphs [857] to [860] (taken individually or collectively) do not warrant refusal in the face of compliance with the planning scheme.

[863] What other reasons are relied upon by Council to refuse the development application in circumstances where compliance has been demonstrated with the planning scheme?

[864] Council did not articulate what, if any, reasons were relied upon to warrant refusal in such circumstances. Rather, as Council's written opening reveals, its case was advanced on a particular basis, namely: (1) it did not accept compliance with the planning scheme and the TLPIs could be established; and (2) other reasons for refusal were alleged but informed, in part, by a contention that an approval would be inconsistent with a range of planning documents. This is reflected in the statement of position set out in Council's written opening (footnotes omitted):[793]

> "The Council's position is that the proposed development should be refused based on the following:
>
> (a) Creating additional landfill capacity in this locality generally, and on the subject land in particular, is bad planning and is not in the community interest. It would not be consistent with the planning controls that apply to the land and to the proposed

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790 Ex.3.003; particularly the draft Strategic Framework attached to the document.

791 Ex.3.003, pp.3-21 to 3-22, subsection (5); p.3-25 to 3-26, Subsection (8), (9) and (10).

792 *Mackay v Brisbane City Council* [1992] QPLR 65 at 67; also cited *in Ashvan Investments Unit Trust v Brisbane City Council* [2019] QPELR 793, [61].

793 Ex.14.001, pp.6-7, para 21.

development (both at the time of lodgement and promulgated since);

(b) There is no need for the proposed development having regard to:

(i) the current available supply of landfill airspace available to accommodate the relevant type of waste;

(ii) approval of the proposal militates against the promotion of resource, recovery and recycling rather than unsustainable landfill (as promoted by all levels);

(c) serious environmental problems arise from the location of the proposal and the site's characteristics, in particular:

(i) the large void naturally (and unhelpfully) acts as a collection point for all water flows including leachate;

(ii) waste will be placed at or below the groundwater table;

(iii) there is no proper, natural unsaturated attenuation zone in the landform;

(iv) historic mining creates an uncertain and unstable landform, adversely impacting upon the performance of any environmental safety measures that may be constructed/implemented above that unstable base;

(d) to the extent there is any residual uncertainty about environmental impacts, the precautionary principle, properly applied, would call for refusal; and

(e) the proposed development will have unacceptable visual impacts, having regard to the planning framework applicable to the land, the proposed development and surrounding land uses."

[865] In its final written submissions, Council relied upon the above submission but did not repeat it.[794] Sensibly, an election was made to highlight particular matters for the Court's consideration. In this context, Council's written submissions emphasised that: (1) contemporary planning relegates landfill to a means of last resort; (2) there is a preference for mining voids to be filled with clean earthen material; and (3) the land will, in any event, be rehabilitated as a consequence of extant obligations arising out of mining approvals.

[866] The evidence establishes that the reasons for refusal identified in paragraphs (a), (b)(ii), (c), (d) and (e) of Council's position statement cannot be accepted and do not stand in the way of an approval being granted subject to conditions. The same can be said for the '*highlighted*' matters referred to in paragraph [865].

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794 Ex.14.024, p.2, paras 1 and 2.

[867] If it is assumed that paragraph (b)(i) of Council's written opening is established, based on the Scenario 1 modelling prepared for the common need and waste joint expert report, it can be accepted that an absence of need for the landfill facility is a relevant consideration in the exercise of the discretion; it is a relevant matter for s 45(5)(b) of the PA. That it is relevant is also consistent with observations made by the Court of Appeal, albeit in relation to a repealed assessment and decision making regime.[795]

[868] The issue in relation to need is therefore not one of relevance. Rather, it can be put this way: how much weight should be attributed to the absence of need for additional landfill airspace capacity in this case, assuming this was established by the evidence?

[869] In my view, the absence of need as asserted by Council, even if established, does not attract significant weight, let alone decisive weight in the face of compliance with the planning scheme. This is for two reasons.

[870] First, the absence of need for the landfill component of the development is not compelling once it is appreciated that:

(a) the planning scheme does not require an applicant to prove there is a need for the landfill facility;

(b) the proposed development will not give rise to any unacceptable impacts on amenity;

(c) the proposed development complies with the planning scheme, which:

(i) expressly supports the proposed development in the Sub Area of the particular zone where the landfill component is proposed; and

(ii) recognises there is an extant need for the land to be rehabilitated so it can be used in an appropriate manner.

[871] Second, the existence, or absence, of need in a case where development is anticipated by a planning scheme can be important when examining impacts on amenity. This particular point was examined in *Arksmead Pty Ltd v Gold Coast City Council* [2001] 1 Qd R 347. In that case, the Court of Appeal considered the interrelationship between an absence of need and amenity impacts in the context of an application for town planning consent under the repealed *Local Government Planning & Environment) Act 1990*. After discussing a number of published decisions of this Court where an absence of need had been taken into account for an application for town planning consent, the Court observed:

> "In each of those cases the effect on amenity and need were considered and in each a detrimental effect on amenity together with an absence of need was decisive. It is difficult to see how it could be said that their Honours proceeded upon a wrong principle in treating the absence of need as a relevant consideration. In such a case, if it is decided that the proposed development would have a detrimental effect on the amenity of the area in question, the judge must then

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795 *Arksmead Pty Ltd v Gold Coast City Council* [2001] 1 Qd R 347, [13].

> decide whether, notwithstanding the detrimental effect on the amenity of the area, there has been shown to be a need for the proposed use which would render the effect on the amenity of the area justifiable."[796]

[872] Whilst this observation relates to a now repealed statutory assessment and decision making framework, there is no reason to suggest it has no application to the exercise of the planning discretion under s 60(3) of the PA. It has in mind this Court will closely consider need where it is found a proposal would have a detrimental effect on the amenity of the area in question. In that circumstance, the question to be asked and answered is as follows: whether there has been shown to be a need for the proposed development that would render the effect on amenity justifiable?

[873] This question does not arise here because the proposed development can be conditioned to manage its impacts on amenity. It will not, to use the language of *Arksmead*, have a detrimental effect on the amenity of the area in question.

[874] In this appeal, everything that could be said in support of refusal was said on behalf of the refusing parties. This is not intended as a criticism. The complex nature of the proposal, and the risk it poses to the environment if not properly planned and executed, called for nothing less. This meant the proposal was subject to rigorous assessment by a number of highly qualified and experienced experts. That this is so is evident from the large body of evidence before the Court. The evidence, which I accept, led me to conclude that the proposed development is a meritorious one, which complies with the planning scheme.

[875] The highest the refusal case could be put at the end of these reasons is that compliance with the planning scheme should not prevail given: (1) there is a technical non-compliance with Specific Outcome 4(5)(a) of the Activity Code; and (2) there is an absence of need for the landfill component of the development. These considerations, taken individually or collectively, do not persuade me the development application should be refused in the face of compliance with the planning scheme. In my view, to refuse the development application in the face of compliance with the planning scheme would not represent a balanced decision in the public interest.

Conclusion

[876] The development application is meritorious one. It will be approved in due course, subject to conditions.

[877] The appeal will be adjourned to allow the parties to prepare a conditions package consistent with these reasons for judgment.

[878] I will hear from the parties as to a suitable review date.

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796 *Arksmead Pty Ltd v Gold Coast City Council* [2001] 1 Qd R 347, [13].

ANNEXURE A - LIST OF ISSUES

The Court, in exercising its discretion under sections 60(2) and 60(3) of the *Planning Act 2016* (Qld) in the Appeal, will need to determine the following matters remaining in dispute:

Planning Framework

1. Whether the "Statement of Proposals including the draft Strategic Framework for the New Ipswich Planning Scheme" (**Statement of Proposals**) is a relevant matter for the Court to consider in the decision-making process.

2. Whether TLPI 1 of 2020 (**TLPI**) has relevance to the decision-making process as:

   (a) an assessment benchmark; or

   (b) a relevant matter.

Weight

3. If the Statement of Proposals should be considered by the Court, whether any weight should be given to the Statement of Proposals in the decision-making process.

4. The extent to which the TLPI should be given weight in the decision-making process.

5. The extent to which weight should be given (in support of approval) to the fact that an Environmental Authority has been issued.

6. Whether compliance with the conditions in the Environmental Authority are in issue, and if so, whether these conditions cannot be complied with.

Resource recovery and sustainability

7. Whether the proposed development promotes resource recovery or will act as a disincentive for resource recovery.

8. Whether:

   (a) approval of the landfill component of the proposed development would facilitate, or cut across, the achievement of waste reduction targets; and

   (b) the resource recovery component justifies the landfill component of the development.

9. Whether the landfill component constitutes sustainable development.

10. Whether there is a "planning principle" that '*resource recovery should be*

promoted (with landfill used as a last resort)', and if so, whether the proposed development is contrary to that planning principle, having regard to the planning provisions and other State policy documents or is otherwise unacceptable having regard to the matters set out in the following table:

	Assessment benchmarks PA, section 45(5)(a)(i)	**Matters prescribed by regulation PA, section 45(5)(a)(ii)**	**Other relevant matters PA, section 45(5)(b)**
Focal	**Ipswich Planning Scheme 2006** s.6.7(4)(a)(i)(A)	**SEQ Regional Plan 2017** Theme 4 – Sustain, as it refers to achieving '*zero net waste*'	**Planning Act 2016** s.5(2)(c)
Contextual	**Ipswich Planning Scheme 2006** s.6.7(4)(a)(iv)(A) s.6.7(4)(a)(iv)(D)		**Planning Act 2016** s.5(2)(a)(i) s.5(2)(a)(iii) s.5(2)(j) **Statement of Proposals** s.3.2.1(23) s.3.5.4.2(6)(j)(iii) s.3.5.4.4(1)(a), (b), (c), (d) Figure 3 – Waste Management Hierarchy s.3.7.8.4(8) **Other relevant State policy documents** Queensland Resource Recovery Industries 10 Year Roadmap and Action Plan: Strategy 2 – Market and supply chain development State Infrastructure Plan: Part B: Resource recovery (page 40), as it refers to 'maximising the recovery of construction materials used in building and infrastructure projects is pivotal to conserving resources' Waste Management

			and Resource Recovery Strategy (Note: relevant sections listed in RFR) Queensland Energy from Waste Policy

Need

11. Whether there is an economic, community or planning need for the proposed development, including:
    (a) whether 'supply' of landfill airspace should be determined by reference to private non-putrescible landfill airspace, or total landfill airspace;

    (b) whether approval of the proposed development would support increased convenience and competition for users of waste recovery and landfill facilities in the local area and South East Queensland;

    (c) whether there is an adequate supply of landfill airspace for the waste sought to be accepted by the landfill in Ipswich and in South East Queensland;

    (d) whether the estimated time for development and completion of the landfill (14-18 years) is:
        (i) accurate; and
        (ii) appropriate, having regard to the nature and extent of need determined.

12. Whether approval of the proposed development will act as a disincentive, or an incentive, for resource recovery.

13. Whether approval of the proposed development will have economic benefits, including by meaningfully contributing to:

    (a) building economic opportunities through the circular economy;

    (b) diversity of industry in Ipswich and South East Queensland;

    (c) employment; and

    (d) economic resilience.

14. Whether the Ipswich community will benefit from approval of the proposed development in any material respect.

15. Whether the proposed development satisfies the test for need which is in the Statement of Proposals, having regard to the following provisions:

(a) *focal provision*: s.3.5.4.4(5)(a)(i); and

(b) *contextual provisions*: ss.3.2.1(23), 3.5.4.2(6)(j)(iii), 3.5.4.4(1)(a), (b), (c), (d), and 3.5.4.4(5)(a)(ii).

Environmental Outcomes

Geotechnical and landfill design

16. Whether the design of the landfill component of the proposed development appropriately addresses the risk of total and differential settlement.

17. Whether the lower liner systems proposed will be able to provide an appropriate level of protection to the environment, including groundwaters, from the waste received to the landfill.

18. Whether the risk of underground fires, and fires within the waste mass caused by spontaneous combustion, is able to be acceptably managed by the proposal.

19. Whether the landfill component of the proposed development will produce a final landform able to be used for industrial purposes.

20. Whether a source of suitable clay soil to construct the liners could be obtained.

21. Whether sources for suitable daily, final and intermediate cover could be obtained.

Surface water and stormwater

22. Whether the partial dewatering of the void as part of the backfill construction methodology will have any unacceptable impacts on the Six Mile Creek and the Six Mile Creek greenspace corridor (**Receiving Environment**), including on:

(a) flow rates, and any consequential erosion; and

(b) water quality.

23. Whether the proposed development will result in unacceptable surface water and stormwater impacts to the Receiving Environment.

24. Whether the stormwater management regime proposed is appropriate to manage the changes to the stormwater and surface water flows which currently occur on the site (primarily into the void).

Groundwater

25. Whether the proposed development will result in unacceptable impacts or risks to groundwaters, now and in the future.

Rehabilitation

26. Whether:

    (a) there will be unacceptable risks to the natural environment post-closure of the landfill component; and

    (b) landfilling is consistent with the existing mining rehabilitation requirements for the site under Environmental Authority EPML02454414.

27. Whether there is an unacceptable environmental risk arising from the potential that the landfill component of the proposed development will be commenced but not completed, or appropriately rehabilitated and maintained into the future.

28. Whether the inclusion of trees and shrubs on the final landfill landform is appropriate.

29. Whether any benefits will accrue from rehabilitation of the mining void by landfilling being carried out as a condition of approval of the proposed development, as opposed to under any existing rehabilitation obligations.

30. Whether the following conservation outcomes (to the extent they are established) support approval of the development application:

    (a) greater conservation outcomes for the locality generally;

    (b) increased koala habitat and movement corridors;

    (c) restored natural drainage channels; and

    (d) the preparation and implementation of a rehabilitation Strategy for Six Mile Creek.

General environmental risk

31. Whether there is a planning principle that development should not '*cause (or have the potential to cause) contamination or other adverse environmental impacts*', and if so whether the proposed development is contrary to that planning principle.

32. Whether approval of the proposed development would be contrary to any planning principle found at matter 31 above, or otherwise have an unacceptable impact on the environment, having regard to the following planning provisions:

	Assessment benchmarks PA, section 45(5)(a)(i)	Matters prescribed by regulation PA, section 45(5)(a)(ii)	Other relevant matters PA, section 45(5)(b)
Focal	**Ipswich Planning Scheme 2006** s.6.7(2)(a) s.6.7(2)(b)(ii) s.6.15(15)(c) s.12.7.3(2)(b) **TLPI** **Waste Activity Code** OO3(2)(a) OO3(2)(b)(iii) SO4(5)(a) SO4(6)(c) SO4(6)(d) ***In relation to the code assessable application for concurrence ERAs:*** **State Code 22** PO4 and PO5 only insofar as they go to satisfying the standard criteria identified in Schedule 4 of the *Environmental Protection Act 1994* (Qld)		**TLPI** Waste Activity Code OO3(2)(a) OO3(2)(b)(iii) SO4(5)(a) SO4(6)(c) SO4(6)(d)
Contextual	**Ipswich Planning Scheme 2006** s.3.1(3)(b) s.3.1(3)(i) s.3.2(1)(b) s.3.2(1)(i) s.6.7(2)(c) s.6.7(4)(a)(i)(D) s.6.7(4)(a)(iv)(G)(I) s.6.7(4)(a)(vi)(D)(II) s.6.15(15)(i), s.12.7.3(2)(a)(xii) s.12.7.3(2)(a)(xiii) s.12.7.4(5)(c)(iii) ***In relation to the code assessable***	**State Interest – Water Quality Policy** (1), (3)(a), 3(b), 3(d), (4), (5) **State Interest – Emissions and Hazardous Activities Policy** (4)(a)	**Planning Act 2016** s.5(2)(a)(i) s.5(2)(a)(ii) s.5(2)(a)(iii) s.5(2)(a)(j) **Statement of Proposals** s.3.4.3.1(4)(c) s.3.5.4.3(2)(b) s.3.5.4.4(3)(c) s.3.5.4.4(3)(d) s.3.5.4.4(3)(g) s.3.5.4.4(5)(a)(iii)(C) s.3.7.8.4(8)(c)(iii) s.3.7.8.4(8)(c)(iv)

	application for concurrence ERAs: **Environmental Protection Regulation 2008 (Qld)** Environmental objectives and performance outcomes for site suitability, location and critical design requirements in Schedule 5, Part 3, Table 2 **Environmental Protection Act 1994** Schedule 4 Standard criteria **State Code 22** Purpose statement 1		**State Code 22** Purpose statement 1 PO4 PO5

Planning outcomes

Land use

33. Whether the proposed development can accommodate future land use consistent with the planning intention in the *Ipswich Planning Scheme 2006*.

34. Whether the proposed development is well-located having regard to:

    (a) the intent and requirements of the *Ipswich Planning Scheme 2006* and the TLPI;

    (b) the constrained nature of the land the subject of the proposed development as a result of former mining activities;

    (c) similar uses in the locality;

    (d) its proximity to:

        (i) waste sources;

(ii) appropriate road infrastructure; and

(iii) a planned terminal for the inland rail project;

(e) community expectations, based on the *Ipswich Planning Scheme 2006*, the TLPI and the Statement of Proposals (to the extent it is relevant);

(f) the landfill component of the Proposed Development being a difficult to locate activity; and

(g) any environmental risks and impacts, and any amenity (visual amenity, the community's perception and sense of place) impacts.

35. With respect to the Queensland Department of Environment and Science document *Guideline - Landfill siting, design, operation and rehabilitation* (ESR/2015/1627, Version 4.01, effective 23 November 2018):

(a) is the Guideline a relevant matter; and

(b) does the Guideline militate against approval or refusal of the proposed development.

Rehabilitation

36. Whether the proposed development will achieve positive rehabilitation outcomes for the land after the landfill use has ceased.

37. Whether the following rehabilitation outcomes (to the extent they are established) support its approval:

(a) achieving greater conservation outcomes for the Six Mile Creek greenspace corridor;

(b) retaining all extensive, treed green space areas and retention of remnant vegetation where possible; and

(c) increasing koala habitat by providing linkages to surrounding bushland.

38. Were the land not to be developed for the proposed development, whether it is likely (having regard to the existing rehabilitation obligations in Environmental Authority EPML02454414) that the land will remain in its present state for longer than if an approval were granted, and remain in its current state with respect to:

(a) its visual appearance to sensitive receptors;

(b) hydrological and hydraulic outcomes for the Land and surrounding catchment, including Six Mile Creek;

(c) ecological outcomes for the Land and surrounding catchment;

(d) rehabilitation outcomes for the Land and surrounding catchment; and

(e) land use planning outcomes for the Land.

39. Whether the proposed development (Special industry) is inconsistent with rehabilitation obligations under Environmental Authority EPML02454414 (and in particular Schedule F – Land) which requires the land be made suitable for industrial uses.

40. Whether the proposed development is contrary to the planning principle that development should not compromise the future capacity of land to be re-used in a way that is compatible with the surrounding area or the uses promoted in planning documents, or is otherwise unacceptable, having regard to the following planning provisions:

	Assessment benchmarks PA, section 45(5)(a)(i)	**Matters prescribed by regulation PA, section 45(5)(a)(ii)**	**Other relevant matters PA, section 45(5)(b)**
Focal	**Ipswich Planning Scheme 2006** s.6.6(2)(g) s.6.7(4)(a)(i)(G) s.6.7(5)(e)(x) s.6.14(2)(a) s.6.14(2)(j) s.6.15(15)(d) s.6.16(2)(a)(iv) s.6.17(2)(t) **TLPI Waste Activity Code** OO3(2)(a) OO3(2)(b)(v) SO4(4)(a) SO4(4)(b) SO4(4)(c) SO4(5)(a)		**TLPI Waste Activity Code** OO3(2)(a) OO3(2)(b)(v) SO4(4)(a) SO4(4)(b) SO4(4)(c) SO4(5)(a)
Contextual	**Ipswich Planning Scheme 2006**	**SEQ Regional Plan**	**Statement of Proposals**

	s.6.6(2)(a) s.6.6(2)(b) s.6.6(2)(c) s.6.6(2)(d) s.6.6(2)(e) s.6.6(2)(p) s.6.6(2)(u) s.6.7(4)(a)(i)(A) s.6.7(4)(a)(i)(B) s.6.7(4)(a)(i)(C) s.6.7(4)(a)(i)(D) s.6.7(4)(a)(i)(F) s.6.7(4)(a)(i)(H) s.6.7(4)(a)(i)(I) s.6.7(4)(a)(ii)(A) s.6.7(4)(a)(ii)(B) s.6.7(4)(a)(ii)(C) s.6.7(4)(a)(ii)(D)(I) s.6.7(4)(a)(iv)(A) s.6.7(4)(a)(iv)(D) s.6.7(4)(a)(v)(A) s.6.7(4)(a)(v)(C) s.6.7(4)(a)(v)(D)(I) s.6.7(4)(a)(v)(D)(IV) s.6.7(4)(a)(v)(D)(V) s.6.7(4)(a)(vi)(A) s.6.7(4)(a)(vi)(C) s.6.7(4)(a)(vi)(D)(VII) s.6.7(4)(a)(vii)(A) s.6.7(4)(a)(vii)(B)(III) s.6.7(5)(a)(i)(A) s.6.7(5)(a)(i)(B) s.6.7(5)(a)(i)(C) s.6.7(5)(a)(i)(D) s.6.7(5)(a)(i)(E) s.6.7(5)(a)(i)(F) s.6.7(5)(a)(i)(G) s.6.7(5)(a)(i)(H) s.6.7(5)(a)(ii)(A) s.6.7(5)(a)(ii)(B) s.6.7(5)(g)(i) Note 6.7J(a) s.6.14(2)(b) s.6.14(2)(c) s.6.14(2)(d) s.6.14(2)(e) s.6.14(2)(f)(i) s.6.14(2)(f)(iii) s.6.14(2)(h) s.6.14(2)(r) s.6.15(15)(a)	**2017** Theme 2 – Prosper Theme 4 – Sustain	s.3.2.1(14) s.3.2.1(16) s.3.3.2.1(1) s.3.5.4.2(5)(b)(iii) s.3.5.4.2(6)(d) s.3.5.4.2(6)(f) s.3.5.4.3(1)(a)(iv) s.3.5.4.3(1)(d) Map SFM2 s.3.5.4.3(2)(a) s.3.5.4.3(2)(b) s.3.5.4.3(2)(c) s.3.5.4.3(2)(d) s.3.5.4.3(2)(g) s.3.5.4.4(3)(g) s.3.5.4.4(5)(a)(ii) s.3.5.4.4(5)(a)(iii)(B) s.3.7.8.4(1) s.3.7.8.4(2) s.3.7.8.4(5) s.3.7.8.4(7)(c)(i) s.3.7.8.4(7)(c)(ii) Map LFM7 s.3.7.8.4(8)(a) s.3.7.8.4(8)(b) **Environmental Authority EPML02454414 TLPI** s.3.1 s.3.2.1(ii) **Waste Activity Code** SO4(2)

	s.6.15(15)(b) s.6.15(15)(e) s.6.15(15)(g) s.6.15(15)(h) s.6.15(15)(i) s.6.16(2)(a)(iii) s.6.17(1) s.12.7.3(2)(a)(iii) s.12.7.3(2)(a)(viii) s.12.7.7(2)(a)(iii) s.12.7.8(2)(a) **SEQ Regional Plan 2017:** Chapter 3, Goal 2: Prosper Element 2 and Strategies 1 and 2, Element 5 and Strategies 1, 2 and 4, Chapter 3, Western Sub-region Outcomes for Prosper 6(d) **TLPI** s.3.1 s.3.2.1(ii) **Waste Activity Code** SO4(2)		

Amenity

41. Whether the proposed development involves filling '*beyond the top of former mining voids*'.

42. Whether the following matters are relevant to the visual amenity issues in dispute:

    (a) the natural topography of the site and surrounding area has been significantly disturbed by open cut mining activities;

    (b) the land (in its current unrehabilitated state) has been stripped of its original character and visual amenity by previous land uses; and

    (c) the land (in its current unrehabilitated state) is currently visible to sensitive visual receptors.

43. Whether the proposed development presents an opportunity to significantly

improve long-term amenity outcomes for surrounding sensitive uses, and the wider community generally, than would be the case if the existing rehabilitation obligations in Environmental Authority EPML02454414 were carried out, as required.

44. Whether, as a result of being visible to sensitive receptors during the operational phase and following completion, the proposed development will have unacceptable impacts on visual amenity, the community's perception and sense of place.

45. Whether the proposed development is of a type or scale appropriate for the prevailing nature of the area and particular circumstances of the site and its surrounds.

46. Whether the proposed development will have unacceptable impacts on the general amenity of the area.

47. Whether the proposed development will have unacceptable impacts on the community's perception and sense of place.

48. Whether the development complies with the following planning provisions:

	Assessment benchmarks PA, section 45(5)(a)(i)	**Matters prescribed by regulation PA, section 45(5)(a)(ii)**	**Other relevant matters PA, section 45(5)(b)**
Focal	**Ipswich Planning Scheme 2006** s.6.7(4)(a)(i)(A) s.6.7(4)(a)(i)(G) s.6.7(4)(a)(v)(C) s.6.7(4)(a)(v)(D)(II) s.6.7(5)(a)(ii)(C) s.6.7(5)(e)(v)(A) s.6.7(5)(e)(v)(B) s.6.14(2)(a) s.6.14(2)(f)(ii) s.6.14(2)(j) s.6.16(2)(a)(iv)(F) s.6.16(2)(b)(i) s.6.16(2)(b)(ii) s.6.17(2)(t) s.12.7.3(2)(a)(i) s.12.7.3(2)(a)(ii) s.12.7.4(1) s.12.7.8(2)(a) **TLPI** **Waste Activity Code** OO3(2)(a)		**TLPI** **Waste Activity Code** OO3(2)(a) OO3(2)(b)(i) OO3(2)(b)(ii) OO3(2)(b)(iv) OO3(2)(b)(v) SO4(5)(a) SO4(5)(b) SO4(7)(a)

	OO3(2)(b)(i) OO3(2)(b)(ii) OO3(2)(b)(iv) OO3(2)(b)(v) SO4(5)(a) SO4(5)(b) SO4(7)(a)		
Contextual	**Ipswich Planning Scheme 2006** s.3.1(3)(j) s.3.2(1)(j) s.6.6(2)(c) s.6.6(2)(d) s.6.6(2)(h) s.6.6(2)(i) s.6.7(3)(a) s.6.7(3)(b) s.6.7(4)(a)(i)(H) s.6.7(4)(a)(i)(I) s.6.7(4)(a)(ii)(D)(II) s.6.7(4)(a)(v)(A) s.6.7(4)(a)(v)(D)(I) s.6.7(4)(a)(v)(D)(IV) s.6.7(4)(a)(v)(D)(V) s.6.7(4)(a)(vi)(A) s.6.7(4)(a)(vi)(D)(VII) s.6.7(5)(a)(i)(C) s.6.7(5)(e)(ix) s.6.14(2)(c) s.6.14(2)(d) s.6.14(2)(h) s.6.14(2)(k) s.6.15(2)(c)(ii) s.6.15(2)(c)(iv) s.6.15(15)(i)(i) s.6.15(15)(i)(iv) s.12.7.3(2)(a)(iv) s.12.7.3(2)(a)(v) s.12.7.2(2)(a)(vii) s.12.7.7(1)(g) s.12.7.7(2)(b)(ii) s.12.7.7(2)(b)(iv) s.12.7.8(2)(e) **TLPI** **Waste Activity Code** SO4(4)(a) SO4(4)(b) SO4(4)(c)	**SEQ Regional Plan 2017** Theme 4 – Sustain Theme 5 – Live	**Planning Act 2016** s.5(2)(i) **Statement of Proposals** s.3.3.4(4) s.3.3.4(5)(d) s.3.3.4(5)(f) s.3.5.4.4(3)(e) s.3.5.4.4(5)(a)(iii)(B) s.3.5.4.4(5)(e) s.3.7.8.4(9)(a) s.3.7.8.4(10)(a) s.3.7.8.4(10)(b) s.3.7.8.4(12)(a) **TLPI** **Waste Activity Code** SO4(4)(a) SO4(4)(b) SO4(4)(c)