GWRC Technical Review of Contaminated Land Report: Preliminary Site Investigation & Detailed Site Investigation (Contamination) – Wellington International Airport Limited Southern Seawall

The following is in response to the review completed by Pattle Delamore Partners Ltd (PDP), dated 11 June 2025 (grey text) and further comments received October 2025 (black text).

PDP Comment	Beca Response	Page Reference
Preliminary Site Investigation		
The PSI states that the amount of soil disturbance proposed for the seawall is not known as detailed design is currently underway and it is assumed that a [sic] majority of soil disturbance will occur in the east area and eastern bank to stabilise the areas. The PSI subsequently outlines that the PSI was based on plans that were available in November 2024 which formed the basis for the site extent and soil sampling investigation, and while that the design has since changed, the site extents as outlined in the November 2024 plans have been retained. Further, the concept plans appended to the PSI are marked as "superseded." Finally, the PSI states that it is not clear whether the proposed works will encounter groundwater… there may be additional management/controls required to minimise discharge to the coastal marine environment. The combination of these elements creates significant uncertainty and results in it being difficult for the reviewer to fully assess the potential for adverse effects on the environment and the adequacy of subsequent work. It is recommended that the most current information and designs are incorporated into the PSI, which should then be reviewed and updated, as necessary.	The PSI was written in November 2024 based on the project understanding at the time – which were the terms of reference for the report. Its primary purpose is to inform the DSI. The DSI, as a more recent investigation, reflects the current project understanding. The preliminary civil drawings included in the original PSI, are retained for context only.	Page number 3, Section 1 (Page 10 of .pdf)
Section 3 (environmental setting) of the PSI does not discuss the inferred/estimated groundwater flow direction. This should be included.	Added to Section 3.3.	Page 7, Section 3.3 (Page 14 of .pdf)

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Appendix F contains a plan that outlines the approximate Hazardous Activities and Industries List (HAIL) areas. We note that, for the golf course site, the HAIL areas are limited to within the boundary of this area. However, for the seawall site, the HAIL areas are shown to extend beyond the boundary. The reason for this inconsistency is unclear, and a consistent approach should be adopted.	Appendix F has been updated to show the full extent of the HAIL areas that intersect the sites.	Appendix F, Page 151 of .pdf
Following on from the above comment, we also query the accuracy of the extent of HAIL area I polygon within the seawall site. Table 6 states that, between 1971 and 1972, additional land south of the airport and on eastern Moa Point Road was reclaimed using, amongst other materials, demolition rubble. This suggests that uncontrolled filling potentially extends further west than the HAIL area I polygon which represents this. So, clarification is sought on how the extent of this polygon has been derived as this may have implications for the review of subsequent work and assessment of risk.	The HAIL I area has been changed to 'potential HAIL I' and extended to account for the potential for uncontrolled filling along part of the seawall.	Appendix F, Page 151 of .pdf
Following on from the above, and as a minor comment, Table 7 considers that the uncontrolled filling meets the definition of HAIL category I (being any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment). Whilst it is arguable as to whether this, or HAIL category G3 may be more appropriate (given the apparent deposition of waste materials that have changed the land profile at a coastal margin), we note that the HAIL map contained in the PSI has incorrectly annotated the HAIL polygon as "land that has been subject to the *migration* of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment" and in doing so, references HAIL category H rather than I. The HAIL categories throughout the report and appendices should be thoroughly reviewed and updated as appropriate.	The inclusion of *migration* was a typo in the HAIL Map and has been corrected. The HAIL category I has also been updated to 'potential I'.	Appendix F, Page 151 of .pdf

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Figure 6 highlights that fire training activities and emergency response activities where aqueous film forming foam (AFFF) was used occurred on the land immediately adjacent to the seawall site (referred to as Areas A and B). However, the report is silent on these matters. Given the migration, persistence and bioaccumulation potential of PFAS, we query whether this, and other, offsite contamination sources need to be considered in Table 7 and the conceptual site model (CSM).	Sentence added regarding Area A and B in Section 4.3.1. Additional row added to Table 7 for potential HAIL H (*Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment*).	Page 13, Section 4.3.1 (Page 20 of .pdf)
Tables 8 and 9 both outline there is a potentially complete pathway in relation to sediment and runoff directly into surface water, with each stating that soil disturbance should be subject to standard erosion and sediment controls preventing discharge to water. However, this advice is not carried through to the conclusions and recommendations section.	An erosion and sediment control plan has been added to the recommendations section.	Page 34, Section 11.2 of the DSI. (Page 39 of the .pdf)
Section 7.2 (recommendations) states that *a contaminated land management plan (CLMP) is recommended for works in the seawall site, which shall be informed by sampling*. We note that the PSI states that the golf course site is covered by the WIAL site-wide NESCS resource consent. We have not been provided with this consent and are unaware of its specific requirements. However, given the HAIL activities and redevelopment proposals for this area, we assume that the consent will require soil sampling and (potentially) a CLMP so as to mitigate adverse effects to the environment if the existing consent does not already specify this. GWRC should satisfy itself of this.	Soil sampling and the CLMP are both referenced in the report. Section 6.1.1.1 states that the site-wide NESCS consent SR520690 requires sampling prior to works. Section 6.2.3 refers to the existing site-wide CLMP	Refer to page number 26 onwards for this information (Page 35 onwards of the .pdf)

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	that covers the golf course site.	
Detailed Site Investigation		
The PSI and DSI have an identical date for issue as 'final draft,' which suggests the information on which each is based would be reasonably identical. However, this is not the case, which suggests that the PSI was finalised prior to the DSI and that it was not updated and reviewed when it was subsequently released with the DSI. For example, the proposed redevelopment activities outlined in the PSI differ from that described in the DSI, suggesting that the PSI was not updated to reflect the work which is now to be undertaken. This has created some confusion as, aside from outlining that the PSI originally encompassed a broader area to the east of the site where project-related activities a no longer proposed, the DSI is silent on other changes such as the amendments to the site boundary, which now includes the area located between the northern site boundary (as shown in the PSI) and Moa Point Road. As outlined previously, the most current information and designs should be incorporated into the PSI, which should then be reviewed and updated, as necessary. Alternatively, detailed clarification on any changes between the two reports and the redevelopment work that is proposed should be included in the DSI.	This was discussed with the reviewer in the meeting held 30 June and has been clarified in Section 1. Due to the review and revision process, the revised drafts of the PSI and DSI submitted to council share the same issue dates. However, the PSI was drafted earlier as indicated in the Revision History in the PSI and DSI documents. The PSI site extent was based on the civil plans dated April 2024 that were current at the time, and the findings of the PSI for the larger site extent was used to inform two DSIs. Therefore, the original site extent was retained for the PSI, but a	Page 5, Section 1 (Page 10 of the .pdf)

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	smaller site extent is used in the DSI.	
Section 4.1 (summary of historical information) describes how the southern seawall area was reclaimed but seemingly overlooks the information contained in the PSI that suggests demolition rubble was also used in the reclamation.	Text has been added to Section 4.1 acknowledging the rubble, and uncontrolled filling is acknowledged in Table 3 – potential contaminants of concern. At the time of the 2024 sampling design and implementation, soil disturbance was not proposed on the seawall; therefore, sampling was not required. Sampling was opportunistically completed along the seawall during recent maintenance works. Demolition rubble was not encountered at the depths excavated. Minimal soil disturbance is proposed in the seawall for the project.	Page 11, Section 4.1 Page 12, Table 3 (Page 16 of the .pdf)
The key in the HAIL map still has the incorrect reference for HAIL category I – referring instead to HAIL category H (i.e. it refers to the migration of	This has been amended on the plan in Appendix B.	Appendix B (preliminary

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hazardous substances from adjacent land, rather than the intentional or accidental release of a hazardous substance).		HAIL Map) and Appendix I (HAIL Map following DSI) on page 69 and page 306 of the .pdf, respectively.
Following on from the above, we note that the HAIL map differs from that provided in the PSI in that the area defined as HAIL category I, which related to the uncontrolled filling activities, is now annotated to include "incidental release from fire training area." This was not discussed previously in the PSI and the reasoning behind this was not clear. We also note that Section 4.2 states that *as the extent of potential fire training and landfilling activities were not known, the contaminants of concern associated with F1 and G3 have been considered in this DSI*. While Table 3 does mention HAIL category F1, category G3 is not discussed at all. Given this, and the previous comments around the application of HAIL categories, we recommend that the HAIL activities that are relevant to the site are subject to thorough review and confirmation. We also query whether HAIL category H (migration of hazardous substances from adjacent land) needs to be considered, given the known incidents of AFFF use on airport land to the north and the historical fire training area to the east of the site and groundwater results from the nearby offsite monitoring well.	The HAIL map in Appendix I has been updated to refine the HAIL area based on the findings of additional soil sampling completed in July 2025. The inclusion of "incidental release from fire training area" was because the PSI site extent was split and the fire training area, while outside the DSI site, had the potential for incidental release to the site since it was accessed from there. As noted in Section 4.1, HAIL code G3 was proposed for part of the site by GWRC in the draft SLUR entry #SN-05-	Refer to: • Appendix I (pg 306 of the .pdf) • Section 4.2 on page 11 and 12 (pg 16 and 17 of the .pdf)

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	1447-02. This appeared to be based on a 2007 URS report; however, no records of a landfill have been found. There are observations and records of uncontrolled fill in the area (rather than waste) and it was considered that HAIL code I was appropriate. HAIL categories have been reviewed as part of considering these review comments and discussion regarding the applicability of HAIL H has been added to Table 3 in Section 4.2.	
Table 4 outlines the potential contaminants of concern for the seawall area. The potential contaminants of concern that were selected for analysis are subsequently outlined in Section 5.1 but exclude volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene and xylenes (BTEX) and **dioxins** which were included in Table 4. No explanation is given as to why these contaminants of concern have been omitted and we seek clarification on this.	Dioxins and VOCs are considered potential contaminants of concern in the adjacent fire training 'pit' when fuel was likely burnt. The fire training 'pit' where combustion occurred – based on the physical and historical evidence collected – is	Section 5.1, page 15 (pg 20 of the .pdf)

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	outside the site extent on the east bank, and visual evidence of burnt material was limited to the 'pit'. Therefore, dioxins are not considered likely to be a contaminant of concern outside of the 'pit' or within the site area. The incidental discharges referred to above relate to AFFF (and PFAS), which is not associated with VOCs (including BTEX) and dioxins. The site is not considered to be down hydraulic gradient of the adjacent historical fire training area. This discussion has been added to the DSI in Section 5.1.	
We seek greater clarification on the investigation rationale and strategy. For example, the report highlights that locations were placed 10 m away from known services and to minimise disturbance to vegetation and fauna. Our view is that a 10 m stand off from services is excessive and that the presence of vegetation such as that known to exist in that area should not dictate where locations can be placed. If specific fauna and habitat were preventing restrictions in certain parts of the site, this needs to be	The key service was a wastewater main (the Moa point wastewater treatment plant outfall) which has a 1.37m diameter. There is also a 0.675m diameter	Appendix C (pg 71 of the .pdf) and Section 6.2 on page 20 (pg 25 in the .pdf)

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discussed in greater detail in the report. Regardless, the result of this approach is that the sampling locations are focussed on a small part of the overall area that was identified as HAIL, resulting in large parts of the site being uncharacterised and therefore, uncertainty in relation to contamination characteristics in these areas. In addition, justification is also sought on why excavation was limited to 1 m bgl - there was no evidence or plans in the DSI in relation to the construction of the laydown yard to support this approach and the plan that did refer to the eastern bank remediation suggests that soil disturbance of at least 1.3 m bgl will be required. Based on the limited information that was presented, our initial view is that the sampling that has been undertaken is not sufficient to characterise the site and adequately assess the potential risk to the environment.	stormwater main with two manholes running through the site. These have been added to the sample location plans in Appendix C. The site has been subject to an ecological assessment which is now referenced in Section 6.2 of the report. The project ecologist provided advice on where test pits could be located to avoid potential lizard, dotterel and kororā (penguin) areas. A sample was collected at 1.3 m bgl in the original DSI but after the site was split in two the sample location was east of the Seawall project site. As PFAS became the primary contaminant of concern, and with the historical PFAS source being at the surface, samples were selected for analysis from	

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	the surface/shallow depths and deeper samples progressively scheduled for analysis to vertically delineate in select locations where PFAS was detected. If the project disturbs soil to 1.3 m in the areas where PFAS was detected at 1.0 m bgl, PFAS will be assumed to be present to 1.3 m bgl. The recent seawall maintenance works provided an opportunity to undertake additional soil sampling which has now been included in the DSI increasing the density of sampling locations within the project site. The additional sampling and analysis completed in July 2025 was consistent with the original findings and characterisation of the site is considered adequate for the purposes of assessing the potential	

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	risk to the environment associated with the soil to be disturbed.	
Section 5.3 states that five machine-excavated test pits and four hand dug pits were excavated, with sample locations WSS_TP1 to WSS_TP5 and WSS_HA7 to WSS_HA10 described in Table 5 and shown on the sampling location plan. This differs to the logs presented in Appendix F which refer to WSS_TP1 to WSS_TP8 only, the photos of which indicate all were advanced using a hydraulic excavator.	The original investigation design included WSS_TP1 to WSS_TP8. For the purposes of this DSI, only WSS_TP1 to WSS_TP5 were within the site, as the others were located east of the site extent. Logs for WSS_TP6 to WSS_TP8 have been removed from the appendices. Pictures and summaries for the hand pits have been included in Appendix F.	Refer to: • Appendix F – amended test pit logs • Appendix G – hand pit summaries.
Section 5.4 of the DSI refers to the PFAS National Environmental Management Plan (NEMP) version 2.0 (HEPA, 2020). This has been superseded by the PFAS NEMP 3.0 (HEPA, 2025) which was released in early March 2025. The DSI should reference and utilise current guidance (we note that it subsequently refers to the PFAS NEMP 3.0 in Section 6 – Assessment Criteria).	The footnote was amended on page 18 in Section 5.4.	Page 18 (pg 23 of the .pdf)
The DSI provides no context on why leachate testing of PFAS was undertaken on the samples (as described in Section 5.4). Some explanation (i.e. to assess landfill acceptance or environmental risk, or both) would be helpful from a review perspective.	This was stated in Section 1, but has been clarified in Section 5.4.	Page 18 (pg 23 of the .pdf)

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We have concerns over the final paragraph in Section 5.4. Specifically, we query what is meant by the statement *In lieu of leachate results from samples collected within the site, leachate results from samples collected adjacent to the site with comparable soil PFAS concentrations were analysed and reviewed*. The paragraph also refers to composite samples. We seek clarification as to why this was undertaken and justification on the appropriateness of this against the objectives of the investigation (i.e. specifically in assessing risk to the environment) and current guidance (i.e. PFAS NEMP 3.0).	Additional leachate analysis has been completed on the soil samples collected July 2025 and reference to the samples collected adjacent to the site have been removed. Changes have been made to Section 5.4, Section 8.2.3, and Section 10.1.1.	Page 18, Section 5.4 (pg 23 of the .pdf) Page 27, Section 8.2.3 (pg 32 of the .pdf) Page 33, Section 10.1.1 (pg 38 of the .pdf)
In terms of assessing risk to the environment, we seek justification on the criteria that have been used: We do not consider reliance on the Landcare Research Ecological Soil Guideline Values (Eco-SGVs - Cavanagh & Harmsworth, 2022) for contaminants in soil to be appropriate. The Eco-SGVs are non-statutory and are not recommended for regulatory use. Aside from the well-publicised industry arguments against adopting the Eco-SGVs, the reclaimed nature of the site, the coastal environment and the redevelopment proposals for this area suggest that the use of these values is inappropriate. The DSI does not qualify the use of these values and, should it choose to do so, must provide comprehensive justification as to their appropriateness. The report should discuss why the Canadian Environmental Quality Guidelines (CCME, 2007) for residential/parkland are applicable to this site,	The industry arguments referred to were requested from GWRC's reviewer, but have not been provided to date. The Ministry for the Environment CLMG No. 2 hierarchy for selecting criteria was employed, and the Landcare Research Eco-SGVs are considered to be the most appropriate New Zealand-derived risk-based environmental guideline values. The ecological	No change in text.

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given that it is neither residential land nor parkland and therefore may be over conservative.	assessment referred to earlier highlights the terrestrial receptors present. The land use pre and post construction is passive recreational which is most akin to parkland. This is conservative but it is common (good) practice in Tier 1 risk assessment where the site-specific exposure scenario does not fit the generic scenarios to select a more conservative rather than less conservative scenario.	
The use of the PFAS NEMP 3.0 (HEPA, 2025) ecological guideline values (indirect exposure) and the interim screening value for reptiles under a direct exposure pathway should each be adequately justified, particularly given that the latter are more relevant to Australian-specific circumstances.	Further rationale for use of the indirect exposure and interim screening value for reptiles has been added to Section 6.2 (refer extract from DSI Section 6.2 on page 18 of this document, following this table)	Section 6.2, Page 20 (pg 25 of the .pdf)
The DSI also refers to the PFAS NEMP 3.0 (HEPA, 2025) ecological water quality guidelines, relying on the 95% species protection values under an interim marine exposure scenario. However, the NEMP 3.0 specifies that,	Further rationale for the use of the 95% species protection values has	Section 6.2, Page 20

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for bioaccumulative contaminants such as PFAS, the 99% species protection default guideline value should be used in assessing toxicity and bioaccumulation in high conservation value ecosystems and assessing bioaccumulation in slightly to moderately disturbed ecosystems.	been added to Section 6.2 (refer extract from DSI Section 6.2 on page 18 of this document, following this table)	(pg 25 of the .pdf)
We strongly question the approach of applying dilution attenuation factors (DAF) for persistent and bio accumulative contaminants such as PFAS without adequate scientific evidence. The PFAS NEMP 3.0 does not advocate this approach, instead recommending that attenuation and transport be handled through site-specific data and modelling which should be thoroughly explained and justified. Biota sampling may also be required to support this. Reliance on the fact that GHD Limited adopted this approach previously, as reported in the DSI, does not form sufficient justification.	As outlined in the report, applying a DAF is a method that has been accepted by GWRC previously, and is an established method used in New Zealand to derive target concentrations and leachability limits for landfills[1], Specifically regarding PFAS, there is little technical guidance estimating mass discharge from the unsaturated zone (Newall, 2023[2]). A supported available example of estimating effects on groundwater does utilise practical in situ porewater measurements, but still	No change.

[1] Technical Guidelines for Disposal to Land (Revision 3.1) – WasteMINZ, 2023.

[2] Newell, C. J., Stockwell, E. B., Alanis, J., Adamson, D. T., Walker, K. L. & Anderson, R. H. (2023). Determining groundwater recharge for quantifying PFAS mass discharge from unsaturated source zones. *Vadose Zone Journal,* DOI: 10.1002/vzj2.20262.

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	also utilises DAF and mixing zone values in the subsequent transport equations (Anderson. 2021[3]). Biota sampling is unlikely to clearly link contaminants to discharge related to soil at the site. Adjacent former fire training areas and other potential sources located hydraulically up-gradient of the site that may be discharging via groundwater and the stormwater and wastewater outfalls could all contribute to biota exposure.	
In respect of the background criteria, the DSI relies on URS New Zealand Limited's (URS) Background Soil Concentrations for the Wellington Region (URS, 2003) and states that that the values for main soil type 3 (Greywacke) have been selected. However, main soil type 3 in the URS document actually relates to Hutt Alluvium. This should be reviewed and justification given as to why these are the most appropriate background values to utilise.	Amended to 'Type 2' as intended. Justification for this change has been added to Section 6.3.	Page 22, Section 6.3 (pg 27 of the .pdf)

[3] Anderson, R. H. (2021). The case for direct measures of soil-to-groundwater contaminant mass discharge at AFFF-impacted sites. *Environmental Science and Technology*, DOI: https://doi.org/10.1021/acs.est.1c01543.

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The DSI indicates that the 'white paint test' was used to assess whether asphalt fragments contained coal tar. However, detail in the methodology around this is lacking. For example, it is unclear whether white spray paint manufactured with petroleum distillate was used (given the many are manufactured with acetone, toluene or xylene solvents, and can produce incorrect test results), whether the paint was sprayed onto a clean surface and how exactly this was achieved. This field test should be described in the same level of detail as any other field screening procedure (noting that the PID field screening procedure and results were not described in the DSI either). We highlight that reporting on the field sampling techniques that were employed, how these were to be undertaken, and the results are a requirement for DSIs under the Ministry for the Environment's (MfE) *Contaminated Land Management Guidelines No.1: Reporting on Contaminated Sites in New Zealand* (MfE, 2021). Given the DSI states it has been written in general accordance with this guideline, it is surprising that it does not contain this detail.	Pertinent steps in the methodology have been added to Section 7.1.1, and the original references to the sections of guidelines that were used to inform the methodology have been kept. This is considered adequate.	For white paint test - Page 23, Section 7.1.1 (pg 28 of the .pdf) For gas monitoring – Page 16, Section 5.3.1 (pg 21 of the .pdf)

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Footnote 11 in relation to the coal tar field screening test directs the reader to section 5.2 of the report, yet this does not mention anything about assessing coal tar in roading materials, instead describing the Investigation Rationale.	The 'refer to section 5.2' in parentheses was within a reference to the WasteMINZ Guidelines for Assessing and Managing Coal Tar Contamination in Roading, and intended to refer to 'section 5.2 – white paint test' of the WasteMINZ guidance. Section 5.2 of the WasteMINZ guidance was followed when completing the white paint test in the field. This has been clarified in the footnote text.	Page 22 (pg 27 of the .pdf)
The DSI lacks description on sample handling and management procedures. In this case, this is relevant as, on reviewing the chain of custody documents, it was observed that some samples were taken on Friday 29 November 2024 but were not received by the laboratory until Monday 2 December. Additionally, some of the containers were received by the laboratory at temperatures (i.e. >17˚ C) that indicate the samples were not chilled before dispatch (including samples that were received by the laboratory the day following dispatch). This, combined with the lack of information on how the samples were handled or managed, results in uncertainty over whether the results for volatile contaminants are reliable.	Samples were placed on ice in chilly bins on site immediately after sampling. Most often samples were packed in the field and delivered directly to Hill Laboratories in Wellington where temperatures were measured by the laboratory prior to further chilling / packaging for transport to their Hamilton laboratory, meaning there	Relates to Section 5.3, page 16 (pg 21 of the .pdf)

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	was not always sufficient time for samples to chill. This was the case for laboratory job no. 3727360 where the samples arrived at the laboratory at >17° at 3.44pm on the day they were collected. Laboratory job no 3728481 contains the samples collected Friday 29 November and shows they were received at the laboratory at 4.28pm on 29 November. The associated laboratory Job Information Summary indicates the samples were not registered (as in scheduled for analysis) until the following Monday 3 December and there is no issue with that, being well within recommended holding times.	
Section 8.2.3 suggests that the exposure pathway between the site and the marine environment is via leaching to groundwater and subsequent discharge. We query whether overland flow and entrainment of sediment	Erosion and sediment control methods were recommended in the	Page 35, Section 11.2

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from a combination of extreme weather and/or wave action should also be considered, given the location of the site.	recommendations section of this DSI (Section 11.2).	(Page 40 of the .pdf)
Section 8.2.3 of the report seemingly suggests that an assessment to the marine environment has been carried out using samples from offsite areas. This is not considered a reliable or acceptable means of assessment, and it is unclear why samples from the site have not been relied upon.	The leachate analysis methodology was carried out on samples from within the site during the additional sampling carried out in July 2025, thus addressing the reviewer's comment. The PFAS concentrations in soil in the July 2025 samples (i.e. within the site) were similar to those encountered during the first round of sampling. Additionally, the locations of the original leachate samples have been added to the sample location plan for context.	Refer to: • Page 18, Section 5.4 (pg 23 of the .pdf) • Page 27, Section 8.2.3 (pg 32 of the .pdf) • Page 33, Section 10.1.1 (pg 38 of the .pdf)
Section 8.2.3 states that the approximate location of well A4_07 is shown in the sampling location plan – it is not. This, alongside some of our previous comments, suggests that the DSI has not been subject to adequate internal review.	This has been amended and is included in the sampling location plan in Appendix C.	Appendix C, pg 71 onwards of the .pdf
The PSI stated that it is not clear whether the proposed works will encounter groundwater and, based on the information presented in the DSI, it remains unclear whether the proposed redevelopment activities along the	This has been clarified in the PSI – groundwater will not be encountered and	N/A

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southern seawall site will do so. Groundwater has not been assessed in the DSI, despite the report indicating the presence of a groundwater monitoring well on the seawall site. This should be discussed and, if necessary, additional investigation undertaken.	additional investigation is not required.	
Detailed Site Investigation – Further Comments October 2025		
The results section of the Executive Summary needs to be updated to include all the samples and locations where ecological guidelines were exceeded for PFAS (TP4, TP5, HA02, HA03, HA04)	The results section in the Executive Summary has been updated to include samples/locations where ecological guidelines were exceeded – refer to Executive Summary.	Page 3, Executive summary
Further sampling conducted in June 2025 has been sufficient to assess contaminant concentrations in soil in the east of the site. However, gaps in sampling are still present (e.g. those areas shown in green highlight on the marked-up figure below). If soil disturbance is proposed in these locations, and there are constraints to sampling prior to construction, we recommend these areas are considered to be potentially contaminated with respect to earthworks controls and soil disposal/reuse until sample results prove otherwise.	The southern green-highlighted area adjacent to the water's edge is a sandy gravel beach. Beach levels vary by approximately 1.0m, associated with storm and large swell erosion and subsequent rebuilding of the beach[4]. There is potential for beach materials to contain low contaminant concentrations being that these will contain material eroded from the bank on	Page 4, Executive summary Page 35, Section 11.2

[4] Beca Ltd (22July 2025) *WIAL Southern Seawall Renewal, Assessment of Effects on Coastal Processes*. Section 3.6 Sediments and Sediment Transport.

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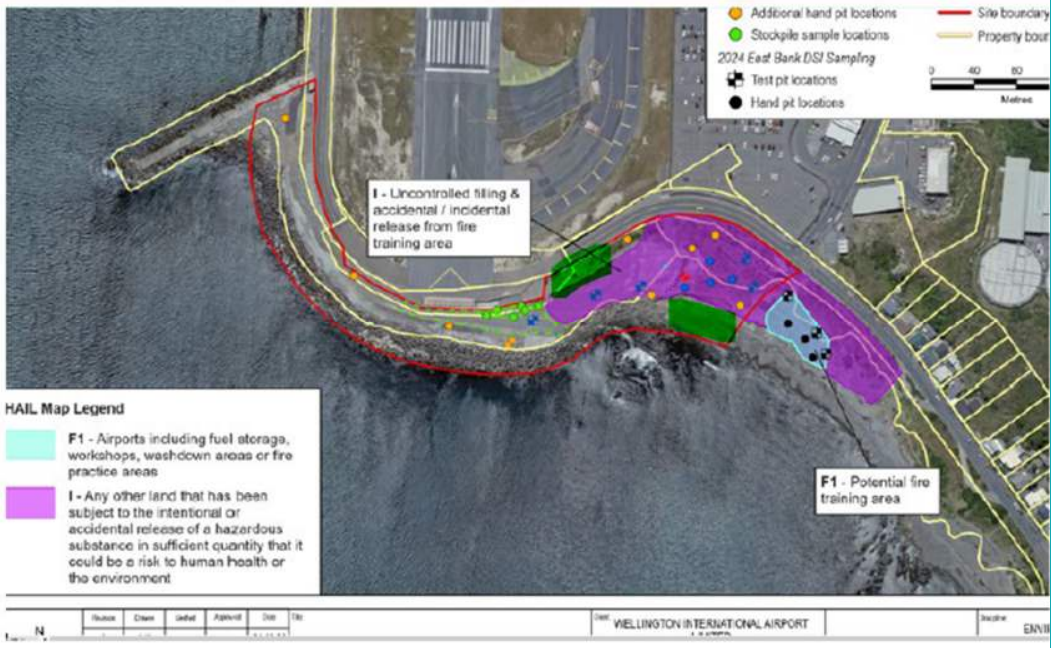	site and from the dynamic marine environment into which stormwater and wastewater is discharged. Material will be temporarily cleared to allow for construction of the toe of the Eastern Bank Rehabilitation (i.e. rock revetment) and then replaced on the beach over the toe and lower revetment. As the beach material is constantly shifting there is not considered to benefit in sampling at this stage, nor is there considered to be benefit in removing the material during construction when surrounding beach materials will be of comparable condition (from a contaminants perspective). The northern green-highlighted area is currently a stockpile area associated with 2025	

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	maintenance works and could not be sampled. The suggested approach is considered appropriate. Wording has been added to the recommendations in Section 11.2 in the DSI to reflect the management and sampling requirements.	
Section 8.1 Summary of soil analytical result**s** states "heav**y** metals and PAHs were not detected at concentrations that exceed human health or environmental acceptance criteria". This text should be updated to reflect the exceedance of environmental criteria for metals in HA03.	The results section has been updated to include the exceedance of the environmental criteria – refer to Section 8.1.	Page 26, Section 8.1
Can the applicants' ecologists please clarify whether there is potential for kororā to be exposed to PFAS contaminated soils at 0.3m bgl and deeper in their burrows or through other typical behaviour. If so has consideration been given to deeper excavation and removal of PFAS contaminated soils in this area to remove the pathway for exposure?	Section 8.2.2 added to include ecologist's advice that kororā almost never dig burrows into hard ground and if the ground was covered by 30 cm of clean material, then this would be fine for the penguins.	Page 26, Section 8.2.2
Related to the above, we consider the pathway for terrestrial ecological receptors would be either: - Complete - Potentially complete	Section 8.2.5 reviewed based on ecologist's advice, with minor update for clarity in Table 7.	Page 27, Section 8.2.5

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The results of sampling and analysis for PFAS show that the eastern extent of the site has been exposed to PFAS, particularly along the northern boundary. Presence of PFAS in these soils could be the result over historic overland flow from the north/northeast and/or direct application and/or spray drift/overland flow from the adjacent fire training area. Therefore, we consider the HAIL map should be updated to include both Category H and Category I to reflect the potential for historic overland flow, spray drift. Refer marked-up figure below which shows locations where PFAS was above the laboratory limit of reporting.	The HAIL category does not have a material effect on the outcome, but the categories have been updated to include HAIL H as requested to account for spray drift. Overland flow is not considered likely due to the topography of the site. HAIL category H has been added to the potential contaminants of concern table in Section 4.2, the HAIL discussion in section 9.1, and to the HAIL map in Appendix I.	Page 12, Section 4.2, Table 3 Page 30, Section 9.1 Appendix I

Extracts from DSI Section 6.2

Further rationale for use of the indirect exposure and interim screening value for reptiles has been added to Section 6.2

The PFOA ecological direct exposure for reptiles is based on a lowest observed adverse effect level (LOAEL) of 50µg/kg for reduced growth (Zhang et al. 2020), divided by a minimum uncertainty factor of 10 for inter-species differences (Australian Government 1999a). An ecological assessment[12] has been completed for the site; which concluded the ecological values for fauna (i.e., coastal avifauna, lizards, invertebrates) were moderate (for lizards), high (for banded dotterel), and low (for other avifauna and invertebrates).

Further rationale for the use of the 95% species protection values has been added to Section 6.2

For bioaccumulative contaminants, which include many PFAS, the ANZG framework specifies that the 99% species protection DGV should be used in:

- Assessing toxicity and bioaccumulation in high conservation value ecosystems
- Assessing bioaccumulation in slightly to moderately disturbed ecosystems.

The coast is downgradient of airport activities, is modified via reclamation and the seawall and is adjacent to the Moa Point wastewater outfall so is not considered a high conservation value ecosystem.

PFAS NEMP (Version 3.0) states guidance should be sought from the environmental regulator to confirm specific jurisdictional requirements. The GWRC NRP Schedule V uses a 95% species protection level for coastal water. The PFAS NEMP directs that freshwater values are to be used on an interim basis until final marine guideline values can be set. The ANZG 2023 interim DGV for PFOS is in the process of being updated following public consultation on the technical brief.