

CUMULATIVE IMPACT RISK ASSESSMENT

Darwin Port Maintenance Dredging Campaign

This Cumulative Impact Risk Assessment (CIRA) has been prepared to support Darwin Port's referral and its response to the NT EPA Direction to Provide Additional Information (regulation 40 of the Environment Protection Regulations 2020 (NT)), dated 13 October 2025, in relation to the Darwin Port Maintenance Dredging Campaign. It assesses the potential for cumulative impacts arising from this proposal in combination with other current, approved and reasonably foreseeable activities in Darwin Harbour, with reference sensitive receptors such as the hard coral and filter-feeder communities at South Shell Island.

Document control

Field	Detail
Document title	Cumulative Impact Risk Assessment – Darwin Port Maintenance Dredging Campaign
Project / activity	Darwin Port Maintenance Dredging Campaign at Fort Hill Wharf, East Arm Wharf and the Marine Supply Base.
Proponent	Landbridge Port Pty Ltd as trustee for the Landbridge Darwin Port Lessee Trust (Darwin Port)
Document owner	Sustainability and Project Approvals Lead, Darwin Port
Version	0.1 – Draft
Date	10 June 2026
Status	Draft – prepared to support Darwin Port's response to the NT EPA Direction to Provide Additional Information (Regulation 40), dated 13 October 2025

Revision history

Version	Date	Author	Summary of changes
0.1	10 June 2026	Sustainability and Project Approvals Manager	Initial draft, populated to support Regulation 40 response

1. Purpose and Scope

This CIRA has been prepared to support Darwin Port's response to the NT EPA's Direction to Provide Additional Information, which requested that Darwin Port describe and explain the potential cumulative impacts of the proposed maintenance works, and how cumulative impacts to sensitive receptors, particularly South Shell Island, will be avoided, mitigated, and managed. It draws on the Darwin Port Maintenance Dredging and Dredge Material Management Plan (the DMP) and the assessment of other Darwin Harbour proposals summarised in Section 4.

This assessment covers marine environmental quality (turbidity and suspended sediment concentration) and marine ecosystems (hard coral and filter-feeder communities), consistent with the environmental factors assessed in the DMP. It does not repeat the quantitative sediment plume modelling presented in Section 6 of the DMP, which is incorporated here by reference.

2. Legislative and Policy Context

Section 10 of the Environment Protection Act 2019 (NT) provides that an impact of an action may be a cumulative impact and may occur over time, in combination with the impacts of other actions. Consistent with this, and with the NT EPA's Environmental Impact Assessment Guideline for Proponents (NT EPA 2022), this assessment considers cumulative impacts arising from the concurrent or sequential occurrence of this proposal with other activities affecting the same environmental values, principally at South Shell Island.

This assessment also applies the Zone of High Impact / Zone of Moderate Impact / Zone of Influence framework set out in the WA EPA Technical Guidance (WA EPA 2016) and adopted in Section 6.6 of the DMP (consistent with the NT EPA Guidelines, NT EPA 2013), and has regard to the following industry guidance applied in the DMP:

- PIANC 2006, Environmental Risk Assessment of Dredging and Disposal Operations (WG10).
- PIANC 2009, Dredging Management Practices for the Environment: A Structured Selection Approach (EnviCom WG100).
- CEDA 2011, Environmental Control on Dredging Projects; CEDA 2015, Integrating Adaptive Environmental Management into Dredging Projects.
- National Assessment Guidelines for Dredging (NAGD), Commonwealth of Australia, 2009.

3. Description of the Proposal

Attribute	Description
Activity / works description	Maintenance dredging (cutter suction dredge, CSD) supplemented by bed levelling (sweep bar) works, to remove or redistribute accumulated unconsolidated sediment (clay, silt, sand) from existing berth pockets, channels and the turning basin.
Location(s)	Fort Hill Wharf (FHW), East Arm Wharf (EAW), and the Marine Supply Base (MSB), which encompasses eight discrete berth/channel/turning-basin areas in total.
Duration and timing	The maintenance campaign is expected to be spread over approximately two to three weeks. Commencement date not yet fixed and will be dependant on vessel assess requirements and surrounding stakeholder activities.
Spatial footprint / extent	Approximately 30,000 m ³ total (including 300 mm over-dredge allowance) across the eight areas — see Table 4-1 of the DMP for the volume by site.
Environmental factors potentially affected	Marine environmental quality (turbidity / suspended sediment concentration), marine ecosystems (hard coral and filter-feeder

	communities), with South Shell Island identified as the key sensitive receptor.
Relevant approvals / referral status	Referred to the NT EPA; subject to a Direction to Provide Additional Information under regulation 40 of the Environment Protection Regulations 2020 (NT), dated 13 October 2025. Bed levelling / sweep bar works assessed separately via the NT EPA pre-referral screening tool (DMP Appendix A) and not included within the referral. Supporting document: Darwin Port Maintenance Dredging Works – Dredging and Dredge Material Management Plan, 24 April 2025 (the DMP).

4. Identification of Other Proposals and Activities

Proposal / activity	Proponent	Status	Timing	Proximity /location	Data source
Darwin Ship Lift and Marine Industries Project	Darwin Ship Lift Pty Ltd	<i>Capital dredging complete as of September 2025</i>	N/A	Directly adjacent to South Shell Island; highest cumulative-impact relevance of all identified projects	Public NT EPA register / project materials
INPEX Maintenance Dredging Program	INPEX Operations Australia	Approved 5-year maintenance dredging program, no campaign undertaken to date	Ongoing approval, campaign timing to be confirmed directly with INPEX	Ichthys LNG Marine Supply Base, within Darwin Harbour	NT EPA register (Assessment Report completed 18 April 2023)
Darwin Pipeline Duplication Project	Santos	Project reported as complete	N/A	Existing pipeline route within the harbour	Public project materials
HMAS Coonawarra	Department of Defence	Capital dredging works undertaken; ongoing maintenance approval	Recurrers approximately every 5–7 years	Eastern shore of Darwin Harbour, ~2 km west of Darwin CBD	Public notices / Dredging and Disposal Management Plan (HMAS Coonawarra, 2023)
Mandorah Marine Facilities	NT Government	Capital dredging reported complete	N/A	Western side of the harbour	Public project materials
Australia-Asia PowerLink (Sun Cable)	Sun Cable	Approved; subject to final investment decision	Not expected before 2028	Subsea cable jet-trenching through Shoal Bay / Gunn Point	Public project materials
Middle Arm Sustainable Development Precinct	NT Government (Dept of Logistics and Infrastructure)	Strategic environmental assessment phase; no construction/dredging schedule confirmed	Not yet determined	Adjacent Darwin Harbour precinct; insufficient project definition to assess overlap at present	NT EPA / DLI public register

The Darwin Ship Lift Project is treated as the priority consultation given its direct proximity to South Shell Island and the explicit reference to it in the NT EPA's Direction.

5. Sensitive Receptors and Environmental Values

Receptor	Environmental value(s)	Sensitivity	Distance from works	Existing condition / baseline
South Shell Island (western side)	Hard coral communities	Moderate–High	Predicted to lie within the Zone of Moderate Impact for both Dry and Wet Season dredging (DMP Section 6.6)	Reduction in hard coral cover previously recorded during concurrent capital dredging by Darwin Port and INPEX (2012, 2014); DMP Section 5.3.1.1
South Shell Island / Old Man Rock	Filter-feeder communities	Moderate–High	Within Zone of Moderate Impact / Zone of Influence (DMP Section 6.6)	No statistically significant impact recorded during 2012–2013 MSB capital works monitoring (DMP Section 5.3.1.2)
Darwin Harbour megafauna (dugongs, turtles, dolphins)	Marine fauna distribution and population	Moderate	Harbour-wide	No dredging-related impacts observed on megafauna distribution/population during INPEX capital dredging (Cardno 2014); dolphin populations stable (Brooks and Pollock 2015)

6. Cumulative Impact Pathways

Environmental factor	Cumulative pathway / mechanism	Contributing activities	Receptor(s) affected	Spatial / temporal overlap
Marine water and sediment quality	Overlapping turbidity / elevated suspended sediment concentration (SSC) plumes from concurrent or closely sequential dredging	This proposal's MSB/EAW maintenance dredging + Darwin Ship Lift capital/maintenance dredging	South Shell Island hard coral and filter-feeder communities	Sequential if works are separated by ≥ 12 months; concurrent risk depends on ongoing maintenance regime by Ship Lift and Darwin Port
Marine water and sediment quality	Overlapping turbidity plumes from concurrent maintenance dredging programs within the harbour	This proposal + INPEX Maintenance Dredging Program (if activated)	South Shell Island communities	Unlikely under current information (no INPEX campaign yet reported); to be confirmed by direct consultation during scheduling of works
Marine ecosystems (benthic habitat)	Sequential disturbance without sufficient recovery time between dredging campaigns at the MSB and linked channel	Back-to-back maintenance dredging campaigns at this proposal's own sites	South Shell Island hard coral community (closest sensitive receptor to the MSB channel)	Considered unlikely as it would require a significant deposition event immediately following completion of works; survey results following 2025 tropical cyclone Fina showed minimal impacts

7. Risk Assessment Methodology

7.1 Likelihood

Level	Descriptor	Description
1	Rare	May occur only in exceptional circumstances; no known cumulative overlap identified.
2	Unlikely	Could occur, but overlap with other proposals is not expected under current scheduling (e.g. Darwin Ship Lift, INPEX).
3	Possible	Might occur; timing of this proposal's own campaign, or of other harbour proposals, is not yet confirmed.
4	Likely	Will probably occur; known overlap in timing and/or location with at least one other activity.
5	Almost certain	Expected to occur; confirmed concurrent or closely sequential activity affecting South Shell Island.

7.2 Consequence

Level	Descriptor	Description
1	Negligible	No detectable change to receptor condition beyond natural (background ~5 mg/L SSC) variability.
2	Minor	Short-term, localised, reversible change within the Zone of Influence; full recovery expected without intervention.
3	Moderate	Measurable impact within the Zone of Moderate Impact; damage to benthic habitat/mortality of biota possible but disturbed areas expected to recover with no long-term modification (WA EPA 2016 definition, DMP Section 6.6).
4	Major	Substantial impact with slow or uncertain recovery; potential for long-term modification of South Shell Island habitat.
5	Severe	Irreversible loss or severe, permanent modification of South Shell Island coral/filter-feeder communities.

7.3 Risk matrix

Consequence ↓ Likelihood →	Rare	Unlikely	Possible	Likely	Almost certain
5 – Severe	Moderate	High	High	Extreme	Extreme
4 – Major	Moderate	Moderate	High	High	Extreme
3 – Moderate	Low	Moderate	Moderate	High	High
2 – Minor	Low	Low	Moderate	Moderate	High
1 – Negligible	Low	Low	Low	Moderate	Moderate

Rating bands Low: manage through routine EMF controls. Moderate: manage through the specific mitigation measures in Section 9 and ongoing monitoring. High: requires active management, escalation and regulator/stakeholder consultation prior to proceeding. Extreme: proposal should not proceed in current form without substantive redesign or additional avoidance measures. No risk in this assessment has been rated High or Extreme on either an inherent or residual basis.

8. Cumulative Risk Assessment

ID	Cumulative impact / pathway	Likelihood	Consequence	Inherent rating	Existing controls	Residual rating
CI-01	Turbidity/SSC exceedance affecting South Shell Island hard coral & filter-feeder communities during this proposal's own dredging/bed levelling	3 – Possible	3 – Moderate	Moderate	EMF Section 8.2 reactive turbidity triggers (3.5 NTU Dry / 21.2 NTU Wet Season); 24-hr reporting and response; operational controls (low cutter speed, static CSD)	Low
CI-02	Cumulative turbidity/SSC overlap with Darwin Ship Lift Project works near South Shell Island	2 – Unlikely	3 – Moderate	Moderate	Direct consultation with Darwin Ship Lift prior to scheduling; timing avoidance; DSL capital dredging already reported complete (Sept 2025)	Low
CI-03	Cumulative turbidity/SSC overlap with INPEX Maintenance Dredging Program	2 – Unlikely	3 – Moderate	Moderate	Confirm INPEX campaign status directly prior to finalising schedule; no INPEX campaign yet reported under its approval	Low
CI-04	Sequential (back-to-back) impact from this proposal's own maintenance dredging / bed levelling campaigns at the MSB without sufficient recovery time	1 – Rare	3 – Moderate	Low	Campaign scheduling based on sediment accumulation monitoring; short campaign duration (2–3 weeks)	Low

9. Mitigation and Management Measures

Risk ID	Mitigation / management measure	Trigger / threshold	Responsibility	Monitoring / verification
CI-01	Reactive turbidity trigger values and corrective actions (DMP Section 8.2.2–8.2.5); low cutter speed and static CSD positioning to minimise plume generation	Dredging-related SSC: 10 mg/L (Dry) / 25 mg/L (Wet); turbidity trigger 3.5 NTU (Dry) / 21.2 NTU (Wet) at SSI-West	Contractor (field monitoring) / Darwin Port (oversight)	Continuous turbidity monitoring at South Shell Island (SSI-West/East) and down-current sites; 24-hr exceedance reporting; 3-business-day assessment
CI-02	Direct consultation and schedule coordination with Darwin Ship Lift Project prior to finalising the maintenance dredging/bed levelling schedule	Any confirmed change to DSL works timing within 12 months of this proposal's campaign	Environmental Manager, Darwin Port	Stakeholder consultation; schedule review prior to works commencing

Risk ID	Mitigation / management measure	Trigger / threshold	Responsibility	Monitoring / verification
CI-03	Confirm current INPEX campaign status directly with INPEX/NT EPA prior to scheduling	Notification of an activated INPEX maintenance dredging campaign	Environmental Manager, Darwin Port	Stakeholder consultation
CI-04	Sequencing of dredging based on hydrographic survey / sediment accumulation monitoring rather than fixed calendar intervals	Hydrographic survey indicating high-spot accumulation requiring intervention	Senior Manager Marine Operations, Darwin Port	Hydrographic survey program

10. Monitoring, Triggers, and Review

Monitoring locations, parameters and frequency

Continuous turbidity monitoring at South Shell Island (SSI-West, SSI-East) and at sites 200 m down-current of the dredging and disposal locations (DMP Section 8.2.3).

Trigger values and response procedure

Seasonal turbidity trigger values of 3.5 NTU (Dry Season) and 21.2 NTU (Wet Season) at SSI-West; 24-hour reporting of exceedance and a 3-business-day assessment (DMP Section 8.2.4).

Schedule review trigger

Re-assess this CIRA if the confirmed timing of the Darwin Ship Lift Project, INPEX Maintenance Dredging Program, or any newly identified harbour proposal changes such that it would overlap with this proposal's campaign window.

Review frequency for this document: prior to works commencing, and again if the campaign is rescheduled beyond the window assessed here.

11. Conclusion

Based on the assessment above, the residual cumulative risk associated with the Darwin Port Maintenance Dredging Campaign, in combination with the other activities identified in Section 4, is considered **Low**. This conclusion reflects:

- (i) the DMP's own finding that, while South Shell Island lies within the Zone of Moderate Impact, disturbed areas are expected to recover with no long-term habitat modification;
- (ii) the reactive turbidity trigger and response regime at Section 8.2 of the DMP; and
- (iii) the absence of confirmed timing overlap with the Darwin Ship Lift Project or INPEX Maintenance Dredging Program under current information.

This conclusion is conditional on Darwin Port completing additional consultation prior to finalising the works schedule, and on confirming those items marked as open/active in Section 4 of this assessment.