25 August 2021

Infrastructure NSW
Attn: Jennifer Chang
19 Martin Place
Sydney NSW 2000
Attention: Jennifer Chang

By email: jennifer.chang@infrastructure.nsw.gov.au

Dear Jennifer,

RE: INTERIM AUDIT ADVICE LETTER NO. 2 - CONDITION B93 OF SSD 8924 MOD 4, THE NEW SYDNEY FISH MARKET

Ramboll Australia Pty Ltd
Level 3, 100 Pacific Highway
PO Box 560
North Sydney NSW 2060

T +61 2 9954 8100
www.ramboll.com

Ref 318000632

1. INTRODUCTION AND OBJECTIVE

As a NSW Environment Protection Authority (EPA) accredited Contaminated Sites Auditor, I am conducting an Audit in relation to the site at 1A to 1C Bridge Road, Glebe, NSW and part of 56-60 Pyrmont Bridge Road, Pyrmont, NSW. The site location is shown on Attachment 1.

State Significant Development (SSD) application 8925 was approved by the Minister of Planning and Public Spaces on 12 June 2020 for Stage 2 of the new Sydney Fish Market (nSFM), for construction, use and operation including:

- A three-storey (4 levels) building with a ground floor area of 26,751 m^2 comprising:
    - Wholesale services, product storage and processing
    - Retail, business and office premises
    - Multi-function spaces for events and functions
    - Staff amenities and end-of-trip facilities
    - Outdoor seating areas
    - Basement car park
- New public domain, including a foreshore promenade and landscaping
- Marina
- Pedestrian, cycle and road access
- Upgrade works to Bridge Road and intersections with Wattle Street and Wentworth Park Road
- Provision of services, site level adjustments and stormwater management
- Subdivision of land.

Ramboll Australia Pty Ltd
ACN 095 437 442
ABN 49 095 437 442

Modification of Development Consent SSD 8925 MOD 4: increase in seabed sediment requiring redistribution was granted on 2 July 2021 (MOD 4).

This second Interim Audit Advice Letter (IAA #2) has been prepared to address new requirements (**in bold**) of condition B93 as follows:

B93. ~~Prior to the commencement of works~~ **Within eight weeks of the approval of SSD 8925 MOD 4**, the Applicant must engage an EPA-accredited Site Auditor to prepare interim audit advice which comments on:

(a) The Data Gap Assessment - The New Sydney Fish Market 1A to 1C Bridge Road, Glebe NSW, Revision A (dated 12 March 201 9) prepared by JBS&G Australia Ply Ltd for Urban Growth NSW Development Corporation which comments on the appropriateness of the assessment and the assessment's conclusions;

(b) Whether the characterisation of the site is sufficient to ensure any asbestos containing materials in soils and at ground surface are managed appropriately;

(c) Whether the Hazardous Materials Management Plan, prepared by JBS&G (dated 8 April 2019), requirements for managing asbestos at ground surface and in soils are appropriate~~.~~**;**

(d) sediment adjustment methodology prepared by Senversa Pty Ltd (dated 15 April 2021), the Acid Sulphate Soil Management Plan prepared by JBS&G Australia Pty Ltd (dated 26 April 2021), and revised Construction Staging Plan.

(e) Any deficiencies identified by the auditor in the interim audit advice/s must be addressed.

Other aspects of the condition (points (a) to (c)) were addressed in the following documents prepared by me:

- 'Site Audit Report - The New Sydney Fish Market, 1A to 1C Bridge Road, Glebe and part of 56-60 Pyrmont Bridge Road, Pyrmont, NSW' and Site Audit Statement (SAS) TO-054-A, dated 25 September 2019 (***TO-054-A***)
- 'Interim Audit Advice No. 1 – Data Gap Assessment and Hazardous Materials Management Plan, The New Sydney Fish Market' dated 13 August 2020 (***IAA #1***)
- 'Site Audit Report - Revised Remedial Action Plan, The New Sydney Fish Market, Pyrmont NSW' and SAS TO-054-B, dated 13 August 2020 (***TO-054-B***).

2. SCOPE OF REVIEW

The scope of IAA # 2 includes:

- Review of the following reports:
  - 'Re: SSD 8925 Modification 4: Basement Redesign and Sediment Redistribution 1A-1C Bridge Road, Glebe and Part of 56-60 Pyrmont Bridge Road, Pyrmont NSW', 15 April 2021, Senversa Pty Ltd (Senversa) (***the Sediment Adjustment Methodology***)
  - 'Acid Sulfate Soil Management Plan, The New Sydney Fish Market, 1A to 1C Bridge Road, Glebe, NSW', Rev 6, 26 April 2021, JBS&G (***the ASSMP Rev 6***)
  - Revised Construction Staging Plan submitted with MOD 4
  - 'Response to Site Auditor Review Comments for Sediment Characterisation Report, New Sydney Fish Markets, Bridge Rd Glebe' 13 August 2021, JBS&G (***the JBS&G Response***)
  - 'Sediment Characterisation Assessment, The new Sydney Fish Market, 1A to 1C Bridge Road, Glebe, NSW', Rev 0, 13 August 2021, JBS&G Australia Pty Ltd (JBS&G) (***the SCA***)
  - 'MOD4 Sediment Adjustment Methodology, Response to Site Auditor Questions', 19 August 2021, Senversa (***the Senversa Response***).
- Reference to the following previously reviewed and endorsed documents:

  - 'Acid Sulfate Soil Management Plan, The New Sydney Fish Market, 1A to 1C Bridge Road, Glebe, NSW', Report No. 54162/113896 (Rev 2), 4 April 2019, JBS&G (***the ASSMP Rev 2***)
  - 'Remedial Action Plan, The New Sydney Fish Market, 1A to 1C Bridge Road, Glebe and part 56-60 Pyrmont Bridge Road, Pyrmont, NSW', Report No. 54162/113808 (Rev 4), 8 July 2020, JBS&G (***the Revised RAP***).
- Discussions with Infrastructure NSW, and with JBS&G and Senversa.

3. SITE DETAILS

The nSFM site details are as follows:

Street address:	1A to 1C Bridge Road, Glebe, NSW 2037 and part 56-60 Pyrmont Bridge Road, Pyrmont, NSW 2009 (Attachment 1)
Identifier:	Lots 3-5 in DP 1064339, Part Lot 107 in DP 1076596, Part Lot 1 in DP 835794 (Attachment 2)
Local Government:	City of Sydney Council
Owner:	Transport for New South Wales
Leaseholder:	Infrastructure NSW
Site Area:	Approximately 3.7 ha (approximately 0.76 ha land-based)
Zoning:	Ports and Employment under State Environmental Planning Policy (SEPP) No. 26 – City West and Maritime Waters under Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.

The nSFM site boundaries are well defined by Bridge Road to the southeast and the existing fish market to the northeast. The site extends approximately 100 m into Blackwattle Bay and a further approximately 50 m at three areas comprising the footprint of wharf structures to be built as part of the proposed development.

The south-western portion of the site (Lot 5 DP 1064339) was occupied by a Hanson Cement concrete batching plant. The central premises of the site (Lot 4 DP 1064339) comprised infrastructure associated with commercial hire boat operations and the remnants of the former Jones Brothers coal loader facilities (Lot 3 DP 1064339). The eastern most portion of the site comprised public open space areas of the current fish market (Lot 1 DP 835794) along the Blackwattle Bay foreshore area.

The former site layout and the footprints of the proposed development are shown on Attachment 2.

4. SEDIMENT CHARACTERISATION ASSESSMENT

4.1 Background

During the demolition works for the former Hanson Cement concrete batching plant (Hanson Wharf), sediment deposits additional to those anticipated during project planning were identified beneath the wharf footprint. These were sediments accumulated beneath the wharf structure that had been anticipated to require redistribution (spreading out) to facilitate construction activities associated with the basement. It was initially anticipated that 1,000 m^3 would require redistribution based on assumptions relating to the base and height of the materials. However, once better access was available the dimensions/volume of accumulated sediment could be better determined, and it is now anticipated that 12,5000 m^3 require redistribution.

The sediment redistribution activities are proposed across the basement footprint to facilitate construction and ensure maintenance of culvert infrastructure performance and removal of existing rock revetment sections. This significant increase in volume resulted in MOD 4.

Redistribution and reprofiling of the sediment, in summary, involves spreading the excess material that has accumulated under the wharf into deeper parts of the basement footprint and reprofiling the seabed within the proposed coffer dam (which is effectively the work zone).

The basement footprint is shown on Attachment 2 and the proposed coffer dam is shown on Attachment 4.

It is understood that the basement will be constructed on piles above the new sediment profile within the water column.

Further site characterisation information was required to enable decision making regarding management including potential relocation of the additional sediment.

4.2 Sampling Programme and Data Quality

Thirteen sediment sample locations were investigated for the SCA (SFM01 to SFM13) on a 20 m grid within the additional area of sediment. This area and the sample locations are shown on Attachment 3.

Sediment samples were analysed for a range of identified potential contaminants of concern including heavy metals, polycyclic aromatic hydrocarbons (PAHs), total recoverable hydrocarbons (TRH), benzene, toluene, ethyl benzene and xylenes (BTEX), volatile organic compounds (VOCs), organochlorine pesticides (OCP), polychlorinated biphenyls (PCBs), tributyltin (TBT) and asbestos. Toxicity Characteristic Leaching Procedure (TCLP) was undertaken for selected samples for heavy metals and PAH. The sediments were also expected to be potential acid sulfate soil (PASS) and samples were field screened and Suspension Peroxide Oxidation Combined Acidity and Sulfur (SPOCAS) laboratory analyses was performed.

Auditor's Opinion: The identified potential contaminants of concern were consistent with the site history and previous investigations across the wider Blackwattle Bay area. Based on previous investigations the sediment was anticipated to be PASS and elevated heavy metals, PAHs and TRH were expected to be present.

A summary of the laboratory analyses is provided in Figure 4.1 reproduced form the SCA.

Figure 4.1: QA/QC – Summary of Sediment Sample Laboratory Analyses

Sample Type	No. of Sampling Locations	Analyses (exc. QA/QC)
Sediment	13 locations	Heavy metals – 20 samples PAHs – 20 samples TRH/BTEX – 18 samples OCPs/PCBs – 16 samples VOCs – 7 samples Tributyltin – 6 samples Asbestos (500 mL) – 14 samples SPOCAS (acid sulfate soils) – 13 samples TCLP heavy metals – 19 samples TCLP PAHs – 11 samples

I have assessed the overall quality of the data by review of the information presented in the SCA as follows in Tables 4.1 and 4.2.

Table 4.1: QA/QC – Sampling and Analysis Methodology Assessment

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Data Quality Objectives (DQO) The SCA defined specific DQOs in accordance with the seven-step process outlined in DEC (2017) Guidelines for the NSW Site Auditor Scheme (3rd Edition) and Schedule B2 of NEPM (2013). The Problem is described as: Additional sediments have been identified beneath the former Hanson Wharf that have previously not been characterised. The sediments have the potential to be impacted by virtue of the unknown origin of the materials. In addition, the materials are located within the highly disturbed Blackwattle Bay, where sediments have previously been identified to be impacted with wide range of contaminants that includes heavy metals, total PAHs, and TRH. As such, the identified additional materials required characterisation to inform appropriate management procedures during the proposed construction works for the nSFM building. The Decisions were described as: • Have potential impacts within the additional sediments in the investigation footprint been appropriately characterised? • Are the materials suitable for on-site retention/re-use? • Has the extent of potential acid sulfate soils that require management during remediation/construction activities been appropriately defined? • Can a preliminary waste classification be provided for materials that may require off-site disposal during future development activities? • Is further assessment required?	Overall: Adequate
Sediment sampling pattern, locations, density and depth Thirteen sediment sample locations were investigated (SFM01 to SFM13) on a 20 m grid within the "envelope of additional sediment" identified beneath the former wharf footprint. This area and the sample locations are shown on Attachment 3. Sediment samples (for chemical constituents) were collected in the biologically active zone, i.e., 0-0.1 m and then at 0.5 m intervals to a maximum depth of 2.2 m below seabed or prior refusal, whichever was shallower. Sediment samples for asbestos analysis were generally collected at 1 m intervals to the maximum depth of the investigation. The final depths of the investigation are detailed following: SFM01 (1.1 m), SFM02 (0.5 m), SFM03 (0.6 m), SFM04 (0.5 m), SFM05 (1.2 m), SFM06 (1.2 m), SFM07 (1.6 m), SFM08 (0.1 m), SFM09 (0.6 m), SFM10 (0.6 m), SFM11 (1.2 m), SFM12 (0.6 m), SFM13 (2.2 m). An average depth of 0.9 m was achieved. The achieved depths were those that could be reached as part of the investigation, given practical constraints associated with site access at the time of the investigation. Penetration depth at each location was dependent on the nature of the substrate encountered and available overhead working space.	The lateral extent of the sampling appears adequate to characterise the target sediments. The SCA states that it is estimated that the sediment bed levels will need to be reduced by a depth of approximately 2 to 3 m below current levels to facilitate the construction of the nSFM building which is greater than the depths of sampling/ assessment. The full depth of the target materials was therefore not sampled. However, the achieved depths are likely to provide a reasonable characterisation and are adequate to confirm conditions are consistent with expectations based on previous investigations across the Bay. The data is adequate to confirm suitability of the material for relocation/ reprofiling within the basement and proposed coffer dam footprint. The SCA states that further assessment, consistent with the requirements of the ASSMP and Revised RAP are to be undertaken across the whole of the site. These will include material at depth within the basement footprint following confirmation of the relative sediment levels, final basement level construction design and site access been facilitated following the complete demolition works of the former wharf structure. Overall: Adequate

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Sediment sample collection method Sediment samples were collected via a manually operated piston coring device (stainless steel barrels, 50.8 mm OD) to collect undisturbed sample types.	Overall: Adequate
Decontamination procedures All non-disposable sampling equipment, including piston coring device, were cleaned with a high-pressure water/detergent spray, rinsed with water and then air dried. The equipment was then inspected to ensure that no sediment, oil, debris or other contaminants were apparent on the equipment prior to the commencement of works. Sampling equipment was subsequently decontaminated using the above process between each location.	Overall: Adequate
Sample handling and containers Collected samples were immediately transferred to laboratory supplied sample jars (additional 500 mL plastic bags were used where asbestos analysis was required). The sample jars/bags were then transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain of custody (COC) form was completed and forwarded with the samples to the testing laboratory. Sediment samples for acid sulfate soil (ASS) and laboratory analysis of samples were placed in small zip lock plastic bags and placed directly on ice during sampling activities. Field testing of samples were completed during/following the collection of all samples in accordance with the field-testing procedure presented in the ASSMAC (1998) noting that field pH (pHf) and field pH peroxide test (pHfox) tests were recorded.	Overall: Adequate
Chain of Custody (COC) Completed COC documentation was provided.	Overall: Adequate
Detailed description of field screening protocols Field ASS screening was conducted within sediment cores advanced as part of the investigation. Sediment samples for field ASS and laboratory analysis of samples were placed in small zip lock plastic bags and placed directly on ice during sampling activities. Field testing of samples were completed during/following the collection of all samples. and pHfox tests were recorded. Field pH (pHf): For each sample, approximately 5 g of sediment was placed into a sample vial with approximately 10 mL of deionised water, following which the mix was stirred with a stainless-steel rod to ensure all soil lumps were removed. A pH probe was then placed into the vial immediately and the pHf was recorded on the field results sheet once the readings stabilised. Field pH Peroxide Test (pHfox): For each sample, approximately 5 g of sediment, visually consistent with that used for the pHf test was placed into a clean and dry vial. Approximately 10 mL of 30% hydrogen peroxide solution was then added to the vial and the contents stirred with a stainless-steel rod until all lumps were dissolved. The vial was then allowed to stand for 10-15 minutes and observations on any physical reactions were recorded on the field results sheet (for example: frothing, bubbling, etc). In the instance of a vigorous reaction, a small amount of deionised water was added to calm the reaction and prevent overflow. Where required to ensure reactions were complete, several additional drops of peroxide were added to the vial. The vial was then allowed to return to ambient temperature prior to measurement of the solution pH, which was recorded as pHfox.	Overall: Adequate

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Calibration of field equipment The pH probe was calibrated and within range and a calibration certificate was provided.	Overall: Adequate
Sampling logs Sampling logs are provided within the report, indicating sample depth, lithology, and observations such the presence of ash/coal, discolouration, staining, odours, and other indicators of contamination were noted.	Overall: Adequate

Table 4.2: QA/QC – Field and Lab Quality Assurance and Quality Control

Field and Lab QA/QC	Auditor's Opinion
Field quality control samples and results Sediment blind and split duplicates were collected at a rate of greater than 1 per 20 primary samples analysed and the majority of resultant RPDs were reported to be within the control limit (0-50 %). The SCA reported heavy metal, TRH and PAH compounds to have elevated RPDs, which JBS&G considered to be a result of the difficulty in obtaining homogenous sediment samples in undisturbed sample types. As a conservative measure, the highest reported concentration of each constituent at each location was considered when interpreting the results of the investigation. A trip spike was submitted with the batch of sediment samples. All trip spike recoveries were within the acceptable limit of 70-130%, with the SCA concluding that the adopted assessment sample preservation methods were appropriate to result in a low risk of contaminant concentration loss during transport of the samples. A trip blank was submitted with the batch of sediment samples submitted to the laboratory. There were no reported concentrations of BTEX above the laboratory limit of reporting with the SCA concluding that this demonstrated the absence of significant contaminant cross contamination issues during the temporary storage and transportation of samples analysed during this investigation.	Overall: Adequate
NATA registered laboratory and NATA endorsed methods Eurofins MGT (Eurofins) were used as the primary laboratory, with Envirolab Services (Envirolab) as the secondary laboratory. All laboratories are NATA registered for the required analyses.	Overall: Adequate
Analytical methods Analytical methods were included in the laboratory test certificates. Asbestos identification was conducted using polarised light microscopy with dispersion staining by method AS4964-2004 *Method for the Qualitative Identification of Asbestos Bulk Samples*.	The analytical methods are considered acceptable for the purposes of the site audit, noting that the AS4964-2004 is currently the only available method in Australia for analysing asbestos. DOH (2009) and enHealth (2005) state that *"until an alternative analytical technique is developed and validated the AS4964-2004 is recommended for use"*. Overall: Adequate
Holding times The extraction and analysis of total contaminant concentrations within primary samples were completed within the recommended holding times for all analytes. Some additional analysis (comprising TCLP and silica gel clean-up) was completed on selected samples following receipt of the initial results, in which the holding times were slightly outside of what is recommended. JBS&G noted that all samples were refrigerated at the laboratory prior to analysis.	It is unlikely that the slight exceedance in extraction time for these constituents would have significantly affected the reported concentrations. On this basis, the minor exceedances are not considered significant with respect to suitability of the resulting data to support the assessment decisions. Overall: Adequate

Field and Lab QA/QC	Auditor's Opinion
Sediment Limits of Reporting (LORs) LORs are summarised in Figure 4.2 and are lower than the assessment criteria for metals, TRH, PAHs, and TBT. However, the LORs are higher than the assessment criteria for PCBs and OCPs. This is consistent with the data sets reviewed for TO-054-A, TO-054-B and IAA #1. The NATA approved limit of detection for asbestos in soil was 0.01% w/w although NEPM (2013) analyses were calculated to lower values for asbestos fines and fibrous asbestos.	TO-054-A, TO-054-B and IAA #1 indicate that two historic sediment samples have exceeded LORs and concentrations of total PCBs of 300 µg/kg and 200 µg/kg, respectively, which exceeds the Default Guideline Value (GV) (34 µg/kg) and GV-High (280 µg/kg). It was concluded that it was highly likely that other sediment samples would have exceeded one of the sediment quality values of total PCBs had the LORs been lower during the investigation. The potential for unidentified PCB (and to a lesser extent OCP) impact has been taken into consideration when reviewing the data. In the absence of any other validated analytical method, the detection limit for asbestos is considered acceptable and is likely to provide a reasonable screen to assess risks. Overall: Adequate
Laboratory quality control samples and results Laboratory quality control samples including laboratory control samples, matrix spikes, surrogate spikes, blanks, and duplicates were undertaken by the laboratory. Some recoveries for surrogate were reported outside the control limits. Other results were within control limits.	The surrogate outliers were minor and are not considered significant within the overall context of the data set and the decision-making framework. Overall: Adequate
Data Quality Indicators (DQI) and Data Evaluation (completeness, comparability, representativeness, precision, accuracy) The SCA concluded: *The field sampling and handling procedures produced QA/QC results which indicate that the sediment data is of an acceptable quality and suitable for use in site characterisation.* *The NATA certified laboratory results sheets indicate that the project laboratory was generally achieving levels of performance within its recommended control limits during the period when the samples from this program were analysed.* *On the basis of the results of the field and laboratory QA/QC program, the sediment data is of an acceptable quality in order to achieve the objectives of the assessment.*	An assessment of the data quality with respect to the five category areas has been undertaken by me and is summarised below.

Auditor's Opinion

The completeness, comparability, representativeness, precision and accuracy of the available data are acceptable for the purposes of assessing the additional sediments that are proposed to be relocated and reprofiled.

4.3 Assessment Criteria

Chemical Contaminants

Sediment data was screened to assess potential ecological risk within the framework provided in the Australian and New Zealand Guidelines for Sediment Quality (ANZAST, August 2018). Sediment guidelines are provided in ANZAST (2018) as sediment quality guideline values (GV). These are provided as default (D-GV) and high (GV-high) values corresponding to the statistical probability of effects. For the relevant organic constituents assessed, the reported concentrations have been

normalised to 1% organic carbon based on sample analysis results. A summary of the sediment assessment criteria is provided in Figure 4.2 reproduced from the SCA.

Figure 4.2: Chemical Contaminants in Sediment Assessment Criteria (mg/kg)

	Limit of Reporting	Laboratory Method	D-GV ANZAST 2018	GV-high ANZAST 2018
TPH				
TPH (C_6-C_{40})[1]	50	Purge Trap-GCMS (USEPA8260)	280	550
PAHs				
Total PAHs[1]	0.5	GCMS (USEPA8270)	10	50
Heavy Metals				
Arsenic	2.0	ICP-AES (USEPA 200.7)	20	70
Cadmium	0.4	ICP-AES (USEPA 200.7)	1.5	10
Total Chromium	1.0	ICP-AES (USEPA 200.7)	80	370
Copper	1.0	ICP-AES (USEPA 200.7)	65	270
Nickel	1.0	ICP-AES (USEPA 200.7)	21	52
Lead	1.0	ICP-AES (USEPA 200.7)	50	220
Zinc	1.0	ICP-AES (USEPA 200.7)	200	410
Mercury (inorganic)	0.05	Cold Vapour ASS (USEPA 7471A)	0.15	1
PCBs				
PCBs (total)[1]	0.5	GCECD (USEPA8140,8080)	0.034	0.28
OCPs				
4,4-DDE[1]	0.1	GCECD (USEPA8140,8080)	0.0014	0.007
Chlordane[1]	0.1	GCECD (USEPA8140,8080)	0.0045	0.009
DDD[1]	0.1	GCECD (USEPA8140,8080)	0.0035	0.009
DDT[1]	0.1	GCECD (USEPA8140,8080)	0.0012	0.005
Dieldrin[1]	0.1	GCECD (USEPA8140,8080)	0.0028	0.007
Endrin[1]	0.1	GCECD (USEPA8140,8080)	0.0027	0.06
Lindane[1]	0.1	GCECD (USEPA8140,8080)	0.0009	0.0014
Organometallics				
TBT[1]	0.0005	ES-MS (USEPA 8323)	9[2]	70[2]

[1] (mg/kg dry weight normalised to 1% OC within the limits of 0.2 to 10%)

Asbestos

The SCA states that it is highly unlikely that future on-site human receptors will come into direct contact with saturated sediments (and will therefore not be exposed to potential asbestos impacts within the materials), the concentration of asbestos within sediments is not considered relevant when assessing suitability for on-site retention/re-use. Notwithstanding, asbestos screening levels have been adopted as applicable to the proposed land-uses for the site and are presented in Figure 4.3 reproduced from the SCA.

Figure 4.3: Asbestos in Soil Health Based Assessment Criteria (% w/w)

	Health Screening Level (w/w)	
Form of Asbestos	**Recreational (C)**	**Commercial/Industrial (D)**
Bonded ACM	0.02 %	0.05 %
Fibrous asbestos or asbestos fines[3]	0.001 %	0.001 %
All forms of asbestos	No visible ACM for surface soil (0 – 0.1 m bgs).	No visible ACM for surface soil (0 – 0.1 m bgs).

Acid Sulfate Soil Criteria

The assessment of ASS conditions was undertaken by laboratory SPOCAS analysis, and the results were compared to the ASS action criteria in the Acid Sulfate Soil Manual (ASSMAC, 1998) presented in Figure 4.4 reproduced from the SCA. Where results exceeded the site action criteria, material was considered to comprise PASS/ASS.

Figure 4.4: ASS Site Assessment Criteria

Soil Type		Action Criteria (1-1000 tonnes disturbed)		Action Criteria (>1000 tonnes disturbed)	
Texture	Clay Content (%)	Sulfur Trail (S_{pos}%) - S %	Acid Trail (TPA/TSA) mol H^+/tonne	Sulfur Trail (S_{pos}%) - S %	Acid Trail (TPA/TSA) mol H^+/tonne
Coarse	<5	0.03	18	0.03	18
Medium	5-40	0.06	36	0.03	18
Fine	>40	0.1	62	0.03	18

Auditor's Opinion

The assessment criteria are adequate to characterise sediments and confirm suitability for relocation and reprofiling within the basement and coffer dam footprints.

4.4 Sediment Assessment

The SCA states that the sediments were observed to be largely consistent (visually) across each sampling location to the maximum depth of the investigation (2.2 m) to an average depth of 0.9 m. The materials comprised of gravelly, clayey silt (mud), with varying levels of inclusions that included coal, ash, organic material, seashells, and metal fragments.

Sulfidic odours and seashells were observed within most sediments as consistent with potential ASS conditions. Slight hydrocarbon odours were noted in sediments at locations SFM10 and SFM13.

Pieces of concrete were observed on the seabed near sampling locations SFM3 to SFM5 and SFM8. The extent (size and distribution) as well as likely source of the concrete could not be determined during the assessment given that the pieces were partially submerged/underlying sediments. No visible asbestos containing material (ACM) was identified during the sediment sampling activities.

Samples of the materials were analysed for a range of identified potential contaminants of concern including heavy metals, PAHs, TRH, BTEX, VOCs, OCP/PCBs, TBT, and asbestos as described in Section 4.2.

A summary of the metals results that exceed the adopted criteria is provided as Attachment 5. A summary of the TRH, PAHs and TBT results that exceed the adopted criteria is provided as Attachment 6. A summary of the data from the historical investigations completed over the balance of the site extracted from Table 9.1 of TO-054-B is provided as Attachment 7.

As consistent with the balance of the site and wider Blackwattle Bay area, elevated heavy metals, PAHs and TRH were reported in sediments across the extent of the investigation footprint. However, the

concentrations were found to be comparable to, and/or less than the corresponding impacts from historical investigations completed over the balance of the site which were reviewed for TO-054-A, TO-054-B and IAA #1 (Attachment 7).

There were no reported detections of VOCs (including BTEX), OCPs or PCBs.

Asbestos in the form of fragments of ACM were not reported to have been observed within material at any of the sampling locations. Trace asbestos fines were detected in samples SFM01 0-1 (0.0006 % w/w), SFM04 0-0.4 (0.0002 % w/w) and SFM07 0-1 (0.0006 % w/w) at concentrations below the adopted screening criterion (0.001 %w/w) applicable to recreational or commercial land-use. Asbestos was not previously analysed in sediment samples reviewed for TO-054-A, TO-054-B and IAA #1.

The results of the SPOCAS testing were as follows:

- The pre-oxidised pH ranged from 7.8-8.7 and post-oxidised pH ranged from 2.3-6
- The peroxide oxidisable sulfur ranged from 0.41 to 3 % Sulfur
- The recorded titratable peroxide acidity (TPA) and titratable sulfidic acidity (TSA) ranged from <2 to 1,600 mol H+/tonne
- The recorded titratable actual acidity (TAA) were all <2 mol H+/tonne
- The average required liming rate was reported at 62 kg calcium carbonate per tonne soil.

Based on the above, the SCA concluded that all sediments encountered as part of the investigation comprise PASS, as consistent with sediments in the wider development footprint and reported in the ASSMP.

The SCA considered that the sediments were consistent with the historical data (noting there was previous asbestos data) within both the wharf area and the wider Blackwattle Bay area, and no unacceptable risks were identified with respect to the reported concentrations of TBT and asbestos. All sediments are likely to be PASS and require appropriate management and treatment during future works that result in their disturbance.

The SCA concluded *"Based on the results and findings of this assessment, it is considered that the sediment materials assessed herein are suitable for on-site retention within the framework outlined in the Revised RAP. Notwithstanding, further assessment of sediments at depth may be required, should the excavation depth (to facilitate the construction of the new Sydney Fish Market building) within the investigation footprint extend beyond the depths reached as part of this investigation."*

The JBS&G response also states *"Near surface sediment within Blackwattle Bay originated as sediment/siltation loads within surface water run off entering the bay from the surrounding urbanised areas of Pyrmont, Ultimo and Glebe. With consideration to the age and nature of these urban areas, trace level asbestos fibres in sediments are a result of weathering and degradation of in-situ and inappropriately demolished asbestos containing building materials associated with residential, commercial and industrial properties upgradient of the bay. These have been washed into the bay with other sediments and have progressively been distributed throughout the bay as a result of marine sediment movement over long periods of time. As such, the trace levels of asbestos are anticipated to be relatively consistent in distribution across the entirety of the bay and as such impacts would not be worsened by the proposed distribution of sediment within limited areas associated with the proposed works… Further, the redistribution works will not impact on the relative risk of exposure to recreational users of the bay in areas where sediments may be exposed at low tide."*

The Auditor notes there may also be more localised sources associated with shipyards and bayside activities potentially using asbestos. This may result in some variations throughout the Bay. However, this is not expected to have a material bearing on outcomes for the site.

Auditor's Opinion

I agree that the additional sediment is consistent with the historical data and contains elevated concentrations of metals, PAHs and TRH. Traces of asbestos fines were reported at very low concentrations. Asbestos was not previously analysed in sediment samples reviewed for TO-054-A, TO-054-B and IAA #1. However, the occurrence at low levels is not inconsistent with expectations in sediment near the shore in commercial/industrial parts of the harbour.

No significant exposure to the sediments by human receptors is expected.

Redistribution of the material within the basement and coffer dam footprints would not significantly alter risks to human health or the environment subject to the framework outlined in the Revised RAP and the ASSMP.

Further assessment, consistent with the requirements of the ASSMP Rev 6 and Revised RAP, are to be undertaken if any further material is proposed to be disturbed based on the final basement design.

5. ASSMP

The ASSMP Rev 2 was reviewed for TO-054-A and TO-054-B. Revision 6 has now been prepared to include a management framework for the sediment relocation and reprofiling activities.

Disturbance of sediment within the Bay portion of the site will, where possible, be minimised via implementation of design solutions prior to commencement of works on site.

However, disturbance of the PASS material is unavoidable during the relocation and reprofiling activities. Implementation of management measures is required to address the acid generation potential of the material during the movement and placement. ASSMP Rev 6 states that given the sediments are currently permanently water-logged, exposure of underlying sediments at depth during these works is not expected to result in significant oxidation of the underlying material that becomes the exposed face. Beyond minimising any mobilisation of newly exposed sediment into the water column, no specific actions are proposed in relation to the material that will remain in-situ. However, should further assessment of site conditions prior to, or during disturbance identify geochemical changes in the in-situ sediments upon this disturbance works, consideration will be given to capping the newly exposed material to preserve the anoxic balance of material within this portion of the site.

For the material that is required to be moved, the primary management techniques proposed will comprise the minimisation of disturbance to the extent practicable. The following is proposed:

- The sediments will be gently excavated using an excavator mounted on a barge and then placed within a separate split hopper barge. The materials will be required to always remain saturated, such that they are not drained and/or exposed to the air
- The split hopper barge will transport the sediments to the final placement location and release the materials within 12 hours of being loaded into the barge (and always released prior to end of workday) to minimise the potential for oxidation of the materials. The saturated material and associated water will be released via the base of the hopper barge, with the draft of the loaded barge being approximately 2 to 4 m above the sediment bed and commencement of unloading, thereby minimising the duration of the 'drop' and thereby potential for sedimentation suspension within the water column
- All sediment adjustment works will be conducted within the confines of closely held sediment curtains to minimise the potential mobilisation of sediment into the water column within the broader site areas (and beyond the work area)
- The final methodology to be implemented will require optimisation/adaptive management based on the results of environmental monitoring to demonstrate the works are not causing or have

the potential to cause environmental impact. A small-scale site trial of the proposed methodology should be completed prior to the commencement of the general reprofiling sediment adjustment activities such that it can be demonstrated that the proposal is practical and meets the objectives of the plan, or alternatively management measures will require adjustment until such can be demonstrated at which point the reprofiling works may commence

- Continuous monitoring of water column turbidity (via visual inspection and monitoring buoys) and water pH will be undertaken during all adjustment activities to ensure measures are appropriate to achieve the required minimal generation of acidity. Monitoring buoys will be implemented immediately outside the silt curtains at locations relevant to the works being undertaken.
- Results will be continuously monitored against baseline water quality data established prior to the commencement of works to demonstrate the appropriate implementation of management measures during all activities
- The sediment adjustment works are required to cease immediately, in instances where the results of environmental monitoring identify that sediments are remaining suspended in the water column for a period that could result in oxidation/acidification of the particles as well as affect surface water quality around the work zone and beyond the site boundary. Under these circumstances, a thorough review of the construction methodology will be required to apply adaptive management to the methods employed and ensure that the environmental risks associated with the works are appropriately managed.

The ASSMP Rev 6 states that given the high buffering capacity of salt water within the Bay, such measures are considered sufficient to minimise the risk of acid generation, heavy metals release and turbidity during the adjustment works.

Auditor's Opinion

The proposed methodology provides a reasonable approach to minimising acid generation. Adequate monitoring and contingencies are proposed to respond should unfavourable conditions be generated.

6. SEDIMENT ADJUSTMENT METHODOLOGY

The Sediment Adjustment Methodology describes how the relocation and reprofiling works are to be undertaken in the field. The works are required to be conducted before installation of the coffer dam due to access restrictions. However, all works will be conducted within the larger site silt curtain and localised silt curtains are also proposed as described below. The proposed methodology is summarised as follows:

- Seabed profiling works will be carried out by a profiling barge using associated machinery. A nonpropelled split hopper barge will also be moored alongside the profiling barge and has a capacity to store up to 1,200 m^3 of material. The material moved by the profiling barge (referred to as profile/cut) will firstly be loaded into the split hopper barge from the work area. The hopper barge is then used to transport the material to its destination
- The profiling barge will operate within a moon pool arrangement with a short silt curtain attached to it. The moon pool generally serves as a barrier, delineating the operational area of the excavator whilst also creating an exclusion zone for other floating plant. It also serves as a containment area for localised turbidity and in the unlikely event of an in-water oil spill. The moon pool acts as the site's second line of silt curtain (double curtain), with the site governed by the larger site wide silt curtain
- A silt curtain will also be installed to the perimeter of the hopper barge for when the sediment material is released/relocated

- Material will be kept saturated by the profiling works to avoid any drying of PASS material. The material will remain wet inside the hopper barge (the material is already saturated from leaving the water), and each loaded barge of material will be relocated from hopper (which will be outside of water, on a barge) and re-placed below the water surface to a deeper area of the site within 12-hours. Typically, the barge/hopper will be emptied of material at the end of each working day and any material found in the barge at end of the working day will be resubmerged into the water. The walkways of the hopper barge are generally washed down at the end of a typical disposal using a bucket with local marine water
- Material in the hopper stays saturated for extensive periods due to the hopper slowly sinking as the material is loaded in. As the water ingresses into the hopper sediments are further saturated
- Generally, the bottom three quarters of the hopper barge are saturated in this process. The top quarter of the barge is continually saturated with wet material as each sediment load is added. The sediments are placed systematically across the barge accordingly. In the event of mechanical failure there is a manual release feature for the hopper barge
- The loaded draft of the barge is between 3-4 m, and the deepest pockets of the site are in the region of -7 Chart Datum. This implies the sediments are falling on average 2 m but up to 3 to 4 m
- The bottom of the barge is very close to the seabed during the disposal which further minimises the fall time of the sediment and the expected plume
- Monitoring buoys will be implemented outside of the proposed silt profiling zone and provide real-time data including turbidity and pH to the profiling team and in accordance with the tiered trigger levels. A baseline would be established prior to works commencing and following completion of the works
- Adaptive management monitoring during the sediment profiling works will be managed in response to results of visual turbidity and from turbidity buoys. An environmental assistant will monitor and collect data during the works. The visual turbidity data will be collected at various locations. The triggers will provide a basis for informing the profiler operator that alterations may need to be implemented throughout the works. At the last stage of the tiered approach, complete cease of the works is implemented to reduce the turbidity at the point of exceedance. This tiered approach is further developed in detail in associated planning and risk workshops prior to commencement of works
- There are three primary contingency methods to avoid sediments oxidising throughout the methodology:

    1. The sediments will not be exposed for longer than 12 hours and always redispersed prior to end of day works.
    2. There is a manual release on the hopper barge if required due to mechanical failure
    3. In the event the manual release does not work (fails), a pump system and sprinkler drawing on the seawater could be applied to mitigate this risk temporarily until repairs are made.
    4. If points #1-#3 have failed for any reason, a local storage of lime in bulker bags sufficient to treat an entire hopper load can be applied. A crane on board the barge would assist to spread this evenly. It is reiterated this event is a last measure and unlikely to occur. Pre-established risk workshops, methodology reviews and overall planning workshops are conducted prior to commencement of works to work through the proposed methodology and adopt an adaptive regime to respond to any events that may occur. Further modified strategies can be formulated in the workshop development stage.

Auditor's Opinion

The proposed methodology is consistent with the methodology described in the ASSMP Rev 6. Subject to competent implementation the proposed methodology should provide a reasonable approach to minimising acid generation and environmental impacts.

7. REMOVAL OF PILES (STAGE 1 WORKS)

Removal of piles is underway, and a relatively small volume of sediments are being disturbed during this activity. The Senversa Response states that they have undertaken baseline surface water quality monitoring and then weekly monitoring. No significant impacts to water quality have been observed thus far and hence the pile removal methodology has not been changed as a consequence of impacts on water quality. Although removal of piles and minor sediment disturbance is underway, no sediments are being relocated as part of these Stage 1 works.

Auditor's Opinion

Acceptable.

8. CONCLUSIONS AND RECOMMENDATIONS

I agree that, based on the outcomes of the SCA, additional sediment is consistent with the historical data and contains elevated metals, PAHs, and TRH. Asbestos had not previously been analysed and traces of asbestos fines have now been reported at very low concentrations. Occurrence at low levels is not inconsistent with expectations in sediment near the shore in commercial/industrial parts of the harbour. However, the identified asbestos is considered unlikely to pose a risk to human health as concentrations were well below the assessment criteria and human exposure to these sediments is unlikely.

Redistribution of the material within the basement and coffer dam footprints would not significantly alter risks to human health or the environment subject to the framework outlined in the Revised RAP and the ASSMP Rev 6.

The SCA states *"Notwithstanding, consistent with the requirements of the [Revised RAP] and [ASSMP Rev 6], following confirmation of the relative levels of the materials within the investigation footprint as well as depths of cut required to facilitate the construction of the building, it is anticipated additional investigation of sediment conditions to the proposed depth of disturbance will be required across the whole nSFM site, inclusive of material underlying the additional sediment."*

The methodology proposed in the ASSMP Rev 6 provides a reasonable approach to minimising acid generation. Adequate monitoring and contingencies are proposed to respond should unfavourable conditions be generated. The methodology proposed in the Sediment Adjustment Methodology is consistent with the ASSMP Rev 6 methodology and subject to competent implementation should provide a reasonable approach to minimising acid generation and environmental impacts.

The ASSMP Rev 6 notes that the final methodology to be implemented will require optimisation/adaptive management based on the results of the proposed environmental monitoring to demonstrate the works are not causing or have the potential to cause environmental impact.

A small-scale site trial of the proposed methodology should be completed prior to the commencement of the general reprofiling sediment adjustment activities such that it can be demonstrated that the proposed methodology is practical and meets the objectives of the plan, or alternatively management measures will require adjustment until such can be demonstrated, at which point the reprofiling works may commence.

The Senversa Response states *"A separate letter is being issued on the small-scale trial, which will likely comprise the movement of a small volume of material from works at the current fish market to the New Fish Market site. … The multi-tiered trigger system is under development as it was recommended for largescale profiling works that have not yet commenced. It will be finalised by September 2021 and issued for reference."* I agree with this approach.

9. LIMITATIONS

This interim audit advice was conducted on the behalf of Infrastructure NSW for the objective described in Section 1 purpose. This interim audit advice may not be suitable for other uses.

The Auditor has relied on the documents referenced in Section 2 in preparing the Auditor's Opinions. The consultants included limitations in their reports. This interim audit advice must also be subject to those limitations. The Auditor has prepared this document in good faith, but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check. If the Auditor is unable to rely on any of those documents, the conclusions of this interim audit advice could change.

It is not possible to present all data which could be of interest to all readers of this interim audit advice. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

* * *

Consistent with the NSW EPA requirement for staged 'signoff' of sites that are the subject of progressive assessment, remediation, and validation, I advise that:

- This advice letter does not constitute a Site Audit Report or Site Audit Statement.
- At the completion of the remediation and validation I will provide a Site Audit Statement and supporting documentation.
- This interim advice will be documented in the Site Audit Report.

Yours faithfully
Ramboll Australia Pty Ltd

Rowena Salmon on behalf of Tom Onus
EPA Accredited Site Auditor 1505

D +61 2 9954 8100
M +61 412 834 360
rsalmon@ramboll.com

D 02 9954 8133
M 0408 665 517
tonus@ramboll.com

Attachments:

1. Site Layout and SCA Investigation Footprint
2. Former Site Layout and Development Footprints
3. DGA Sample Locations
4. Revised Construction Staging Plan (Stage 1 - Marine Works)
5. Metals Exceedances Reported in the SCA
6. TRH, PAH and TBT Exceedances Reported in the SCA
7. Summary of Historic Sediment Data across the Bay reviewed in TO-054-A, TO-054-B and IAA #1

Attachment 1 - Site Layout and SCA Investigation Footprint

Legend:

- Approximate New Sydney Fish Market Development Boundary
- Approximate Investigation Footprint

JBS&G

Job No: 60081	
Client: Infrastructure NSW	
Version: R01 Rev A	Date: 07-Jan-2021
Drawn By: RF/RH	Checked By: CB

Scale 1:8,000

0 100 200
metres

Coor. Sys. GDA 1994 MGA Zone 56

Sydney Fish Markets

SITE LOCATION

FIGURE 1

File Name: 60081_01_SiteLocation

Attachment 2 - Former Site Layout and Development Footprints

Legend:

- New Sydney Fish Market Development Footprint
- Cadastral Boundary
- Approximate Land Area
- Approximate Seawall Extent

Proposed Landuse

- Fish Market Building Envelope
- Public Domain
- Approximate Fish Market Basement Footprint

JBS&G

Job No: 54578

Client: UrbanGrowth NSW

Version: R01 Rev 3	Date: 08-Apr-2019
Drawn By: RF	Checked By: JR

Scale 1:2,000

0 25 50
metres

Coor. Sys. GDA 1994 MGA Zone 56

1A-1C Bridge Road, Glebe, and part 56-60 Pyrmont Bridge Road, Pyrmont, NSW

SITE LAYOUT

FIGURE 2

File Name: 54578_02
Reference: Near Map - http://www.nearmap.com.au/. Imagery - 18-01-2018.

Attachment 3 - SCA Sediment Sample Locations

Legend:

- Approximate New Sydney Fish Market Development Boundary
- Approximate Investigation Footprint
- Sediment Sample Locations (2020)
- NSW Cadastre (DFSI, 2020)

JBS&G

Job No: 60081	
Client: Infrastructure NSW	
Version: R01 Rev A	Date 7/01/2021
Drawn By: RH	Checked By: CB

Scale 1:791

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Sydney Fish Markets

SEDIMENT SAMPLING LOCATIONS

FIGURE 4

File Name: N:\Projects\Infrastructure NSW\60081 New Fish Market Advice\GIS\Maps\R01 Rev A\60081_04_SampleLocations.mxd
Reference: NSW DFSI, 2019

NEW FISH MARKETS CONSTRUCTION STAGING - MAIN WORKS

STAGE 1 - MARINE WORKS

KEY ACTIVITIES:
-COFFERDAM/SHORING INSTALL
-BOX COFFERDAM WORKS
-MARINE AND LAND BASED PILING
-SITE ESTABLISHMENT

Activity Description:

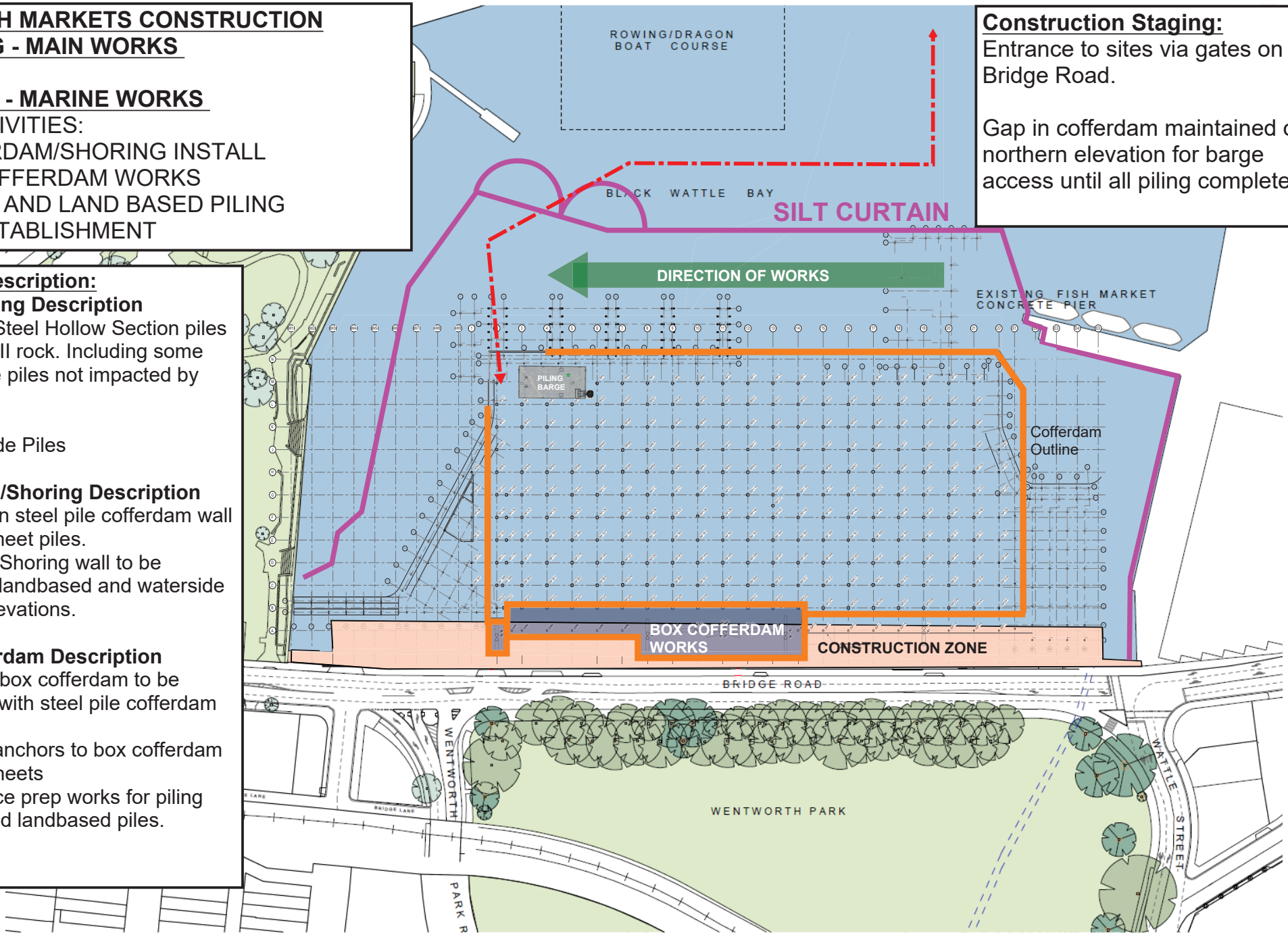
Marine Piling Description
- Install of Steel Hollow Section piles into Class III rock. Including some promenade piles not impacted by cofferdam.
- Piles
- Promenade Piles

Cofferdam/Shoring Description
- Single skin steel pile cofferdam wall made up sheet piles.
- Southern Shoring wall to be completed landbased and waterside on other elevations.

Box Cofferdam Description
- Southern box cofferdam to be completed with steel pile cofferdam walls.
- Install of anchors to box cofferdam southern sheets
- Commence prep works for piling platform and landbased piles.

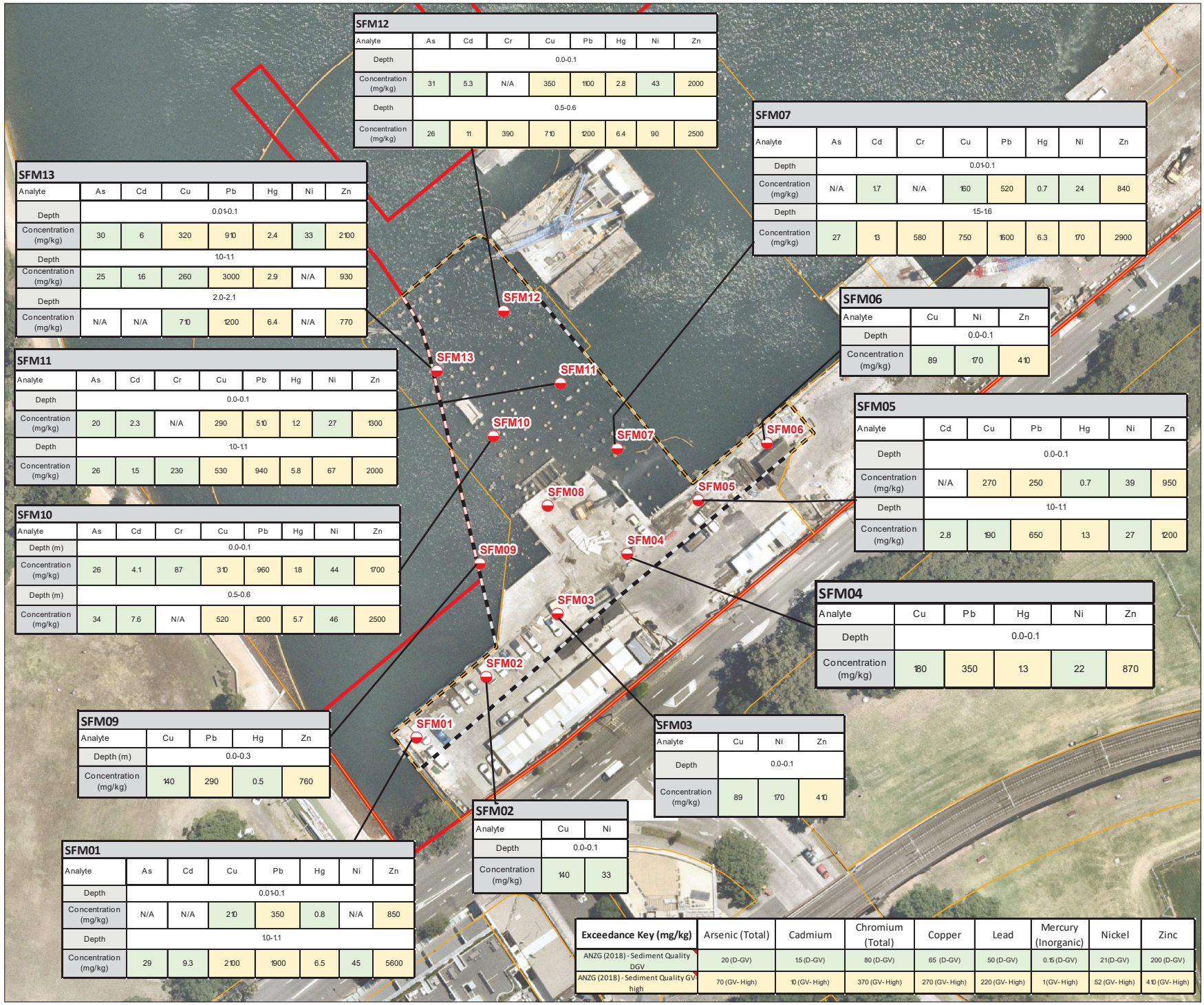
Construction Staging:
Entrance to sites via gates on Bridge Road.

Gap in cofferdam maintained on northern elevation for barge access until all piling complete.



Attachment 4 - Revised Construction Staging Plan (Stage 1 - Marine Works)

Attachment 5 - Metals Exceedances Reported in the SCA



SFM12

Analyte	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
Depth	0.0-0.1							
Concentration (mg/kg)	31	5.3	N/A	350	1100	2.8	43	2000
Depth	0.5-0.6							
Concentration (mg/kg)	26	11	390	710	1200	6.4	90	2500

SFM13

Analyte	As	Cd	Cu	Pb	Hg	Ni	Zn
Depth	0.0-0.1						
Concentration (mg/kg)	30	6	320	910	2.4	33	2100
Depth	1.0-1.1						
Concentration (mg/kg)	25	16	260	3000	2.9	N/A	930
Depth	2.0-2.1						
Concentration (mg/kg)	N/A	N/A	710	1200	6.4	N/A	770

SFM11

Analyte	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
Depth	0.0-0.1							
Concentration (mg/kg)	20	2.3	N/A	290	510	1.2	27	1300
Depth	1.0-1.1							
Concentration (mg/kg)	26	1.5	230	530	940	5.8	67	2000

SFM10

Analyte	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
Depth (m)	0.0-0.1							
Concentration (mg/kg)	26	4.1	87	310	960	1.8	44	1700
Depth (m)	0.5-0.6							
Concentration (mg/kg)	34	7.6	N/A	520	1200	5.7	46	2500

SFM09

Analyte	Cu	Pb	Hg	Zn
Depth (m)	0.0-0.3			
Concentration (mg/kg)	140	290	0.5	760

SFM01

Analyte	As	Cd	Cu	Pb	Hg	Ni	Zn
Depth	0.0-0.1						
Concentration (mg/kg)	N/A	N/A	210	350	0.8	N/A	850
Depth	1.0-1.1						
Concentration (mg/kg)	29	9.3	2100	1900	6.5	45	5600

SFM02

Analyte	Cu	Ni
Depth	0.0-0.1	
Concentration (mg/kg)	140	33

SFM03

Analyte	Cu	Ni	Zn
Depth	0.0-0.1		
Concentration (mg/kg)	89	170	410

SFM04

Analyte	Cu	Pb	Hg	Ni	Zn
Depth	0.0-0.1				
Concentration (mg/kg)	180	350	1.3	22	870

SFM05

Analyte	Cd	Cu	Pb	Hg	Ni	Zn
Depth	0.0-0.1					
Concentration (mg/kg)	N/A	270	250	0.7	39	950
Depth	1.0-1.1					
Concentration (mg/kg)	2.8	190	650	1.3	27	1200

SFM06

Analyte	Cu	Ni	Zn
Depth	0.0-0.1		
Concentration (mg/kg)	89	170	410

SFM07

Analyte	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
Depth	0.0-0.1							
Concentration (mg/kg)	N/A	1.7	N/A	160	520	0.7	24	840
Depth	1.5-1.6							
Concentration (mg/kg)	27	13	580	750	1600	6.3	170	2900

Exceedance Key (mg/kg)	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc
ANZG (2018) - Sediment Quality DGV	20 (D-GV)	1.5 (D-GV)	80 (D-GV)	65 (D-GV)	50 (D-GV)	0.15 (D-GV)	21(D-GV)	200 (D-GV)
ANZG (2018) - Sediment Quality GV-high	70 (GV- High)	10 (GV- High)	370 (GV- High)	270 (GV- High)	220 (GV- High)	1(GV- High)	52 (GV- High)	410 (GV- High)

Legend:

- Approximate New Sydney Fish Market Development Boundary
- Approximate Investigation Footprint
- NSW Cadastre (DFSI, 2020)
- Sediment Sample Locations (2020)

Result — Highlighted value is equal to or exceeds D-GV (ANZAST 2018)

Result — Highlighted value is equal to or exceeds GV-High (ANZAST 2018)

N/A — Highlighted value did not exceed criteria at stated depth.

All other results were reported at concentrations less than the laboratory LOR.

As = Arsenic, Cd = Cadium,
Cu = Copper, Pb = Lead,
Hg = Mercury, Ni = Nickel,
Zn = Zinc

JBS&G

Job No: 60081

Client: Infrastructure NSW

Version: R01 Rev A | Date 7/01/2021

Drawn By: RH | Checked By: CB

Scale 1:1,200

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

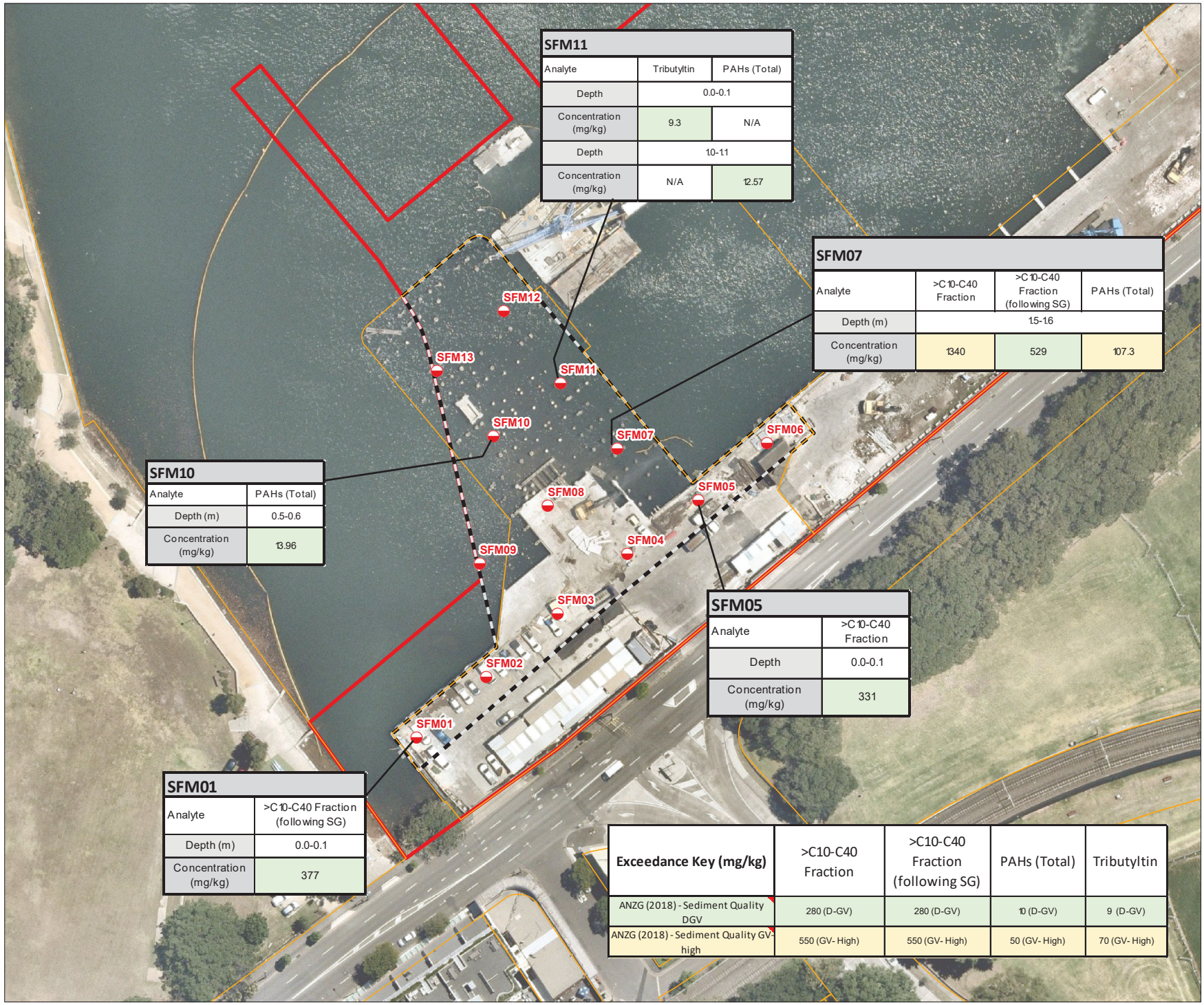
Sydney Fish Markets

SAMPLE EXCEEDANCES - INORGANICS AND HEAVY METALS

FIGURE 5A

File Name: N:\Projects\Infrastructure NSW\60081 New Fish Market Advice\GIS\Maps\R01 Rev A\60081_05a_SampleExceedances_Inorganics_Metals.mxd
Reference: NSW DFSI, 2019

Attachment 6 - TRH, PAH and TBT Exceedances Reported in the SCA



Legend:

- Approximate New Sydney Fish Market Development Boundary
- Approximate Investigation Footprint
- NSW Cadastre (DFSI, 2020)
- Sediment Sample Locations (2020)

Result — Highlighted value is equal to or exceeds D-GV (ANZAST 2018)

Result — Highlighted value is equal to or exceeds GV-High (ANZAST 2018)

N/A — Highlighted value did not exceed criteria at stated depth.

All other results were reported at concentrations less than the laboratory LOR.

JBS&G

Job No: 60081

Client: Infrastructure NSW

Version: R01 Rev A | Date 7/01/2021

Drawn By: RH | Checked By: CB

Scale 1:1,200

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 56

Sydney Fish Markets

SAMPLE EXCEEDANCES - NORMALISED ORGANICS

FIGURE 5A

File Name: N:\Projects\Infrastructure NSW\60081 New Fish Market Advice\GIS\Maps\R01 Rev A\60081_05b_SampleExceedances_Organics.mxd
Reference: NSW DFSI, 2019

Attachment 7 - Summary of Historic Sediment Data across the Bay reviewed in TO-054-A, TO-054-B and IAA #1

Table 9.1: Evaluation of Sediment Analytical Results – Summary Table (mg/kg)

Analyte	n	Detections	Maximum	n > Human Health Screening Criteria	n > Sediment Quality DGV Criteria	n > Sediment Quality GV-High Criteria
TPH >C_{10}-C_{36}	22	22	5,000	-	**22 above DGV 280 mg/kg**	**20 above GV-High 550 mg/kg**
Benzo(a)pyrene TEQ	49	11	21	0 above HIL-D 40 mg/kg	-	-
Total PAHs*	76	37	76.3	0 above HIL-D 4,000 mg/kg	**14 above DGV 10 mg/kg**	**2 above GV-High 50 mg/kg**
Arsenic	76	43	36	0 above HIL-D 3,000 mg/kg	**16 above DGV 20 mg/kg**	0 above GV-High 70 mg/kg
Cadmium	76	29	7	0 above HIL-D 900 mg/kg	**19 above DGV 1.5 mg/kg**	0 above GV-High 10 mg/kg
Chromium (total)	76	76	71	0 above HIL-D 3,600 mg/kg	0 above DGV 80 mg/kg	0 above GV-High 370 mg/kg
Copper	27	27	386	0 above HIL-D 240,000 mg/kg	**21 above DGV 65 mg/kg**	**13 above GV-High 270 mg/kg**
Lead	76	73	1,270	0 above HIL-D 1,500 mg/kg	**34 above DGV 50 mg/kg**	**26 above GV-High 220 mg/kg**
Mercury (inorganic)	76	37	14.8	0 above HIL-D 730 mg/kg	**36 above DGV 0.15 mg/kg**	**28 above GV-High 1 mg/kg**
Nickel	76	60	44	0 above HIL-D 6,000 mg/kg	**18 above DGV 21 mg/kg**	0 above GV-High 52 mg/kg
Zinc	27	27	1,660	0 above HIL-D 400,000 mg/kg	**21 above DGV 200 mg/kg**	**18 above GV-High 410 mg/kg**
TBT*[x]	27	19	27.6	-	**1 above DGV 9 µg Sn/kg**	0 above GV-High 70 µg Sn/kg
PCB*	76	2	<0.0769	-	**2 above DGV 0.034 mg/kg**	0 above GV-High 0.280 mg/kg
Aldrin	27	0	<0.001	0 above HIL-D 45 mg/kg	-	-
Dieldrin*	76	0	<0.1	-	0 above DGV 0.0028 mg/kg	0 above GV-High 0.0070 mg/kg
p.p' DDE*	76	0	<0.1	-	0 above DGV 0.0014 mg/kg	0 above GV-High 0.0070 mg/kg
o.p'-+p.p' DDD*	49	0	<0.1	-	0 above DGV 0.0035 mg/kg	0 above GV-High 0.0090 mg/kg
Total DDT*	76	0	<0.1	-	0 above DGV 0.0012 mg/kg	0 above GV-High 0.0050 mg/kg
Alpha/gamma Chlordane	76	0	<0.1	-	0 above DGV 0.0045 mg/kg	0 above GV-High 0.0090 mg/kg

Analyte	n	Detections	Maximum	n > Human Health Screening Criteria	n > Sediment Quality DGV Criteria	n > Sediment Quality GV-High Criteria
Endrin*	76	0	<0.1	0 above HIL-D 100 mg/kg	0 above DGV 0.0027 mg/kg	0 above GV-High 0.0600 mg/kg
Heptachlor	27	0	<0.001	0 above HIL-D 50 mg/kg	-	-
Methoxychlor	27	0	<0.1	0 above HIL-D 2,500 mg/kg	-	-

n number of samples
- No criteria available/used
NL Non-limiting
*Normalised to 1% TOC for TOC range 0.2% to 10% (applicable to sediment quality DGV and GV-High only)
[x]TBT concentrations in µg Sn/kg dry weight, 1% TOC.