ANNEXURE A - SPECIFICATIONS FOR THE BEACH PROFILE AND SEDIMENT MONITORING AT THE PORT OF NGQURA FOR 36 MONTHS

1. INVITATION TO SUBMIT A QUOTATION

1.1. Tenderers are hereby invited to tender for the Beach Profile and Sediment Monitoring at the Port of Ngqura, Gqeberha, South Africa.

2. SCOPE OF WORKS AND CONDITIONS OF CONTRACT

2.1. BACKGROUND AND PURPOSE

The beach profile and sediment monitoring is a requirement of the Port and it is required on the beaches north and south of the harbor. This monitoring is done to measure the harbors impact on the longshore sediment transport along the stretch of coastline in which the port is located.

2.2. SCOPE OF WORKS

2.2.1. The scope of works comprise of:

- Beach profile monitoring of survey line points N1, N2, N3, N4, S1, S2, S3, S4 and S5 on the north and south side of the harbour as seen in **Annexure A** – **Figure 1**
- The entire beach profile surveyed from points N1 – N4 and S1 to S5 on a 10m x 10m grid.
- Sediment sampling at defined locations (N1, N2, N3, N4, S1, S2, S3, S4 and S5) on the north and south beaches as specified in **Annexure A – Figure 1**

2.3. PROJECT SPECIFIC SPECIFICATIONS AND TECHNICAL SPECIFICATIONS

2.3.1. All levels in this contract shall be relative to Mean Sea Level (MSL). References are made to the port Chart Datum (CD) which is 1.026m below MSL.

2.3.2. The co-ordinate system to be used for this contract shall be as follows:

- Map projection: Gauss Conformal
- Datum: Hartebeesthoek 94
- Spheroid: WGS84
- Scale factor: 1
- Central Meridian: 25°E
- Reference System: WG25
- Co-ordinates: Eastings (X, increasing eastwards)
  Northings (Y, increasing northwards)
- Distance units: International metre

2.3.3. The equipment used for the shoreline profiles and grid survey shall be fit for purpose and capable of providing measurements within the specified tolerances. The tolerances for the X, Y and Z co-ordinates shall all have an accuracy of within 0.05 metres.

2.3.4. Beach profiling and sediment monitoring:

2.3.4.1. Existing Shoreline Profiles:

- The beach profiles shall extend from +2.7m MSL (+3.5m CD) to at least -0.3 m MSL (-0.5m CD). Points surveyed along the profile line points N1, N2, N3, N4, S1,

S2, S3, S4 and S5 shall be at a maximum spacing of 10m and at any significant change of gradient. The surveyor is to record the ground type along each profile (e.g., sandy beach, rock outcrop, sand dune, etc). Photographs must be taken at each profile.

2.3.4.2. Grid Survey:

- The entire beach profile surveyed between points N1 to N4 and S1 to S5, extending from +2.7m MSL (+3.5m CD) to at least -0.3 m MSL (-0.5m CD) on a grid format at a maximum spacing of 10m x 10m.

2.3.4.3. Method of survey:

- The method of survey shall be lidar survey via a drone, or any other method as deemed fit by the tenderer to achieve the objectives of the scope of works.

2.3.4.4. Sieve Analysis:

- The sieve analysis shall cover the range 63 microns to 2000 microns and will include D50, mode and mean as statistical outputs.

2.3.5. Preparation of records and deliverables for the measurements include the following:

2.3.5.1. Shoreline Profiles:

- The historical surveyed profile lines (**Annexure A - Figures 2 to 10**) as well as the latest surveyed profile lines.
- A description of the ground type along each profile line (e.g., sandy beach, rock outcrop, sand dune, etc.).
- The historical variation in the +1 m MSL contour for profiles N1, N2, N3, N4, S1, S2, S3, S4 and S5 (**Annexure A - Figures 11 and 12**) as well as the latest variation in the +1 m MSL contour.
- ASCII data files of the X, Y and Z coordinates of all the surveyed points.
- All details with regards to the survey. This is to include: Method of survey, survey personnel, date, equipment used, control points and checks.
- Photographs at each profile must be included in the report.

2.3.5.2. Grid Survey:

- The surveyed beach profile surveyed between points N1 to N4 and S1 to S5 on a 10m x 10m grid as well as the historical variation for profiles N1 to N4 and S1 to S5.
- The variations in the +1 m MSL contour between N1 to N4 and S1 to S5 as well as the historical variation in the +1 m MSL contour for profiles between N1 to N4 and S1 to S5, including indication of sediment movement, direction of movement and volumes moved.
- A general description of the ground type along the surveyed beach profile (e.g., sandy beach, rock outcrop, sand dune, etc.).
- ASCII data files of the X, Y and Z coordinates of all the surveyed points.
- All details with regards to the survey. This is to include: Method of survey, survey personnel, date, equipment used, control points and checks.
- All photos, videos, and any other electronic data captured from the survey conducted.

2.3.5.3. Sieve Analysis:

- Percentage retained by each sieve screen.
- D50, mean and mode statistics.
- Photographs at each sieve analysis site must be included in the report.

2.3.6. All data shall be provided in hard copy and electronic format on a Compact Disc and remains property of TNPA.

2.3.7. It shall be noted that the electronic data of all the historical data would be made available to the successful tender.

2.4. LOCATION OF THE SITE, SITE CONDITIONS AND ACCESS

2.4.1. The Project is located at the Port of Ngqura, Gqeberha, Eastern Cape, South Africa. The survey area extends from approximately 6km south of the port to approximately 12km north of the port.

2.4.2. The mean tidal range is approximately +0,79 to +1,29m above CD (Chart Datum) at neaps and + 0,21 to + 1,86m at springs. CD is 0.836 m below MSL as per the Navy's hydrographical charts. **Please note that, for the Port of Ngqura, CD is 1.026 below MSL and is not indicated on the Navy Charts or records as published by the South African Navy Hydrographic Office.**

2.4.3. Access to the site can be gained via the N2, taking the Port of Ngqura off ramp onto Neptune Road, and then proceeding straight to the Port of Ngqura Port Entrance Plaza.

2.5. DURATION, COMPLETION DATE AND EXTENSION OF THE WORKS

2.5.1. The duration of the Works is (including two weeks for submission and approval of the SHE file and any normal average expected weather delays during the months in which the works are executed):

- 36 months (1 survey every 3 months, therefore a total of 12 in 36 months)

2.5.2. The completion date for the project shall be stated on issue of the Purchase Order to the Contractor.

2.5.3. Any extensions to the Completion Date shall be subject to:

- Change in scope of the works.

2.6. PROJECT MANAGEMENT

2.6.1. A kick off meeting shall be arranged between the TNPA Procurement Contracts Manager, TNPA Project Manager, TNPA SHE Department and the Contractor, prior to commencement of the works and within 1 (one) week of successful issue of the Purchase Order, to discuss:

- Project Scope,
- Project Plan and Programme,
- Target Dates,
- Method Statements,
- Quality Control Plans ,
- SHE Requirements,
- Submission of invoices and job cards for payments,
- Signing off of the relevant contractual documents pertaining to the Purchase Order.
- Any other regulations and requirements, etc.

2.6.2. Regular meetings of a general nature may be convened and chaired by the TNPA Project Manager.

2.6.3. The Contractor shall submit a Project Programme to the TNPA Project Manager for approval within one week of the Project Kick Off meeting.

2.7. VEHICLES, PLANT & EQUIPMENT:

2.7.1. The Contractor must ensure that all vehicles, plant & equipment to be used on site and in the Port are licenced, maintained and kept in good condition and working order.

2.7.2. All Plant and Equipment required for the execution of the works shall be supplied by the Contractor and calibration and test certificates must be included.

2.7.3. The Contractor shall submit a comprehensive list of equipment intended for use on this contract.

2.8. CONTRACTORS STAFF TO BE USED ON SITE:

2.8.1. The Contractors Staff to be used on site must:

- Be inducted by the TNPA SHE Department before working on site and in the Port.

- Have and use all safety and personal protective equipment (PPE) necessary for the task to be performed on site and in the Port.

- Be certified, skilled and competent to conduct their duties (competence certificates shall be provided as per the Port of Ngqura SHE Requirements and will be presented to the TNPA Supervisor upon request for such documentation).

- Be suitably qualified and experienced to undertake the surveys and data analysis, as well as details of the persons who will undertake and supervise the surveys, including preparation of the profiles and other deliverables.

- Conform to the acceptable standards of behaviour and dress appropriately.

2.9. WORKING HOURS

2.9.1. The working hours shall be from 08h00 to 16h30, Monday to Friday.

2.9.2. The contractor must not vary the working hours without written instruction from the TNPA Project Manager.

2.10. DATA SHEETS, RECORDS & REPORT

2.10.1. The Contractor must submit to the TNPA Supervisor for verification and sign off, data sheets on the Contractor's stationary which show work completed.

2.10.2. All data sheets shall be signed off by the TNPA Supervisor and submitted together with the invoices.

2.10.3. A report must be compiled on a quarterly basis discussing the effectiveness of the sand bypass system in relation to the volume of sand bypassed and beach profiles measured. The report shall discuss any changes in the beach profiles and sediment measured and recorded, as well as potential reasons for a change in the profiles. The report shall conclude with recommendations and conclusions on the effectiveness of the sand bypass system based on the volumes bypassed and the beach profiles recorded.

2.10.4. Service provider must be prepared to make a presentation to the Environmental Management Committee (EMC) twice during the duration of the contract.

2.10.5. All data shall be provided in hard copy and electronic format on a Compact Disc and remains property of TNPA.

2.10.6. Calibration certificates must be included.

2.11. QUALITY CONTROL

2.11.1. Quality control of the project shall be under the management of the TNPA Project Manager and Supervisor.

2.11.2. The Contractor shall also conduct their own internal quality control of the works.

2.11.3. The Contractor shall submit a Quality Control Plan to the TNPA Project Manager for approval within one week of the Project Kick off Meeting. Failure to submit shall result in the works being put on hold and a possibility of delay penalties being applied.

2.11.4. All equipment used is to be calibrated prior to any survey work being done on this contract and a current certificate of calibration from the SABS (or approved equivalent) is to be supplied to the TNPA. Should the field checks reveal calibration irregularities, TNPA will order that a full calibration be carried out by the contractor at his own cost, and TNPA may instruct the Contractor to repeat any work carried out subsequent to the previous calibration. This repeated work will be done at the Contractor's expense.

2.12. INSURANCE

2.12.1. Before the Contractor surveys the beach profiles and conducts sediment analysis, the contractor must effect and maintain (if the contractor does not already carry these insurances under its annual policies of insurance) at its own expense, all insurances required by law and the contract on terms and conditions and for amounts acceptable to the TNPA PORT OF NGQURA, including:

a. Public liability insurance covering liability to third parties for injuries, death, loss of and damage to the property from anything done or omitted to be done for the public liability insurance.

b. Motor vehicles third party insurance for all relevant vehicles

2.12.2. Before commencement of the works and whenever subsequently requested in writing by the TNPA Project Manager, the Contractor must provide TNPA PORT OF NGQURA with certificates of currency to demonstrate that the insurance referred to have been affected and are being maintained.

2.12.3. The contractor must notify TNPA PORT OF NGQURA immediately of any circumstances, injuries, deaths or incident that may occur on site which may, or may not, involve a claim against both the Contractor and TNPA PORT OF NGQURA.

2.13. INDEMNITY AND INJURY MANAGEMENT

The Contractor or Operator and any persons from the Contractor working on site must first ensure that they provide their signatures on the indemnity form before entering the site.

2.14. COMPLIANCE

2.14.1. The Contractor must comply and ensure that the operator complies with the Occupational Health and Safety, (Act 85 of 1993) and all applicable legislation and Regulations, the National Road Traffic Act, (Act 93 0f 1996) and all applicable legislation and Regulations, the National Environment Management Act, (Act 108 of 1998) and all applicable legislation and Regulations, industrial agreements, registered workplace agreements, the Safety, Health and Environment (SHE) requirements and lawful directions of the TNPA Port of Ngqura.

2.14.2. The Contractor shall comply with the Port of Ngqura's SHE requirements and requirements (See **Section 4** for the TNPA Port of Ngqura SHE requirements).

2.14.3. The Contractor shall submit a SHE file for approval and as required by the TNPA Port of Ngqura SHE Department after award of tender.

2.15. PARKING

2.15.1. Parking will be at the site.

2.15.2. Parking of the Contractor's plant and vehicles in the Port will be at the Contractor's risk.

3. TECHNICAL EVALUATION CRITERIA

1.1. All tender evaluations shall be as specified by the TNPA Procurement Department in the Tender Documentation.

1.2. The Technical Evaluation of the Tender shall be as per the table below:

Nr	category	Total Weight	Weight	Requirements	Type of proof/ Detail to be submitted	Model answer
	Scope of Work: Evaluation Criteria				100 - The bidder has innovative and outstanding solutions to requirements. 80- The bidder exceeds requirements, has adequately mitigated risks in requirements beyond those listed. 60 - Meets critical requirements 40- Partially meets requirements. 20- Partially meets requirements. 0 - Company cannot meet, high risk	
1	**Capacity**	**30**				**Model answer**

Nr	category	Total Weight	Weight	Requirements	Type of proof/ Detail to be submitted	Model answer
1.1.	Capacity of key personnel 1.1.1 Registration in recognized professional body, 1.1.2 Qualification & 1.1.3 CVs of Key Persons		10	Key personnel to be evaluated on qualifications, experience and professional registration status, detailed on CVs. Registration certificates must be certified.	**1.1.1 <u>Project Manager (Lead):</u>** Bidder must provide a **Project Manager** (Lead) with either ✓ BSc or BEng in Civil Engineering and ✓ must be registered with ECSA as a Professional Engineer (Pr. Eng.) or international recognized professional body (e.g., UK Engineering Council, etc.) ✓ with relevant three (3)-year experience in conducting surveys in the coastal environment. The following shall be submitted: • Qualification • CV • Professional registration Note: Experience will be considered for a continuous period from pre-registration to post-registration. The minimum years of experience required is 3 years.	0 – No Submission 20 – All required documents submitted but indicates minimum 1 year but less than 2 years of relevant experience. 40 – All required documents submitted but indicates minimum 2 years but less than 3 years of relevant experience. 60 – All required documents submitted but indicates minimum 3 years but less than 4 years of relevant experience. 80 - All required documents submitted but indicates minimum 4 years but less than 5 years of relevant experience. 100 – All required documents submitted and indicates more than 5 years of relevant experience.

Nr	category	Total Weight	Weight	Requirements	Type of proof/ Detail to be submitted	Model answer
			10		**1.1.2 <u>Surveyor:</u>** Bidder must provide a **Land Surveyor** with National Diploma (Civil) or higher and must be professionally registered with ECSA or international recognized professional body (e.g. UK Engineering Council, etc.) or registered with SACPCMP as a Professional Land Surveyor with relevant experience in conducting surveys in the coastal environment. The following shall be submitted: • Qualification • CV • Professional registration Experience will be considered for a continuous period from pre-registration to post-registration. The target years of experience is 3 years.	0 – No Submission 20 – All required documents submitted but indicates minimum 1 year but less than 2 years of relevant experience. 40 – All required documents submitted but indicates minimum 2 years but less than 3 years of relevant experience. 60 – All required documents submitted but indicates minimum 3 years but less than 4 years of relevant experience. 80 - All required documents submitted but indicates minimum 4 years but less than 5 years of relevant experience. 100 – All required documents submitted and indicates more than 5 years of relevant experience.

Nr	category	Total Weight	Weight	Requirements	Type of proof/ Detail to be submitted	Model answer
			10		**1.1.3 <u>Health and Safety Officer</u>** Bidder must provide a **Health and Safety Officer** with Diploma (or higher) in Health and Safety Management and registered with SACPCMP as Professional Construction Health and Safety Officer (PrCHSO) with experience in construction health and safety management. The following shall be submitted: • Qualification • CV • Professional registration Experience will be considered for a continuous period from pre-registration to post-registration. The target years of experience is 3 years.	0 – No Submission 20 – All required documents submitted but indicates minimum 1 year but less than 2 years of relevant experience. 40 – All required documents submitted but indicates minimum 2 years but less than 3 years of relevant experience. 60 – All required documents submitted but indicates minimum 3 years but less than 4 years of relevant experience. 80 - All required documents submitted but indicates minimum 4 years but less than 5 years of relevant experience. 100 – All required documents submitted and indicates more than 5 years of relevant experience.
2	**Previous Work experience**	**35**				**Model answer**

Nr	category	Total Weight	Weight	Requirements	Type of proof/ Detail to be submitted	Model answer
2.1.	Previous experience indicated through reference letters.		35	Tenderer's experience in delivering similar projects of similar scale	**2.1.1 <u>Reference letters</u>** Bidder must provide a list of similar projects covering coastal surveying along the beach, executed over the last 10 years. Each similar project must be accompanied by a reference letter from client on their letterheads and must confirm the work performed with specific reference to the project, project value, company involvement. The target number of reference letters is 3, indicating 3 independent similar projects. Note: Completion certificates and letters of appointment will not be considered	0 – No list of similar projects submitted, or list submitted but no reference letters to confirm any of the projects listed. 20 – List of similar projects submitted and accompanied by one reference letter to confirm one of the projects in the list. 40 – List of similar projects submitted and accompanied by two reference letters to confirm two of the projects in the list. 60 – List of similar projects submitted and accompanied by three reference letters to confirm three of the projects in the list. 80 – List of similar projects submitted and accompanied by four reference letters to confirm four of the projects in the list. 100 – List of similar projects submitted and accompanied by at least five reference letters to confirm at least five of the projects in the list.
3	**Technical Method Statement**	**35**				**Model answer**

Nr	category	Total Weight	Weight	Requirements	Type of proof/ Detail to be submitted	Model answer
3.1.	Technical Method statement and Quality Management (Beach Profile Monitoring)		20	Method Statement (Must be based on the scope of work defined in the tender document).	**3.1.1 <u>Technical Method Statement</u>** Bidder must submit: (1) a detailed and structured method statement specific to the scope of works and (2) must detail how the service will be executed in a safe, secured and environmentally friendly manner and (3) must address the survey processes to be followed, (4) SHE and quality management during the survey, (5) commissioning and handing over of the completed service.	0 – No response 20 – Method statement submitted with 1 requirement. 40 – Method statement submitted with 2 requirements. 60 – Method statement submitted with 3 requirements. 80 - Method statement submitted with 4 requirements. 100 - Method statement submitted with all 5 requirements.
			15	Quality management plans must detail how the quality will be managed during the implementation of the project	**3.1.2 <u>Quality Management</u>** Bidder must demonstrate full understanding of quality management principles by presenting: (1) a well detailed quality management plan specific to the scope of works, (2) must define the quality, scope, and metrics by which the services provided will be evaluated, (3) it must detail what quality measures are in place to manage the quality of the service, and (4) it must detail what role and responsibilities assigned to key personnel to ensure quality service is delivered.	0 – No response 20 – Quality management submitted with 1 principle. 40 – Quality management submitted with 2 principles. 60 – Quality management submitted with 3 principles. 80 - Quality management submitted with 4 principles. 100 - Quality management submitted with more than 4 principles.

Nr	category	Total Weight	Weight	Requirements	Type of proof/ Detail to be submitted	Model answer
	TOTAL POINTS	**100**	100			

- This technical evaluation criteria is to be read in conjunction with the Tender Document.
- Minimum points required to qualify = **60**

3. TNPA PORT OF NGQURA SHE REQUIREMENTS

3.1. All SHE requirements shall be as per the SHE Department's requirements.

4. LEGAL MATERS

4.1. All data provided to the Contractor during the course of the Project is the property of Transnet National Ports Authority.

4.2. No sharing, copying, or use of the data for personal gain will be allowed without the written approval of TNPA Port of Ngqura.

5. BILL OF QUANTITIES

ITEM NO.	DESCRIPTION	Unit	QTY	Rate YEAR 1	Total Amount
	This BoQ shall be read in conjunction with this Specifications Document and the RFQ clauses.				
1.	**PRELIMINARY AND GENERAL**				
1.1	Preliminary and General (detailed breakdown to be provided upon request for such information).	Sum	1		
1.2	SHE File (detailed breakdown to be provided upon request for such information).	Sum	1		
2.	**Beach Profile & Sediment Monitoring**				
2.1	Beach profile monitoring at survey line points N1, N2, N3, N4, S1, S2, S3, S4 and S5	No.	4		
2.2	Beach profile monitoring between N1 to N4 and S1 to S5 on 10m x 10m grid using drone lidar survey methods or similar approved.	No.	4		
2.3	Beach profile monitoring between N1 to N4 and S1 to S5 on 10m x 10m grid using alternate method to Item 2.2: Specify:_____	No.	4		Rate Only
2.4	Sieve analysis at survey points N1, N2, N3, N4, S1, S2, S3, S4 and S5	No.	4		
2.5	Compilation of report discussing the effectiveness of the sand bypass system in relation to the volume of sand bypassed and beach profiles measured. The report shall discuss any changes in the beach profiles and sediment measured and recorded, as well as potential reasons for a change in the profiles. The report shall conclude with recommendations and conclusions on the effectiveness of the sand bypass system based on the volumes bypassed and the beach profiles recorded.	No.	4		
3.	**Cost Year 1 (Y1) value (excluding vat and inflation)**				
4.	**Total contract value for 3 years = (Cost Year 1 (Y1) excluding vat and inflation) X 3**				
5.	**Add 15% VAT**				
6.	**Total contract value for 3 years (including VAT)**				

Notes to the Multi- Year Pricing Table:
The first year of the contract will not be subject to price escalation
Cost for Year 2 (Y2) will be Total costs of Year 1 (Y1) x CPI adjustment in accordance with the formula below
Cost for Year 3 (Y3) will be Total costs of Year 2 (Y2) x CPI adjustment in accordance with the formula below

Notes to Pricing:

a) **Respondents, if awarded the contract, are required to indicate that their prices quoted would be kept firm and fixed for a period of 12 months, subject thereafter to adjustment (i.e., after the initial period of 12 months), utilizing the Consumer Price Index (CPI) as per below:**

CONTRACT PRICE ADJUSTMENTS

Formula

b) **b) Prices submitted for this bid will be regarded as non-firm and subject to adjustment(s) in terms of the formula set out below,**

c) **c) The following price adjustment formula will be applicable for calculating Contract price adjustments (CPA).**
Pa = (1-V) Pt ((CPI)) + VPt where:

Pa	**=**	**The new adjusted price to be calculated**
(1-V)Pt	**=**	**85% of the original bid price**
CPI	**=**	**In this tender Transnet will only use the Consumer Price Index (CPI) as a single factor from the Statistical Release "P0141" – Consumer Price Index, published by the Department of Statistics, South Africa.**
VPt	**=**	**15% (or 0.15) of the original bid price. This portion of the bid price remains fixed, i.e., it is not subject to price adjustment.**

Formula component definitions:

Adjustable amount: (1-V) Pt

e) The adjustable amount is the portion of the bid price, which is subject to adjustment. In this contract, the adjustable amount is 85% of the original bid price. For example, if the bid price is R1000, then only R850 will be subject to adjustment.

Fixed portion: VPt

f) The fixed portion represents those costs that will not change over the adjustment period and DOES NOT represent the profit margin. In this bid, the fixed portion is 15% of the original bid price. Using the same example as above, it would amount to R150 which will remain fixed over the contract period.

Cost components and proportions: D1

g) The cost components of the Contract price usually constitute the cost of materials (raw material or finished product), cost of direct labour, cost of transport and those other costs that are inclined to change. The proportions are the contribution to the contract price of each of these cost components. In this bid, the Consumer Price Index (CPI) Statistical release P0141 will be used to adjust the price adjustments.

Cost Component	% Contribution
D1 – Consumer Price Index	100% of 85%
TOTAL (Cost components must add up to 100%)	100 %

Applicable indices / references:

h) The applicable index refers to the relevant market index, which is a true reflection of price movement(s) in the cost over time. In this bid the following indices or reference will be applicable:

Cost component	Index Publication	Index Reference
D1- Consumer Price Index	Stats SA, Statistical Release P0141	P0141

Base Index Date

i) The base index date applicable to the formula is defined as the date of advertisement of the bid. The P0141 Stats SA Statistical release in the month of the tender will be used as the base index. If a Stats SA Statistical release P0141 is not published in the month in which the tender is advertised, the first Statistical Release P0141 in the month immediately prior to the month of the tender being advertised shall be used.

End Index Date

j) The end index dates are the dates at predetermined points in time during the Contract period. In this bid the end indices are the indices published in the month immediately following the annual anniversary of the month in which the tender is advertised. In other words, months 13, 26, 39 etc.

Price Adjustment Periods

k) Adjustment to contract prices will be applied for on an annual basis

ANNEXURE A

SURVEY AREA
&
HISTORICAL ENVELOPES

Station	X	Y
S1	62500.95	-3742937.80
S2	61954.03	-3743488.52
S3	60239.12	-3745795.44
S4	59126.14	-3747566.82
S5	61547.72	-3744078.53
N1	64994.53	-3740690.17
N2	65251.53	-3740472.17
N3	67846.36	-3738783.42
N4	73919.77	-3734960.67

FIGURE 1 - SURVEY AREA & POINTS

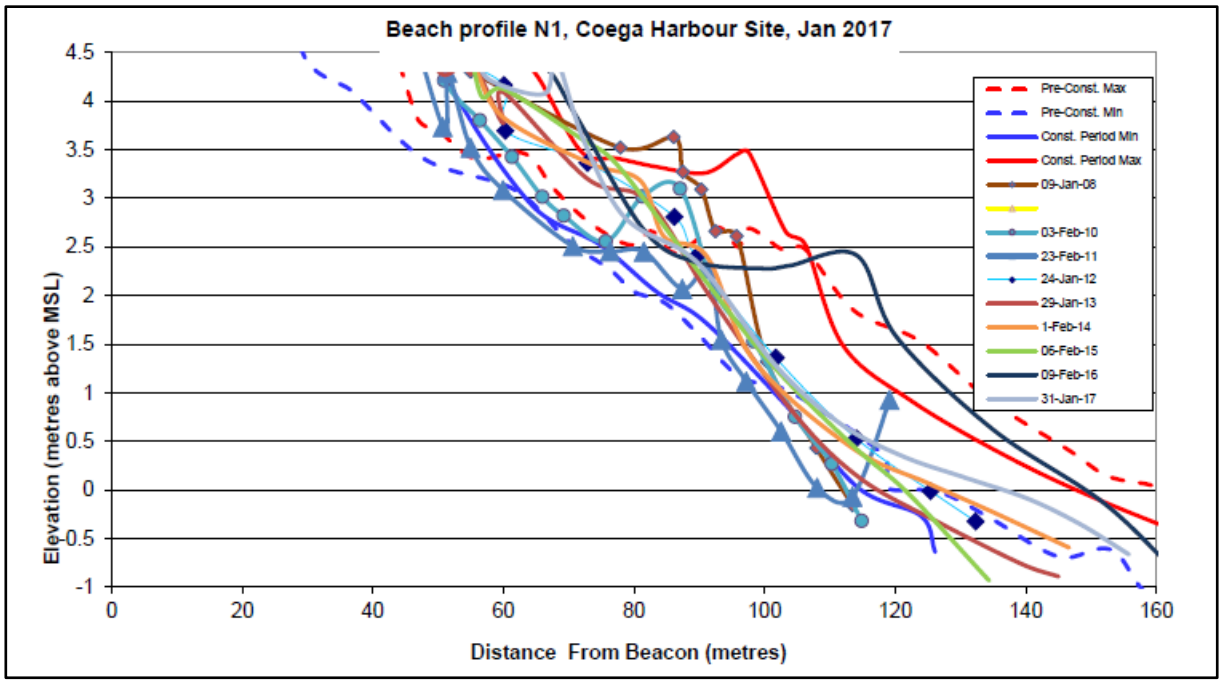

FIGURE 2 – BEACH PROFILE N1

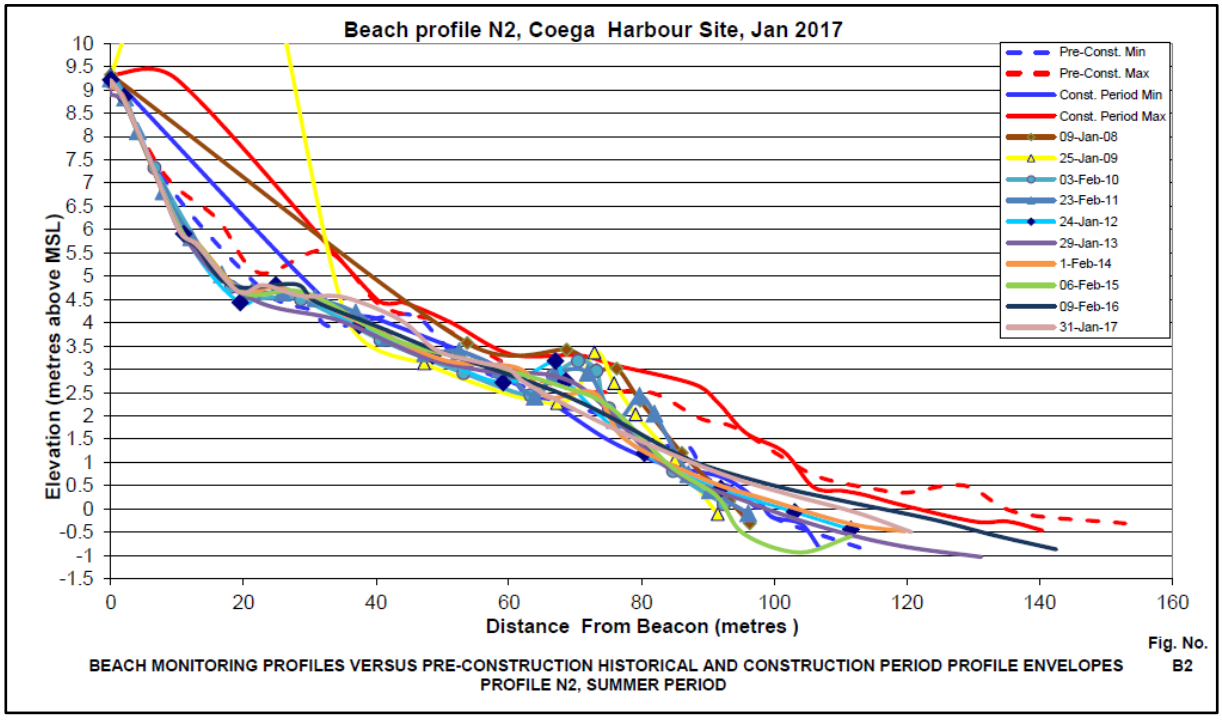

FIGURE 3 – BEACH PROFILE N2

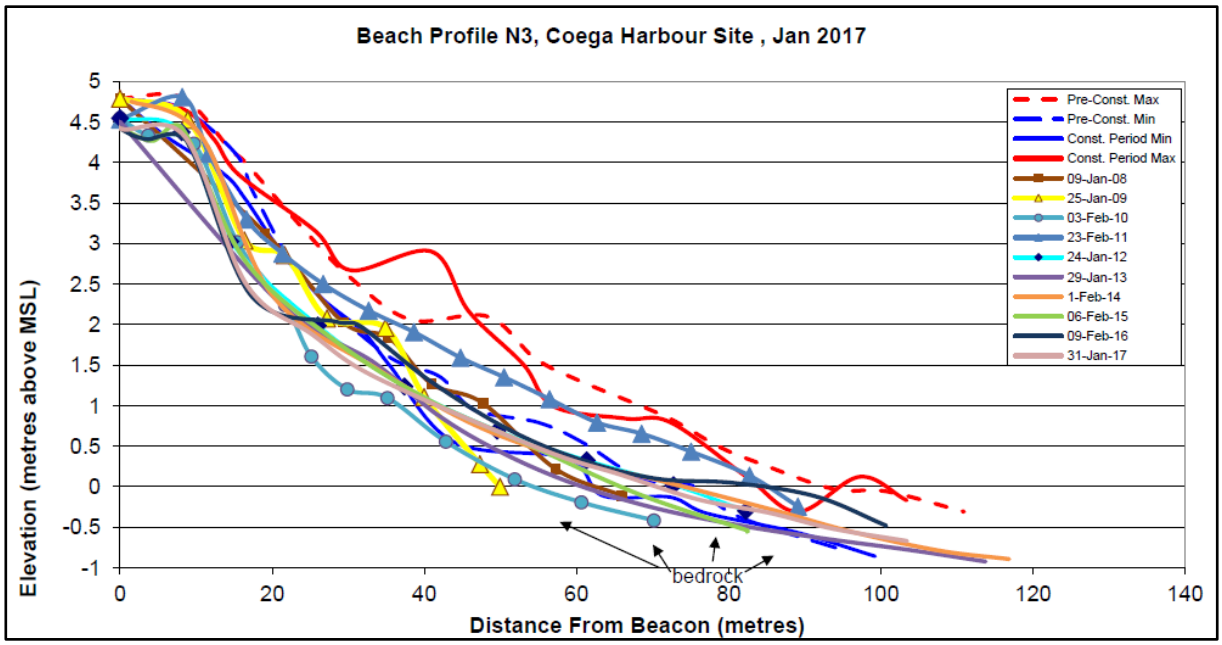

FIGURE 4 – BEACH PROFILE N3

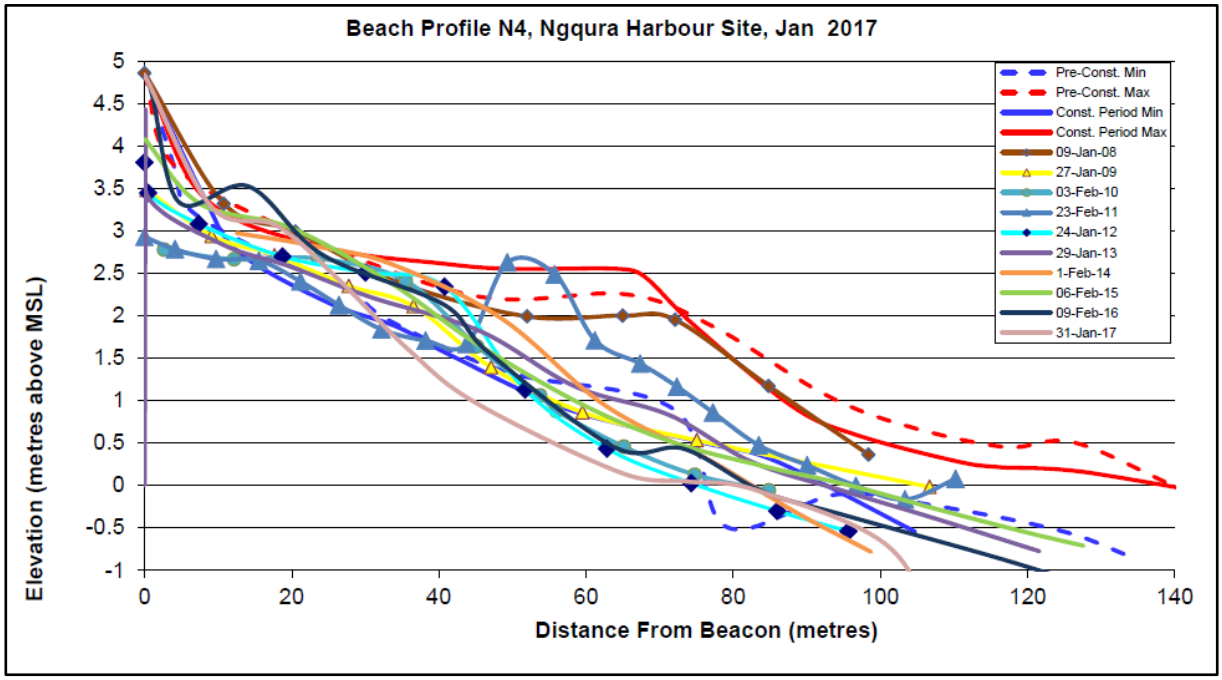

FIGURE 5 – BEACH PROFILE N4

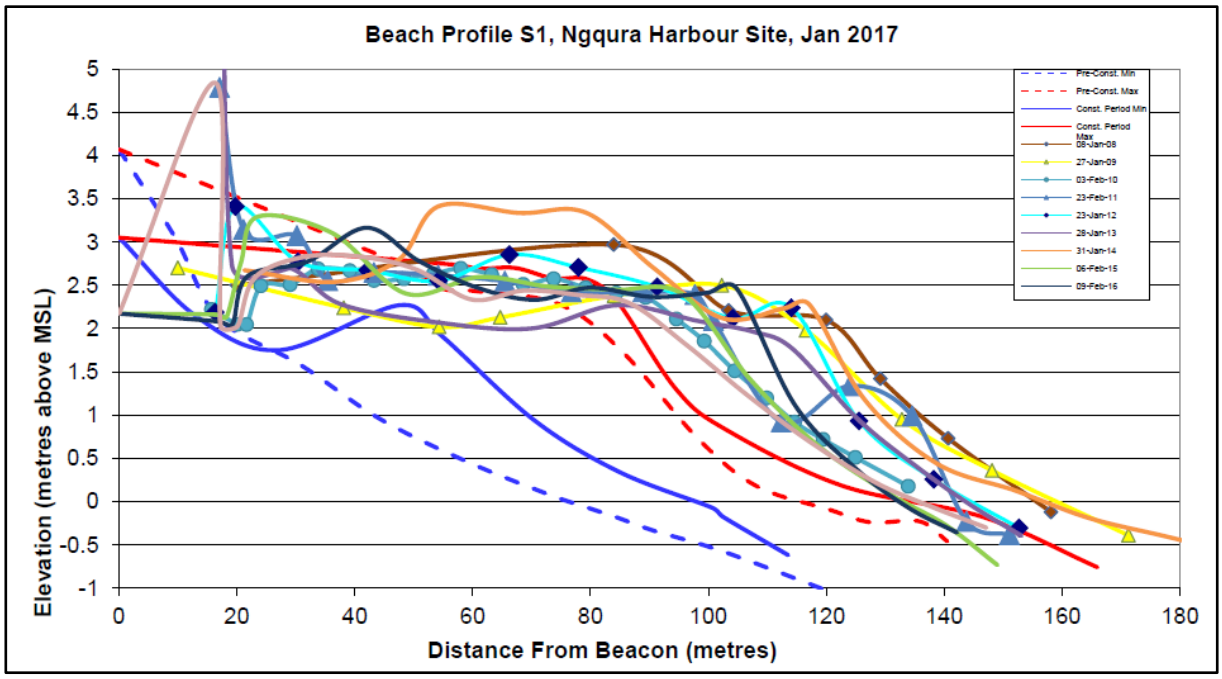

FIGURE 6 – BEACH PROFILE S1

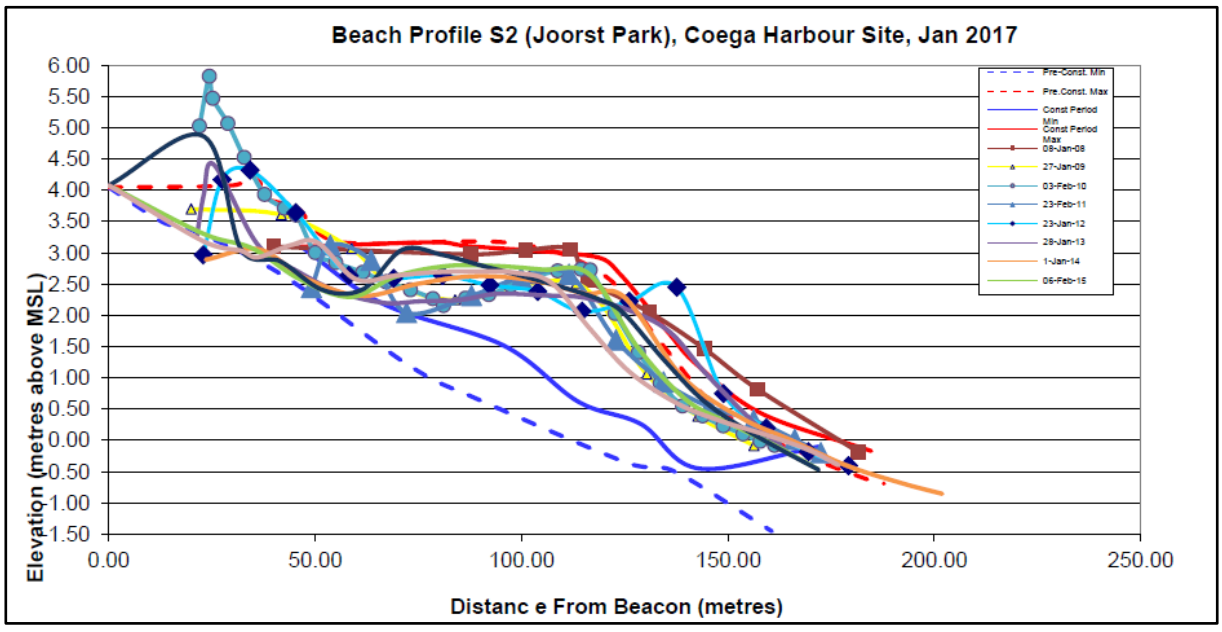

FIGURE 7 – BEACH PROFILE S2

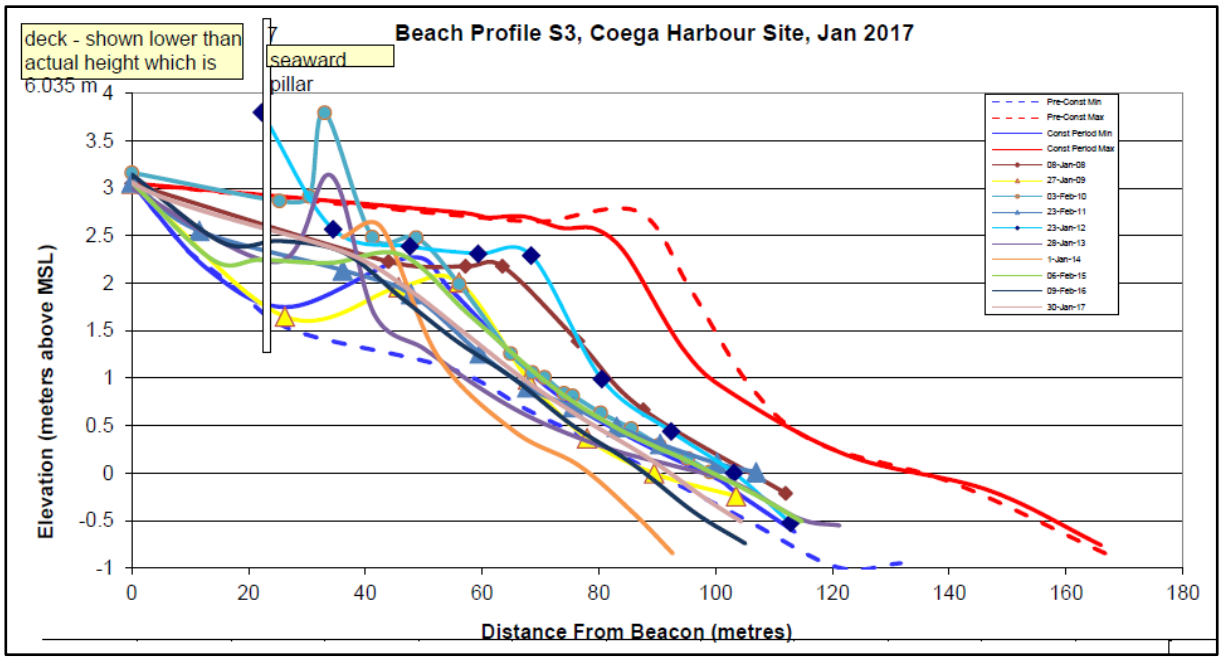

FIGURE 8 – BEACH PROFILE S3

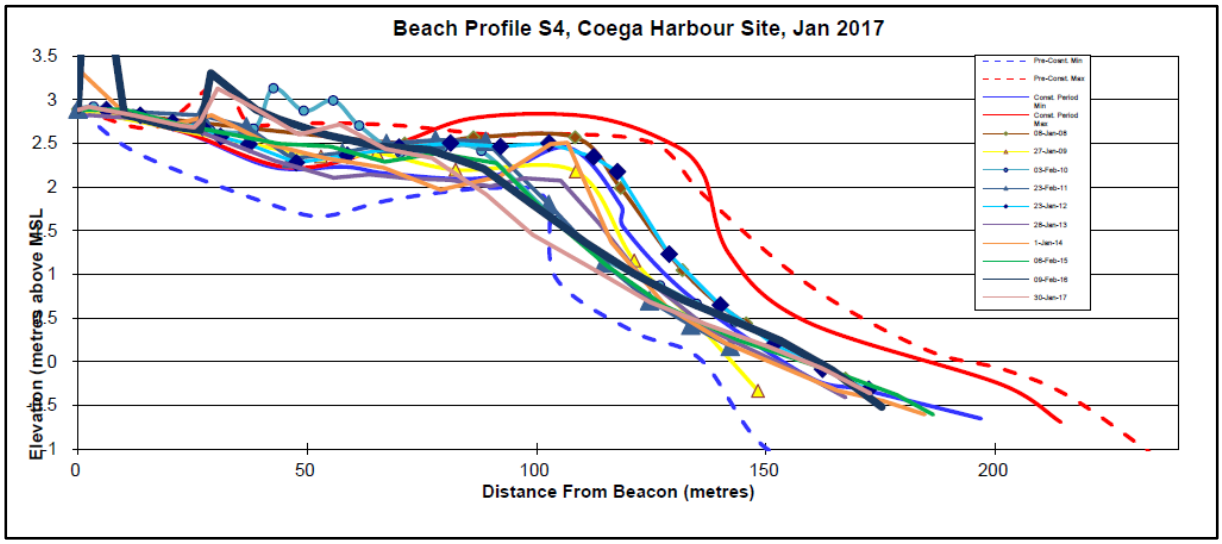

FIGURE 9 – BEACH PROFILE S4

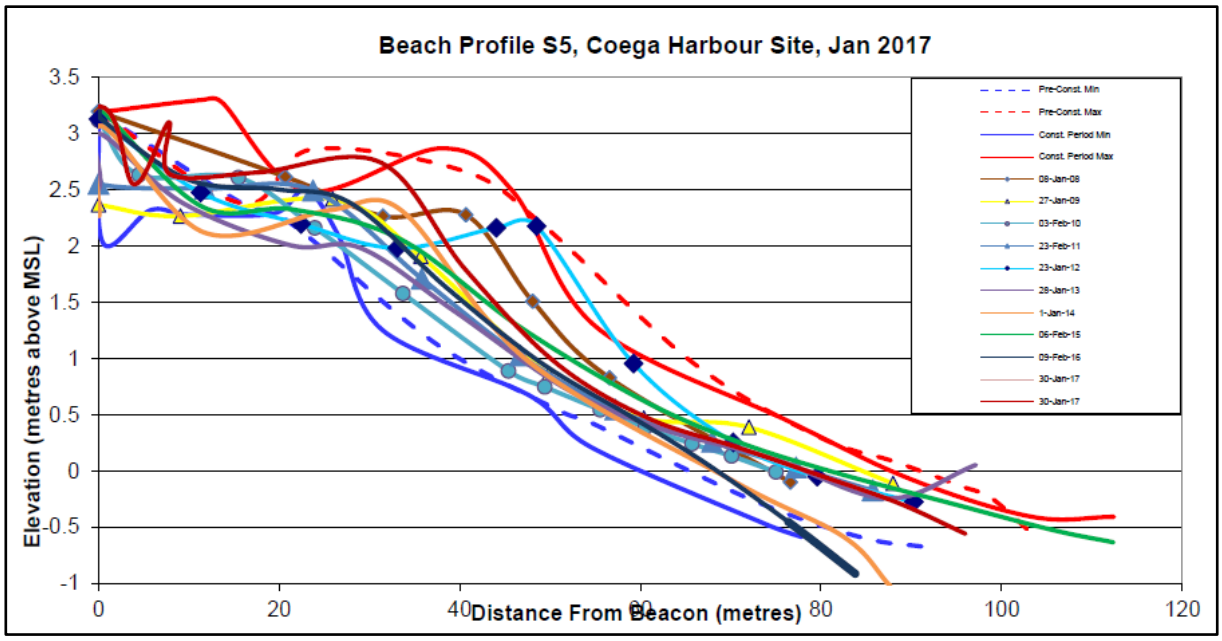

FIGURE 10 – BEACH PROFILE S5

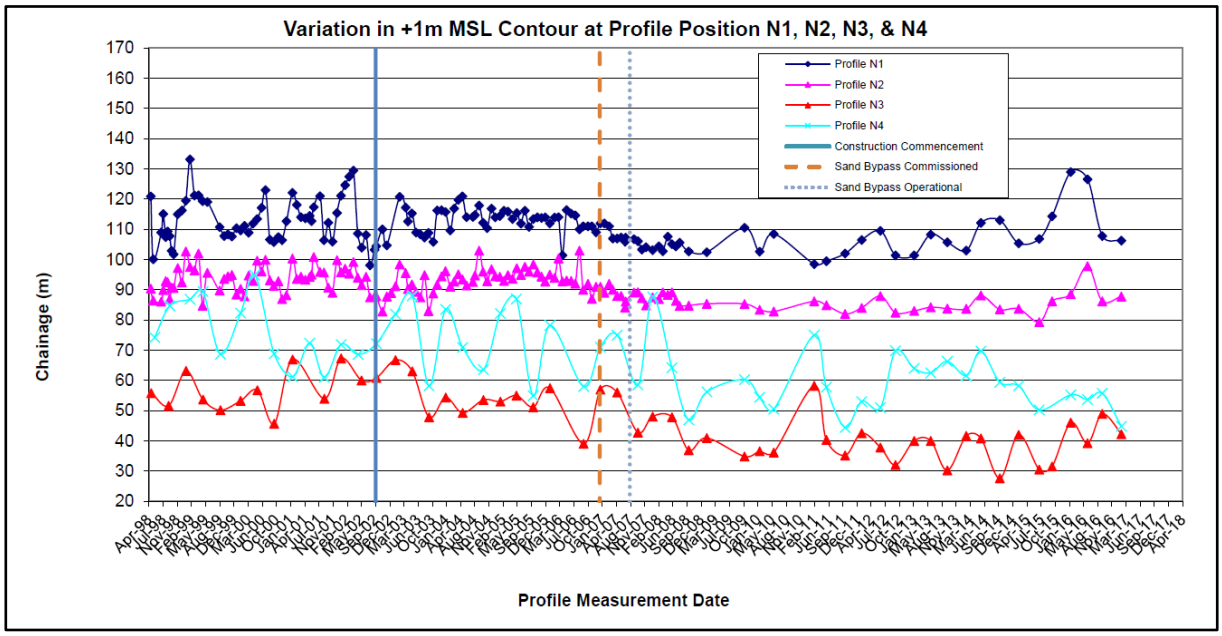

FIGURE 11 – VARIATION in + 1 m MSL at N1, N2, N3 & N4

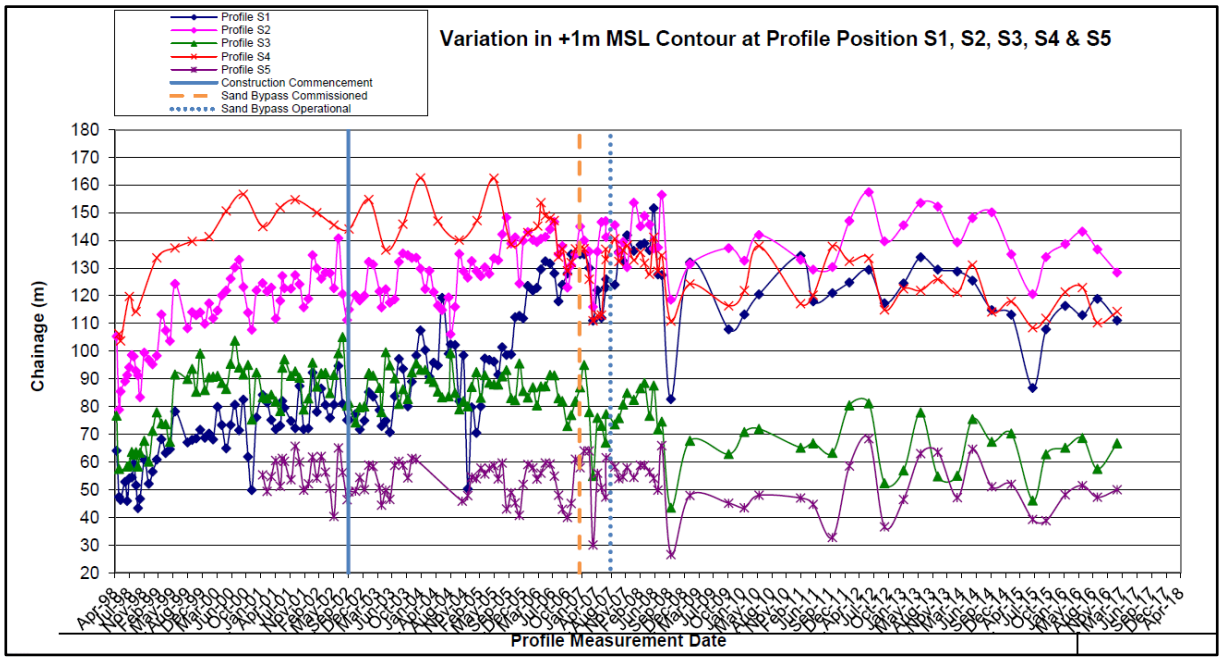

FIGURE 12 – VARIATION in + 1 m MSL at S1, S2, S3, S4 & S5