WorleyParsons

resources & energy

Francois Smit

Principal Coastal Engineer

Curriculum Vitae

Name	Francois Smit
Date of Birth	22/03/1968
Identity Number	6803225119081
Tertiary Qualification	MEng (Civil), University of Stellenbosch, 1991 BEng (Cum Laude) (Civil), University of Stellenbosch, 1989
Professional Membership	Associate: South African Institute of Civil Engineering (090403) (01/01/2005) Associate Member: American Society of Civil Engineers (395167) (01/03/2002)
Name & Contact Details of Current Employer	WorleyParsons RSA (Pty) Ltd, PO Box 398, Bellville, 7535 **Tel:** +27 (0) 21 912 3000 **Fax:** +27 (0) 21 912 3090 **Email:** Francois.Smit@WorleyParsons.com
Date of Joining Firm	01/07/2011

Summary of Employment

2014 - current	Principal Coastal Engineer, WorleyParsons RSA (Pty) Ltd
2011 - 2014	Lead Coastal Engineer, WorleyParsons RSA (Pty) Ltd
2008 - 2011	Lead Coastal Engineer, WorleyParsons Engineering Pty Ltd
2007 - 2008	Lead Coastal and Oceans Engineer, WorleyParsons Engineering Pty Ltd
2007 - 2007	Principal, Marine and Shore Technology Consultants, Dubai, UAE
2005 - 2007	Head of Coastal Monitoring and Design Unit, Dubai Municipality
2000 - 2005	Coastal Engineer, Dubai Municipality
1999 - 2000	Self-employed, River Blues cc, South Africa
1996 - 1999	Coastal Engineer, Coastal Processes Group, Coastal Development and Marine Resources Programme, Environmentek, CSIR
1992 - 1996	Research Engineer, Coastal and Hydraulic Engineering Group, Coastal Development Programme, Division of Earth, Marine & Atmospheric Science & Technology, CSIR
1991 - 1992	Research Engineer, Coastal and Marine Processes Programme, Division for Earth, Marine & Atmospheric Science & Technology, CSIR

Technical Experience

Francois Smit is a Coastal Engineer with twenty years' experience in coastal engineering, including three with WorleyParsons. Experience includes coastal zone management, coastal monitoring, coastal processes modelling and waterfront and coastal structures design. Specific expertise includes coastal measurement and monitoring, including ADCP, coastal imaging (video) and laser (LIDAR) technologies; wave climate and design condition assessments; harbour/marina/waterfront planning and design; shoreline stability assessment; coastal asset condition surveys; temporary and/or innovative coastal protection methods, including artificial surf reefs and geo-containers; computational and physical modelling of coastal processes, including surf zone turbulence and suspended sediment transport, wave and wind-induced hydrodynamics, coastal response and marine water quality.

2011 - Current **WorleyParsons RSA (Pty) Ltd**

Principal/Lead Coastal Engineer

KwaZulu-Natal Sea Level Rise Modelling – Sea Level Rise assessment for 400 km stretch of KwaZulu-Natal coastline in support of setback lines development.

Walvis Bay New Container Terminal Independent Review Engineer Services – IRE services for contractor undertaking design and construction of new container terminal in Walvis Bay Port, Namibia.

Feasibility Study for LNG importation at Saldanha Bay - Feasibility study for marine elements of LNG import facilities comprising jetty terminal facility at Saldanha Bay, South Africa.

Quantum Power LNG Terminal Preliminary Metocean Assessment – Rapid metocean assessment to investigate potential for establishing LNG import terminal in Ghana.

Saldanha Regional Marine Outfall Feasibility and Preliminary Design – Feasibility study, preliminary design and outfall discharge modelling for Frontier Saldanha Utilities' proposed Saldanha regional marine outfall.

Feasibility Study and FEED for LNG importation at Mossel Bay - Feasibility study and FEED for marine elements of LNG import facilities comprising berthing facilities and protective breakwater for Gas to Liquids facility at, Mossel Bay, South Africa.

City of Cape Town False Bay Sediment Transport and Coastal Erosion Study – Coastal engineering studies and concepts development for assessment of sediment transport and erosion mitigation between Muizenberg and Simonstown,

WCDM Saldanha Bay Desalination Plant – Coastal engineering studies for a proposed desalination plant in the Saldanha Bay area, South Africa.

Oil Terminal siting feasibility studies, Iraq – Hydrodynamic and sediment transport modelling assessment in support of refined petroleum products import/export terminal feasibility study.

Marine early works concepts for development of a mega LNG berthing and processing facility near Palma in northern Mozambique - Studies included pioneer dock and barging options for construction materials offloading.

Pre-tender support - mooring load & berth specifications - Support for a marine contractor bidding for design and construction of an LNG facility at Lampung in Indonesia.

Barging, dredging and greenfield port siting advisory services - for a tier 1 coal mining company operating in Mozambique.

Gas fired power station, LNG supply concepts, marine inputs - Marine inputs for a concept level assessment for LNG shipping and supply to a gas fired power station near Maputo, Mozambique.

West Nile Delta Coastal Erosion, Egypt - Coastal processes and shoreline evolution assessment in support of site selection and concept layout of a new gas facility

Hunt Point Tug Harbour, Australia - Coastal and estuarine sediment transport studies for a new tug harbour.

Early Works, Mozambique - Site assessment for the development of a pioneer dock.

City of Cape Town Desalination Plant Feasibility Study - Marine studies for establishing the preferred site and overall feasibility (metocean conditions, intake/outlet works and shoreline stability) of establishing a 150 ML/day desalination plant (2012 ongoing).

Qatar Economic Zone 3 Canal Physical Model Supervision: Supervision of 3D wave penetration physical modelling at CSIR facilities in Stellenbosch.

2007 - 2011 **WorleyParsons Engineering Pty Ltd**

Lead Coastal Engineer, Muscat, Oman (2008 – 2011)

BP West Nile Delta shoreline erosion study – Shoreline change study for pipeline shore crossing in Egypt.

Al Seeb Wastewater Outfall Relocation – Wave, hydrodynamic, sediment and effluent dispersion modelling studies and metocean surveys in support of the outfall pipeline and diffuser design for a new treated effluent emergency release outfall in Muscat, Oman.

Salalah Multi-User FZC Canal – Wave, hydrodynamic, sediment and effluent dispersion modelling studies to assess suitable locations for industrial cooling water release at Salalah Free Zone, Salalah, Oman.

New Doha Port Project – Coastal engineering studies in support of the design of New Doha Port, Qatar.

Ras Tanura Refinery Tank Farm Reclamation – Coastal engineering studies in support of design of island reclamation and protective revetment for tank farm establishment, Ras Tanura, Saudi Arabia.

GASCO SHT-2 Causeway – Dispersion modeling studies to assess the impacts on existing intakes/outfalls and prevailing sediment transport regime of a proposed causeway and sulphur handling terminal at Ruwais, U.A.E.

Duqm IWPP Coastal Advisory Services – Advisory services for an independent power station tender at Duqm, Oman.

Akwa Ibom Port Feasibility – Coastal studies (including computational modeling of waves, hydrodynamics and sediments) as part of feasibility assessment for new port complex at Akwa Ibom, Nigeria.

U.A.E. Coastal Facilities Design Studies – Coastal modeling and breakwater design studies as part of marine facilities development at 25 offshore and onshore locations around Abu Dhabi, U.A.E.

Harmoul Coastal Protection Review – Review of proposed coastal protection measures at Harmool village north of the Port of Sohar, Oman.

ADMA-OPCO HSEIA for Drilling – Drilling mud dispersion modeling as part of HSEIA, Abu Dhabi, U.A.E.

Blue City Extreme Water Levels Study – Extreme water level estimation at Blue City site in Oman to assist in confirming site establishment levels for Phase 1.

Borouge 3 Feasibility Study - Managing coastal modelling and engineering design studies in support of Borouge 3 chemical plant feasibility study; drawing up scopes of work for hydrographic surveys and metocean measurement campaigns, Ruwais, U.A.E..

Ma'aden Fine-Scale Modelling – Undertook and oversaw numerical modelling studies into waves, currents, thermal outfall plumes and sedimentation in support of cooling water intake basin and outfall design for Ma'aden facilities in Ras as Zawr, Saudi Arabia.

Ras as Zawr Port Coastal Engineering Review – Technical review of coastal structures design at 60% and 90% stages for Ras as Zawr Port, Saudi Arabia. Review of numerous technical study reports prepared by the contractor's consultant, including studies on wave transformation, extreme and operational wind and wave conditions, extreme water levels, site design criteria, and more. Attended and reported on ship navigation simulations at HR Wallingford laboratory in the UK.

Island D51, The World - Coastal master planning studies and coastal engineering design for the development of a luxury resort island forming part of the World development in Dubai, U.A.E.

Lead Coastal and Oceans Engineer, Abu Dhabi, UAE (2007 – 2008)
EMAL Extreme Water Levels Assessment - Extreme water level estimation to assist in site level establishments for new Emirates Aluminium Smelter site at Taweelah, Abu Dhabi, U.A.E..

Ras as Zawr Port – Review of coastal structures design at 30% stage. Review of numerous reports prepared by the contractor's consultant, including those on wave transformation, extreme water levels, sediment transport and design criteria.

2007 - 2007 Marine and Shore Technology Consultants, Dubai, UAE

Principal
Saphira Coastal Master Planning – Coastal master planning project for a proposed residential development in Rabat, Morocco. Site investigation, setback analysis, runup estimation and wave transformation undertaken to assist in location estimation and crest level estimation for proposed coastal protection structures.

Zuwarah Coastal Master Planning - Coastal master planning project for a proposed residential and business district development near Zuwarah, Libya. Initial wave and hydrodynamic modelling was undertaken to inform the planners on proposed setbacks from shoreline for developments. Possible coastal protection measures were identified, a preliminary marina layout developed and cost estimates for all coastal structures and nourishments were provided.

Baglioni Residence, The World - Coastal concept masterplanning project for a proposed boutique hotel and upscale tourist development on one of the World Islands. An initial estimate of climatic conditions (waves, currents) was established utilizing coastal engineering tools and numerical modelling. Island profiles and beach slopes were determined to inform the developers of required sand volumes. Setbacks from shoreline for the development was determined and coastal protection structures proposed. Initial cost estimates for all coastal structures and nourishments were provided.

Jumeirah Beach Islands, Umm Suqeim - Coastal masterplanning project for a proposed residential development off Umm Suqeim, Dubai. Initial feedback on expected wave climate and proposed shoreline orientations was provided to the planners. Possible coastal protection measures and changes to the proposed reclaimed islands were identified. Project is ongoing.

Oil spill modelling, Angola –Oil spill modelling analysis to investigate potential spill scenarios for Angolan offshore exploration blocks held by Maersk. The work was undertaken as part of EIA for Lwandle Technology Consultants using Applied Science Associates' (ASA) OILMAP spill modelling system.

2000 - 2007 **Dubai Municipality**

Head of Coastal Monitoring and Design Unit (2005 – 2007)
Dubai Coastal Zone Monitoring Programme – Designing and drawing up the terms of reference for the second phase of the Dubai Coastal Zone Monitoring Programme; overseeing the tendering and a ward of the project; representing the Dubai Municipality as liaison engineer during the execution phase.

Dubai Coast 3D Water Quality Study - Drawing up the terms of reference for a water quality study of the Dubai coastal zone including all mega-reclamation developments and incorporating a field measurement campaign, overseeing the tendering and a ward of the project, and representing the Dubai Municipality as liaison engineer during the execution phase.

Dubai Coastal Zone Management Guidelines - Managing and directing the activities of the unit – Responsibilities involved: The preparation of budgets and project schedules; ensuring an appropriate level of human and other resources were maintained to enable the effective functioning of the unit; guiding numerical modelling studies of coastal processes, guiding data analyses and coastal monitoring activities; carrying out coastal modelling as required on a diverse range of projects; reviewing project reports and studies carried out by consultants for external Dubai projects, particularly as part of No Objection Certificate procedures; reviewing coastal engineering designs of coastal structures and beach nourishments; drawing up and reviewing terms of reference and requests for proposals on a variety of coastal engineering and coastal monitoring projects.

Coastal Engineer (2000 – 2005)
Dubai Coastal Zone Monitoring Programme – Designing, implementing and managing a coastal zone monitoring program for the coastline of Dubai Emirate. Implementing and maintaining a GIS system (ESRI Arcmap 8.3/9.1) and associated coastal zone database for the management of the Dubai coastline. Designing and executing in-house field measurement campaigns to capture wave, water level and current information at different sites around Dubai. Equipment utilized included: 1200 kHz ADCPs (currents-only, currents and waves, bottom-tracking), Valeport 730W, Sontech FlowTracker. Measurement campaigns were held at Jumeirah Open Beach, Dubai Creek, Jebel Ali Port and Al Mamzar Lagoon.

Multi-Function Artificial Reef Design – Designing an artificial reef with primary coastal protection function, but also incorporating additional functionality for diving/snorkelling and surfing. The project involved extensive numerical modelling of wave, flow and sediment transport processes. The design was eventually tested in a physical model basin at HR Wallingford and a contract award for construction off the Dubai coast.

Dubai Hydrographic Lidar Survey - Designing and drawing up tender documents for a hydrographic lidar survey of the Dubai coastline, evaluating the submitted tenders, recommending award and acting as the Municipality's technical liaison during project execution.

Dubai Coastal Assets Condition Survey - Designing and drawing up tender documents for a coastal structure condition survey of the Dubai coastline, evaluating the submitted tenders, recommending award and acting as the Municipality's technical liaison during project execution.

Dubai Coastal Management Guidelines - Preparing tender documents, evaluating and analyzing tenders and recommending contract award.

Dubai Creek Water Quality and Sediment Characteristics Study – 3D hydrodynamic and water quality study of Dubai Creek, including field measurements and development of Dubai Creek water quality management system.

Jumeirah Coastal Zone Management Plan Phase 3 – Coastal development and management project, including rectification of poorly functioning existing breakwater

Beach Renourishment and Harbour Entrance Dredging – Design of renourishment of Jumeirah Public Beach, Dubai which included the dredging of the entrances of a number of small-craft harbours where sedimentation had occurred.

Jumeirah Sand Source Investigation – Geotechnical and seismic survey offshore of Dubai in search of beach quality sand sources for beach replenishment use.

Small-scale Dredging and Beach Renourishment Trial – Design, execution and monitoring of a nearshore dredging and beach renourishment trial utilizing small dredger.

Coastal Modelling Capacity Building - Setting up a numerical modeling capability within the Coastal Management Section and assisting in transferring technology and expertise to identified section personnel.

Al Yasat Ali Island Harbour – Provision of numerical modelling support during design and construction of harbour and associated quay wall, slipway, landing ramp, pontoons, revetments and groynes. Modelling support included wave transformation, wave agitation, nearshore hydrodynamics and sediment transport modelling.

Jumeirah Open Beach Current Measurements - Responsible for setting up and deploying three ADCPs and two pressure recorders for recording waves, water levels and wave-driven currents in and around breakwaters at Jumeirah Open Beach.

Dubai Creek Water Level and Current Measurements - Responsible for deploying three ADCPs and two water level recorders at locations in Dubai Creek to gather data for assisting a consultant design of 5 abra (water taxi) stations, analyzing and reporting on captured data.

Port of Jebel Ali Water Level and Current Measurements - Responsible for deploying water level recorders within the Port of Jebel Ali, measuring currents using a bottom-tracking ADCP instrument fixed to a boat and analyzing and reporting on captured data. Work carried out for U.A.E. University.

Al Mamzar Wave and Current Measurements - Responsible for deploying 2 bottom-mounted ADCPs within and outside Al Mamzar Lagoon for measuring currents and waves and analyzing and reporting on captured data.

1999 - 2000 River Blues cc, South Africa

Specialist Advice On Numerical Modelling – Advice to CSIR on wave refraction modelling, nearshore hydrodynamic model and associated graphical user interface development.
Diamond Transport Along Palaeo-Coastlines – Support to CSIR on numerical prediction of diamond transport along palaeo-coastlines.

1991 - 1999 CSIR

Coastal Engineer, Coastal Processes Group, Coastal Development and Marine Resources Programme, Environmentek (1996 – 1999)
Diamond Transport Along Palaeo-Coastlines - Numerical prediction of diamond transport along palaeo-coastlines for De Beers Marine.

Profsurf Cross-Shore Beach Profile Model – Development of numerical model to model cross-shore wave transformation, alongshore currents, undertow, bedload and suspended sediment transport and profile change for CSIR Executive**.**

WaveGIS Refraction Studies Management System – Development of GIS-based wave modelling framework for setting up, running and managing HISWA

wave refraction modelling projects.

FEMCIRC & FEMORPH Development – Development of 2D horizontal finite element models describing nearshore wave-driven circulation, sediment transport and morphological change.

Table Bay Wave Refraction Study - Project leader responsible for executing a wave refraction study within Table Bay with the aim of providing wave conditions in the form of nearshore wave occurrence tables in the vicinity of the Port of Cape Town.

Port of East London Wave Refraction/Diffraction Studies - Responsible for modeling the refraction and eventual diffraction of waves into the port of East London. The study was carried out to evaluate the effects on port operation of various scenarios, such as failure of the breakwater.

Investigation Into Effects Of Proposed Dredging Activities On Turbidity Levels And Shoreline Stability In Saldanha Bay - Responsible for executing numerical wave refraction and diffraction studies in Saldanha Bay and evaluating results to determine critical shear stresses for suspension of fine dredged material within the bay as well as identifying changes in wave climate associated with proposed dredging of the entrance channel. The study was a specialist study which formed part of an environmental impact assessment for Portnet. Extensive use of ArcInfo® GIS was made to analyse and present results.

Murray's Bay Wave Refraction Study - Carried out a wave refraction study to determine nearshore wave conditions for the design of a small-craft harbour at Murray's Bay on Robben Island, Table Bay, South Africa.

Turbidity and shoreline stability, Saldanha Bay - Effects of proposed dredging activities on turbidity levels and shoreline stability in Saldanha Bay for Strategic Fuel Fund (SFF).

Use of sea water for cooling, Saldanha Stainless Steel Plant (SSP), Saldanha Bay - Feasibility study into the possible use of sea water for cooling; specialist submission to pre-feasibility study. Responsible for executing a study utilizing a numerical model (CORMIX) to evaluate the proposed use of sea water and eventual discharge of warm water within Saldanha Bay.

Research Engineer, Coastal and Hydraulic Engineering Group, Coastal Development Programme, Division of Earth, Marine & Atmospheric Science & Technology (1992 – 1996)
Coastal Protection, Namibia – Investigation into coastline protection options to optimize exploitation of mining terrain for NAMDEB.

Small Craft Harbour, Frégate Island, Seychelles – Wave refraction studies in support of a proposed small craft harbour for Happel.

Coastal Protection Scheme Review, Dubai - Review of coastal protection scheme for Dubai Municipality, Dubai, UAE.

Review of Beach Protection Measures: Pointe de Flacq, Mauritius – Numerical modelling of **c**oastal processes in support of review carried out for Sun International.

Beach Establishment And Stability, Le Coco Beach Hotel, Mauritius - . Numerical modelling of **c**oastal processes in support of proposals for the provision and long-term protection of beach amenities.

Elizabeth Bay Mine Discharge Plumes Evaluation – Responsible for executing a numerical model to determine tidal circulation patterns and mine discharge plume development; determining nearshore wave conditions through a numerical wave refraction study; utilising GIS in estimating beach volume and bed level changes based on survey data collected over the years.

Research Engineer, Coastal and Marine Processes Programme, Division for

Earth, Marine & Atmospheric Science & Technology (1991 – 1992)
WAVESURF - Responsible for developing a numerical model WAVESURF to describe cross-shore wave transformation and associated water level changes.

Courses, Conferences and Seminars

2011	Development of Coastal Setback Lines Seminar 2011: University of Stellenbosch
2010	Arabiancoast 2010 Conference: IAHR/Sultan Qaboos University
2009	OmanHydro: Royal Navy of Oman
2008	Membrane Technology used in Desalination and Wastewater Treatment for Reuse: Middle East Desalination Research Centre
2006	UNESCO-IHE Online Integrated Coastal Zone Management: UNESCO-IHE
2003	Mike21 CAMS (Morphological Modelling) Course: Danish Hydraulics Institute
1998	Integrated Environmental Management: CSIR Environmentek
1998	Virtual Reality: Business Overview: CSIR Virtual Reality Solutions
1998	TOC Project Management: CSIR
1994	Business Presentation Skills: Business Presentation Skills Ltd
1992	Basic Project Management: Groman Consulting Group

Publications and Papers

Authored one book chapter and more than 30 papers published in conference proceedings. Guest editor of Shore and Beach special issue Fall 2008.

Scraggs, C., Mocke, G.P., Smit, F., Vieira, F., Zhu, X. (2012). **Overview of the coastal engineering studies performed for the design of a new commercial port in Qatar.** *Proceedings of PIANC-COPEDEC VIII*, Channai, India.

Vieira, F., Smit, F., Mocke, G P (2010). **Assessing the Impact of Extreme Events on the Coast of Oman.** Proceedings of the Second International Conference on Coastal Zone Engineering and Management (ARABIANCOAST 2010), Muscat, Oman

Nesterov, O, Scraggs, C, Smit, F., Mocke, G P (2010). **Modelling of Hydrodynamics and Seawater Temperature along the UAE Coast.** Proceedings of the Second International Conference on Coastal Zone Engineering and Management (ARABIANCOAST 2010), Muscat, Oman

Vieira, F., Smit, F., Mocke, G P (2010). **Quantifying the vulnerability of the coast of Oman to extreme events**, ICCE 2010, Shanghai, China (Poster)

Vieira, F., Smit, F., Mocke, G P (2009). **Estimates of extreme water levels in the Arabian Gulf and Oman using coastal modelling and data analysis**, Omanhydro Symposium, Muscat, Oman

Mocke, G P, Smit, F (2008). ***Editorial and Invited Contribution***: **Challenges and Impacts Associated with Coastal Mega-Reclamation Developments**. Shore & Beach, Vol 76, No.4, Fall 2008. American Shore & Beach Preservation Association (ASBPA).

Smit, F. and Mocke, G.P., 2008. **Monitoring and management of shoreline change along the dynamic Dubai coastline**, in Krishnamurthy, R.R., Glavovic, B.C., Kannen, A., Green, D.R., Ramanathan, A.L., Han, Z., Tinti, S. and Agardy, T. (eds.), *Integrated Coastal Zone Management (ICZM) – The Global Challenge*, Research Publishing Services, Singapore.

Smit, F., Mocke, G.P., Giarrusso, C.C. and Baranasuriya, P.W., 2008. **Coastal modelling of the Dubai coastline with emphasis on morphological validation**. *Proceedings of PIANC-COPEDEC VII*, Dubai.

Mangor, K., Mocke, G., Giarrusso, C., Smit, F., Bloch, R., Fuchs, J., Lumborg, U. and Niemann, S.L., 2008. **Shoreline management of the Dubai coast**. *Proceedings PIANC-COPEDEC VII*, Dubai.

Smit, F., Mocke, G.P., Caprile, R. and Sinclair, M., 2007. **Bathymetric LIDAR data GIS applications for coastal zone management in Dubai**. *Proceedings of CoastGIS 2007*, Santander, Spain.

Smit, F., 2007. **Dubai Coastal Zone Monitoring Programme**, invited presentation to *Workshop on Coastal Erosion in the Batinah, Oman*. Sultan Qaboos University, Muscat, Oman.

Mocke, G.P., Fernando, S.G., Fernando, P.C., Smit, F., Finch, D., Ward, S., Johnson, H., Zyserman, J., Stewart, T., 2006. **Coastal processes quantification in support of a decision matrix approach for coastal enhancement design at Jumeirah, Dubai**, *Proceedings of the 30th International Conference on Coastal Engineering*, San Diego.

Authored and co-authored more than 25 additional scientific publications between 1993 and 2006.

Language Proficiency

	Speak	Read	Write
Afrikaans	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent