

*Maintenance of the Crocodile West River System
Reconciliation Strategy Study*


Surface water quality status in Crocodile (West) catchment

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29 September 2011


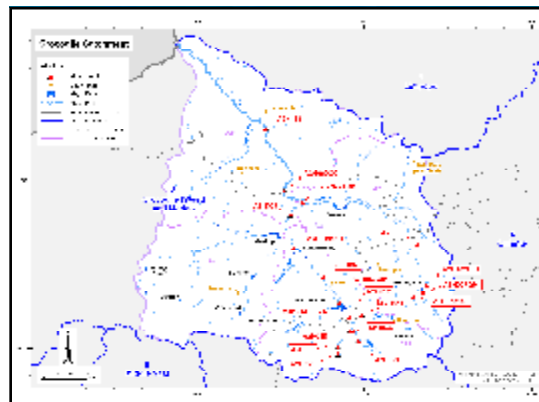


Outline

- Location of monitoring points assessed
- Revision of Preliminary Resource Water Quality Objectives (RWQO's)
- Compliance to RWQOs (chemical)
- Summary of water quality trends
- Distant plot for the crocodile west river
- Water quality issues & concerns
- Ways Forward




Location of the selected 19 monitoring points in the Crocodile West Catchment

RWQOs


- Fitness for Use
- Identified Users in WMA
- Generated scenarios (Ideal, Acceptable, Tolerable)
- Compared WQ data to scenarios
- Decided on appropriate limits for RWQOs



Water Users

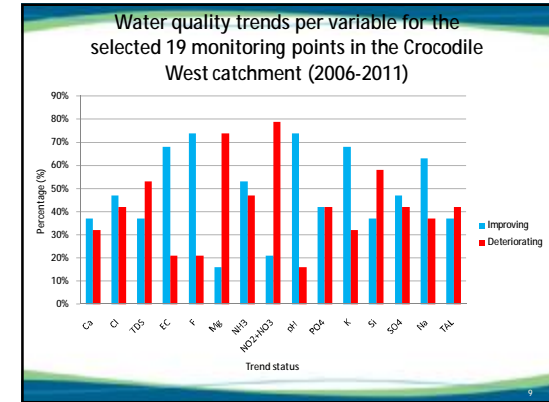
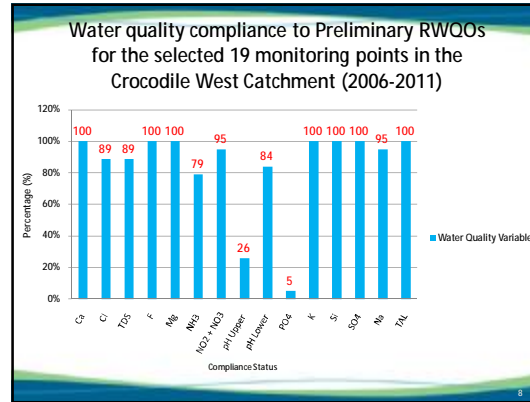
- Preliminary Ecological Reserve-draft
- Domestic
- Irrigation
- Livestock Watering
- Industrial Water Use (Category 3)
- Recreational Full contact

SAWQG 1996

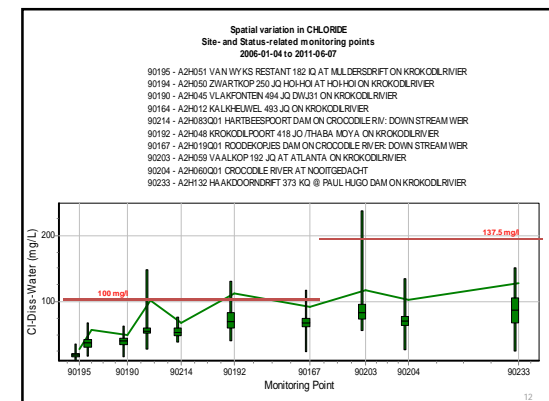
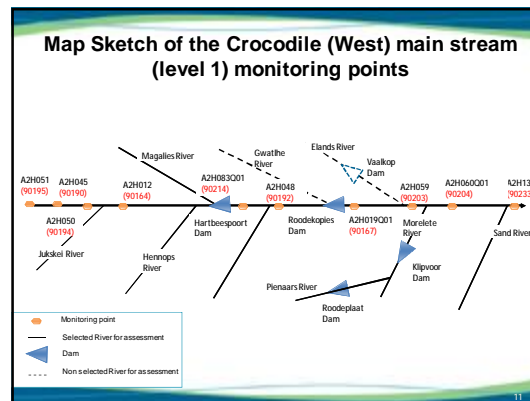


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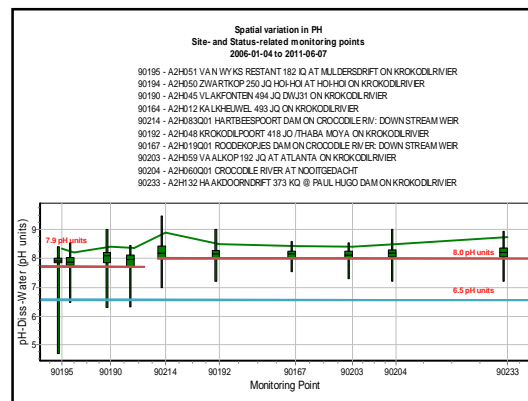
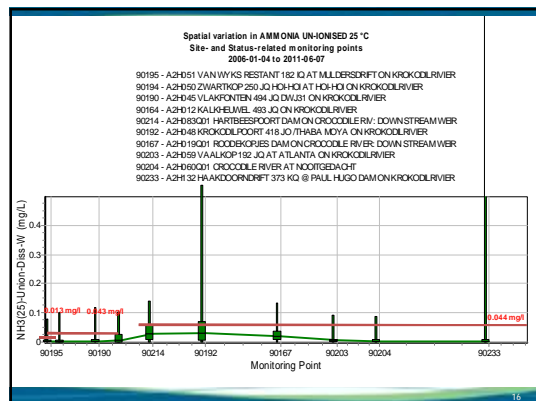
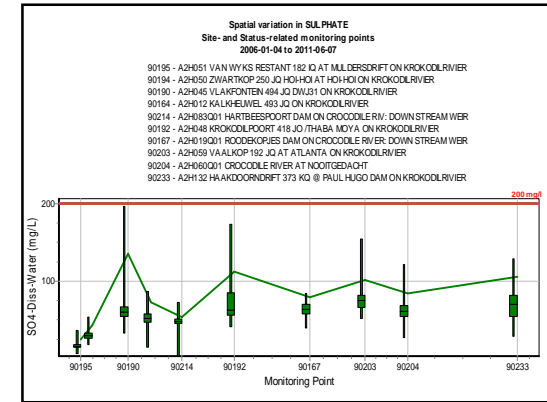
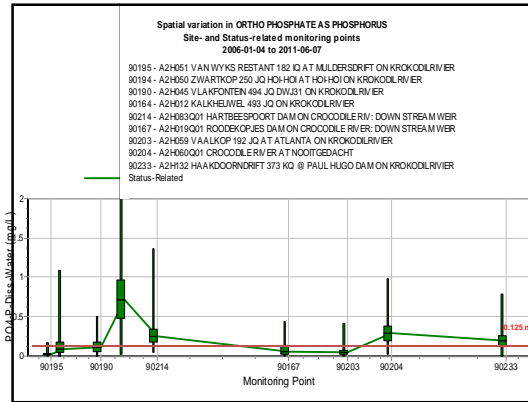
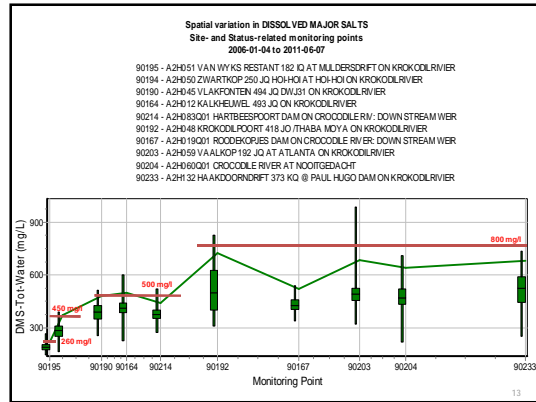
Generic Resource Water Quality Objectives at a National Level



Distance plot for the Crocodile West River main stream (Variables of concern)



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Water quality issues and concerns		
Water Quality Issue	Driver	Effect
Eutrophication (Nutrient enrichment)	Wastewater treatment works.	Algal growth, smell, toxic algae, water treatment extra costs, taste and odour, irrigation clogging, impact on aesthetics and recreational water users.
	Intensive agriculture fertilizer use, and dense urban sprawl un-serviced sewage.	
Microbial contamination	Wastewater treatment works, Informal dense settlements.	Impact on recreational users (human health), washing and bathing.
Turbidity	Informal dense settlements.	Dam sedimentation, increase in water treatment costs and irrigation clogging.
	Urbanisation, mining, agriculture, and point source discharges.	
Salinisation	Wastewater treatment works	Increased water treatment costs, soil salinity and irrigation system clogging.
	agricultural (intensive irrigation) and mines (operational and abandoned).	
Toxicants*	Pesticides industry	Fish kills, bioaccumulation of pollutants in fish and crocodiles.

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Way forward

- Establish a DWA Croc-West WQ technical task team.
- Establish a phased approached action plan
 - Catchment Situation assessment
 - Determination of Resource Water Quality Objectives (RWQOs) and compliance analysis which includes
 - Water quality reconciliation and foresight
 - Water Quality Options analysis and scenario development
 - Develop Water Quality Management Plan

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Thank you

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Preliminary RWQOs (1)

	Monitoring Point	Calcium (Ca)	Chloride (Cl)	Dissolved Major Salts (DMS/TDS)	Electrical Conductivity (EC)	Fluoride (F)	Magnesium (Mg)	Ammonia (NH3)	Nitrate + Nitrite (NO2+NO3)
Crocodile West River	AZH051	80	100	260	70	0.7	70	0.013	6
	AZH050	80	100	450	70	0.7	70	0.043	6
	AZH045	80	100	500	70	0.7	70	0.043	6
	AZH012	80	100	500	70	0.7	70	0.043	10
	AZH083001	80	100	500	70	0.7	70	0.044	10
	AZH048	80	100	800	70	0.7	70	0.044	10
	AZH019001	80	100	800	85	0.7	70	0.044	10
	AZH059	80	137.5	800	120	0.7	70	0.044	10
	AZH060001	80	137.5	800	120	0.7	70	0.044	10
	AZH132	80	137.5	800	120	0.7	70	0.044	10

Preliminary RWQOs (1 cont...)

	Monitoring Point	Calcium (Ca)	Chloride (Cl)	Dissolved Major Salts (DMS/TDS)	Electrical Conductivity (EC)	Fluoride (F)	Magnesium (Mg)	Ammonia (NH3)	Nitrate + Nitrite (NO2+NO3)
Jutskel River	AZH023	80	100	450	70	0.7	23	0.065	10
	AZH044	80	100	450	70	0.7	23	0.0716	10
Hannops River	AZH014	80	100	450	70	0.7	23	0.0716	10
Pienars/Moretele Rivers	AZH027001	50	50	500	60	0.7	35	0.072	3
	AZH006	40	100	500	70	0.7	35	0.072	3
	AZH102001	40	100	500	70	0.7	35	0.072	3
	AZH021001	40	53.81	500	70	0.7	35	0.072	3
	AZH013	80	100	500	85	0.7	35	0.072	3
Magalies River	AZH023	80	50	450	70	0.7	70	0.02	3

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Preliminary RWQOs (2)

	Monitoring Point	pH Upper	pH Lower	Phosphate (PO4)	Potassium (K)	Silicon (Si)	Sulphate (SO4)	Sodium (Na)	Alkalinity (TAL)
Crocodile (West) River	AZH051	7.9	6.5	0.125	25	20	200	70	300
	AZH050	7.9	6.5	0.125	25	20	200	70	300
	AZH045	7.9	6.5	0.125	25	20	200	70	300
	AZH012	7.9	6.5	0.125	25	20	200	70	300
	AZH083001	8	6.5	0.125	25	20	200	70	300
	AZH048	8	6.5	0.125	25	20	200	92.5	300
	AZH019001	8	6.5	0.125	25	20	200	92.5	300
	AZH059	8	6.5	0.125	25	20	200	92.5	300
	AZH060001	8	6.5	0.125	25	20	200	92.5	300
	AZH132	8	6.5	0.125	25	20	200	92.5	300

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Preliminary RWQOs (2 cont...)

	Monitoring Point	pH Upper	pH Lower	Phosphate (PO4)	Potassium (K)	Silicon (Si)	Sulphate (SO4)	Sodium (Na)	Alkalinity (TAL)
Jutskel River	AZH023	8.4	6.5	0.125	25	20	100	70	200
	AZH044	8.4	6.5	0.125	25	20	100	70	200
Hannops River	AZH014	8.4	6.5	0.125	25	20	100	70	200
Pienars/Moretele Rivers	AZH027001	8.4	6.5	0.125	12.5	10	100	92.5	200
	AZH006	8.4	6.5	0.125	12.5	10	100	70	200
	AZH102001	7.9	6.5	0.125	12.5	10	100	70	200
	AZH021001	8.4	6.5	0.125	25	10	100	70	200
Magalies River	AZH013	8.4	6.5	0.125	25	10	100	92.5	200
	AZH023	8.4	6.5	0.125	12.5	20	100	46	300

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