1 JBS18 (EWR 15: FISANTSKRAAL (VET RIVER) – OSAEH 29.3)

1.1 SITE DESCRIPTION

EWR 15 is situated in the Vet River downstream of the confluence with the Sand River, within MRU Vet C which is delineated from Erfenis Dam to the Sand River confluence (downstream of Erfenis Dam) (DWAF, 2009). No significant change in land use occurs in this MRU which is mainly bushland thicket and natural grassland. However it does include two Eco-regions.

Fish habitat fairly is well represented at site as well as flow-depth categories and cover for species favoring fast habitats. Slow (especially SD) habitats had to be supplemented by sampling of another site. Macroinvertebrate survey habitat availability is adequate and is not a limiting factor of macroinvertebrate diversity. Vegetation is not ideal as there is disturbance due to farming activities and a large degree of colonisation by exotic species. Land use in the area is predominantly agricultural and pastoral farming.

Location	EWR 15 Fisantkraal	**Altitude**	1247 m
Longitude	26.12569	**Latitude**	-27.93482
EcoRegion	Highveld 11.08	**Quaternary catchment**	C43A
Water Management Area	Middle Vaal River	**Geomorphological zone**	Lower Foothills

EWR 15, shallow cobble dominated rapid area

1.2 PRESENT ECOLOGICAL STATE (PES)

Geom	Reduced baseflows and a decline in floods have reduced sediment transport; so flushing of fines and scour is reduced. The continued provision of small and moderate floods (from catchment below the dams) will maintain the PES at this site.
WQ	The present state is based on water quality data from monitoring site C4H004. Moderate changes to

	the salts (EC- moderate to high) and SO_4. Increased nutrients (high ammonia) are due to mainly return flows from irrigation. Presence of high electrolyte content and highly polluted water tolerant diatom species.
Fish	The EC of D can be ascribed to the absence of *A. sclateri*, *B. anoplus* and *T. sparrmanii* from the observed fish assemblage.
Inverts	Sep 07: SASS5 score: 73 No of Taxa: 16 ASPT: 4.6 Apr 08: SASS5 score: 62 No of Taxa: 14 ASPT: 4.4 The EC of C/D is due to the seasonal flows being reduced in winter and the water quality changes seasonally driven by high turbidities and nutrients. Both of these variables smother riffle habitats.
Rip veg	The area is currently considerably degraded mainly due to the introduction of a number of exotic species. The exotic species in the area, in fact, contribute to a total of over 50% of the total number of species identified during the surveys. Furthermore, the lack of extreme events, such as fire and flooding, are causing homogenization of the riparian vegetation.
Diatoms	Diatom results are based on a sample taken during 2007. The Ecological Category (EC) was a D and the community indicated high levels of organic pollution with pollution tolerant species dominating the community.

1.3 MAIN IMPACTS AT THE SITE

	PES	Causes	Sources	F/NF
WQ	C	Moderate in-stream toxicity.	Possibly toxins from agricultural practices (fertilizers/pesticides).	NF
		High ammonia (moderate to low nutrients).	Agricultural activity.	
Geom	C	Reduced baseflows and decline in number and size of floods.	Allemanskraal and Erfenis dams upstream of the EWR site.	F
Rip veg	E	Terrestrial exotic invasive species.	Anthropogenic.	NF
		Aquatic exotic invasive species.	Anthropogenic.	F
Fish	D	Changes in seasonality especially the reduction in spring freshets and moderate flows.	Extensive abstractions for irrigation.	F
		Reduction in water quality due to runoff from agriculture.	Water abstraction for irrigation. Return flows from agriculture in the catchment leads to decreased water quality and eutrophication.	NF
Inverts	C/D	Loss of almost all taxa that prefers very fast flowing water.	Water abstraction upstream in the Vet River for irrigation purposes.	F
		Loss of taxa that have a high and moderate requirement for good water quality.	Agricultural runoff from irrigation practices.	NF

1.4 RESULTS: PRESENT ECOLOGICAL STATE

Driver Components	PES	Trend
GEOMORPHOLOGY	C	Stable
WATER QUALITY	C	Stable
DIATOMS	D	
Response Components	**PES**	**Trend**
FISH	D	Stable
MACRO INVERTEBRATES	C/D	Stable
INSTREAM	D	
RIPARIAN VEGETATION	E	Negative
ECOSTATUS	D/E	

The main reasons for the PES are intense agriculture, loss of riparian vegetation and encroachment of alien vegetation and to a lesser extent abstraction.

1.5 SUITABILITY AS FUTURE BIOMONITORING SITE

The Vet River catchment includes the secondary drainage (C4) of the Vaal River catchment and the Sand River is a major tributary of the Vet River. The river system includes two major dams, Erfenis Dam on the Vet River, and Allemanskraal Dam on the Sand River and has flow release regulating capabilities. EWR 15 is at the same location as OSAEH 29.3 and therefore this site was not assessed during this study. As this is the only site that has been identified in the Vet River, the data collated during the Reserve study is important and adequate and this site should be included in future monitoring programmes.