



an agency of the
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CaseID: 12292

Date: Friday September 07, 2018

Page No: 1

Final Decision

In terms of Section 38(4) of the National Heritage Resources Act (Act 25 of 1999)

Attention: South African Radio Astronomy Observatory

Heritage Impact Assessment (HIA) and Conservation Management Plan (CMP) for the South African Radio Astronomy Observatory (SARAO) Square Kilometre Array (SKA) Project in the Northern Cape Province.

Digby Wells Environmental (Pty) Ltd was appointed by the South African Radio Astronomy Observatory (SARAO) to undertake a Heritage Impact Assessment (HIA) and Heritage Management Plan (HMP) as a result of the Strategic Environmental Assessment (SEA) Process for the proposed Square Kilometre Array (SKA) project in the Northern Cape Province. The HIA has been submitted in terms of section 38(1) of the National Heritage Resources Act, Act 25 of 1999 (NHRA). The HIA and HMP have been submitted as a condition of the approved Integrated Environmental Management Programme (IEMP) following the SEA process (SAHRIS Case ID 10314 - <http://sahra.org.za/sahris/cases/csir-ska-phase-1>).

The proposed development includes the construction of 133 satellite dishes (112 in the core and 21 in the spiral arms), upgrade of and construction of access roads, overhead and underground power cables, substations and electrical kiosks, five photovoltaic plants, 20 borrow pits, three stone quarries, three construction camps and upgrades to the Klerefontein construction camp. The core area covers 128 000 ha while the three spiral arms cover 1 400 ha. The lifespan of the project is expected to last 50 years.

The MeerKAT and KAT-7 telescopes and other instruments are currently under construction and in operation within the core area. The SKA core area consists of 36 farms which are intended to be proclaimed a Protected Area in terms of the National Environmental Management: Protected Areas Act, Act 57 of 2003 (NEMPA). The HMP will inform the management measures to be incorporated into the Park Management Plan to be developed by South African National Parks (SAN Parks) for the Protected Area.



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Page No: 2

In an Interim Comment issued on the 28/03/2018, SAHRA noted the submitted Notification of Intent to Develop (NID) and Project Execution Plan (PEP) and endorsed the recommendations of the NID and the way forward.

Du Piesanie, J et al. 2018. Heritage Impact Assessment: The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project.

Various limitations of the study are noted which include access issues, environmental conditions, and the inability to photograph identified heritage resources in close proximity to sensitive satellite equipment. As a result of the above and other constraints highlighted in the report, the use of a predictive model used to focus the physical survey of the project area is noted. Furthermore, it is noted that the survey teams were accompanied by representatives of the San Council, and that a Public Participation Process was conducted. No significant public comments specifically regarding heritage resources were received.

A total of 40 heritage resources were identified as part of the field survey (in addition to the 105 identified as part of the SEA phase). Of these 40 sites, 30 sites are defined as archaeological sites, two as fossil sites and eight built environment sites. The fossil and built environment sites are discussed in the specialist reports below. The archaeological sites include archaeological graves, multiple component sites consisting of material cultural remains (Stone Age lithics, glass, ostrich eggshell fragments) and features (stone walls, and engraved boulders), rock engraving and painted sites, and open-air stone age sites. Sites BGG-001, BGG-002 and SA-016 were rated as sites of very high cultural significance.

Impacts to identified heritage resources include direct and indirect impacts, however, only site SA-016 will be directly impacted and requires focused archaeological mitigation. Indirect impacts include accidental damage or destruction of unknown heritage resources, accidental damage to identified heritage resources, visual impacts to heritage resources, and cumulative impacts such as a change in the landscape and sense of place.

An analysis of the impact of the development on heritage resources versus the socio-economic benefit of the project showed that the project will be more beneficial to the local and regional communities, as well as to South Africa as a whole, than retaining the status quo of the landscape and the current conservation status of the heritage resources.



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Page No: 3

Recommendations provided in the report (those not discussed in the specialist reports below) include, but are not limited to, the following:

- In-situ conservation of sites with appropriate buffers: BHS 1; BHS 5; BHS 6; HER-SKA014; HER-SKA056; MXD-001; MXD-002; MXD-003; SA-001; SA-002; SA-005; SA-006; SA-007; SA-009; SA-012; SA-013; SA-014; SA-015; SA-017; BGG-001; BGG-002; RA-003, RA-004, RA-005; RA-006, RA-007, RA-008, RA-009 and RA-010; HER-SKA004; HER-SKA013; HER-SKA068; HER-SKA069; HER-SKA008; HER-SKA016; HER-SKA027; HER-SKA056 and burial grounds and graves associated with farmsteads within the core area (as highlighted in Table 8-8);
- Establishment of a 1 km no-go buffer around BHS 7 and a 50 m no-go buffer around BHS 8;
- Detailed recording, surface collection and test excavations subject to section 35 permit application procedures for sites SA-005, SA-006, SA-012, SA014, SA-015 and SA-017 if re-alignment of infrastructure is not possible;
- Archaeological mitigation subject to section 35 permit application procedures for site SA-016 with a watching brief during earth moving activities;
- Recording of sites BHS 2, BHS 3 and BHS 4 as part of a section 34 permit process for demolition;
- Establishment of a 1 km no-go buffer around sites BHS 5 and BHS 6, with detailed recordings and management measures;
- Develop a Conservation Management Plan and Chance Find Protocol from implementation; and
- Rehabilitate development footprint after construction.

Bamford, M. 2018. Palaeontological Impact Assessment for the proposed SKA Antennas, Access and Powerline, Williston Spiral, Northern Cape Province.

The Palaeontological Assessment results conducted as part of Case 10314 must be read along with the results of the above report. Additionally, as a result of a meeting held with the consultants, SAHRA requested a geological map showing the inspection stops (Plan 9 located as an appendix of the Palaeontological Report).

The submitted PIA focussed on the southern Williston Spiral Arm of the SKA project as this is the area with the highest palaeontological sensitivity as shown on the SAHRIS PalaeoSensitivity map and was not subjected to extensive assessment as part of the SEA process (Case 10314). Noted restrictions of the PIA



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Date: Friday September 07, 2018
Page No: 4

field assessment include access to only four farms within the spiral, which is why only these plus the access road (Langbaken Road) were surveyed.

The southern Williston spiral arm is underlain by the Abrahamskraal Formation of the Beaufort Group and the Waterford Formation of the Ecca Group. Expected fossils in the Beaufort Group rocks include faunal remains such as dinocephalians, dicynodonts, gorgonopsians and primitive reptiles. Aquatic fauna such as temnospondyl amphibians, palaeoniscoid fish, non-marine bivalves and phyllopod crustaceans; trace fossils such as tetrapod trackways, burrows, coprolites, worm burrows and fish fin trails; and flora such as petrified wood, rarer leaves of *Glossopteris*, horsetail stems, plant rootlet horizons, lycopods and ferns are expected within the Ecca Group rocks.

A total of two fossil sites were identified as a result of the field assessment, however not within the project footprint. These include scattered pieces of shale with impressions of *Calamites* and *Paracalamites* (Stop 19 on the farm Sandtuin) and small fragments of siltstones with *Glossopteris* leaf impressions and *Equisetum* stem (Stop 26 on Municipal grounds for the radio tower). Possible fossilised wood occurs at Stop 20 according to locals, however nothing was identified.

Only surface activities and excavations to the depth of a few metres are planned for the project components. While fossil leaves and plants occur in the area, they only occur rarely and with a patchy distribution in the mudstones and siltstone. Fossils of moderate importance might occur on the land parcels indicated as highly sensitive on the SAHRIS PalaeoSensitivity map but may not be abundant.

Recommendations provided in the report include the following:

- A palaeontologist should be present when roads and foundations are excavated or alternatively the Environmental Control Officer (ECO) or responsible person can follow the Chance Finds Protocols and monitor the excavations on the listed land parcels at the sites of the antennae;
- SARAO must develop a Fossil Finds Procedure for inclusion into the IEMP, and implement it during construction and operational activities; and
- Chance Find Protocol is appended to the report for implementation.

Hart, B and Mayat, Y. 2018. SKA Built Heritage Specialist Study.



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Date: Friday September 07, 2018
Page No: 5

The built environment study made use of desktop research, field assessments and valuation reports compiled as part of the sale of the core area farms. The valuation reports are not seen as heritage reports, but only records of structures within the farms that were valued for sale. A limitation of the study includes that limited investigations of the spiral arms by the built environment specialists, however these areas were surveyed as part of the broader HIA.

A total of eight built environment heritage resources are discussed in detail in the report. These include corbelled houses, farmsteads and a retaining wall. Site 1, 5 and 7 have been graded as sites of Grade II significance. Site 2, 3 and 6 have been graded as sites of Grade IIIA significance, Site 4 and 8 have been graded as sites of Grade IIIB significance. It is noted that sites 7 and 8 are not located within the SKA project area.

Site 1 is noted as a good example of a corbelled house with many original fittings and features and is noted to be the northern most square based corbelled house. Site 5 (Groot Paardekloof Farmstead) was mentioned in the highly significant Bleek & Lloyds manuscript. Site 7 is noted to be a good example of a corbelled house that is fully intact and skilfully constructed with associated material cultural remains.

A total of 165 structures were assessed (including the eight sites discussed above) and a total of 47 structures were found to be older than 60 years. A total of 31 of these structures were found to be older than 60 years, with a low significance and could be demolished. The remaining 16 structures have various mitigation measures such as "can be demolished after special detailed documentation and recording" and "retain heritage resource". Six structures (on farms De Hoek Groot Paardekloof) and that were found not to be older 60 years old but should be retained as part of a historic farm werfs.

Identified risks to heritage resources include damage by construction vehicles, storage of construction materials, damage by construction workers, environmental degradation and waste and rubble not removed after construction, vandalism, illegal occupation, demolition of structures can impact the sense of place and the cultural landscape.

Recommendations provided in the report include (but not limited to) the following:

- Declaration of Built Heritage Resources: All identified heritage resources should be formally declared (Grade II) or included in a heritage register (all retained Grade 3);
- Recording of retained identified Built Heritage Resources;



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CaseID: 12292

Date: Friday September 07, 2018

Page No: 6

- Recording of identified Built Heritage Resources proposed for demolition;
- Development of a Conservation Management Plan that includes consideration of the Cultural Landscape and Sense of Place;
- Consideration of compatible reuse of structures;
- A buffer no-go area of 1 km must be maintained around Grade II sites;
- A buffer no-go area of 150 m must be maintained around Grade IIIa sites;
- A buffer no-go area of 50 m must be maintained around Grade III b and c sites;
- BHS 1: The corbelled building and successive farm houses are to be retained and enhanced. No limitations are proposed on the types of use of the buildings, as long as the proposed new uses and functions are compatible with the defined CS of the structures;
- BHS 7: The proposed access road must be rerouted to outside the proposed 1km buffer to remove any negative impacts that may manifest. Furthermore, development in the valley to the north must be minimised;
- All Grade III structures that are proposed to be demolished should be documented in detail as outlined under the proposed mitigation measures. Individual Section 27 and/or Section 34 permit applications in terms of the requirements of the NHRA made to the local provincial heritage resources authority, Ngwao Boswa jwa Kapa Bokone (NBKB);
- All structures that are over 60-years-old and are proposed to be demolished need to have individual Section 34 permit applications in terms of the requirements of the NHRA made to the local provincial heritage resources authority, Ngwao Boswa jwa Kapa Bokone (NBKB).

Mulder, S. 2018. Visual Impact Assessment: The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project.

The proposed SKA and its project components were found to have a high visual impact on the landscape in general and will be visible up to 20 km during the day and 8 km at night. There is expected to be a noticeable change and the project will be highly intrusive. The identified heritage sites were noted as sensitive receptors as part of the viewshed analysis and VIA. A total of 53 heritage sites located in the core area and 18 outside the core area will be subjected to very high visual exposure during the day (0-2 km). A total of 17 heritage sites within the core and 17 outside the core area will be subjected to high visual exposure during the day (2-5 km) with 11 within the core impacted at night. A total of seven (7) heritage sites within the core and 11 outside the core area will be subjected to moderate visual exposure during the day (5-9 km) with 10 within the core impacted at night. A total of 15 heritage sites outside the



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CaseID: 12292

Date: Friday September 07, 2018

Page No: 7

core area will be subjected to low visual exposure (9-14 km) with 17 within the core impacted at night and five (5) outside the core. A total of 21 heritage sites outside the core area will be subjected to very low visual exposure (14-20 km).

Highly significant heritage sites located within the core that will be subjected to very high visual impact include the following: BGG-001 and BGG-002. Highly significant heritage sites located outside the core that will be subjected to very high visual impact include BHS-007. Abiquaputs, a highly significant site named in the Bleek and Lloyd archives will experience a very low visual impact.

When the socio-economic benefit of the project is compared to the visual impact of the impact on the landscape and heritage resources, the report states that the project may be viewed positively as a project of international significance and signifies advances in scientific research.

Recommendations provided in the report include (but are not limited to) the following:

- As much existing natural vegetation as possible should be retained, specifically bushes and trees if present. This will assist to conceal the development;
- Areas susceptible to dust should be frequently wetted by means of a water bowser during the construction phase. It is extremely important to suppress the visual aspects of dust to avoid creating the impression of a polluting industry;
- Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible;
- Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used;
- Where possible avoid construction and operational activities at night. If construction and operational activities take place at night, then only areas where these activities are taking place should be lit and the number of lights and brightness must not exceed the minimum requirements for safety and security. Down lighting and low-pressure sodium light sources must be implemented to minimise light pollution. Lights should be directed inwards towards the Project area and not outwards from the Project area;
- Educate receptors on the benefits of the Project to change their perceptions of the visual impact; and



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CaseID: 12292

Date: Friday September 07, 2018

Page No: 8

- An appropriate grievance mechanism should be developed to respond to grievances from receptors (human) that relate to visual aspects.

The VIA was subjected to a Peer Review by Newton Landscape Architects (Klapwijk, M. 2018). The peer review found that the VIA was conducted according to accepted practises and methodologies, guidelines and legislation. No significant issues were noted.

Du Piesanie, J and Van der Walt, J. 2018. Conservation Management Plan: The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project.

The overall object of the CMP is to provide management measures for the heritage resources within the SKA project area and align these measures with SAN Parks objectives and policies as the future land management authority of the proposed Protected Area.

Specific management measures not discussed in the specialist reports above include, but are not limited to, the following:

- The core SKA area will be fenced with four controlled access points, but communities will be provided escorted access to graves and cultural sites for ritual purposes;
- Table 6-2 in the CMP summarises all management measures discussed in the specialist reports above per development activity and phase of the project;
- Monitoring activities are discussed in section 6.3 of the CMP with specific requirements summarised in Table 6-3 and Table 6-4;
- Heritage Awareness programmes are to be developed along with training material for the SARAO Site supervisor and team;
- Site recording and preliminary conditional assessment form are appended to the CMP;
- A Fossil Finds Procedure (FFP), Archaeological Finds Procedure (AFP) and Burial Grounds and Graves Finds Procedure have been appended to the CMP that provide details of expected chance finds within the project area, with procedures to follow should chance finds be uncovered.



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Page No: 9

Final Decision

The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit and Burial Grounds and Graves (BGG) Unit has no objection to the proposed development and endorses the recommendations of the specialists found in the HIA, heritage specialist reports and CMP. The following additional conditions must be adhered to:

- Identified heritage resources that could not be photographed due to close proximity to sensitive satellite infrastructure must be photographed by film cameras (non-digital) or sketched in order to complete the recording of these sites;
- Monitoring activities (Table 6-3 of the CMP): SAHRA recommends that the on-site inspection of very highly sensitive palaeontological, very highly and highly sensitive archaeological areas be conducted at least 30 calendar days prior to earth-moving activities to provide enough time to implement the FFP/CFP should chance finds be encountered. This would also allow enough time for permit application procedures and review, to ensure that construction timeframes are not impacted by downtime/construction stoppage;
- The SARAO Site supervisor must familiarise themselves with the potential fossils that may occur within the area as part of the training programme;
- The awareness programmes and training material noted in section 7 of the CMP must be submitted to SAHRA for comment. Additionally, in Table 7-1 of the CMP, SAN Parks employees must be included as potential users of the awareness programme;
- Recording forms: The section "type of resource" must use the SAHRIS site types taxonomy taking into account the hierarchy of the list for better integration into SAHRIS;
- Recording forms: The restrictions section should move to section 4 of the form so it can apply to all categories referred to in the form above. Additionally, the reasons for the restrictions must be provided (conservation, economic, spiritual for the movable and immovable heritage);
- Recording forms: Coordinates of resources must be in decimal degrees using the wgs84 datum;
- The Chance Finds Protocol document must be amended to include photographs of fossils found in-situ and/or un-prepared, shown in appendix A of the document;
- The recommendations provided in the 2016 Dr J Almond Palaeontological report (Case ID 10314) regarding the areas not assessed by Dr M Bamford in this case must be adhered to.



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Page No: 10

Advice:

- A Memorandum of Understanding (MoU) with McGregor Museum in Kimberley should be entered into as the only repository for archaeological and palaeontological material in the Northern Cape. The MoU should outline responsibilities of all parties with regards to the long-term conservation of excavated and collected material from the SKA Project;
- It is noted that SAN Parks is in the beginning stages of drafting a Park Management Plan as part of the proposed declaration of the PA as per the NEM:PA. SAHRA must be noted as a key stakeholder to be consulted regarding the management of heritage resources and future plans within the proposed PA;
- Should SAN Parks employees working within the proposed PA require SAHRIS training, the SAHRA National Inventory Unit (NIU) will be available to assist depending on budget availability;
- The CMP may benefit from the 2016 3D Modelling exercise conducted by the American non-profit CyArk on several corbelled houses in the Northern Cape (<http://www.theheritageportal.co.za/article/cutting-edge-3d-technology-brings-historic-corbelled-houses-life>);
- The oral histories of the previous landowners and farmworkers should be collected to preserve the intangible heritage of the area so that the places of intangible heritage occur do not decrease in cultural significance.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

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Date: Friday September 07, 2018
Page No: 11

Phillip Hine
Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/488663>

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.