



## **SINOSTEEL AUSTRALIA PTY LTD**

*ACN 009 277 230*

**EL's 26535, 26539, 26556 and 26557**

### **CARPENTARIA PROJECT**

### **GROUP TECHNICAL REPORT**

**for the period ending 31<sup>st</sup> August 2014**

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Submitted to:	Geoscience Information, NTGS
Tenement Holder:	Sinosteel Australia Pty Ltd
Exploration Operator:	Sinosteel Australia Pty Ltd
Tenements:	EL's 26535, 26539, 26556 and 26557
Commodities sought:	Mn, Cu, Al
Map Sheets:	1:250K Robinson River, Pellew and Mount Young  1:100K Calvert River, Robinson, Wearyan, Pellew, Vanderlin, BingBong and Borroloola
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## EXECUTIVE SUMMARY

Tenements EL26535, EL26539, EL26556 and EL26557 form the “Carpentaria Project” and are held in the name of Sinosteel Australia Pty Ltd, who are also the operator of the tenements. Sinosteel were granted the tenements in July 2008.

There are no existing or historical mines or significant mineral occurrences within the tenements, and there has been little to no previous exploration work due to the Cainozoic cover over most of the project area. The tenements were pegged to explore for manganese and copper mineralisation hosted in the Proterozoic rocks that sit under the Cainozoic cover and for possible stratiform, pisolitic manganese deposits at the base of Cretaceous shallow marine deposits.

The Carpentaria project area covers portions of the Robinson River, Pellew and Mount Young 1:250,000 map sheets. The 1:100,000 map sheets include Calvert River, Robinson, Wearyan, Pellew, Vanderlin, BingBong and Borroloola. The majority of tenement area is covered by recent Quaternary cover. Pre-Quaternary outcrop from 1:250,000 mapping is restricted to the southern limits of the tenements only. Outcropping geology consists of Cretaceous sandstone, claystone and siltstone, and Sandstones of the Mesoproterozoic Roper Group and Karns Dolomite, and dolomitic siltstones and sandstones of the Palaeoproterozoic Talwallah Group.

During the previous reporting period (2012-2013), Sinosteel Australia completed their first RC drilling program at the Carpentaria Project. 40 drill holes were completed for a total of 2,555 downhole metres. Selected drill samples were sent for geochemical analysis. CSA Global managed and supervised the drilling program. A report by CSA Global on the drill program, subsequent rehabilitation works and results of geochemical assays of drill samples are appended to the previous combined annual report. The main positive exploration result from this program was the discovery of 10-15% Mn in drill hole SERC030 (named the “East Robinson Prospect”), located approximately 5km to the northeast of Seven Emu Station within tenement EL26556.

During this reporting period (2013-2014), Sinosteel Australia reviewed the results obtained from the drilling program completed in the previous reporting period. The Beijing Longterm Mining Company, a geological consulting company based in China, were contracted to complete a project scale desktop review and targetting study. Geological and geophysical consulting company Resource Potentials obtained recently released open-file data from the McArthur Basin gravity surveys and completed 3D modelling of regional magnetic and gravity data to inform a regional scale study. A regional geophysical and geological study was then completed by Resource Potentials and a report was written. Both of these reports are provided as appendices to this combined annual report.

In addition, Resource Potentials completed re-processing of the VTEM airborne EM data acquired by Geotech Airborne Ltd in 2010, to calculate an estimate of the depth of conductive regolith cover to assist consideration of likely depth of Proterozoic basement rock. Also, very subtle VTEM conductivity responses associated with the East Robinson Prospect and the Fletcher Prospect (west of the Fletcher River), that were previously overlooked as regolith features, were modelled in 3D to

provide an estimate of the depth and orientation of the sources of the conductivity anomalies as Mn targets.

Existing and new exploration targets generated from the project and regional scale studies were prioritised. Sinosteel geology staff completed a site visit during June 2014 to inspect target areas and consider possible drill sites and access tracks. A helicopter was used for the field reconnaissance. Six rock samples were collected during the site visit and analysed for Mn and Al mineralisation. At the same time, selected rock chip samples from shallow parts of a couple of drill holes completed in the 2012 drilling program were analysed for Al mineralisation. Assay results and an associated summary report by Resource Potentials are appended to this annual report.

An RC drilling program was planned to test the higher priority targets. The existing MMP was updated and submitted to seek approval for exploration RC drilling. Approval for track clearing and exploration drilling was received late in the reporting period. Local community representatives were consulted, but some of the planned drilling in tenements EL26539 and EL26556, within the Greenbank Station area, was cancelled due to opposition from the station owners. The drilling program was started in the next reporting period (September 2014) and a total of 34 holes for 2,078m of RC drilling was completed. Results of the recently completed drilling program and any geochemical assays from drill samples will be provided in the next annual report.

Tenement EL26535 was surrendered at the end of the reporting period as no exploration targets had been identified within the tenement and the tenement is considered by the company to have low mineral prospectivity. In addition, the tenement is wholly contained within the boundaries of the Seven Emu pastoral lease, and the owner and manager of this station has been very obstructive to any exploration work within the station area.

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# 1 INTRODUCTION

Sinosteel Australia was granted EL's 26535, 26539, 26556 and EL26557 in July and August 2008. The tenement areas are located along a coastal region of the southern part of the Gulf of Carpentaria in the Northern Territory (Figure 1). The region has a tropical climate, with a wet season lasting from November to April. Access along roads is typically only possible in the dry season, from May to October.

The tenure is primarily covered by Quaternary cover. Pre quaternary outcrop from 1:250,000 scale mapping is restricted to the southern limits of the tenements. Outcropping geology consists of Cretaceous sandstone, claystone and siltstone; and Mesoproterozoic sandstones of the Roper Group and Karns Dolomite, and dolomitic siltstones and sandstones of the Talwallah Group.

The project area is considered prospective primarily for manganese mineralisation, similar in style to the Groote Eylandt Mn deposits and carbonate hosted hydrothermal manganese, like prospects at Robinson River within tenement EL26556. Groote Eylandt Mn mineralisation occurs within Cretaceous shallow marine sediments of the Walker River Formation. It is possible that the Walker River Formation extends under cover in the southern part of Sinosteel's tenure. Hydrothermal carbonate hosted Mn mineralisation occurs in other parts of the tenements, but there has been no large deposits discovered to date.

Following initial desktop studies during 2008-2009, airborne EM survey data acquisition, processing and interpretation during 2009-2010, further integrated interpretation and targetting, and a site visit during 2010-2011, and then completion of the maiden RC drill program during 2012: Sinosteel undertook an internal review of exploration work completed since grant of the tenements and re-evaluated the prospectivity of the project area, during this reporting period. This involved a project scale desktop study by consultants based in China, the Beijing Longterm Mining Company, and a regional scale study completed by consulting company Resource Potentials.

The outcome of these studies were that Sinosteel investigated the bauxite mineralisation potential of the project area and other Mn and Cu exploration targets that had been generated from the regional and project scale studies.

Potential exploration target areas were prioritised and Sinosteel geology staff completed a site visit to inspect potential drill sites and drill access tracks. Several rock samples were collected during this site visit and sent for geochemical analysis.

A drill program to test higher priority exploration targets was planned and the existing MMP was updated and submitted for approval for exploration drilling. Approval was given by the Department late in the reporting period. The drill program was started in the next reporting period (September 2014). The results of the drill program will be presented in the next annual report.

## **2 GEOLOGICAL SETTING AND PREVIOUS EXPLORATION**

The Carpentaria project area covers portions of the Robinson River, Pellew and Mount Young 1:250,000 map sheets. The 1:100,000 map sheets covered, or partly covered by the project area, include Calvert River, Robinson, Wearyan, Pellew, Vanderlin, BingBong and Borroloola. Pre-Quaternary outcrop from 1:250,000 mapping is restricted to the southern limits of the tenements only. Outcropping geology consists of Cretaceous sandstone, claystone and siltstone, Sandstones of the Mesoproterozoic Roper Group and Karns Dolomite, and dolomitic siltstones and sandstones of the Palaeoproterozoic Talwallah Group.

There are no existing or historical mines within the Carpentaria project area, and there has been little to no previous exploration work due to the Cainozoic cover in most of the project area. There are two known manganese occurrences named Robinson River 1 and Robinson River 2 which are located along the banks of the Robinson River within tenement EL 26556.

Following grant of the tenements in 2008, Sinosteel undertook an open-file data compilation and desktop study that was completed in 2009; an airborne electromagnetic (EM) survey was recommended to detect conductive EM responses associated with Mn mineralisation under cover.

A VTEM airborne EM survey was completed by Geotech Airborne in 2010. Targetting and interpretation of the VTEM survey and other exploration data was completed over the 2010-2011 reporting period, though no highly ranked EM targets were identified.

A site visit was completed in 2011 to inspect exploration target areas, and then a Mine Management Plan (MMP) for exploration operations was created and submitted. Approval of the MMP was received late in the 2011-2012 reporting period.

Sinosteel completed their first RC drill program at the project during August-September 2012. The results of that drill program were presented in the previous reporting period (2012-2013).

### **3 EXPLORATION COMPLETED DURING THE REPORTING PERIOD**

During this reporting period, Sinosteel undertook an internal review of exploration work completed since the grant of the tenements. Independent geological and geophysical consultants were contracted to complete new regional and project scale desktop studies, and provide an update to the company regarding the mineral prospectivity of the project area. The exploration targets generated from these studies were combined with existing targets, and then prioritised to inform exploration drill planning. A site visit was made to inspect the higher priority target areas and consider possible drill sites and access tracks. The anomalous VTEM airborne EM responses of some of the existing targets were modelled in 3D to estimate the depth and orientation of the conductive anomaly sources. The existing MMP was updated with new drill plans and submitted to the Department, but approval for exploration drilling was not received until late in the reporting period. Therefore, the drill program was started in the next reporting period and was completed in September-October 2014, where 34 RC holes were drilled for a total of 2,078m. The RC drilling results will be presented in the next annual report.

#### **Regional Scale Desktop Study**

Resource Potentials completed a regional scale study to inform a better understanding of the mineral prospectivity of the project area. The study involved a brief review of mineral deposit styles in the regional area such as the Groote Eylandt Mn deposit, the HYC Pb-Zn deposits, the Redbank Cu pipes and the diamondiferous Merlin kimberlite field, and considered the potential for these mineralisation styles to occur within Sinosteel's Carpentaria Project area based on available geological and geophysical information.

The Southern McArthur Basin gravity survey data, which was released open-file to the public in early 2014, was processed and modelled, and the results were included in the study. Regional scale unconstrained 3D inversions of the gravity data were completed to provide an estimate of the earth's density distribution in 3D. Euler solution processing was trialled to estimate the depth to Proterozoic bedrock.

The regional magnetic data were also re-processed for the regional area and modelled in 3D to estimate the depth to the top of expected magnetic source rocks, namely the volcanic rocks of the Talwallah Group.

The report and associated data products generated by Resource Potentials are provided as Appendix 1.



## **Project Scale Desktop Study**

Beijing Longterm Mining Company, a geological consulting company based in China, were contracted to complete a project scale desktop review and targetting study. The report is currently provided in Chinese text only. The report focussed on interpretation of anomalous VTEM airborne EM, magnetic and ASTER satellite imagery responses.

The report by Beijing Longterm Mining Company is provided as Appendix 2.

## **Re-Processing and 3D Modelling of VTEM Airborne EM Data**

Resource Potentials processed the VTEM airborne EM data acquired by Geotech Airborne Ltd in 2010, to calculate an estimate of the depth of conductive regolith cover to assist consideration of likely depth of Proterozoic basement rock.

The GIS data products resulting from this work are provided as Appendix 3.

Anomalous VTEM conductivity responses associated with the East Robinson Prospect (east of the Robinson River) and the Fletcher Prospect (west of the Fletcher River) were modelled in 3D to provide an estimate of the depth and orientation of the sources of the conductivity anomalies.

The report on 3D modelling of the VTEM EM data is provided as Appendix 4.

## **Site Visit and Geochemical Analysis of Rock Sample and Drill Chips**

Existing targets and new exploration targets generated from the project and regional scale studies were prioritised. Sinosteel geology staff completed a site visit during June 2014 to inspect target areas and consider possible drill sites and access tracks. A helicopter was mainly used for the field reconnaissance. Six rock samples were collected during the site visit and analysed for Mn and Al mineralisation. Selected rock chip samples from shallow parts of a couple of drill holes completed in the 2012 drilling program were analysed for Al mineralisation, at the same time. Samples were analysed using both the Inductively Coupled Plasma (ICP) and X-Ray Fluorescence (XRF) methods.

Four of the rock samples (labelled 001-004) were collected to test for bauxite mineralisation (containing Al). These samples returned values ranging 5-10% Al and 10-20% Al oxide ( $Al_2O_3$ ).

The other two rock samples (labelled 005-006) were collected to test for Mn mineralisation and returned values of approximately 25,000 ppm Mn and 3.5% Mn oxide (MnO). These two samples were collected from the banks of the Foelsche River, where the Savanna Highway crosses the river.

**Table 1: Locations of rock chip samples. The co-ordinate system is datum GDA94 and projection MGA Zone 53.**

Sample Number	Easting	Northing
001	678049mE	8199583mN
002	678049mE	8199583mN
003	678165mE	8200497mN
004	678212mE	8200533mN
005	701293mE	8206772mN
006	701300mE	8206782mN

**Table 2: Simplified table of assay results for rock chip samples 001-006. The main assay results of interest for each sample are highlighted in yellow (\* = not sampled).**

Method Analyte	ME-XRF26s	ME-XRF26s	ME-XRF26s	ME-XRF26s	ME-ICP61	ME-ICP61	ME-ICP61	ME-XRF13n	ME-XRF13n	ME-XRF13n
	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MnO	SiO <sub>2</sub>	Al	Fe	Mn	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>
	%	%	%	%	%	%	ppm	%	%	%
001	*	*	*	*	5.01	2.49	175	10.15	3.94	77.2
002	*	*	*	*	5	27.2	282	9.94	42.1	39
003	*	*	*	*	9.33	1.31	143	19.6	2.08	67.3
004	*	*	*	*	5.92	1.34	27	11.7	2.05	79.3
005	3.24	4.17	3.51	82.96	1.61	2.59	23900	*	*	*
006	4.29	4.59	3.66	79.09	2.21	3	25500	*	*	*

In addition, a few RC drill chips collected from the 2012 drill program were sent for geochemical analysis. The shallow parts of drill holes CARC001, CARC009 and CARC010 were analysed for bauxite (Al) mineralisation using XRF analysis. The assay results ranged from 6.68 to 14.05 % Al oxide ( $Al_2O_3$ ).

Geochemical assay results for the rock samples and rock chips are provided as Appendix 5.

An associated summary report about the field reconnaissance and assay results by Resource Potentials is provided as Appendix 6.

### **Drill Program Planning**

A drilling program was planned to test the higher priority targets that were generated following the desktop studies, site visit and re-processing of geophysical data. A map of the planned drill sites is provided as Appendix 7.

The existing MMP was updated and submitted to seek approval for exploration drilling. Approval for exploration drilling was received late in the reporting period. Therefore, the drilling program was started in the next reporting period (September 2014). A total of 34 holes for 2,078m of RC drilling was completed. Results of the drilling program and any geochemical assays of drill samples will be provided in the next annual report.

Letters were posted to the station managers to let them know that a drill program was being planned by Sinosteel. The letter included a topographic map showing locations of proposed drill holes. Sinosteel attempted to contact all of the station managers by telephone as well. However, only some of the station managers could be contacted by phone initially. All of the station managers were contacted either by phone or in person before any earthworks and drilling were started within their respective station areas.

Geological and geophysical consulting company Resource Potentials were engaged to organise the drill program, arrange contracts with earthworks and drill contractors and supervise the work. This involved organisation of field equipment and hire of a caravan, for camping onsite during the drill program.

## **Annual Tenement Reporting and Administration**

Sinosteel completed the usual annual tenement reporting and administration requirements. Exploration reports were submitted for each of the tenements. All of the tenements were under-spent over the reporting period. Therefore, applications for a Variation of Covenant were submitted to, and approved by, the Department. An application for a Variation of Covenant was not submitted for tenement EL26535, as Sinosteel decided to surrender this tenement in its entirety at the end of the reporting period.

As this reporting period (2013-2014) was the 6<sup>th</sup> exploration year since the grant of the tenement, Sinosteel were required to relinquish the tenements. Therefore, tenement renewal applications were submitted for each of the tenements to seek an additional 2 years to continue exploration. Exploration work was continued in the next reporting year based on verbal and email communication from the Department that it was very unlikely that these applications would not be approved by the Department.

Sinosteel were also required to submit applications for a Waiver of Reductions for each of the tenements, to avoid reducing the tenement areas by 50%. These applications were approved by the Department.

## **4 DISCUSSION OF RESULTS AND FUTURE WORK**

The funds and time that Sinosteel expended in the regional and project scale desktop studies in this reporting period were necessary to define new exploration targets and prioritise targets for exploration drilling. The main outcomes of this work were the ideas to test for bauxite mineralisation and to expand drilling around the Mn discovery made in drill hole SERC030 in the 2012 RC drill program.

The exploration targets were prioritised and then Sinosteel completed a site visit to inspect the target areas and to consider possible drill sites and access tracks. Exploration staff also tried to make contact with the station managers during this site visit. Six rock samples were collected during the site visit and analysed for bauxite and manganese mineralisation. The samples analysed for bauxite mineralisation confirmed low to moderate concentrations of Aluminium oxide. The samples analysed for manganese mineralisation were collected from the banks of the Foelsche River and confirm the discovery of low grade supergene mineralisation in this location.

An RC drilling program was designed and the existing MMP was updated and submitted to the Department for approval to complete exploration drilling. Authorisation of the MMP was received late in the reporting period and so the drilling program was started early in the next reporting period. Results of the drilling program will be presented in the next combined annual report.

## **5 SAFETY AND ENVIRONMENT**

No safety issues were raised during this reporting period.

There were also no significant environmental issues raised during this reporting period.

## **6 REFERENCES**

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## **KEYWORDS**

Carpentaria Project, Manganese, Bauxite, Copper, Group Report, helicopter reconnaissance, geochemical analysis, rock chip samples, RC drill chip samples