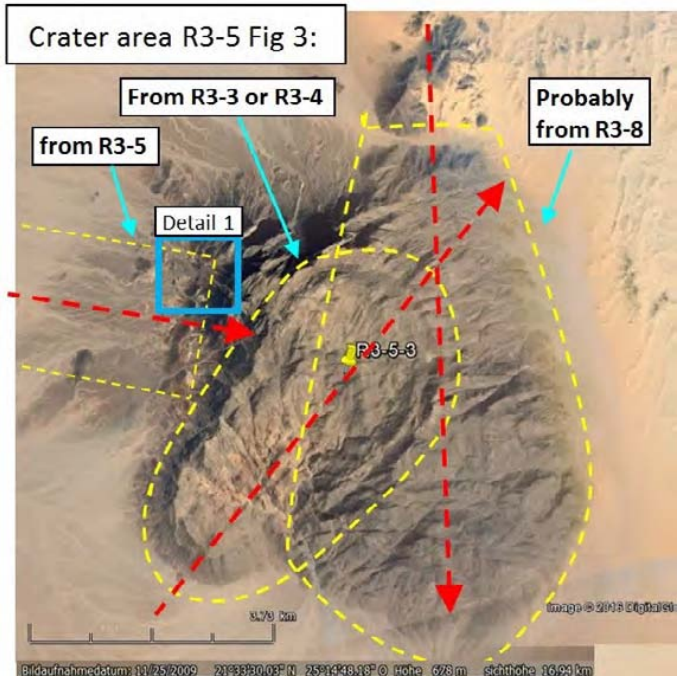
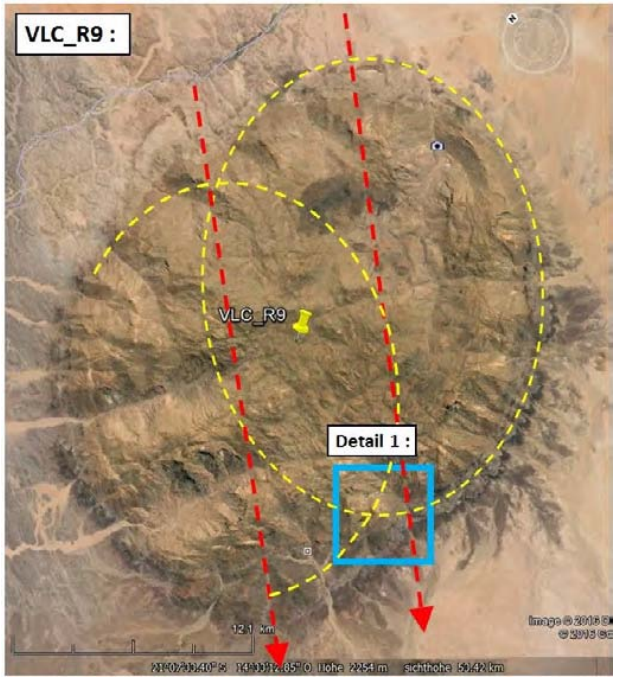
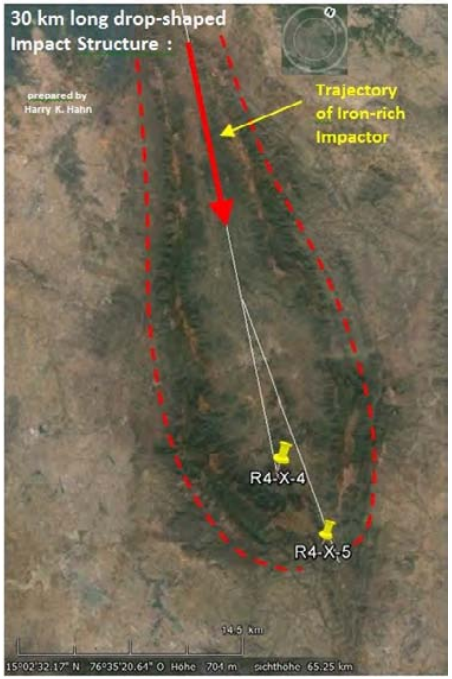
<u>Appendix</u> : → Collection of Satellite Images to prove the hypothesis :

"Global Impact Events are the cause for Plate Tectonics & the formation of Continents and Oceans"

by Harry K. Hahn







The satellite images shown in this document provide first indication & evidence to prove the hypothesis that a global impact event (→ the Permian-Triassic Impact Event **"PTI"**) has caused the break-up of the "supercontinent" Pangea. All structural evidence shown in my study and in this supporting document here, clearly point towards a global impact event which has caused the fracture pattern, that has initiated the break-up of Pangea, and which has defined most continent- (plate-) borders

There are many large-scale structures visible, e.g. perfect elliptical & double-elliptical structures, linear-structures, structures which have a drop-like shape (→ some of them contain major iron-ore reserves), crater-wall structures, fan-like structures, structures which have a shutter-cone-like appearance, and many volcanic structures which clearly were formed by high dynamical events (→ they probably represent ejecta (molten material) from the PTI or from secondary craters caused by the PTI).

There are also ejecta lobe structures (similar to ejecta lobes of the Graterri Crater on Mars) and flow-structures visible, which probably show the flow of molten ejecta material before it solidified. There are also complex fracture patterns, and deformations (→ mostly on mountain tops) are visible, which were probably caused by seismic shock waves and/or atmospheric shock waves.

Geological evidence for the Permian-Triassic (PT)-Impact Crater :

The hard evidence for the correctness of the statement, that "**Global Impact Events*** are the primary cause for Plate- (Expansion-) Tectonics and the cause for the formation of continents and oceans on Earth", will be the confirmation of the Permian-Triassic (PT) Impact Crater (-Event), and its effects on Earth !

A number of scientists specialized in impact research already proposed, that the Siberian Traps, the largest eruption of continental flood lavas on Earth, may be better explained by a large Impact than by a conventional mantle plume.

In the following I want to show now some extracts from a book written by the well-known impact researcher Prof. Dr. Christian Koeberl.
These extracts will provide further indication and evidence for the Permian-Triassic (PT) Impact Crater and its effects, which I describe in my study !

The titel of the book : **"Impact Markers in the Stratigraphic Record" – Authors : C. Koeberl & F. Martinez-Ruiz** (ISBN : 3-540-00630-3)

In the following the extracts from the book :

Page 29 : Siderophile element anomalies (e.g. enhanced Ir contents) were found at some P-Tr boundary locations (e.g., Holser et al. 1989). And recent research suceeded in demonstrating the P-Tr boundary event was a much shorter event than thought. At Meishan, China, a negative excursion in the carbon isotopic composition had a duration of less than about 160,000 years and suggested that it could be the result of the impact of an icy carbon-rich comet.

Page 29 : Kaiho et al. (2001) reported sulfur isotope and chemical data for samples from the Meishan (China) Permian-Triassic (P-Tr) boundary section. They interpreted S-isotope data, as well as the occurrence of Fe- and Ni-rich particles, as evidence for a large-scale impact event that penetrated the Earth's mantle and formed a crater approximately **1000 km** in diameter.
A number of scientists pointed out that the Sibirian Traps cannot be the result of a mantle plume (e.g. Czamanske et al. 1998, Sharma 1997, Elkins-Tanton and Hager 2000)

Page 109 : An impact event is also supported by evidence from extraterrestrial noble gases in fullerenes recovered from P-Tr boundary beds in China, Japan and Hungary.

Page 109 : Because there is a similar duality of signals between likely volcanic and impact sources at the P-Tr boundary, similar to the K-T boundary, the hypothesis of Impact Researchers should be tested, which claims that the Siberian Traps could have been caused by decompression melting at the impact site. And that impact volcanism can uniquely explain the dual signals in the geological record.

Page 110 : An indicative model of Impact Researchers shows that it is possible for the volume of decompressed mantle beneath a large ~ 200 km sized crater to greatly exceed the excavated volume of the impact crater itself, primarily due to reduction of lithostatic load. Under suitable conditions of geothermal gradient, this would lead to near instantaneous melting with volumes of the order of 10^6 km^3 , similar to the characteristic volumes of LIP's.

Page 110 : And the induced large-scale vertical and horizontal thermal gradients are expected to have a long-term effect on secondary mantle flow.

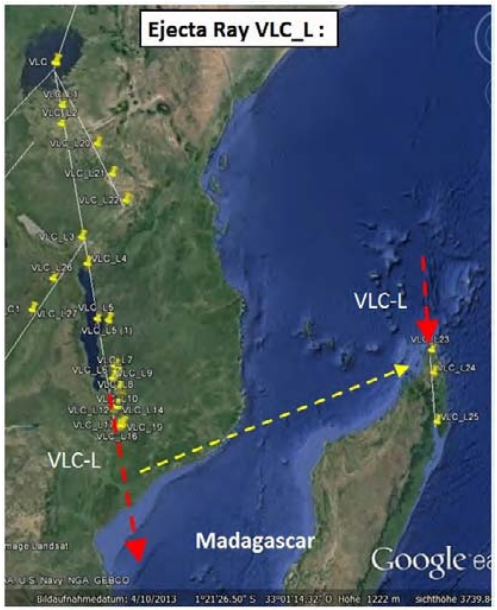
Page 111 : Decompression melting may contribute more melt than conventional shock melting.

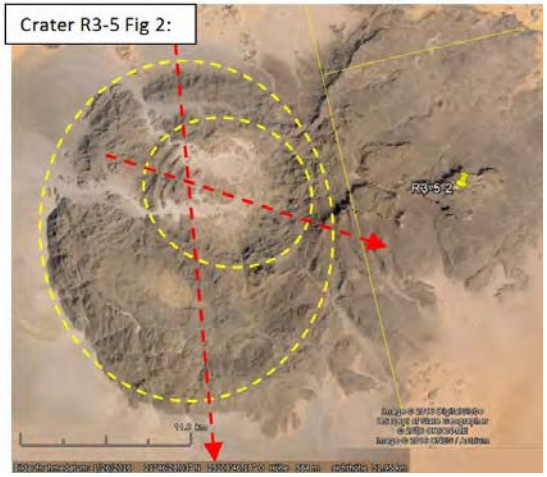
Page 111 : We propose that the Siberian Traps, which are accessible and currently under considerable scrutiny, may be better explained by a large impact than by a conventional mantle plume. The closure of a former ocean between Siberia and Mongolia, as well as amalgamation with north and south China blocks may also have been occuring during Permian-Triassic times (→ and may be the result of a large impact event ! → comment from H.K.Hahn)

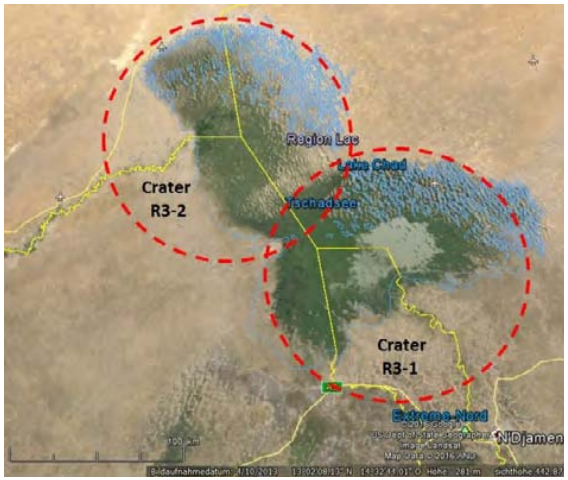
Page 97 : Decompression melting must be seriously considered whenever an impact is sufficiently large to cause the transient crater depth to excavate a substantial fraction of the local crustal thickness, and thereby cause a sudden drop in lithostatic pressure beneath the crater.

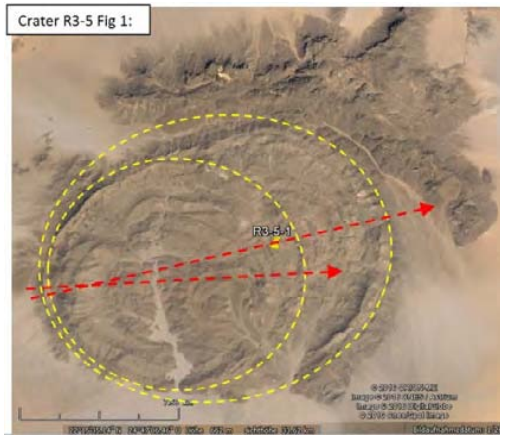
Contents :

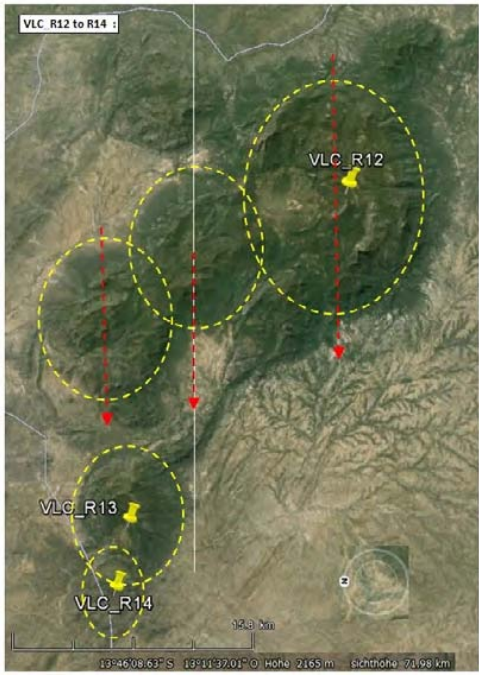
Here some interesting (secondary) PTI – Impact Structures from the presented collection :

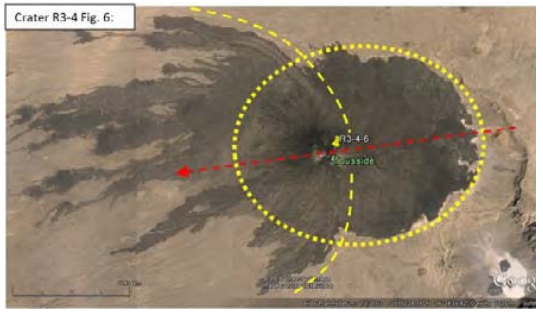


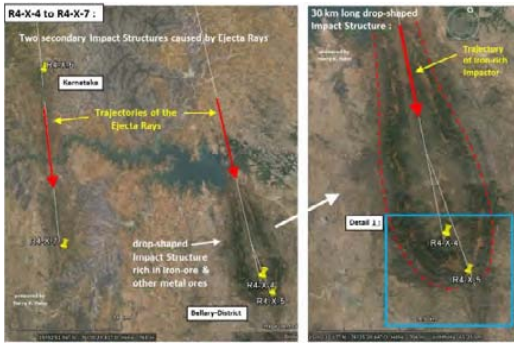


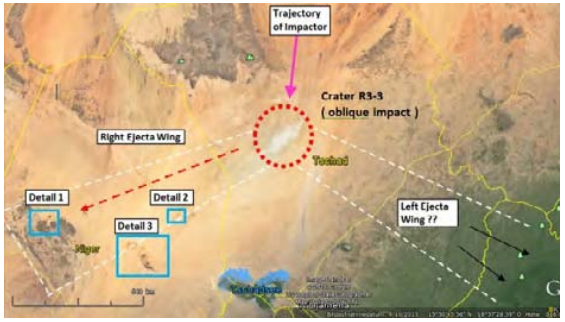


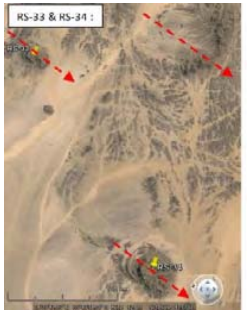


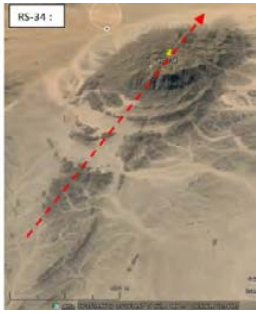






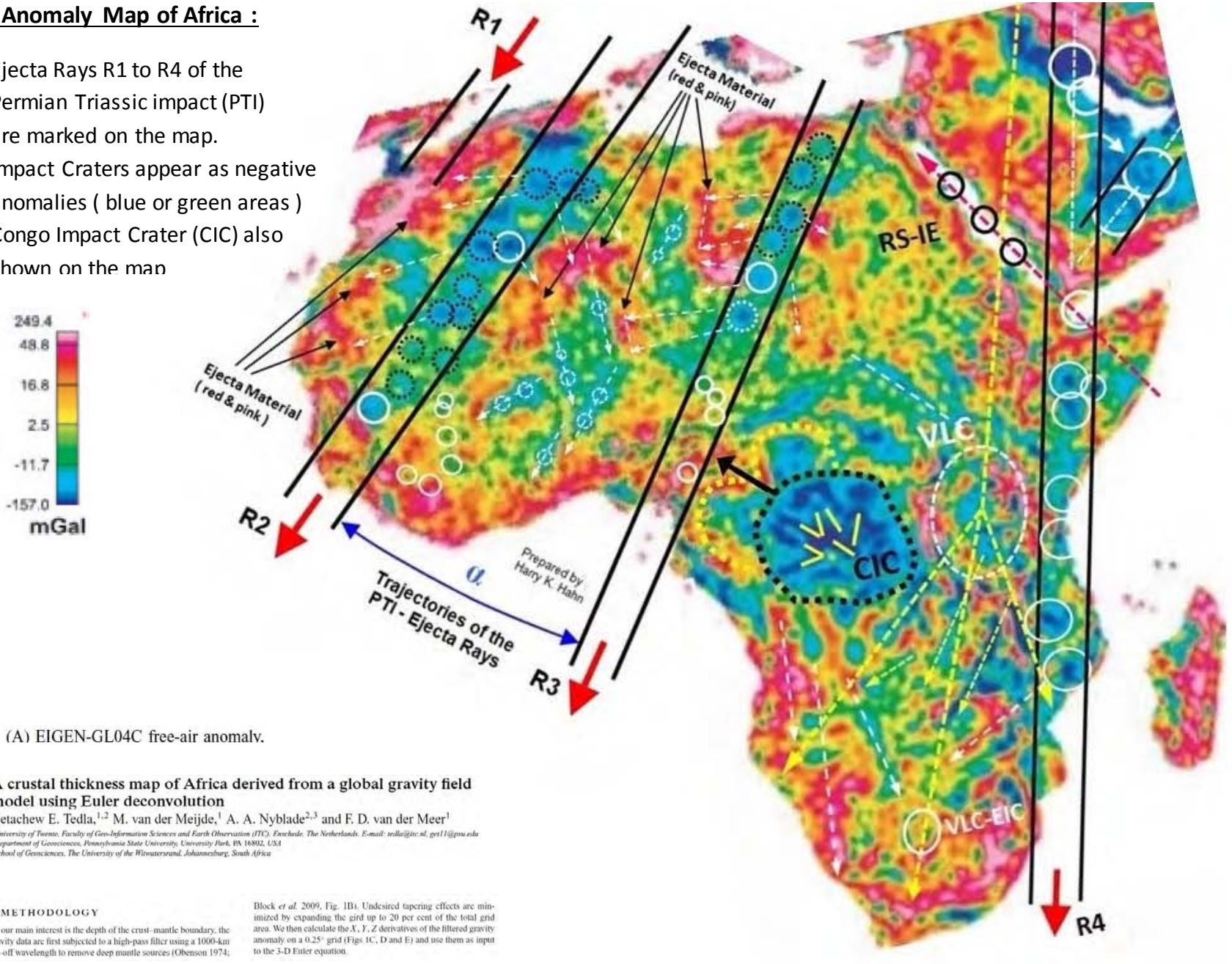






Gravity Anomaly Map of Africa :

- ➔ Ejecta Rays R1 to R4 of the Permian Triassic impact (PTI) are marked on the map.
- ➔ Impact Craters appear as negative anomalies (blue or green areas)
- ➔ Congo Impact Crater (CIC) also shown on the map



(A) EIGEN-GL04C free-air anomaly.

A crustal thickness map of Africa derived from a global gravity field model using Euler deconvolution

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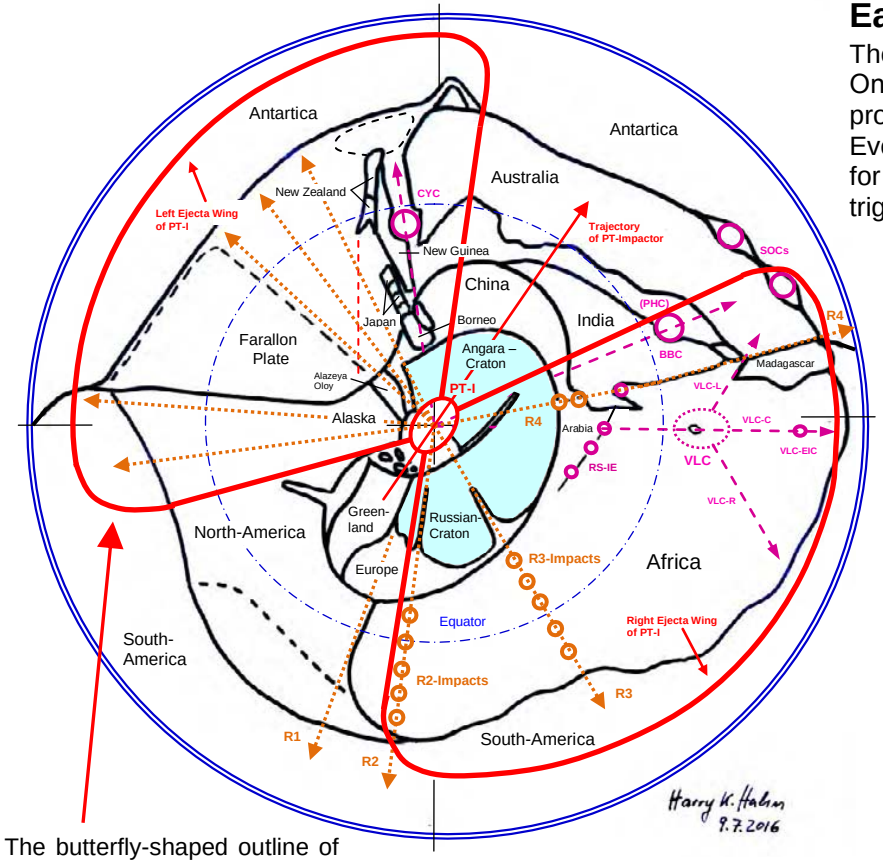
3 METHODOLOGY

As our main interest is the depth of the crust–mantle boundary, the gravity data are first subjected to a high-pass filter using a 1000-km cut-off wavelength to remove deep mantle sources (Obenson 1974; Block *et al.* 2009, Fig. 1B). Undesired tapering effects are minimized by expanding the gird up to 20 per cent of the total grid area. We then calculate the X, Y, Z derivatives of the filtered gravity anomaly on a 0.25° grid (Figs 1C, D and E) and use them as input to the 3-D Euler equation.

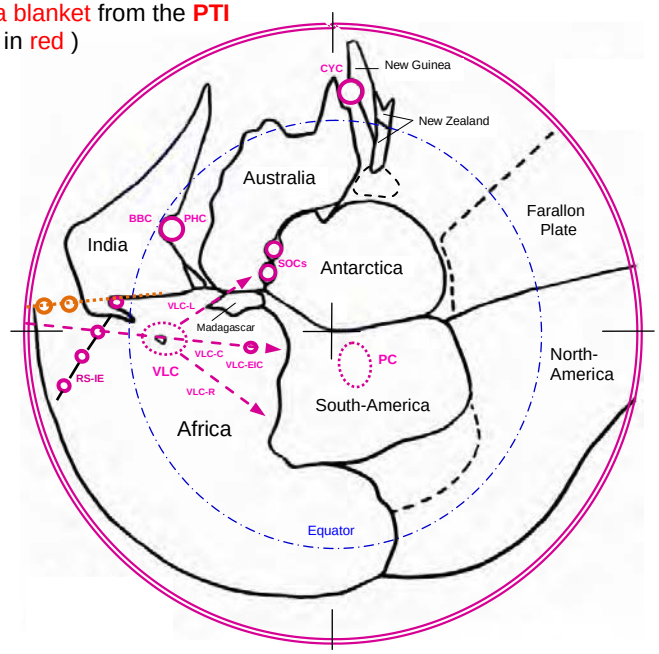
Earth at the time of the PT-Impact Event

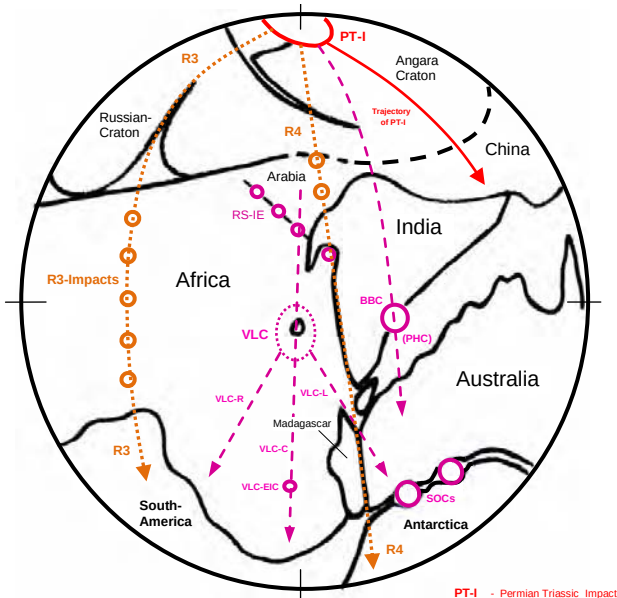
The following maps show how our planet Earth probably looked at the time of the Permian-Triassic (PT)-Impact On these maps, the arrangement of Earth's continents at PTI-time is based on impact structures which in all probability were caused by the PT-Impact Event (especially the CYC-, the BBC/PHC- and the VLC-Impact Event & the Ejecta Rays (crater chains) R1-R4 were used as a reference). And an Expansion Tectonics model for Earth was used as base for these maps. The PT-Impact Event caused the shown fracture pattern, which triggered an expansion tectonics process on Earth. → **Earth's Ø** at the time of the PT-Impact : **~6500-7500 km**

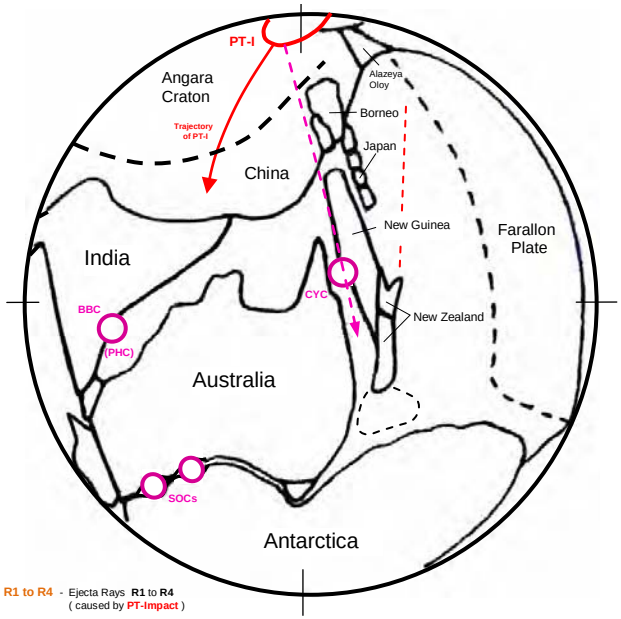


Harry K. Hahn 9.7.2016

The butterfly-shaped outline of the ejecta blanket from the **PTI** (marked in red)

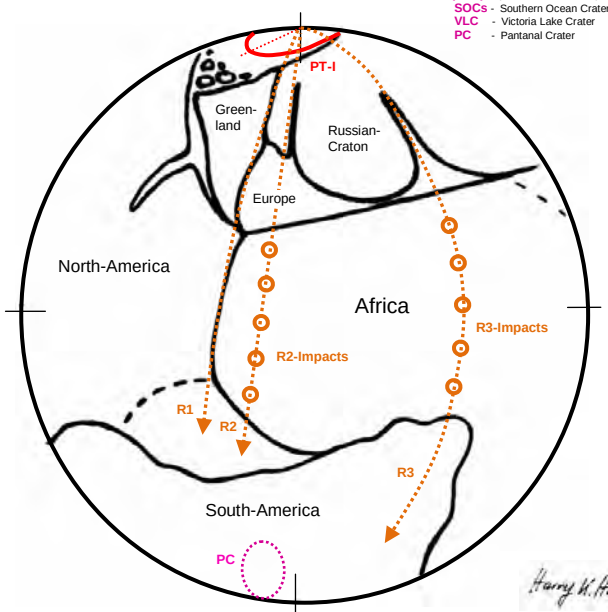


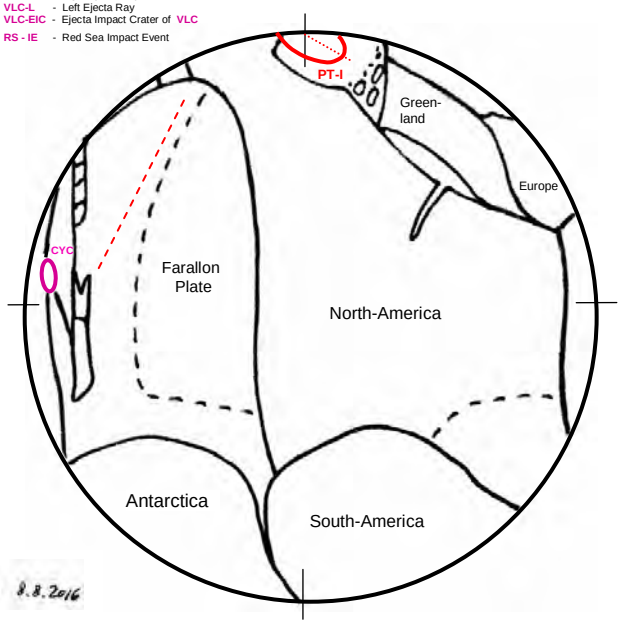




PT-I - Permian Triassic Impact
CYC - Cape York Crater
BBC - Bengal Bay Crater
(PHC) - (Port Hedland Crater)
SOCs - Southern Ocean Craters
VLC - Victoria Lake Crater
PC - Pantanal Crater

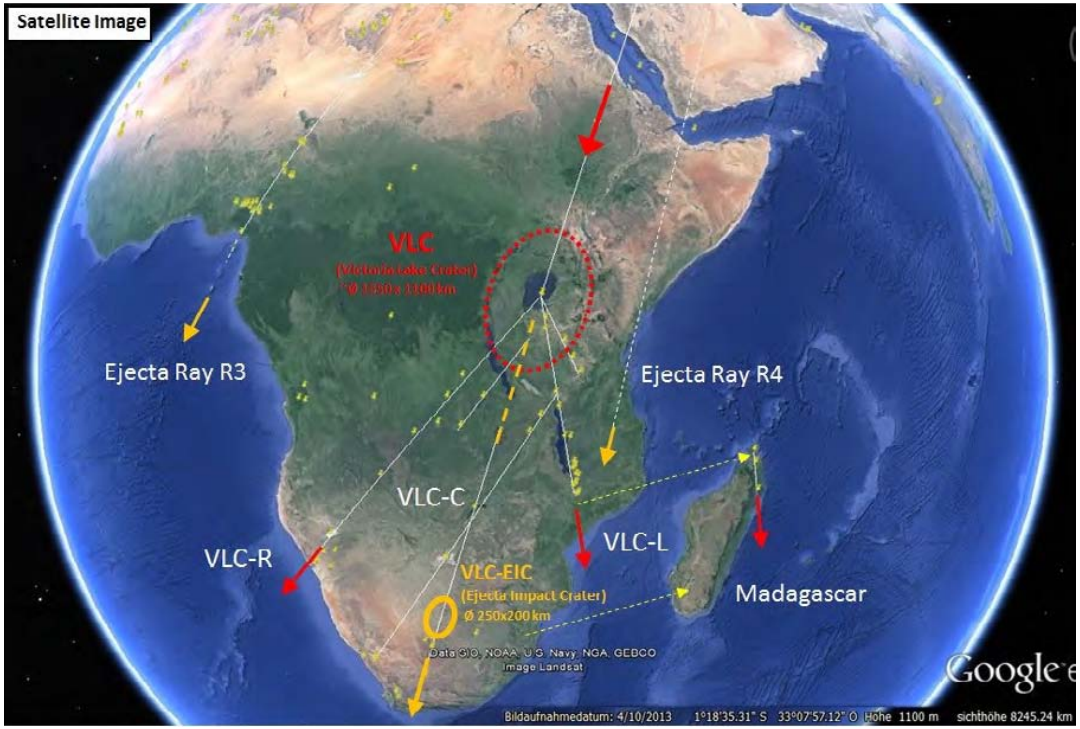
R1 to R4 - Ejecta Rays **R1** to **R4** (caused by **PT-Impact**)
VLC-C - Central Ejecta Ray of **VLC**
VLC-R - Right Ejecta Ray
VLC-L - Left Ejecta Ray
VLC-EIC - Ejecta Impact Crater of **VLC**
RS - IE - Red Sea Impact Event



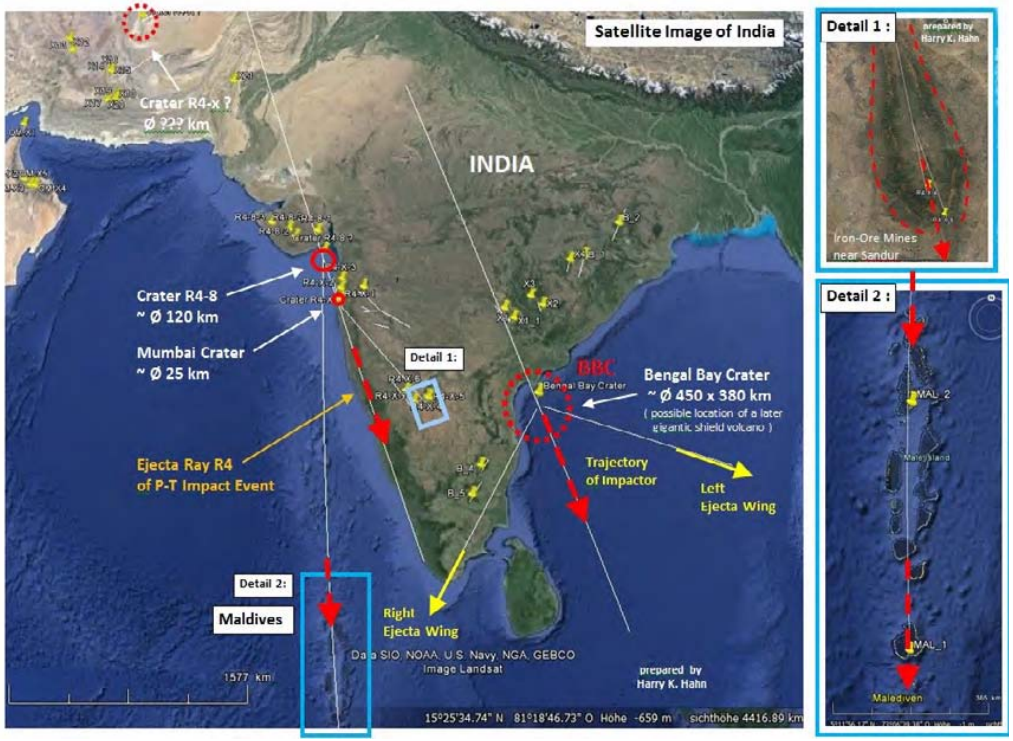


Harry K. Hahn 8.8.2016

The Victora Lake Impact Event :

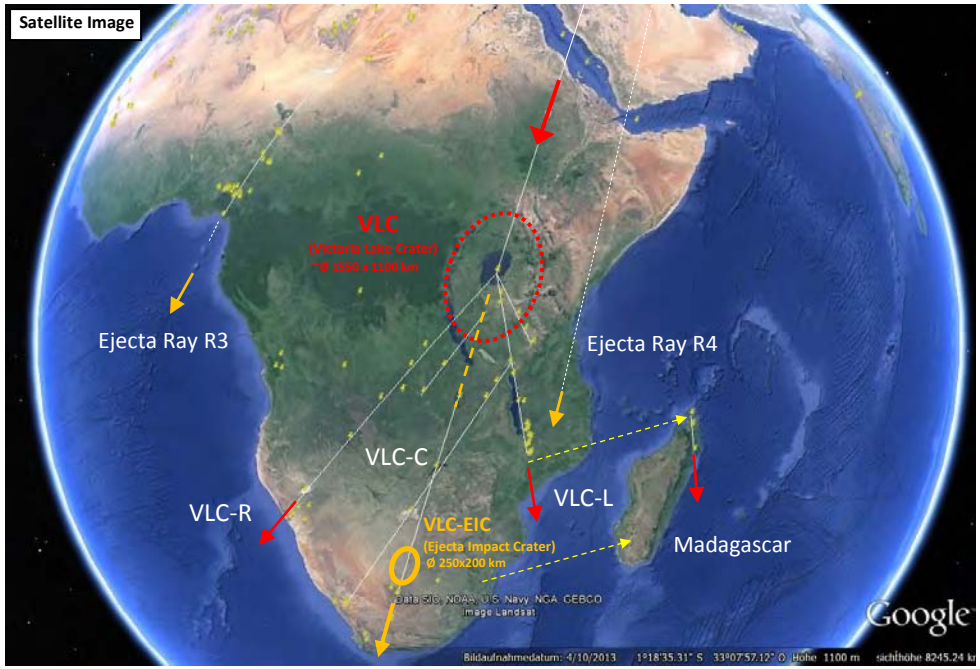


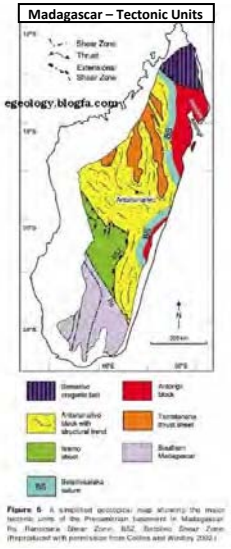
The secondary impact events of the PTI in India :

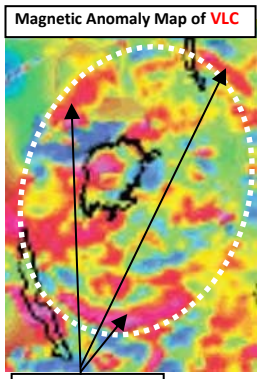


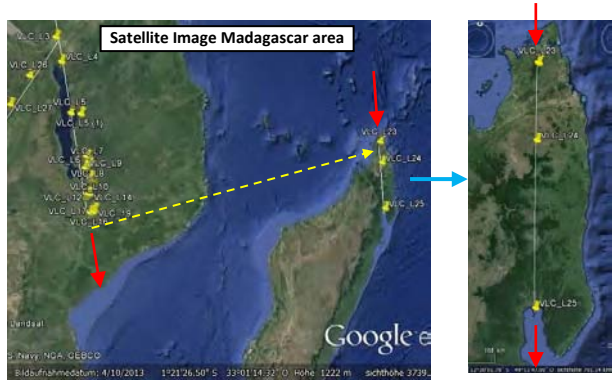
A1 A powerful Ejecta Ray from the Victoria-Lake Impact Event (~Ø 1550 x 1100 km) started the separation of Madagascar from Africa

The separation of Madagascar from the African Plate was initiated by secondary impact events which were caused by the Permian-Triassic (PT) Impact ~253 Ma ago.
Especially the secondary impact which caused the **"Victoria Lake Crater" (VLC)** contributed to this separation of Madagascar from Africa. This powerful Impact Event, which was an oblique impact, and which occurred in the Victoria Lake area, produced two strong "ejecta wings" or ejecta rays (VLC-R & VLC-L) and a "Central Ejecta Ray" (VLC-C) which caused the Iron-Ore Deposits in South-Africa (→EIC). From the location and shape of the secondary impact structures caused by the Victoria Lake Impact (→ yellow pins on satellite map → see following pages !), the orientation of the two ejecta wings and the trajectory of the main impactor can be reconstructed. This provides strong evidence that the VLC was caused by the PT-Impact. (→ similar to the Bengal Bay Crater). In all probability the impact impulse of ejecta ray VLC-L (L=left), which runs from the VLC over Malawi Lake (→ a result of the impact of VLC-L) towards the original position of Madagascar, caused a shear break (→ on the western border of the Madagascar-Fragment) which is responsible for the break-off of Madagascar from the African Plate. This happened at the same time when Ejecta Ray R4 caused a major fracture between Africa and Australia/India (→ see modified map below)
Gravity Anomaly- & Topographic- Structures provide further evidence for this scenario. And Gravity Anomaly- & Magnetic-Anomaly Structures also confirm the VLC-Impact Scenario.

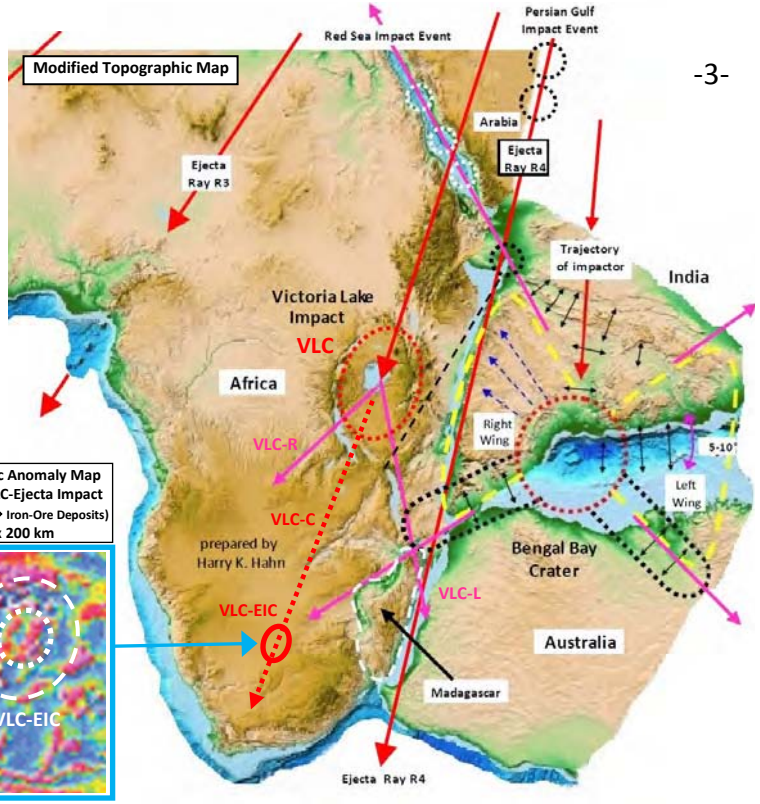






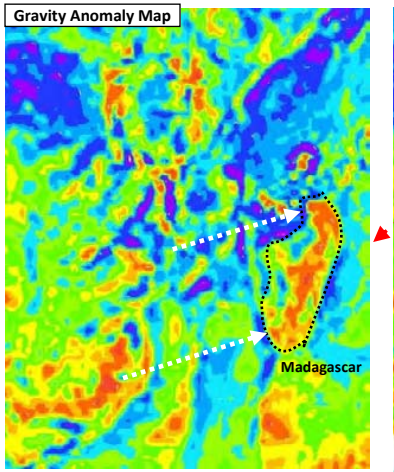


The modified Topograhic Map on the righthand side shows how Africa, India and Australia were positioned to each other, and how this land area of Pangea broke apart, caused by the powerful Ejecta Rays and Secondary Impactors from the PT-Impact Event.

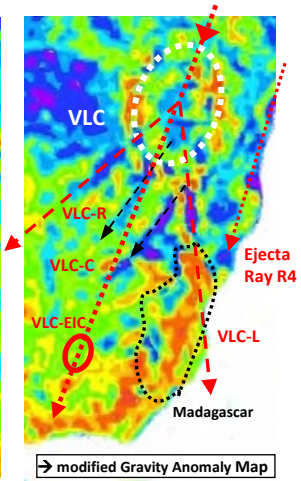


-3-

Madagascar – Position Today

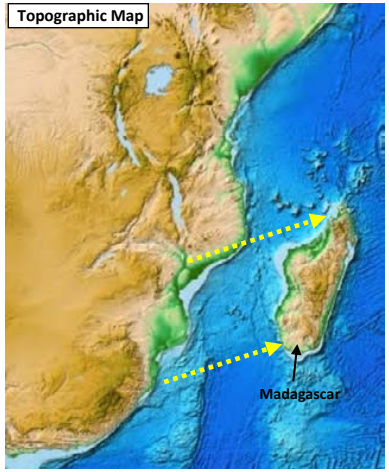


Madagascar – Original Position

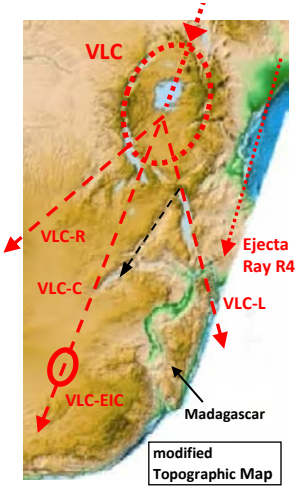


→ modified Gravity Anomaly Map

Madagascar – Position Today



Madagascar – Original Position

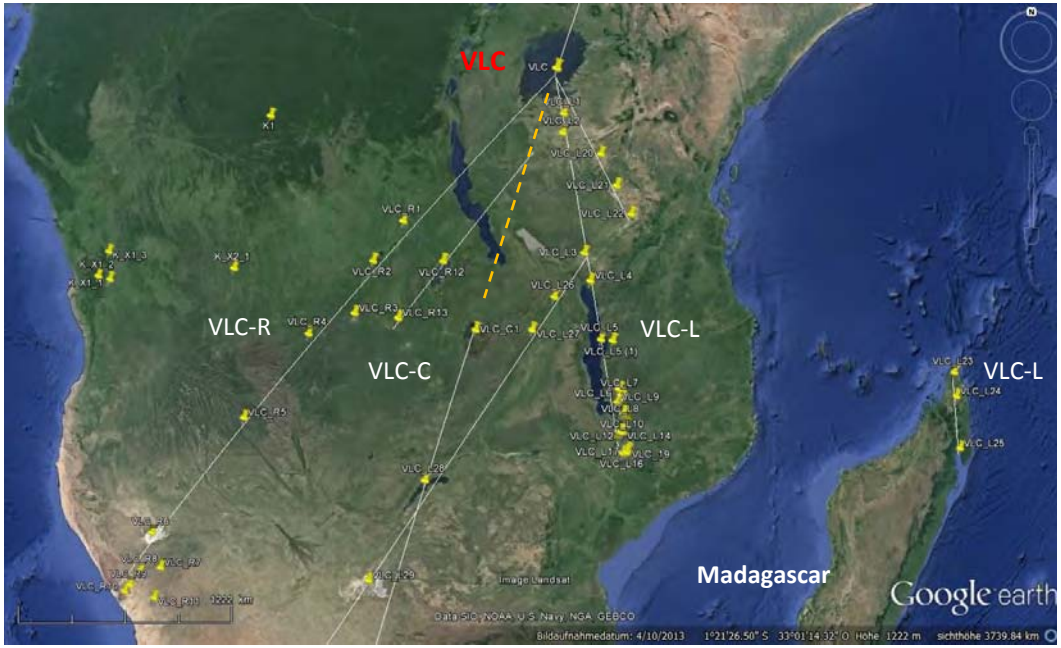


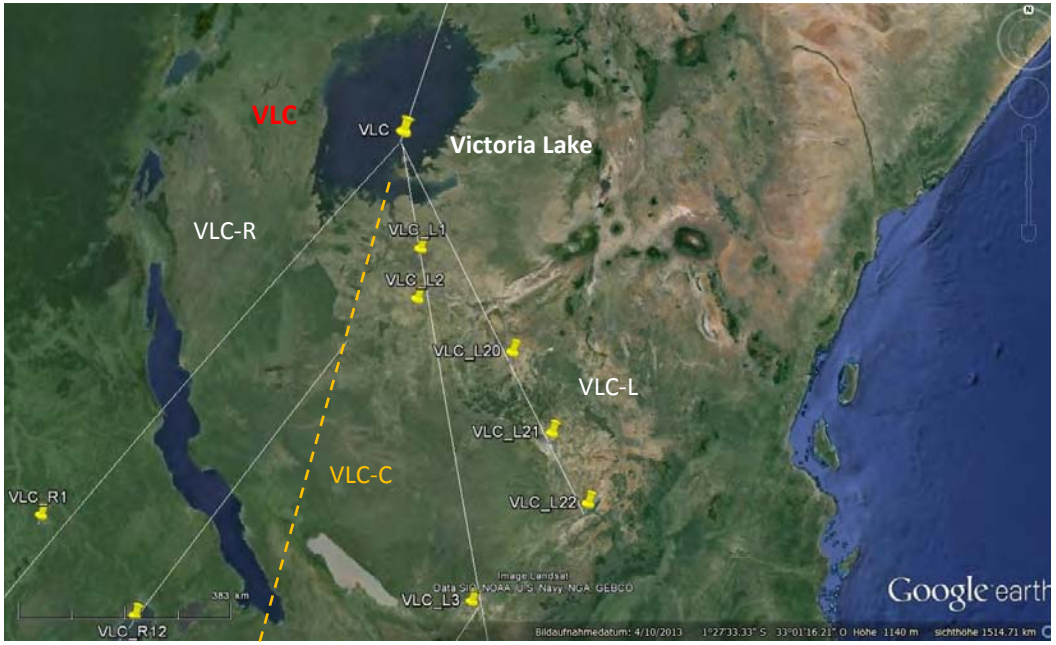
modified Topographic Map

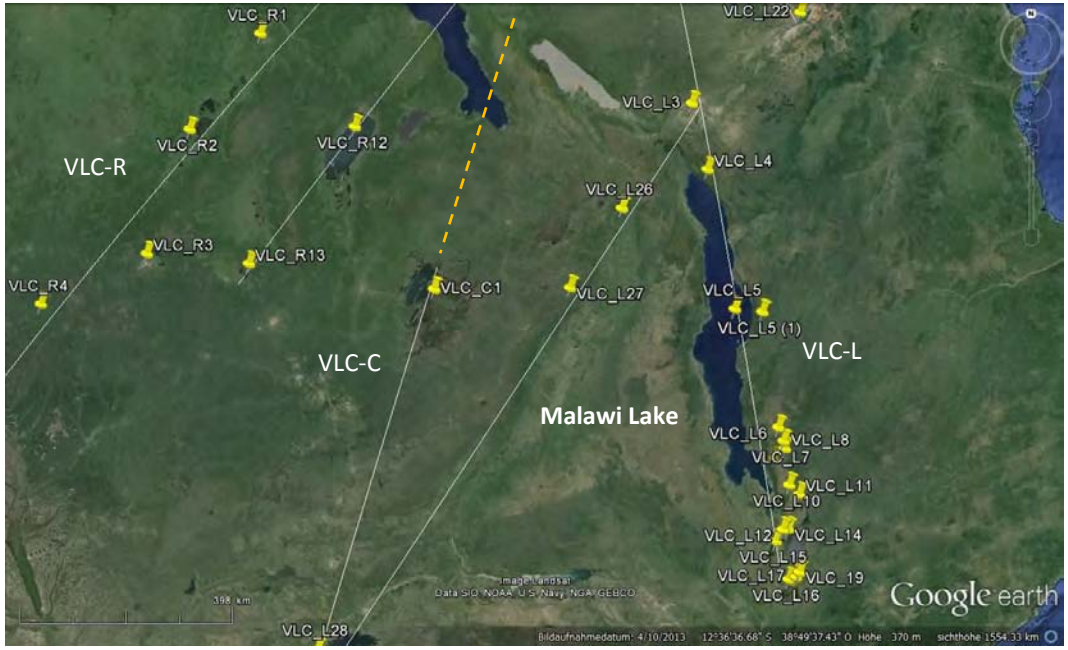
Magnetic Anomaly Map of the VLC-Ejecta Impact Crater (→ Iron-Ore Deposits) ~ Ø 250 x 200 km

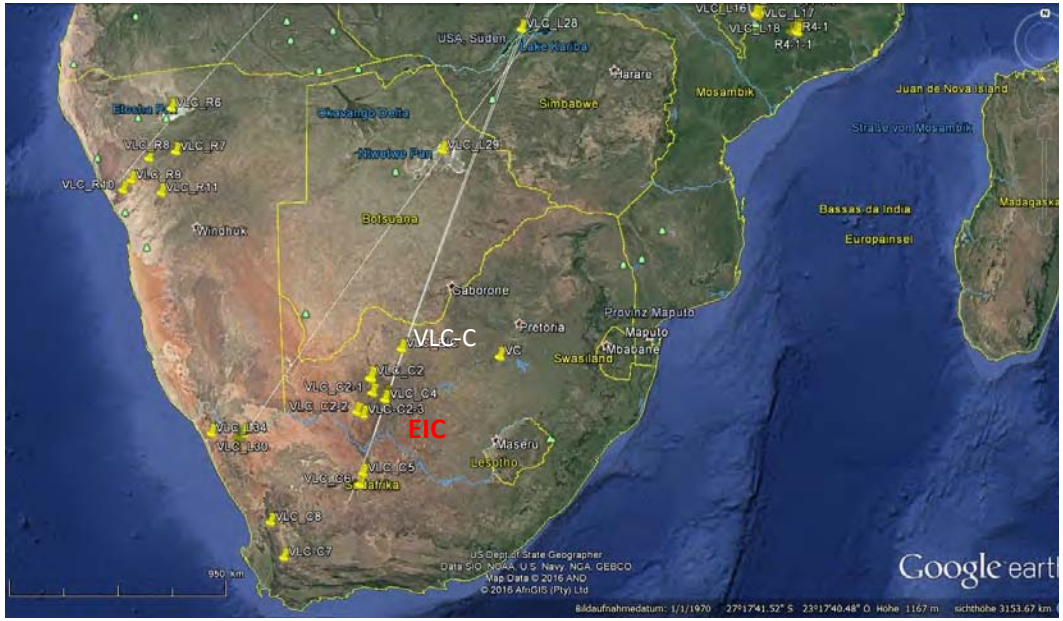
Overview of the locations of selected Secondary Impact Structures, caused by the VLC-Impact Event

The secondary impact structures are mainly located along the Ejecta Rays (ejecta wings) VLC-L & VLC-R, along the Central Ejecta Ray VLC-C , and along other (secondary) ejecta rays which branch off from the main ejecta rays. The left Ejecta Ray VLC_L ends on the African Plate around 300 km south of the southern end of Malawi Lake. But there is strong indication that it continuous in the North of Madagascar. If this is correct, then this would constrain Madagascar's original location precisely to the location shown on the first page of this document. The Central Ejecta Ray VLC-C ends in South-Africa were the ejecta from the VLC has caused extensive Iron-Ore deposits → a further proof for the Impact Hypothesis

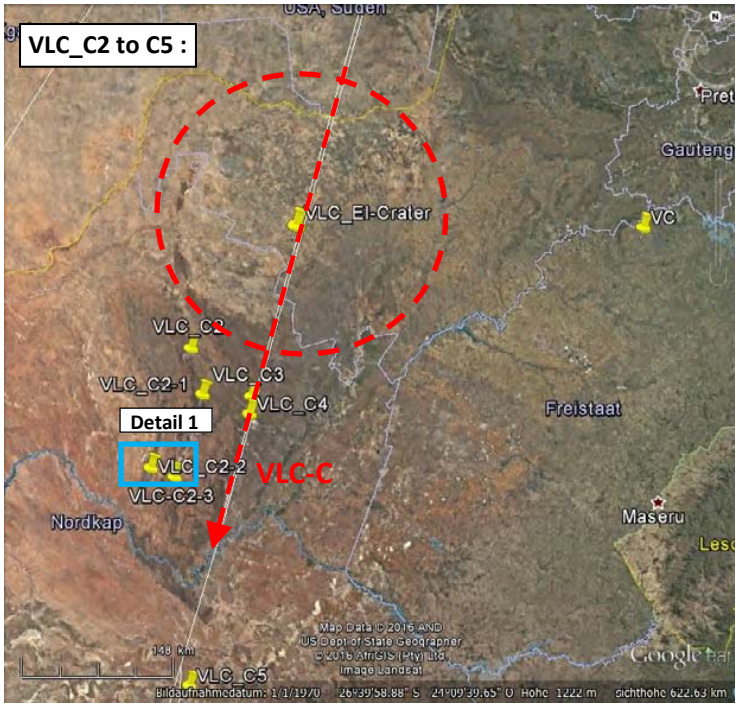


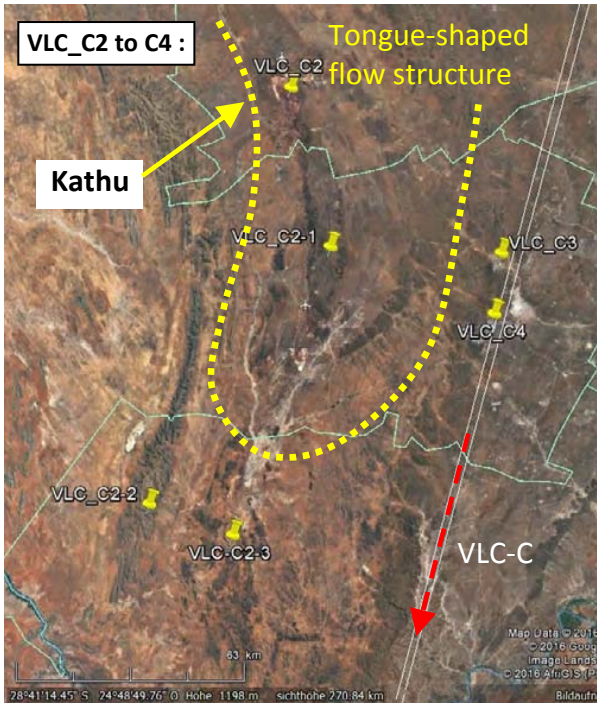






The Ejecta Impact Crater (EIC) Ø~ 250x200 km, located on the VLC-C (Central) Ejecta Ray of the VLC caused Iron-Ore Deposits in South Africa





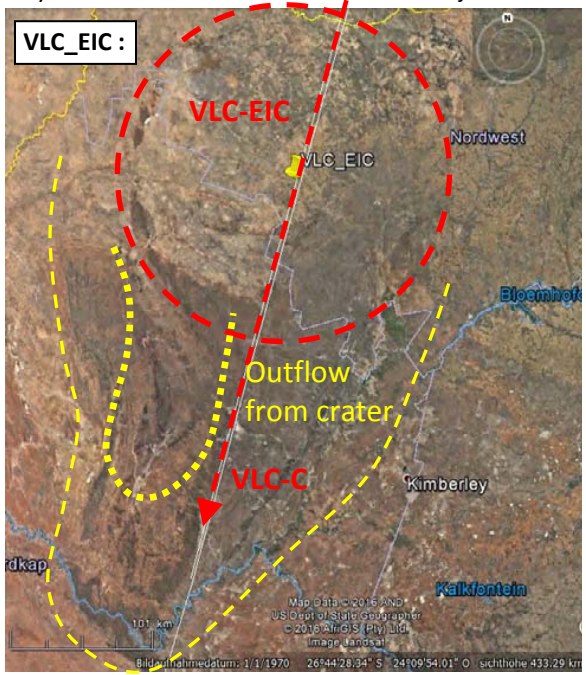
Satellite Image - Ejecta Impact Crater (EIC) Ø 250x200km

→ red arrow indicates the trajectory of theimpactor
yellow lines indicate flow direction of Ejecta

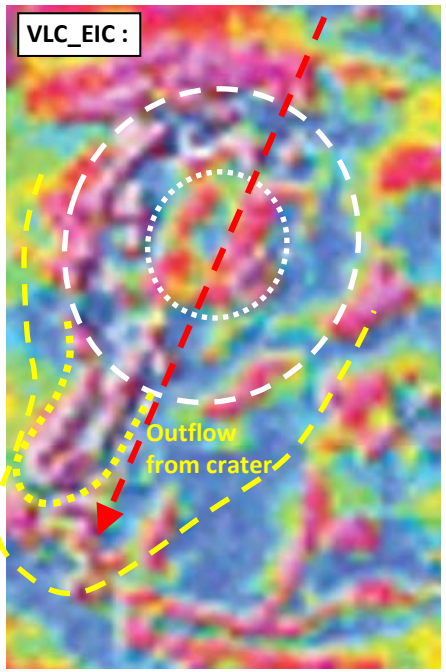
VLC-C2 : Kathu : → Iron-Ore Mines :

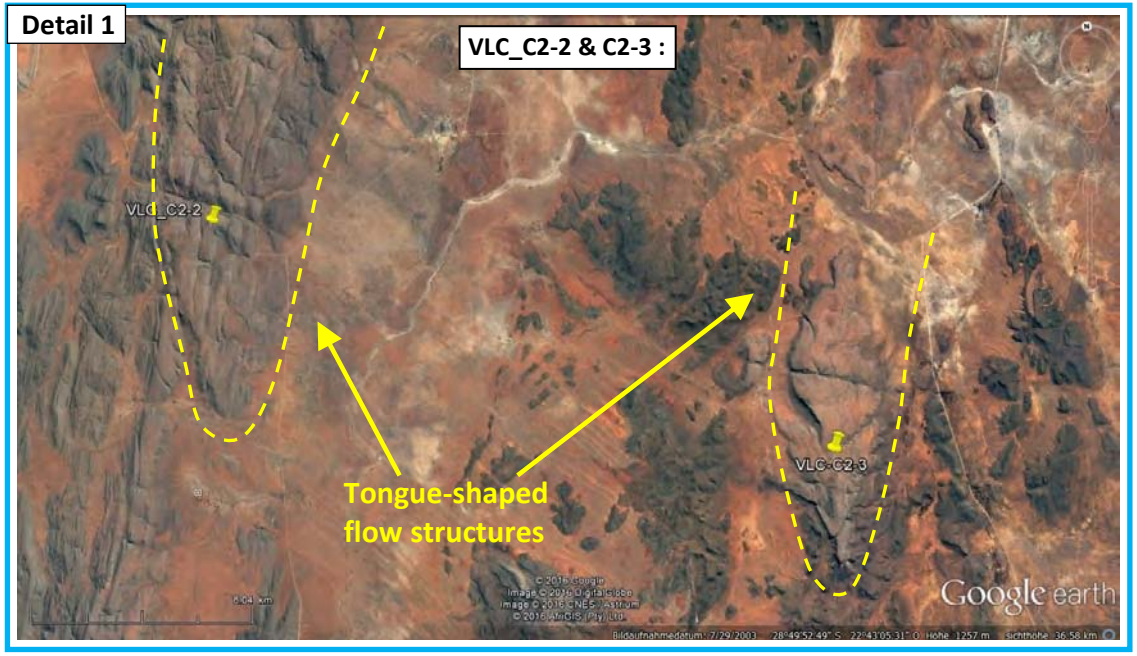
e.g. Sishen Mine 30km from Kathu is one of the largest Iron-Ore Mines in the world. Lump ore is extracted from a large Hematite ore body hosted by a Lake Superior-type banded iron formation (BIF) called Kuruman Formation (see also → manganese field). The lump to fine ratio of the Sishen ore is 60:40. The ore body measures approximately 14km long, 3.2km wide and 400m deep.

VLC-C2-1 : Postmasburg : → Iron-Ore (Hematite), Manganese Ore, Diamonds, Asbestos

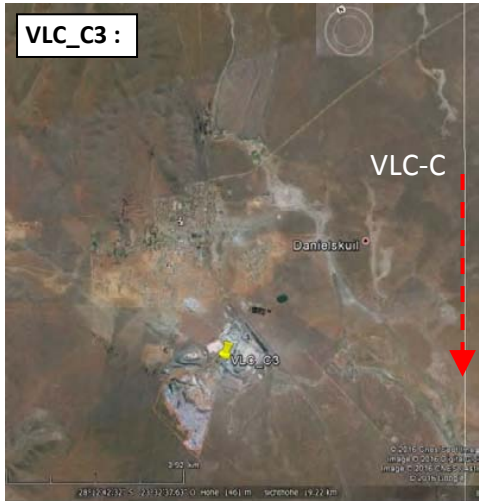


Magnetic Anomaly Map of EIC

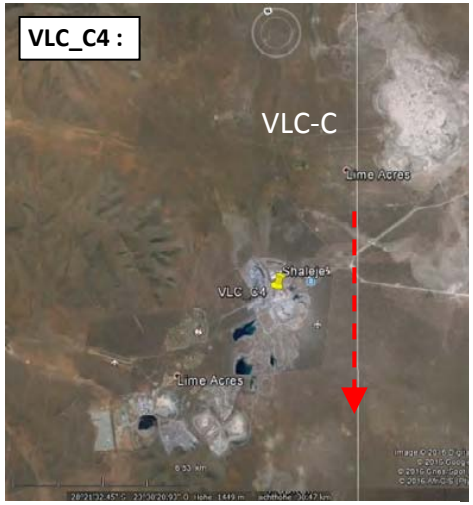




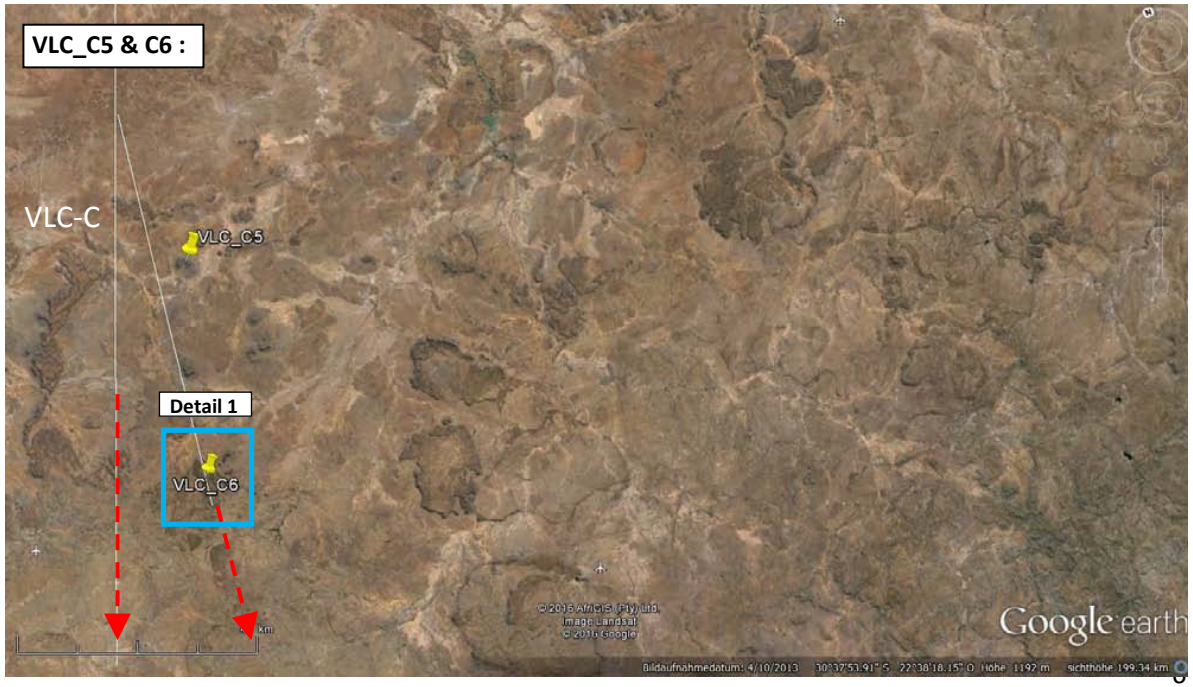
Further secondary impact structures on the VLC-C (Central) Ejecta Ray of the VLC Impact



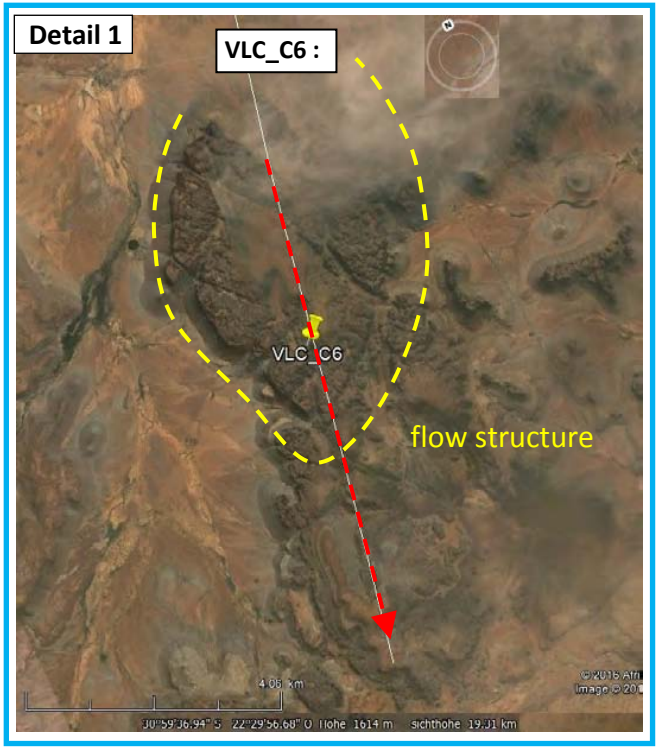
Danielskuil : → **Limestone Mine**
Magnetite, Pyrophyllite, Calcium Carbonate

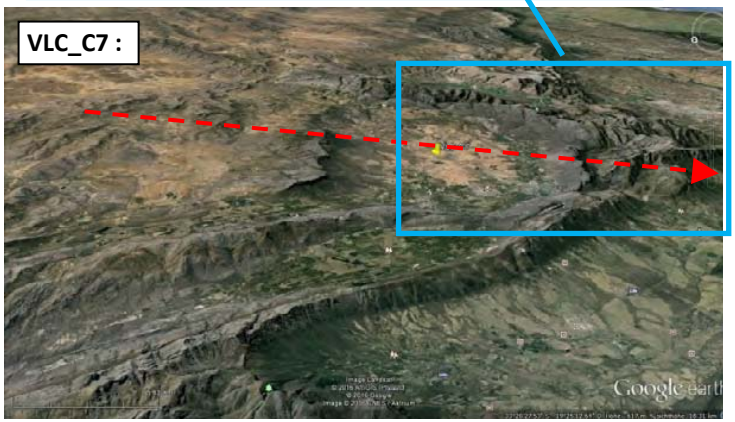


Lime Acres : → **Limestone Mine**
same mining products as in Danielskuil

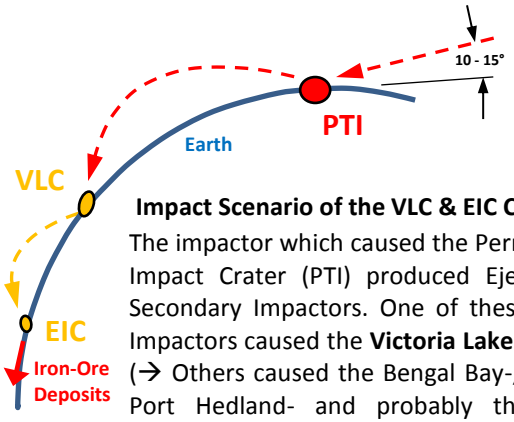


further products :
Asbestos, Diamonds





Impact Scenario of Victoria Lake Crater & Ejecta Impact Crater :

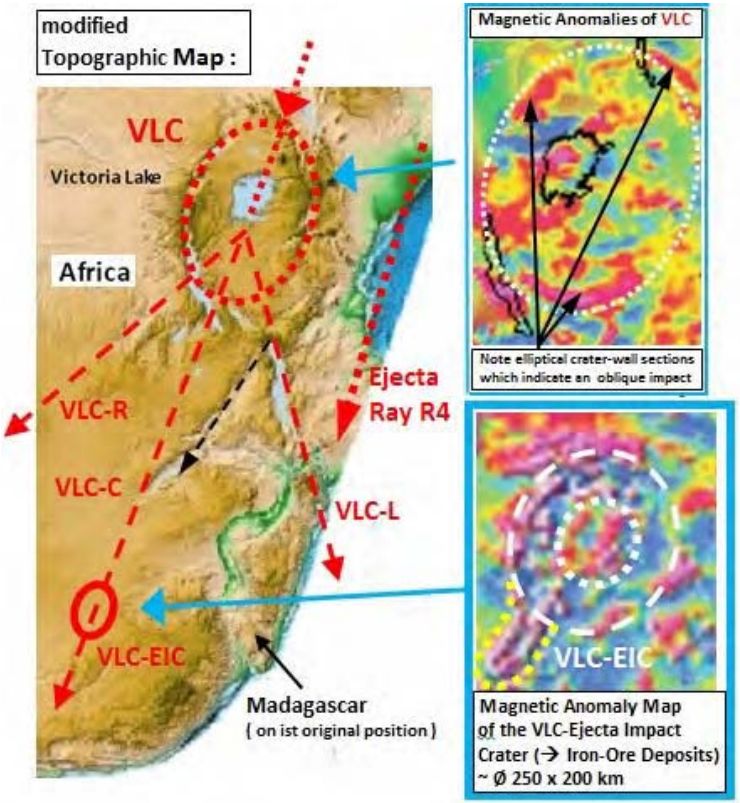


Impact Scenario of the VLC & EIC Crater :

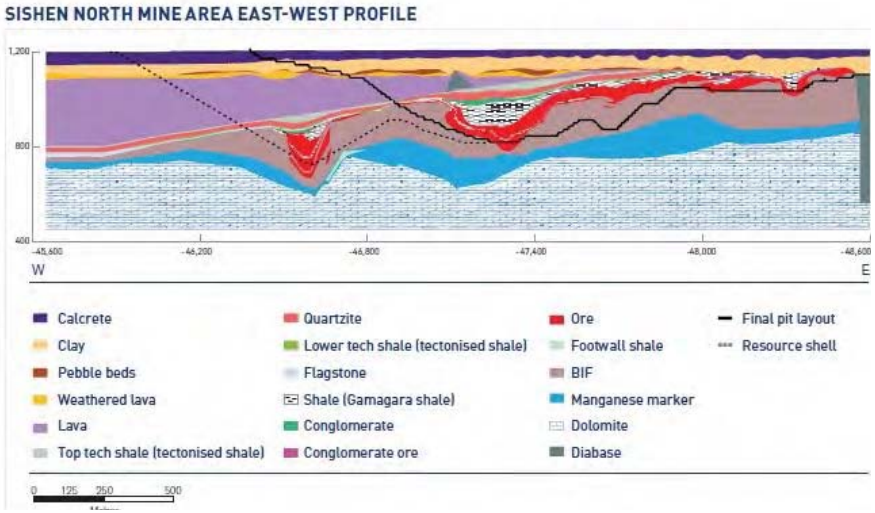
The impactor which caused the Permian-Triassic Impact Crater (PTI) produced Ejecta & large Secondary Impactors. One of these Secondary Impactors caused the **Victoria Lake Crater (VLC)** (→ Others caused the Bengal Bay-, Cape York-, Port Hedland- and probably the Pantanal- & Southern Ocean Craters)

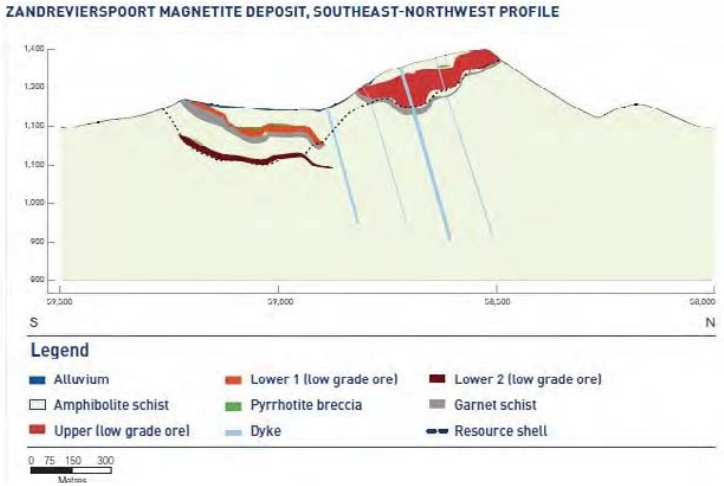
Then part of the VLC impactor was ejected from VLC and caused the Ø 250x200 km **Ejecta Impact Crater (EIC)** plus outflow from this crater, which caused the Iron-Ore Deposits in South-Africa

Detail view of the Victoria Lake Impact Event :



Geological Information to some Iron-Ore Deposits in South-Africa :





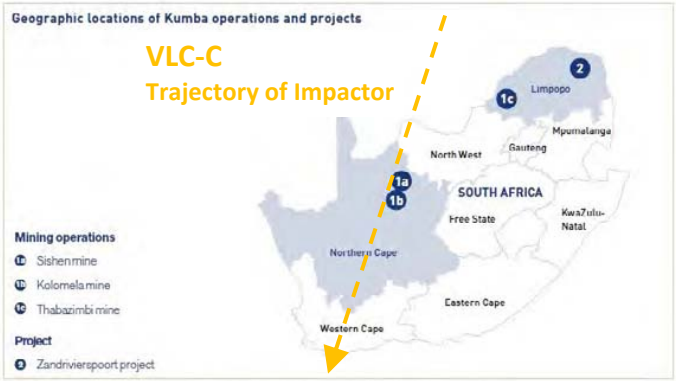


Figure 1: Geographic locations of Kumba operations and projects for which Ore Reserves and Mineral Resources have been declared.

At the Sishen mine deposit, the upper parts of the Asbestos Hills Subgroup have been ferruginised to ore grade. These stratiform, laminated and massive ores constitute the bulk of the resource. The laminated and massive ores are commonly folded and faulted into basinal and pseudo-graben structures.

Deep palaeo-sinkholes, filled with brecciated ore and Gamagara sedimentary rocks, are found on the southern parts of the Sishen properties. The sinkholes are restricted to antiformal structures close to the Maremane Dome on the southern portions of the mine. They are an important mechanism for preserving collapse breccia ore.

They are unconformably overlain by a thick package of sedimentary rocks (conglomerates, shales, flagstone and quartzite) termed the Gamagara Subgroup (S.A.C.S., 1995). Many researchers including Beukes and Smit (1987) and Moore (pers. comm.) have correlated this unit with the Mapedi Formation, which constitutes the lowermost unit of the Olifantshoek Supergroup. The Olifantshoek Supergroup is the oldest recognised red-bed sequence in the region. It is some 400 Ma younger than the Transvaal Supergroup.

Conglomerates of ore-grade with well-rounded clasts and fine-grained, well-sorted, gritty ores are common at Sishen mine. Partly ferruginised shales, interbedded with ore conglomerates and thick flagstones are also a feature of the Gamagara Subgroup.

Along the western margin of Sishen mine, diamictite of the Makganyene Formation and lavas of the Ongeluk Formation have been thrust over the sedimentary rocks of the Gamagara Subgroup. The diamictite and lava have been eroded by later events. Tillite of the Dwyka Group and pebble beds, clay and calcrete of the Kalahari Group, have been deposited on these erosional unconformities.

A few thin, diabase dykes with north-south and northeast-southwest orientations, have intruded the stratigraphic sequence. They form impervious barriers and compartmentalise the groundwater.

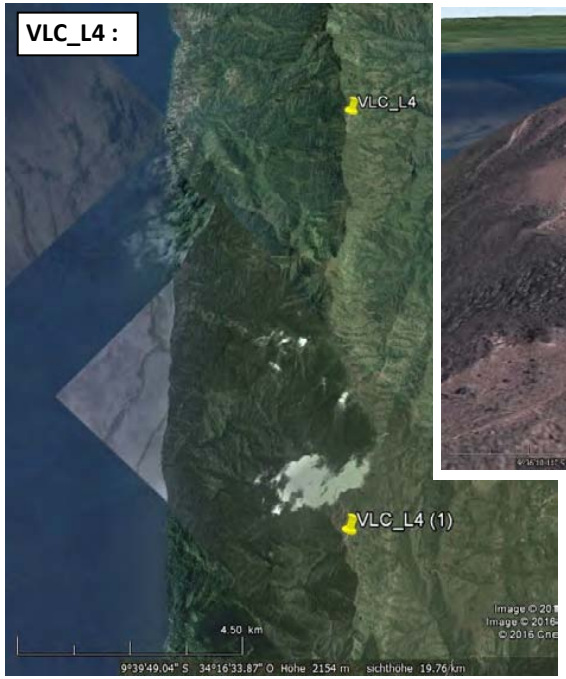
Haematite ore bodies:

- **Operation:** Kolomela mine (252.9Mt @ 64.3% Fe), year-on-year increase of 59%
- **Operation:** Sishen mine (563.8Mt @ 59.5% Fe), year-on-year increase of 4%
- **Operation:** Thabazimbi mine (17.1Mt @ 62.1% Fe), year-on-year increase of 5%

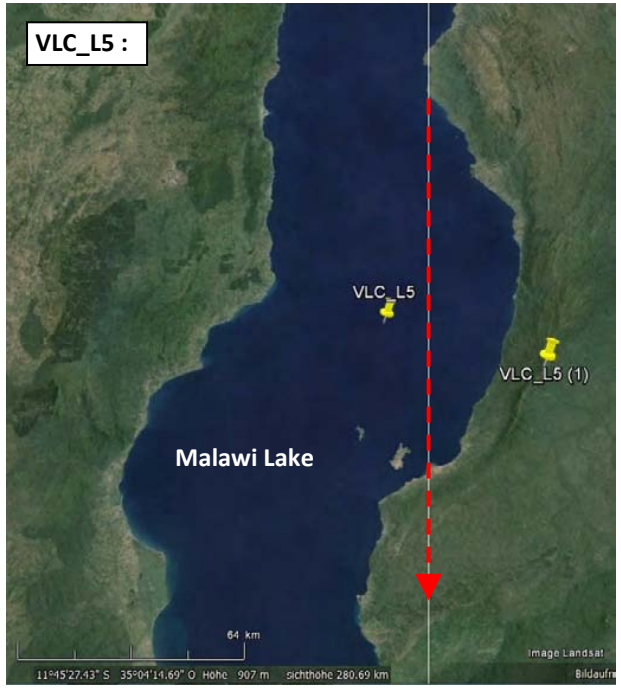
Magnetite ore bodies:

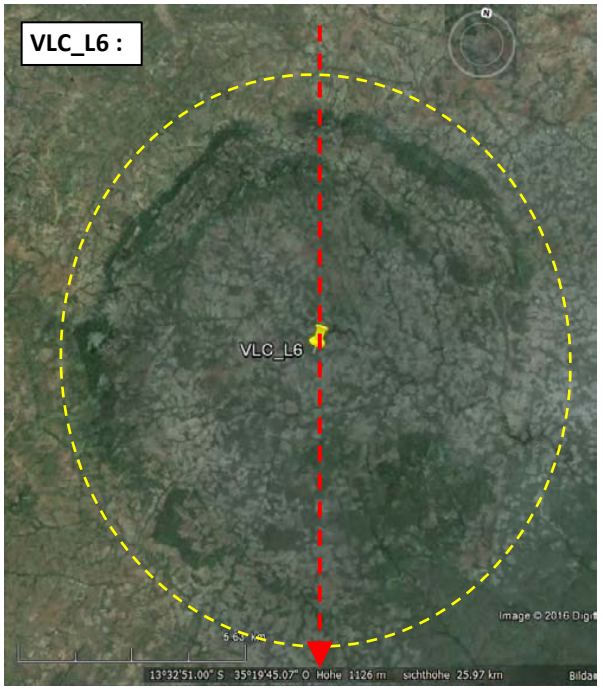
- **Project:** Zandrivierspoort (476.1Mt @ 34.5% Fe and 40.8% Magnetite)

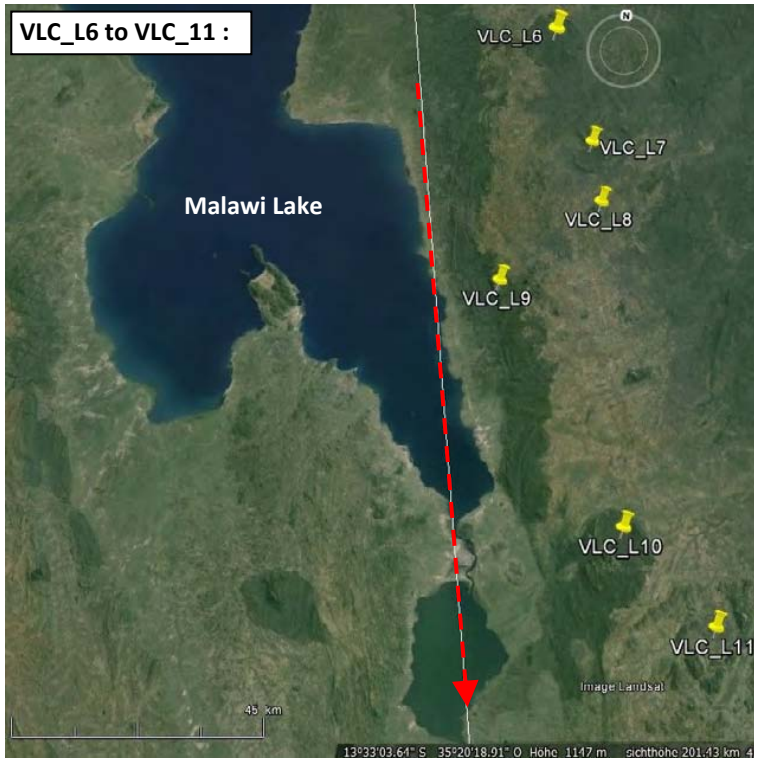
Secondary Impact Structures along the VLC-L (Left) Ejecta Ray of the VLC Impact :

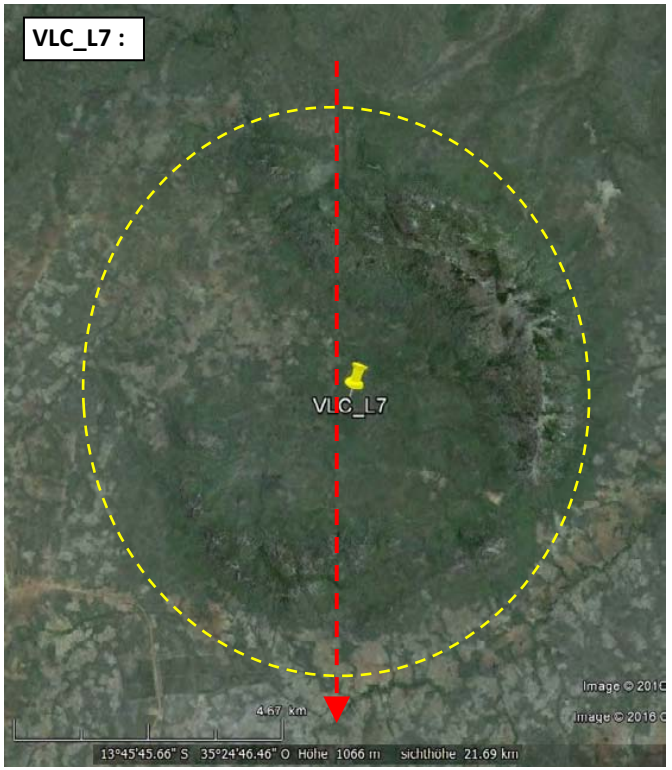


VLC_L4 Detail view :

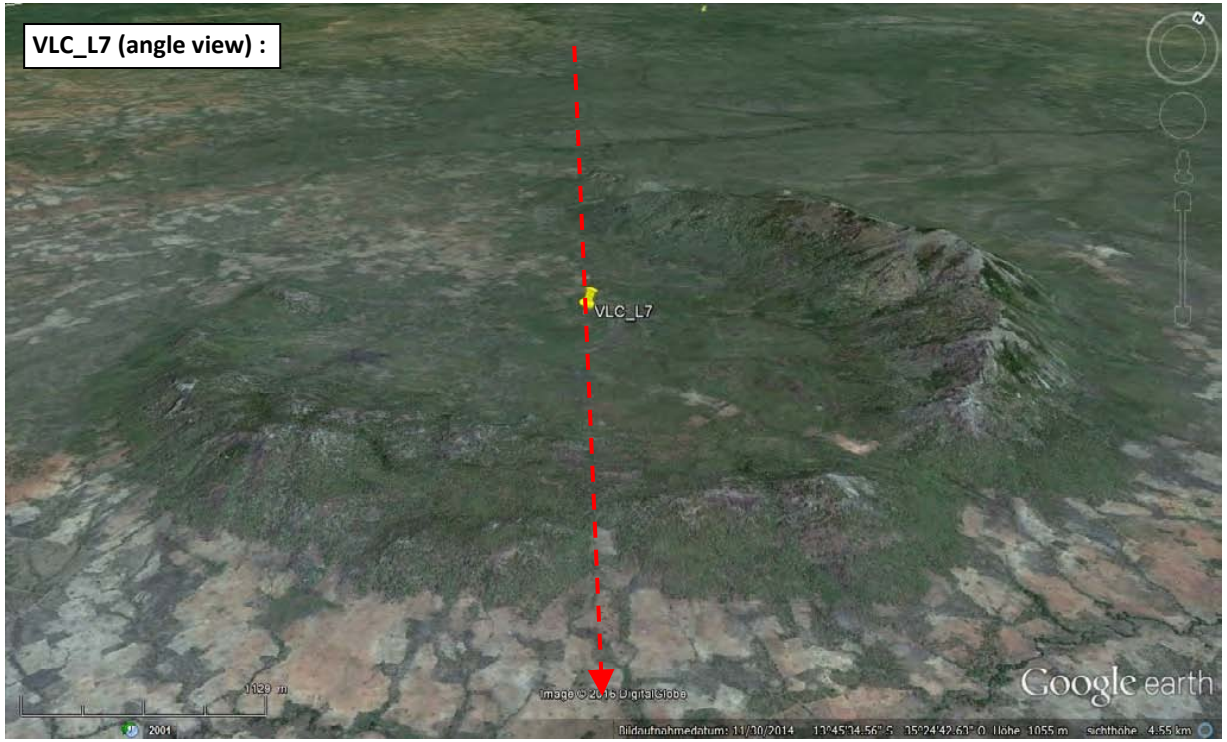




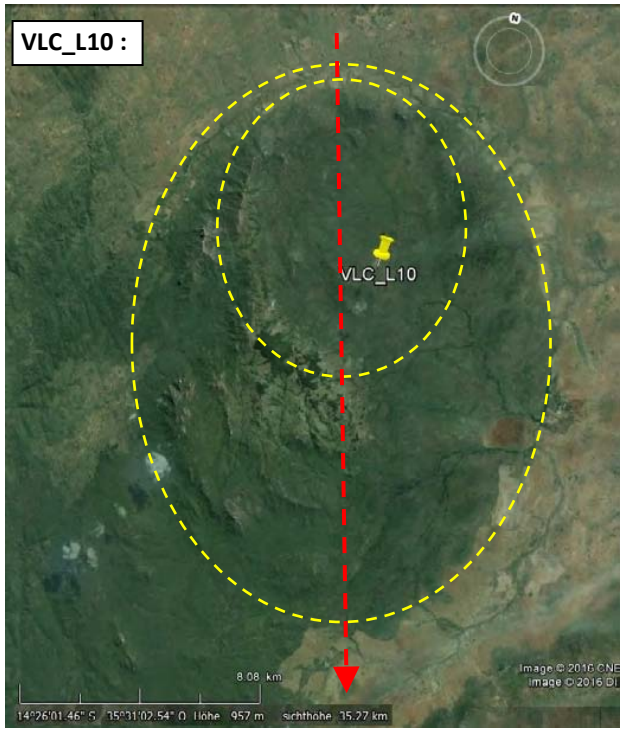




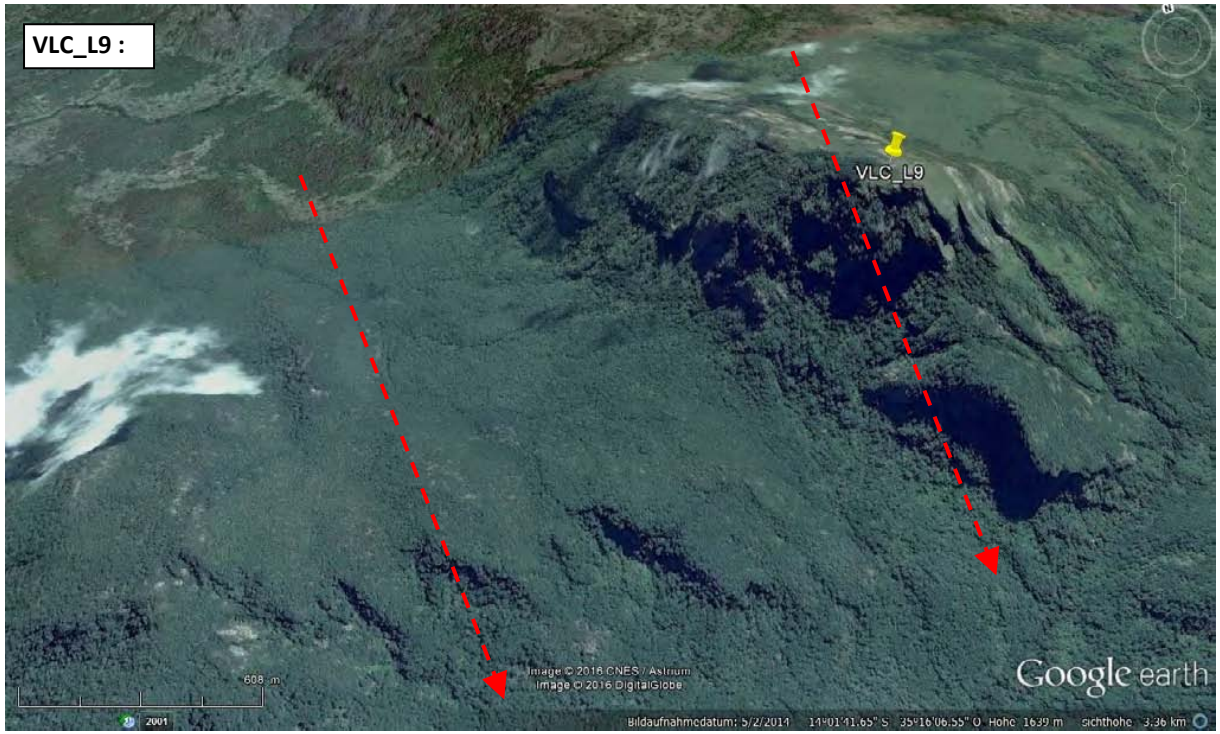
VLC_L7 (angle view) :



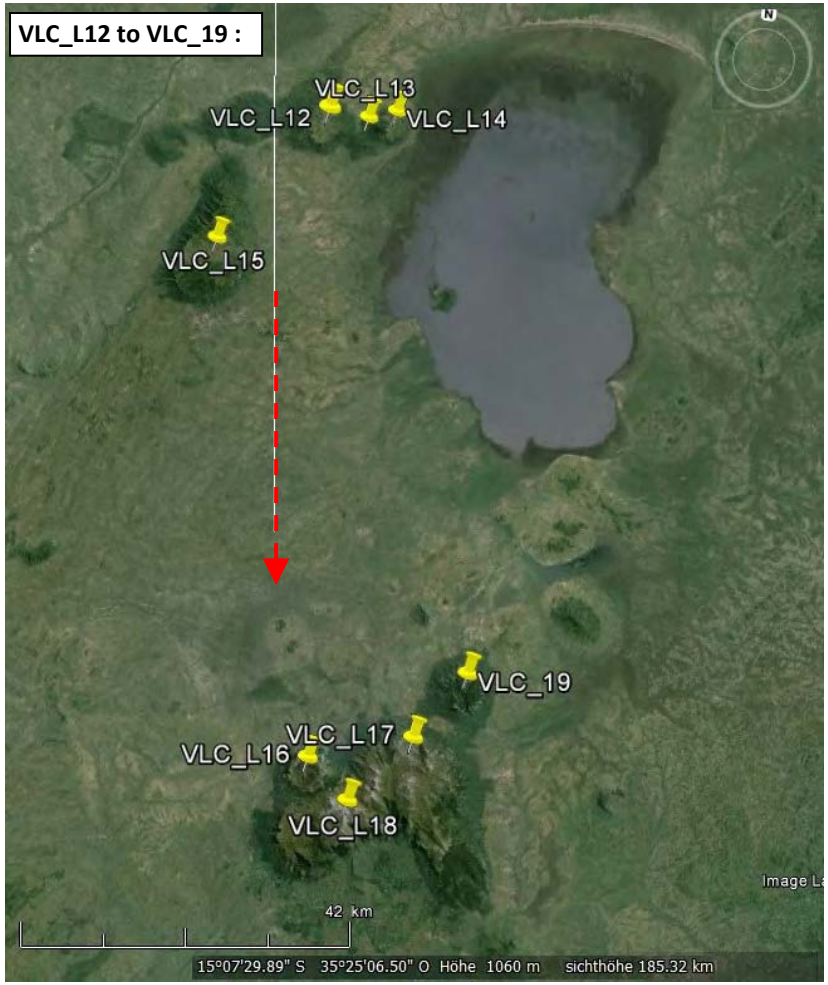
VLC_L10 :

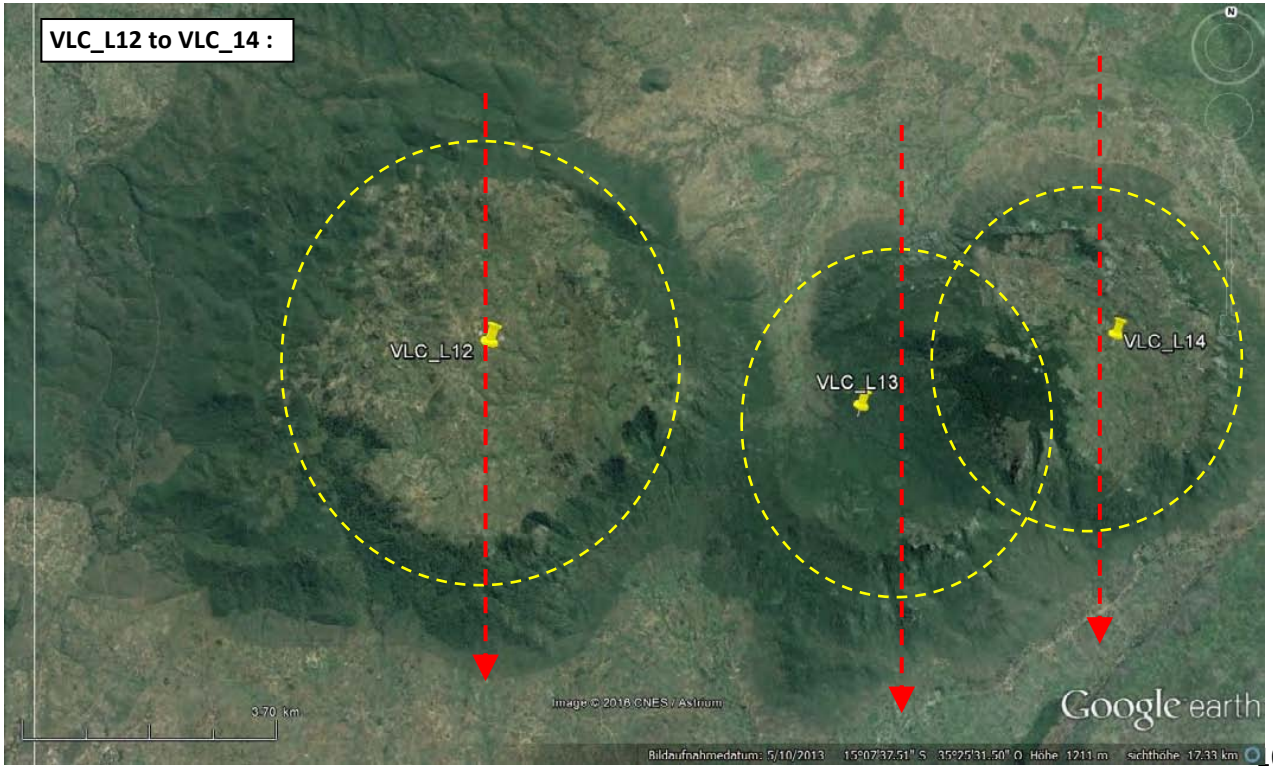


VLC_L9 :



VLC_L10 (angle view) :


VLC_L12 to VLC_19 :
VLC_L13
VLC_L12
VLC_L14
VLC_L15
VLC_19
VLC_L17
VLC_L16
VLC_L18
42 km
15°07'29.89" S 35°25'06.50" O Höhe 1060 m sichthöhe 185.32 km


VLC_L12 to VLC_14 :
VLC_L12
VLC_L13
VLC_L14
3.70 km
Image © 2016 CNES / Astrium
Google earth

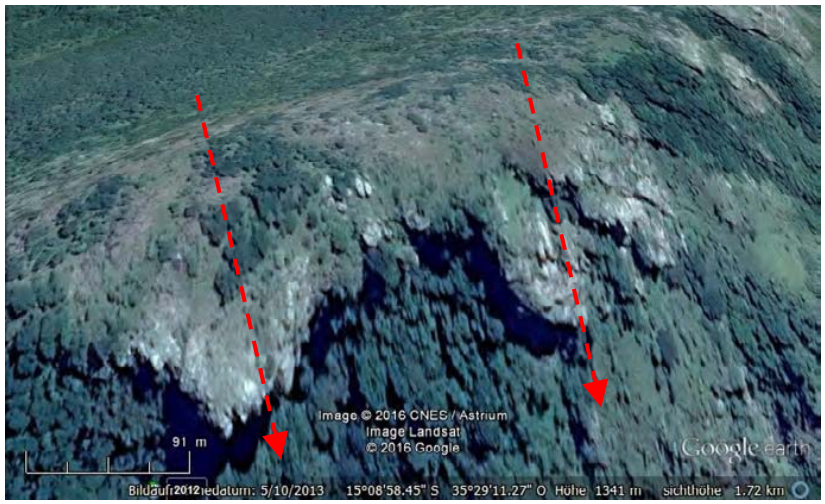
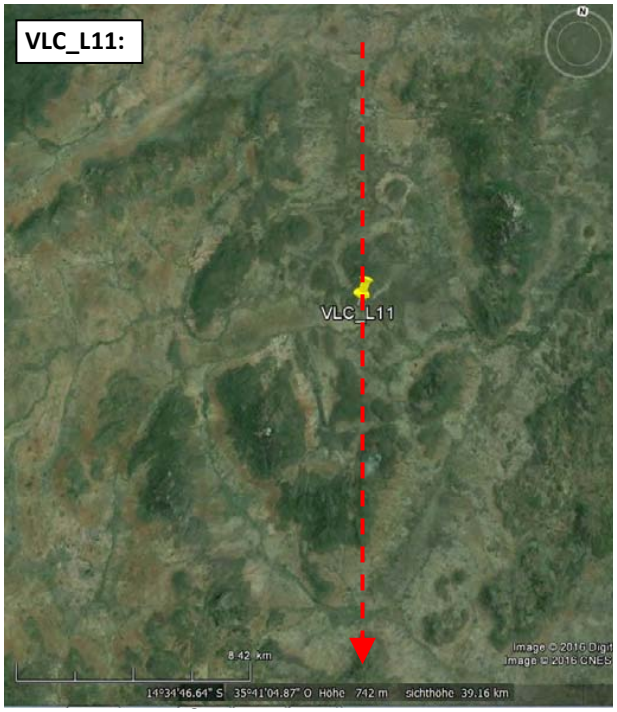
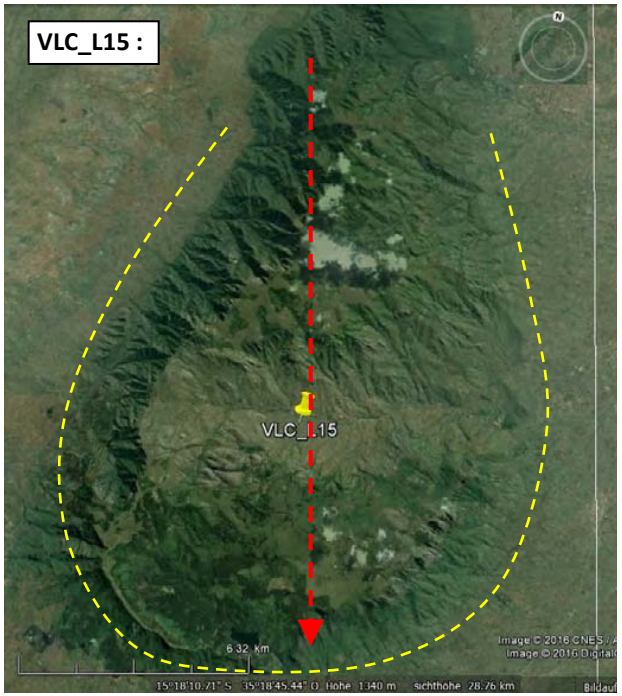
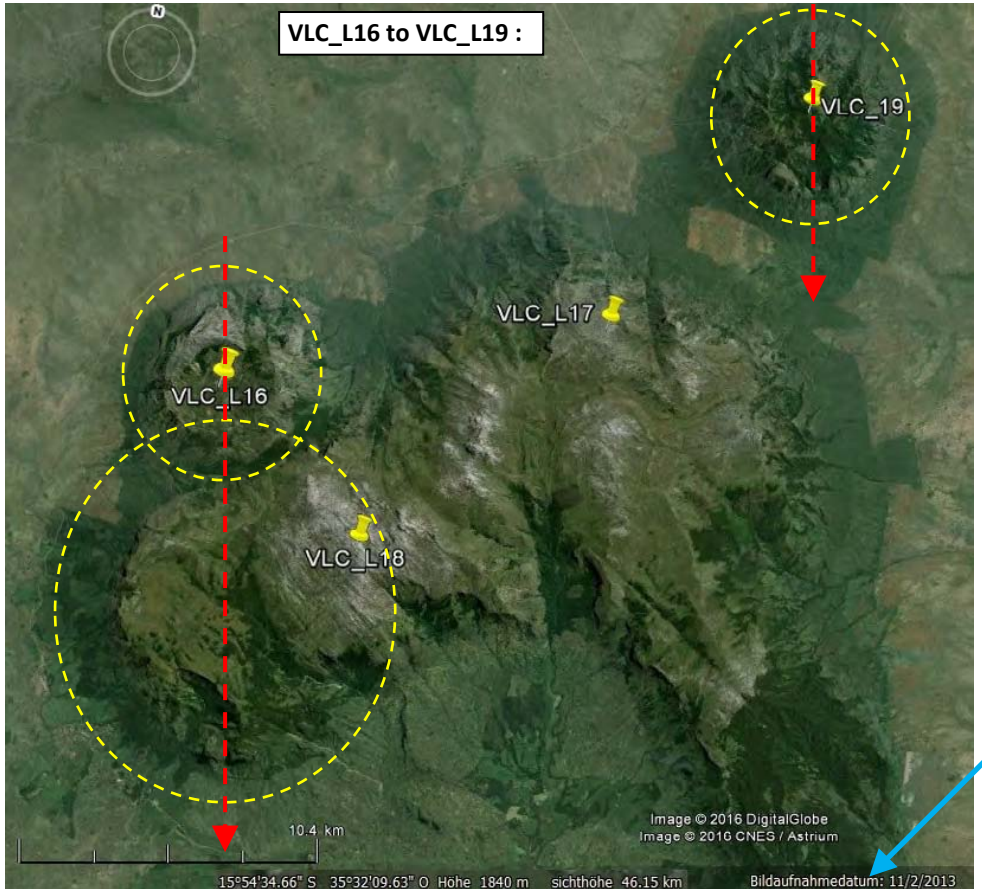
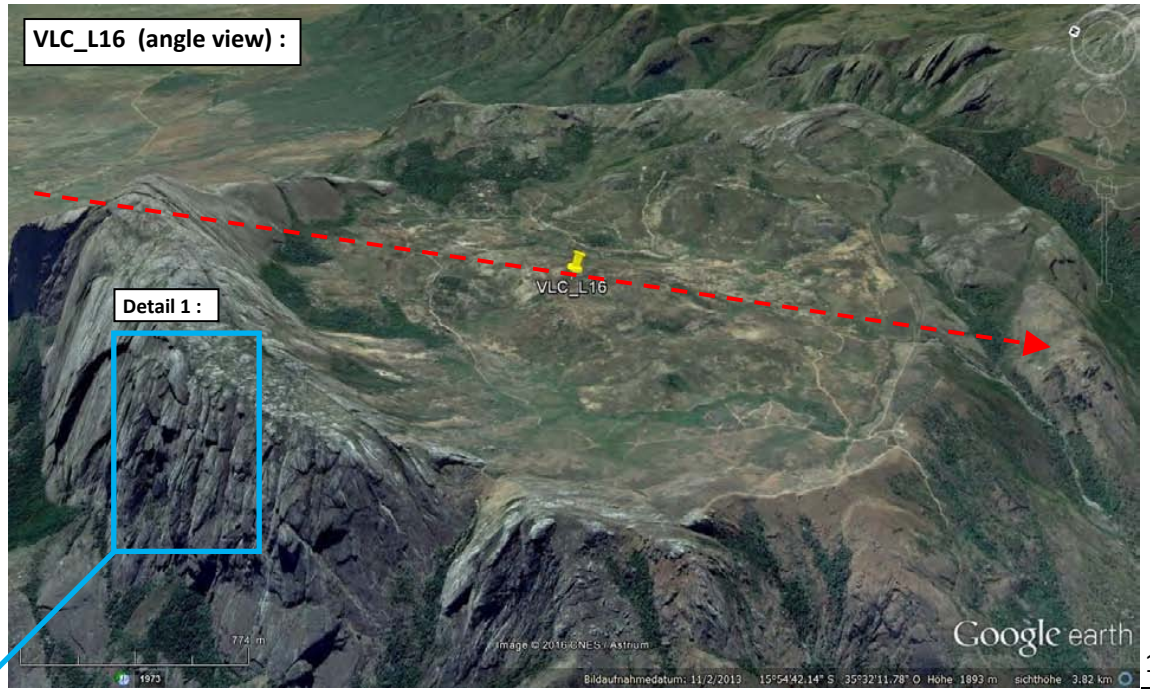


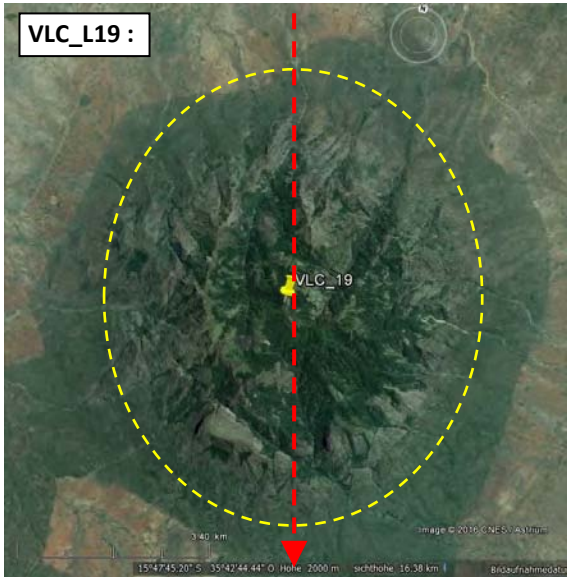
Image © 2016 CNES / Astrium
Image Landsat
© 2016 Google
91 m
Google earth

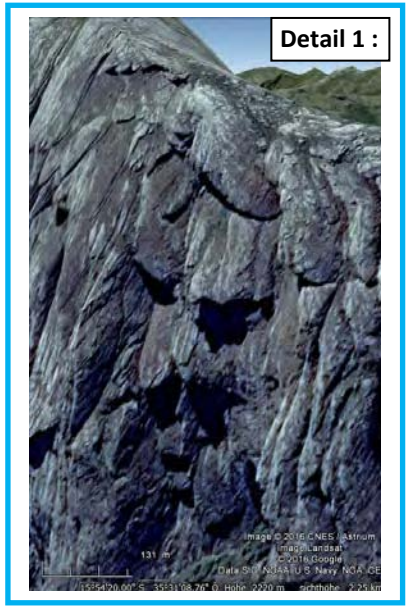

VLC_L11:
VLC_L11
8.42 km

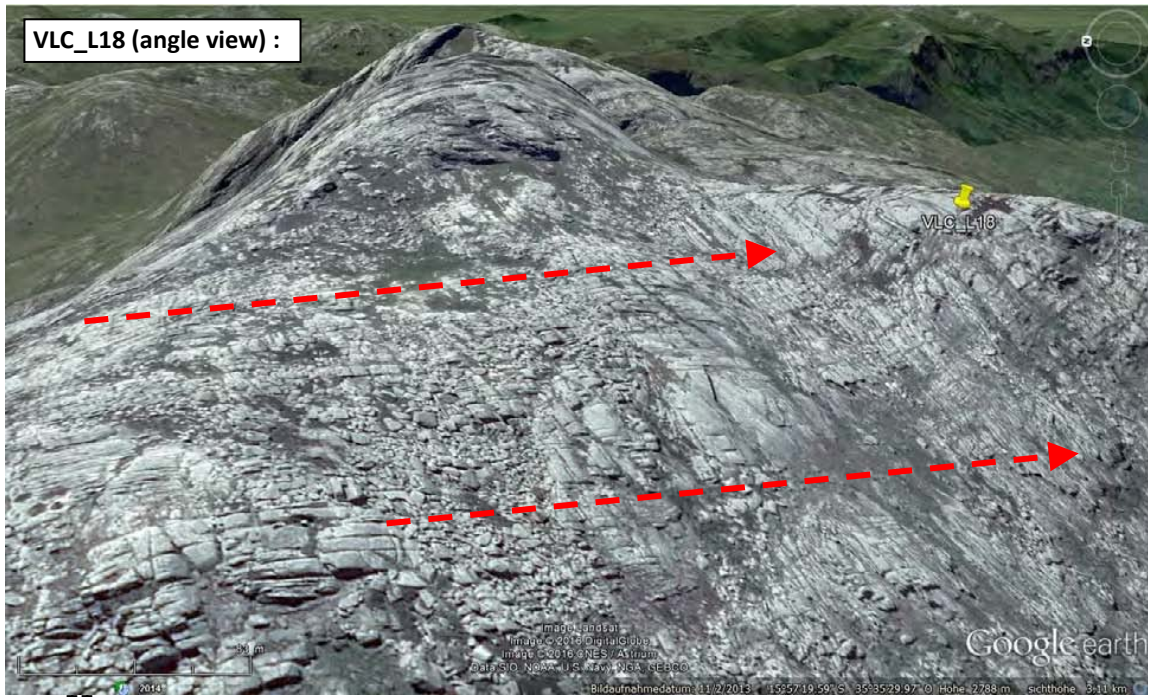

VLC_L15 :
VLC_L15
6.32 km

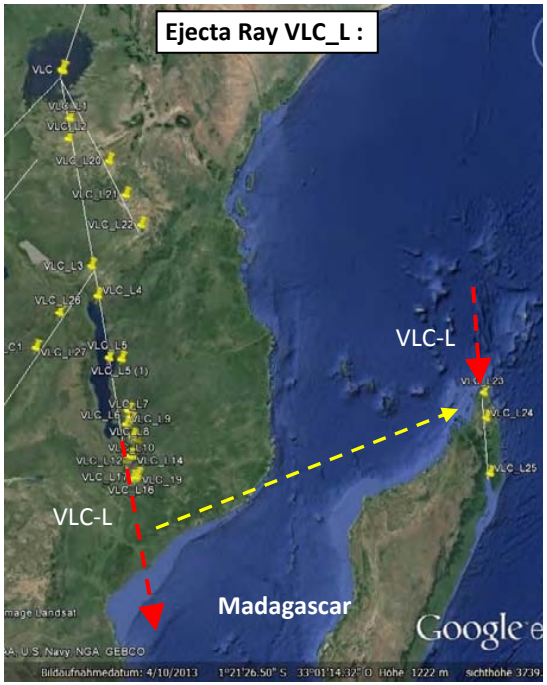

VLC_L16 to VLC_L19 :
VLC_19
VLC_L17
VLC_L16
VLC_L18
10.4 km
Image © 2016 DigitalGlobe
Image © 2016 CNES / Astrium
15°54'34.66" S 35°32'09.63" O Höhe 1840 m sichthöhe 46.15 km
Bildaufnahmedatum: 11/2/2013

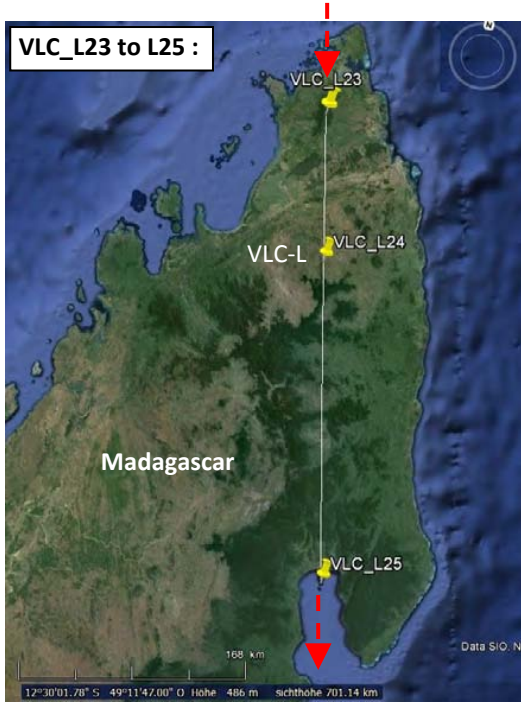

VLC_L16 (angle view) :
Detail 1 :
VLC_L16
Google earth

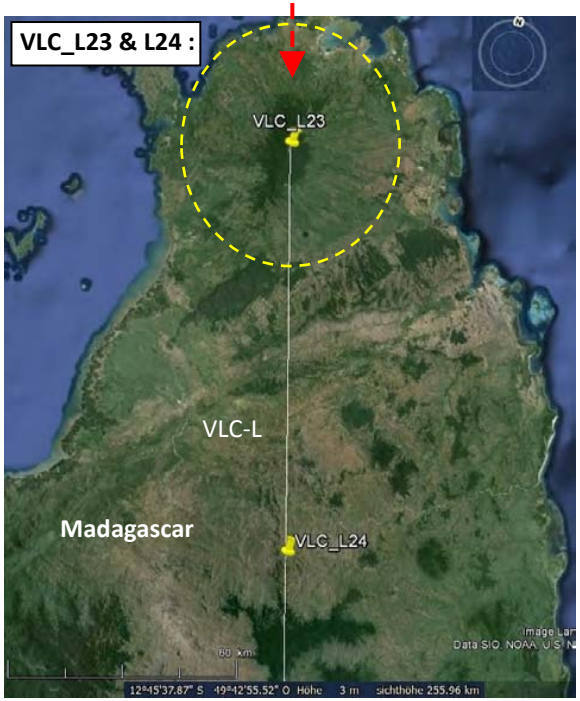

VLC_L19 :
VLC_19

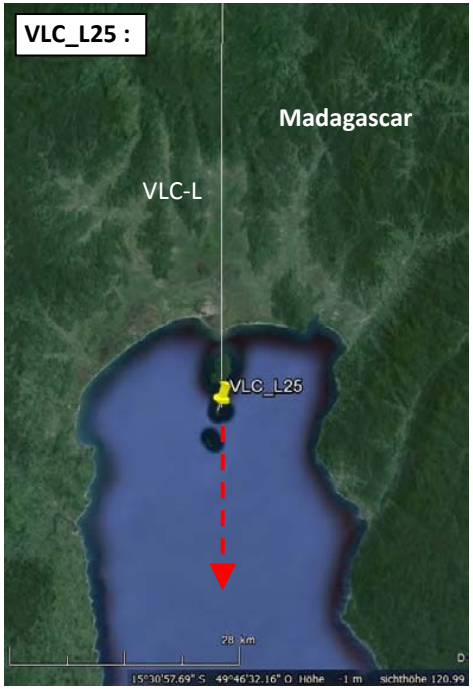

Detail 1 :

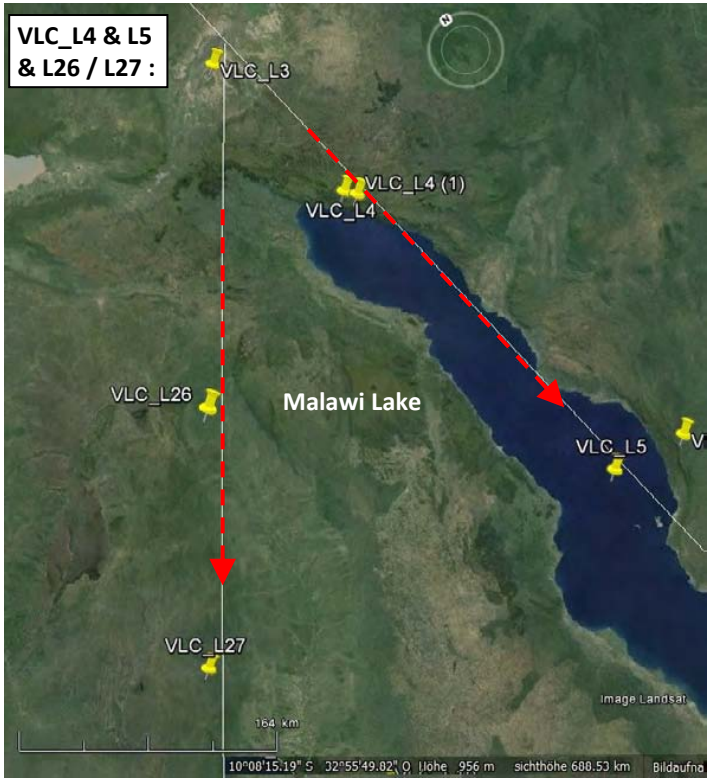

VLC_L18 (angle view) :
VLC_L18
Google earth

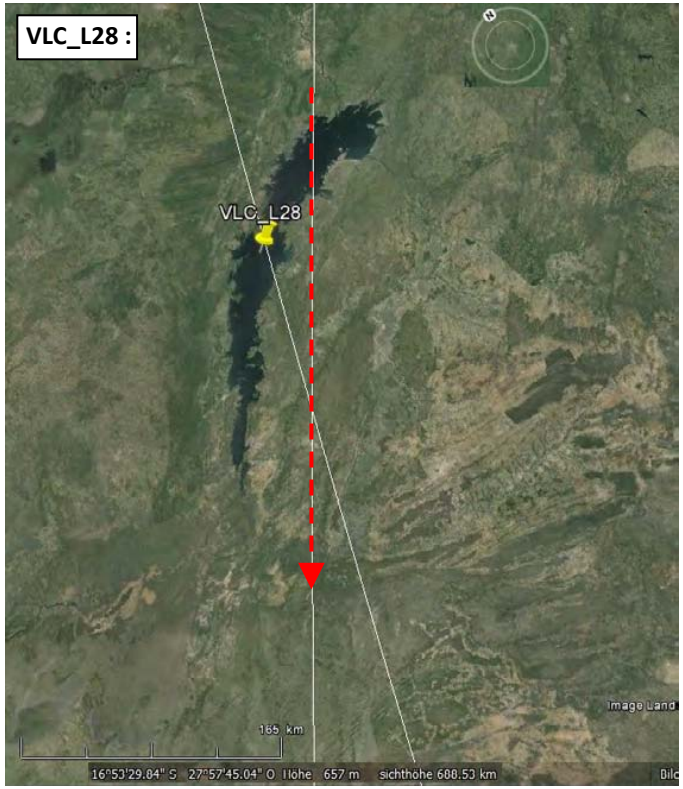

Ejecta Ray VLC_L :
VLC-L
VLC-L
Madagascar

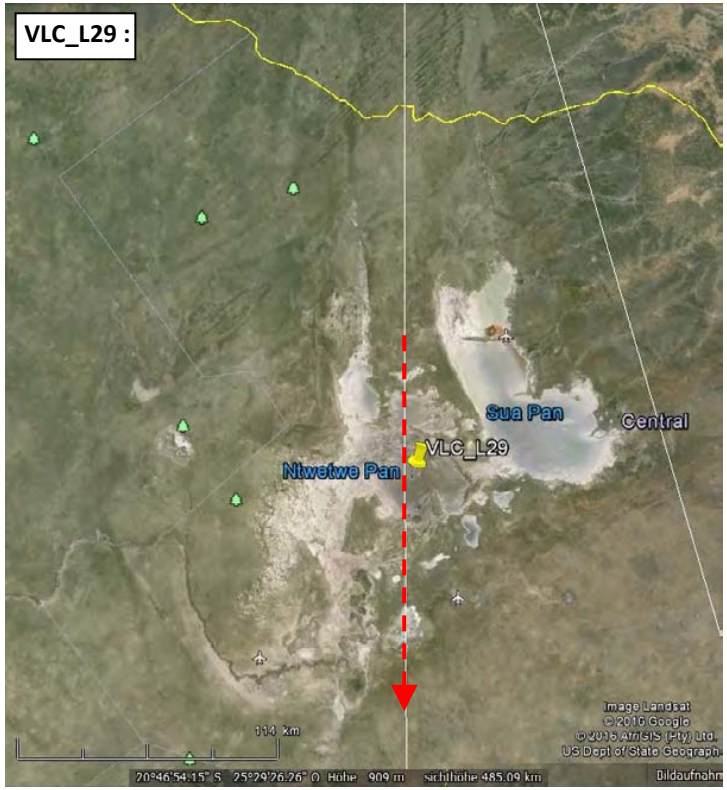

VLC_L23 to L25 :
VLC_L23
VLC-L
VLC_L24
Madagascar
VLC_L25

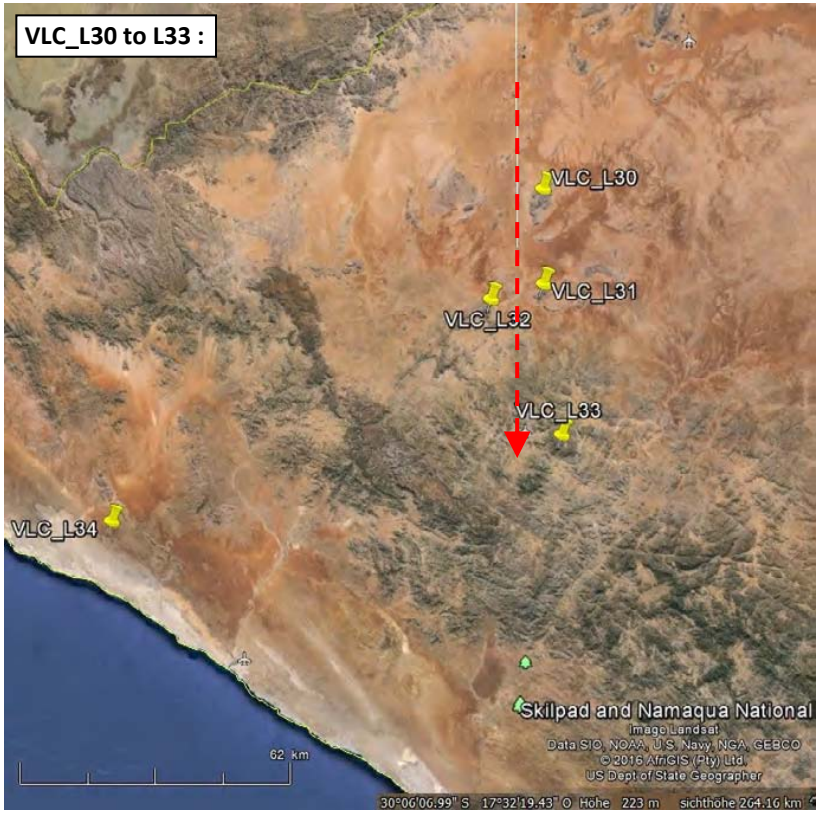

VLC_L23 & L24 :
VLC_L23
VLC-L
Madagascar
VLC_L24

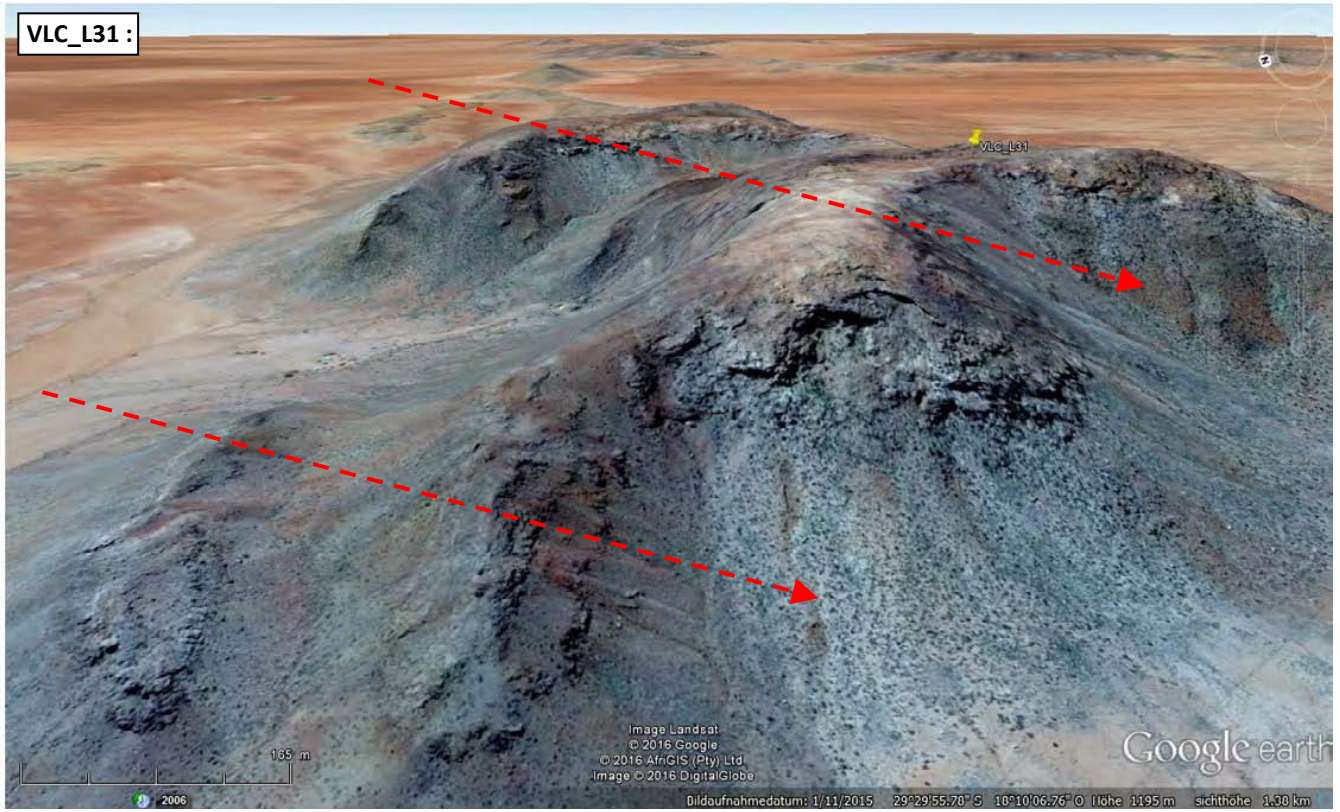

VLC_L25 :
Madagascar
VLC-L
VLC_L25

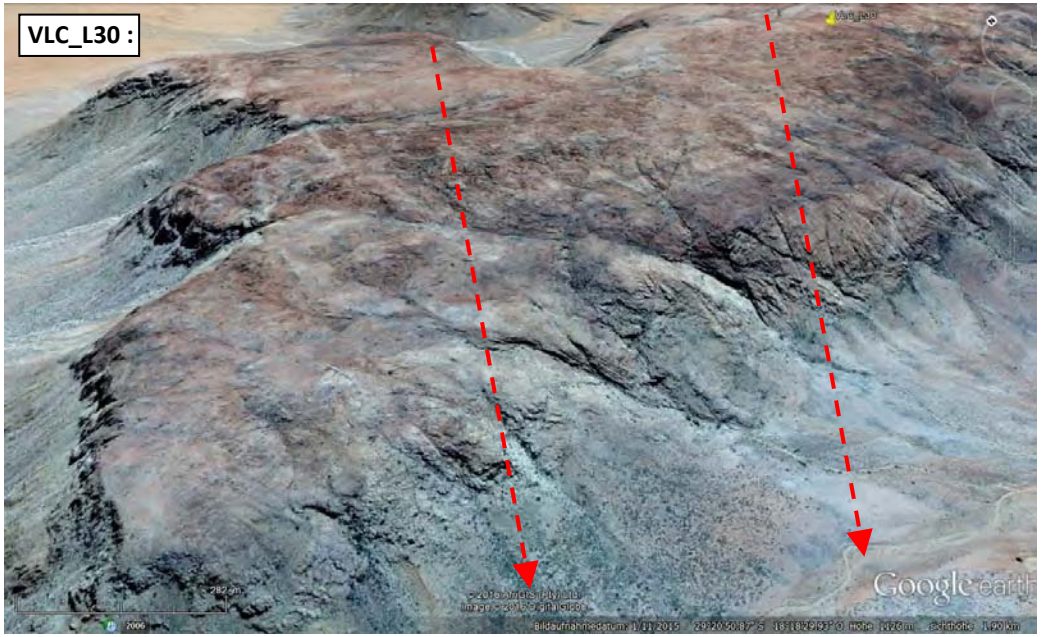

VLC_L4 & L5
& L26 / L27 :
VLC_L3
VLC_L4 (1)
VLC_L4
VLC_L26
Malawi Lake
VLC_L5
VLC_L27

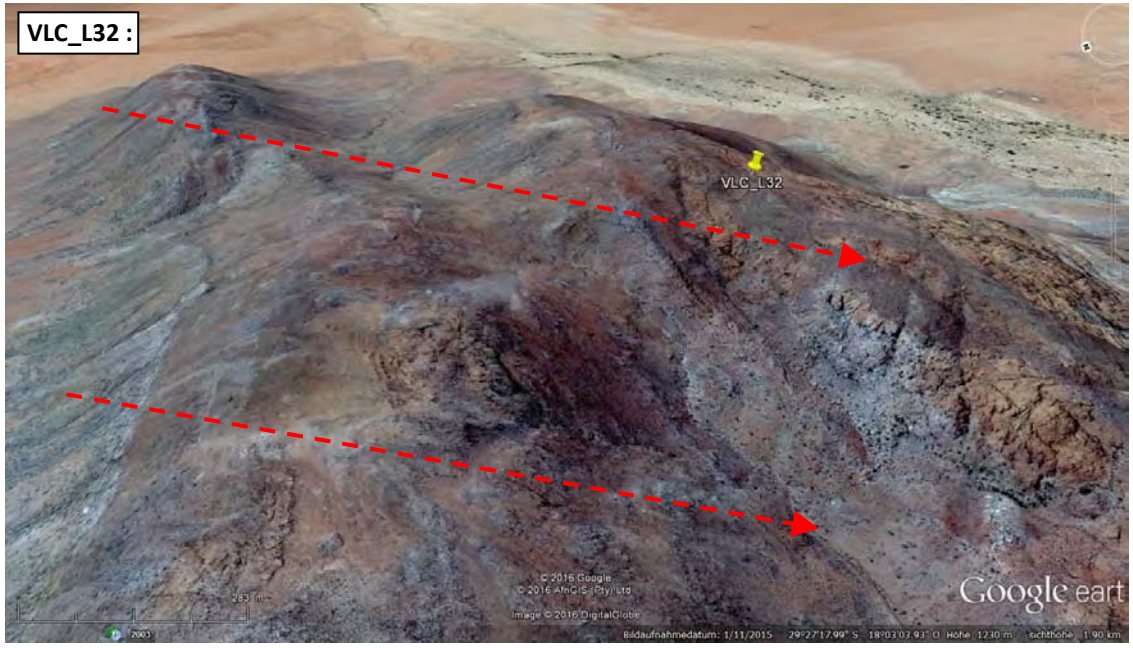

VLC_L28 :
VLC_L28

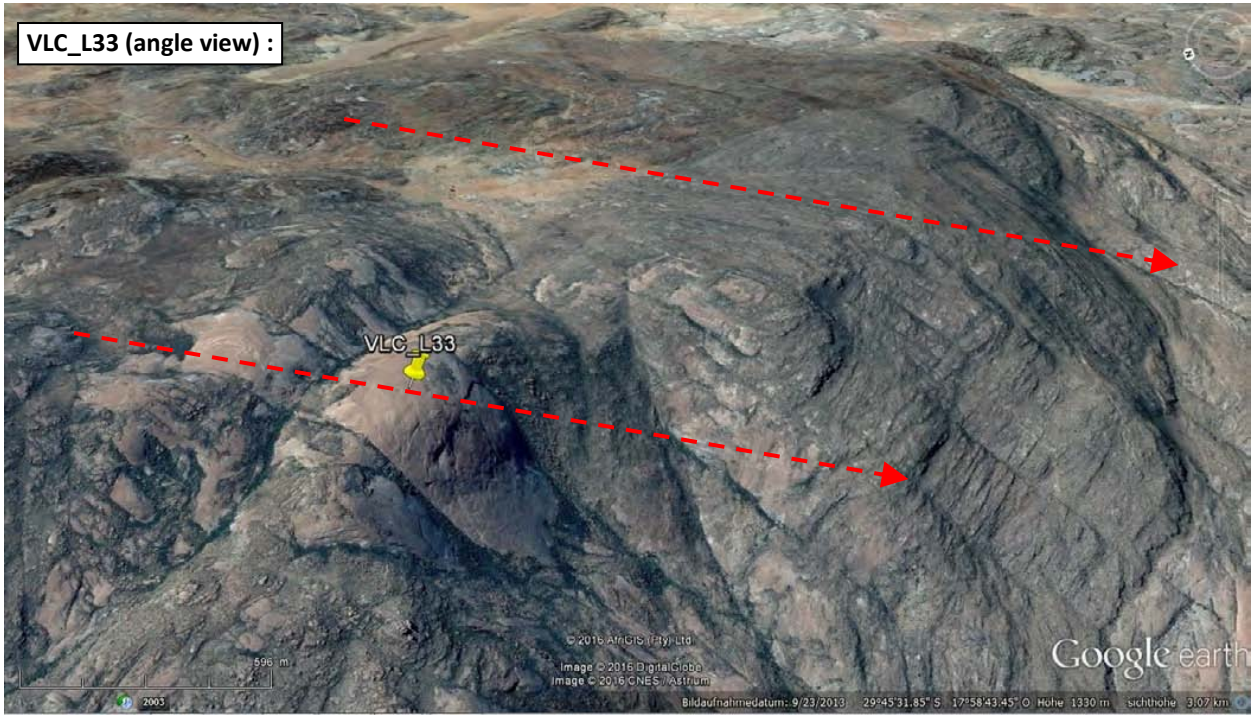

VLC_L29 :
Sua Pan
Central
VLC_L29
Niwetwe Pan

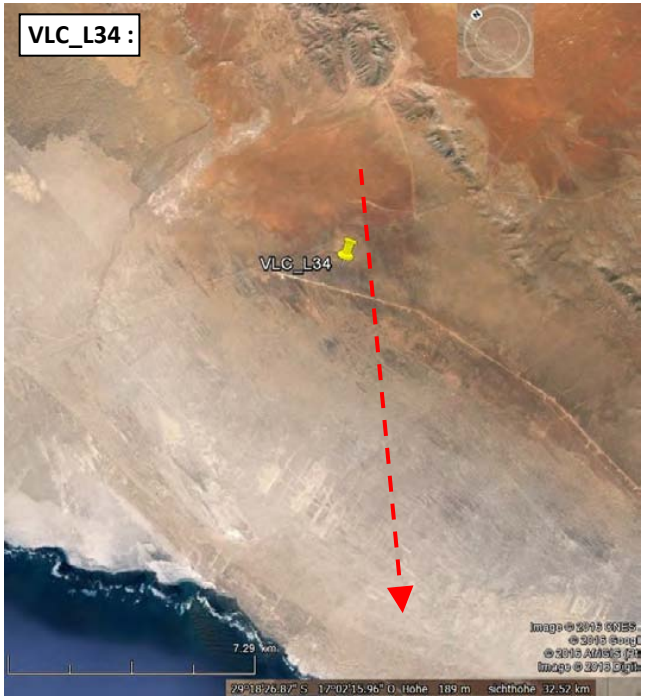

VLC_L30 to L33 :
VLC_L30
VLC_L31
VLC_L32
VLC_L33
VLC_L34
Skilpad and Namaqua National
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2016 AfriGIS (Pty) Ltd.
US Dept of State Geographer
62 km
30°06'06.99" S 17°32'19.43" O Höhe 223 m sichthöhe 264.16 km


VLC_L31 :
VLC_L31
Image Landsat
© 2016 Google
© 2016 AfriGIS (Pty) Ltd.
Image © 2016 DigitalGlobe
Google earth
185 m
2006
Bildaufnahmedatum: 1/11/2015 29°29'55.78" S 18°10'06.76" O Höhe 1195 m sichthöhe 1.30 km

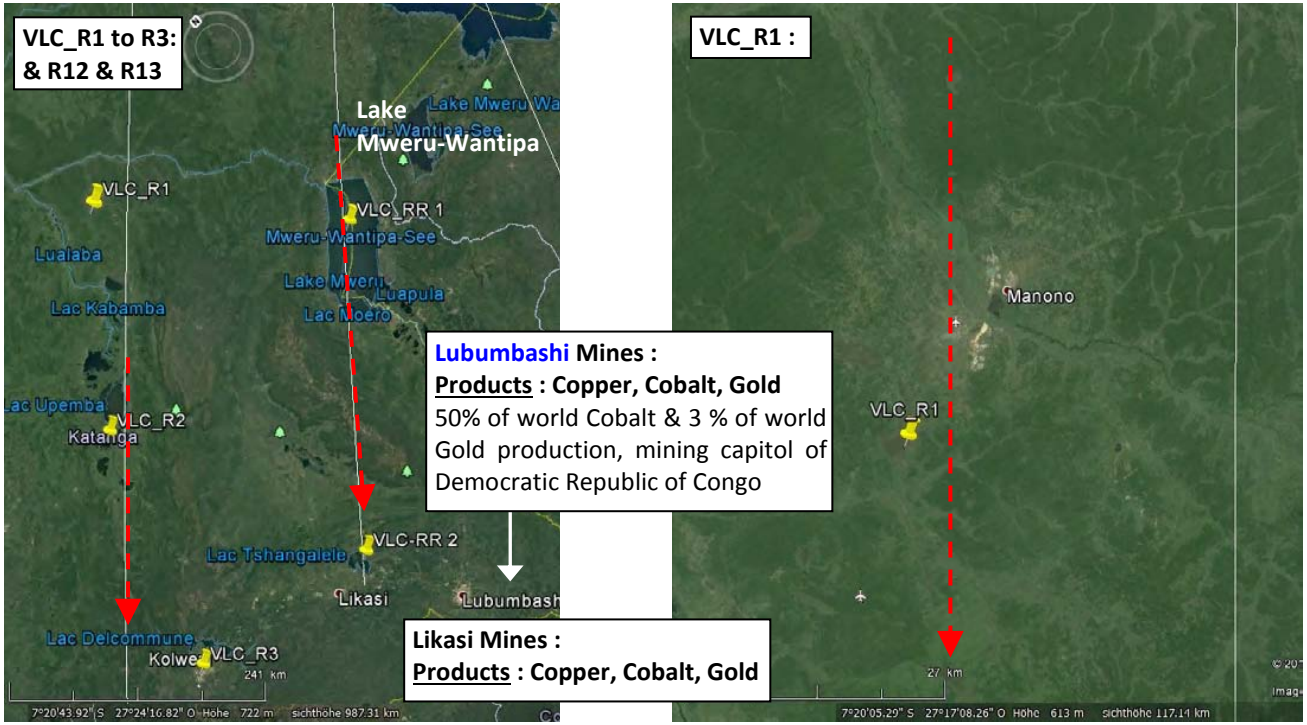

VLC_L30 :
Google earth

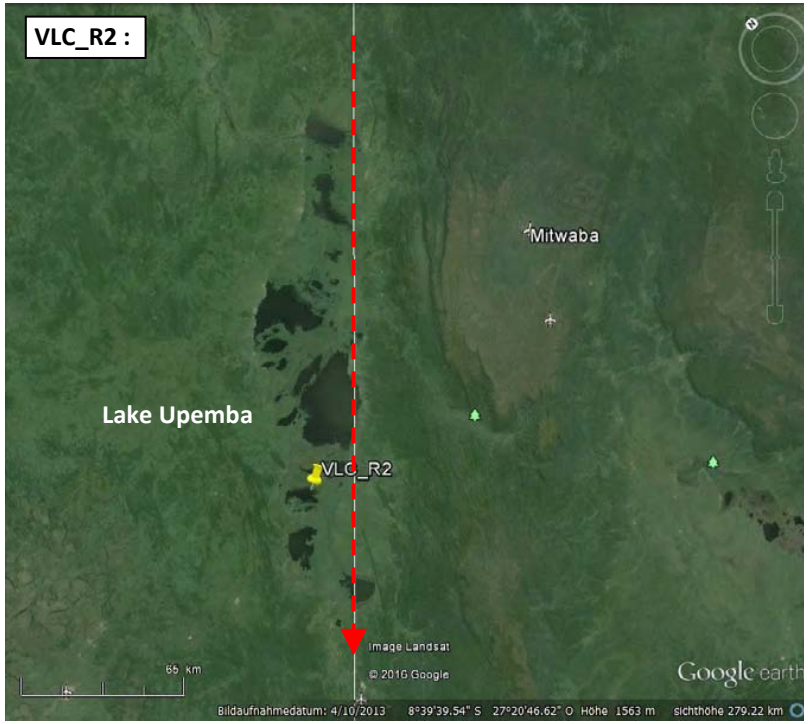

VLC_L32 :
VLC_L32
© 2016 Google
© 2016 AfriGIS (Pty) Ltd.
Image © 2016 DigitalGlobe
Google eart
2003
Bildaufnahmedatum: 1/11/2015 29°27'17.99" S 18°03'03.93" O Höhe 1230 m sichthöhe 1.90 km

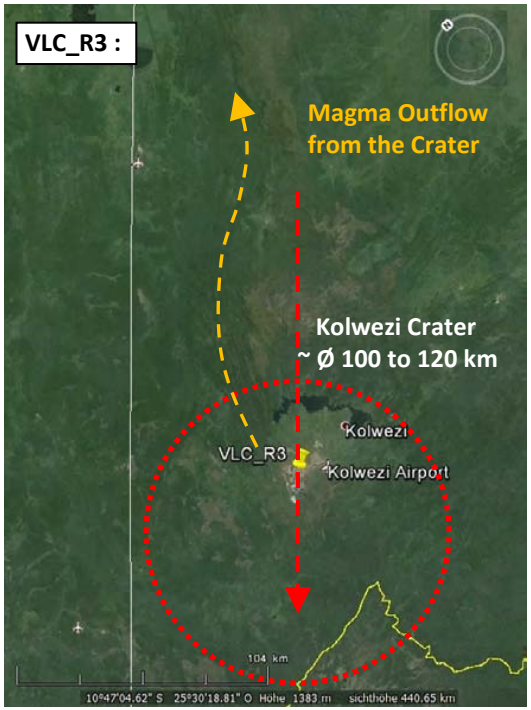


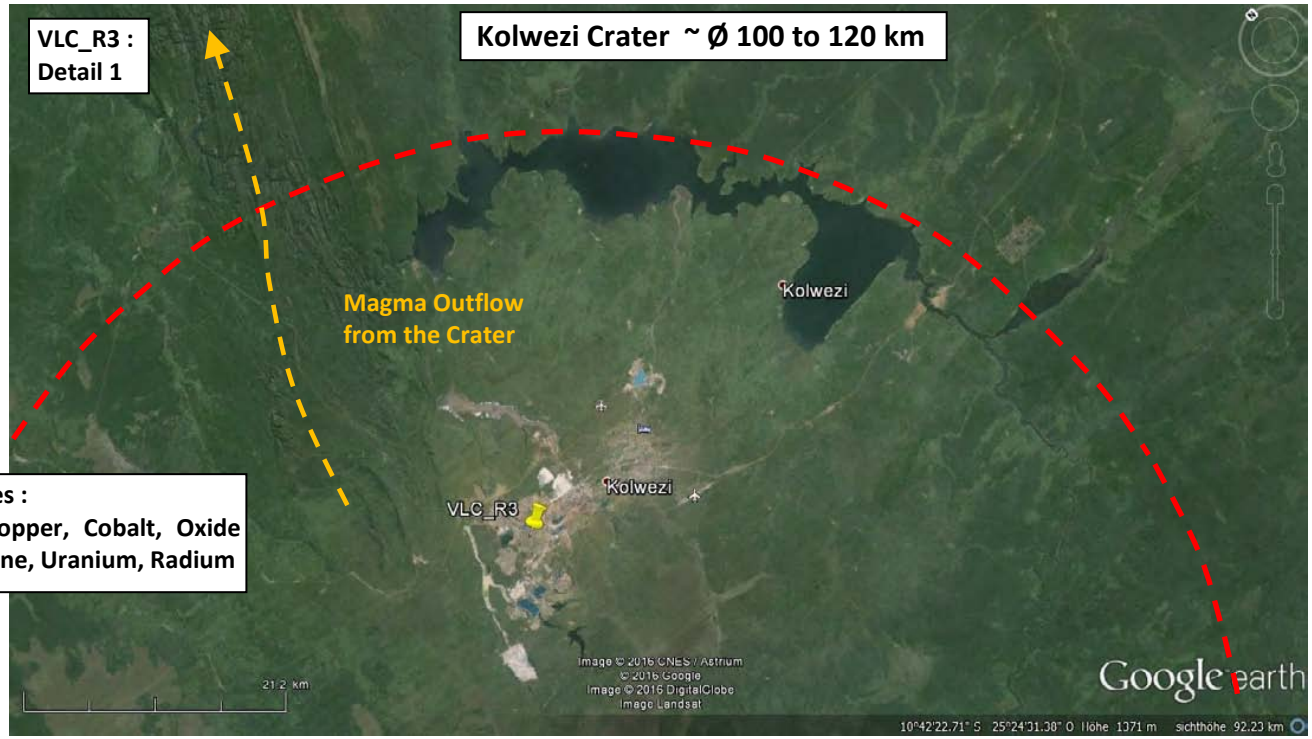


Secondary Impact Structures along the VLC-R (Right) Ejecta Ray of the VLC Impact :

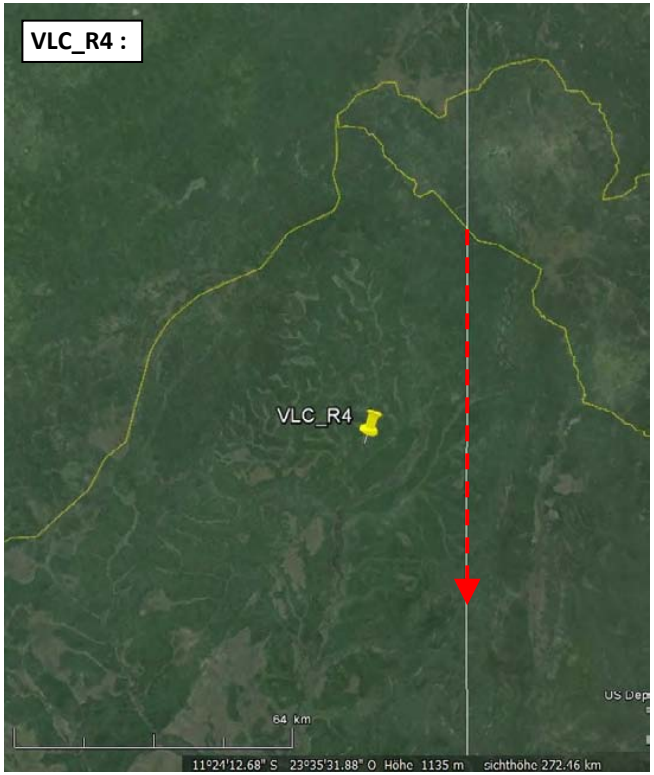


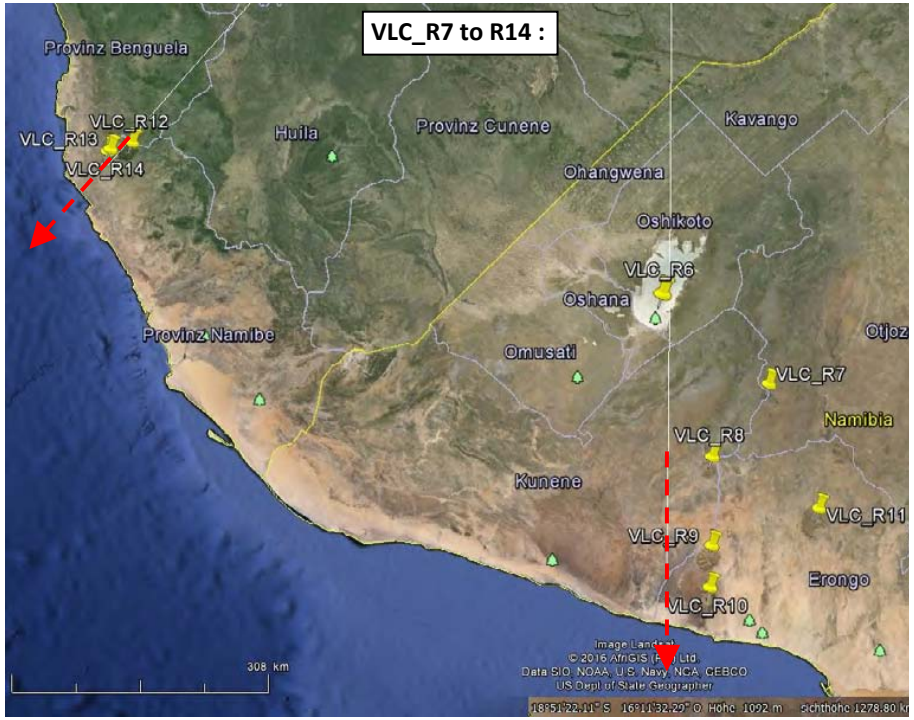


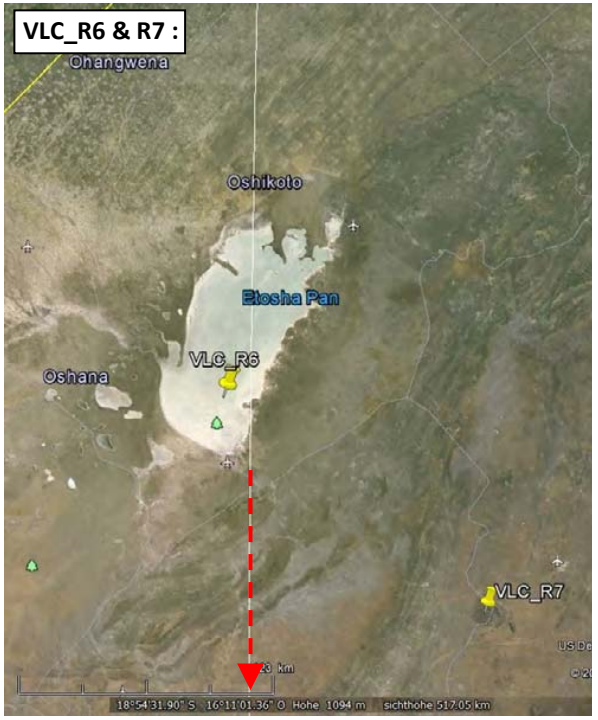


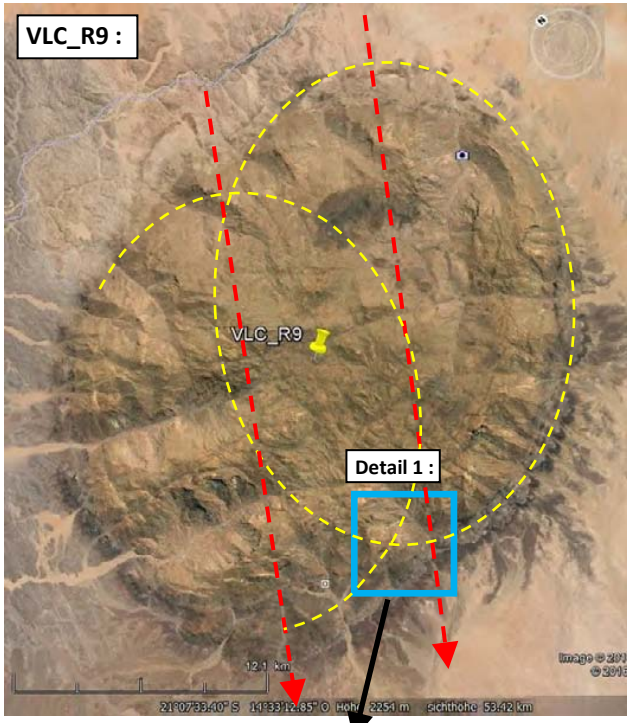


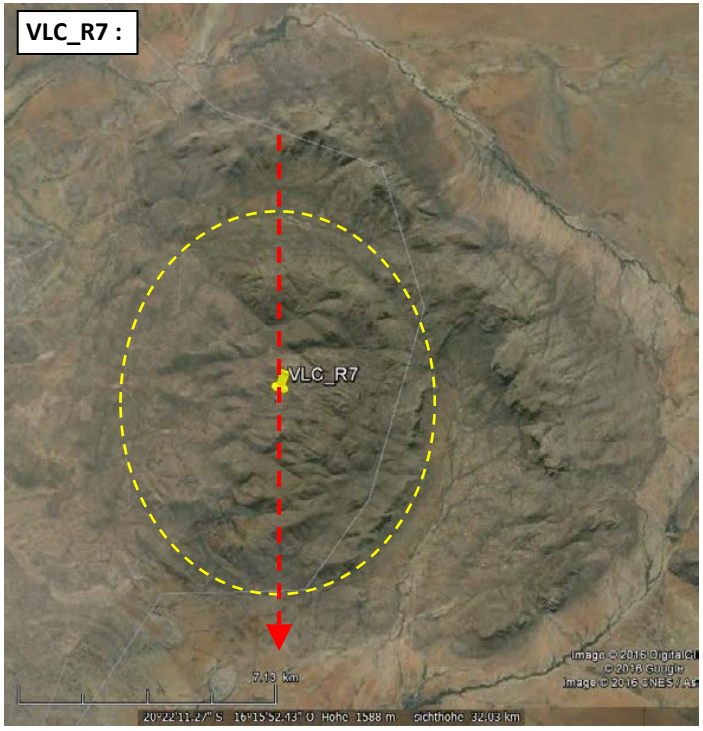
Kolwezi Mines :
Products : Copper, Cobalt, Oxide Ores, Limestone, Uranium, Radium

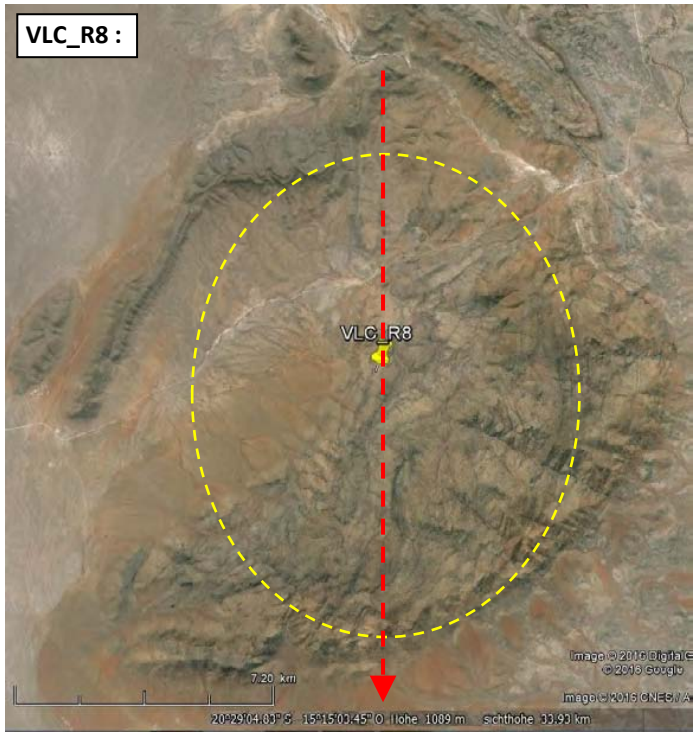



VLC_R7 to R14 :
Provinz Benguela
VLC_R12
VLC_R13
VLC_R14
Huila
Provinz Cunene
Kavango
Ohangwena
Oshikoto
VLC_R6
Oshana
Provinz Namibe
Omusati
Otjoz
VLC_R7
Namibia
VLC_R8
Kunene
VLC_R11
VLC_R9
Erongo
VLC_R10
308 km

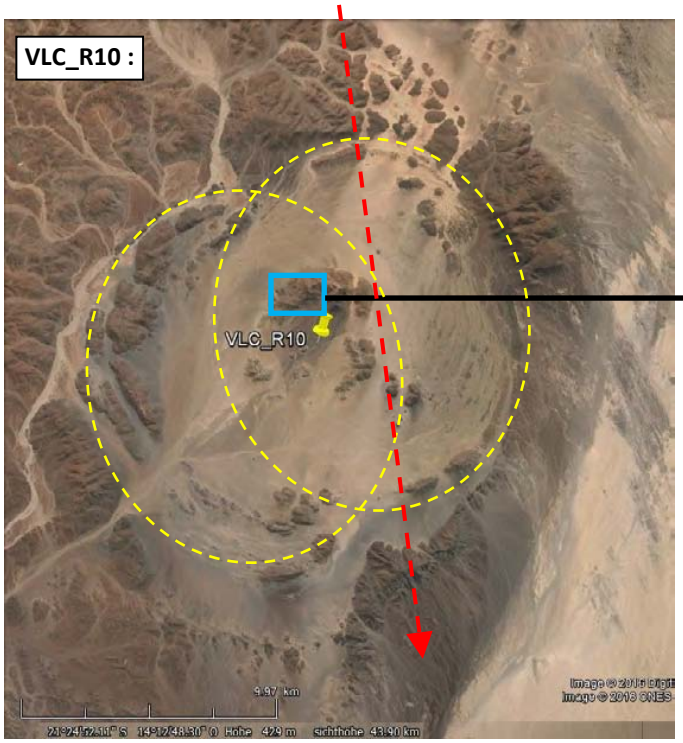

VLC_R6 & R7 :
Ohangwena
Oshikoto
Etosha Pan
VLC_R6
Oshana
VLC_R7

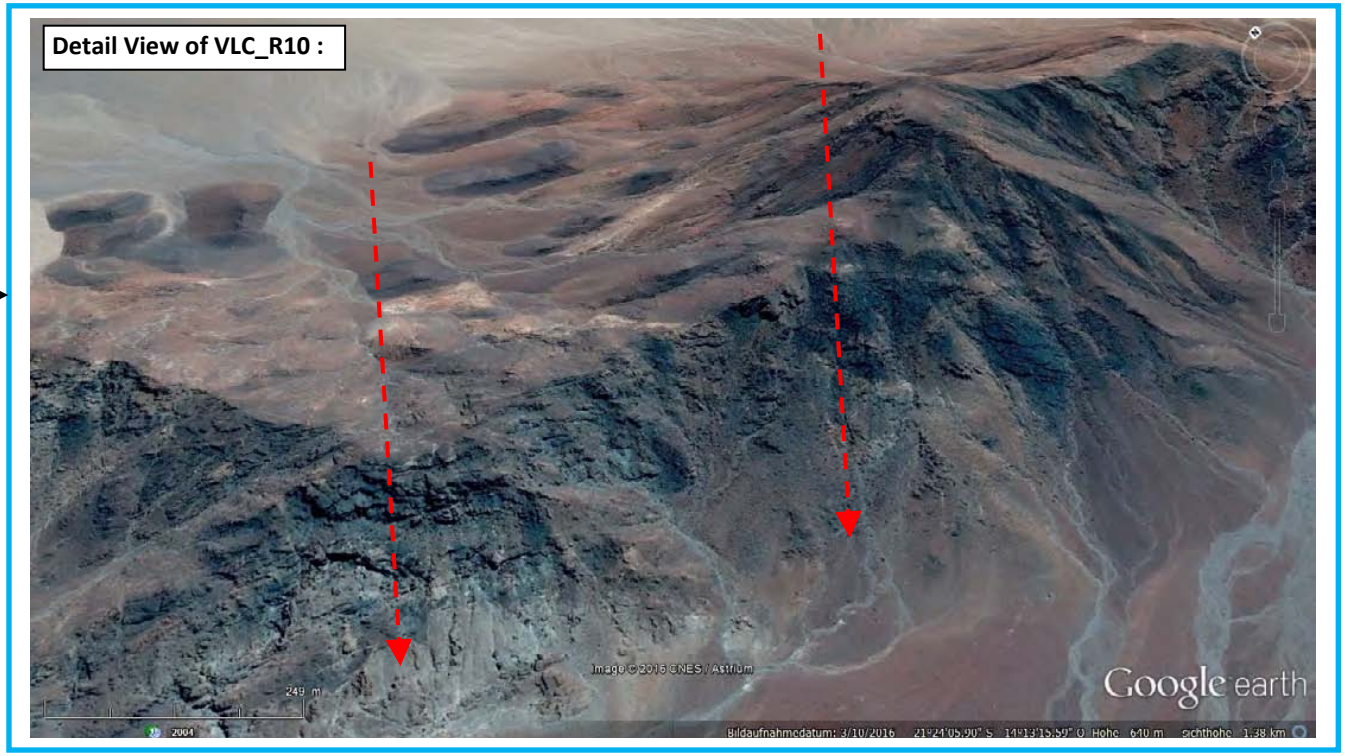

VLC_R9 :
VLC_R9
Detail 1 :
12.1 km

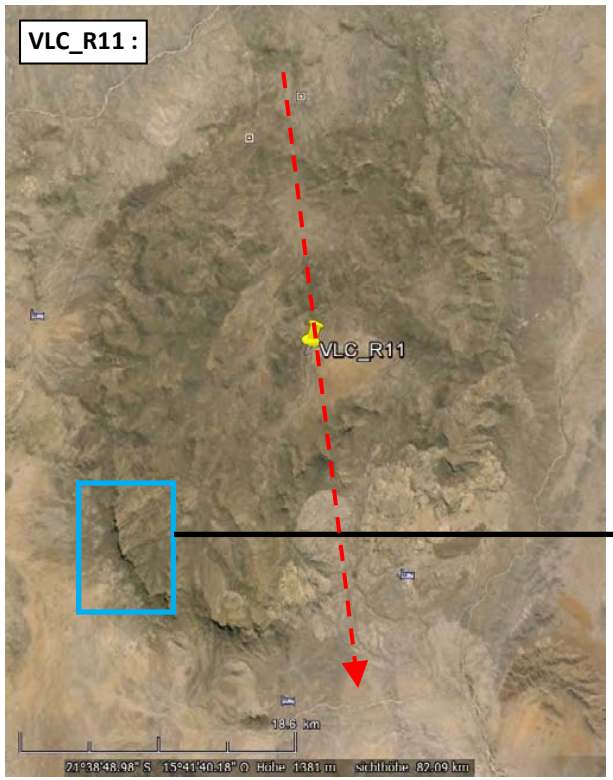

VLC_R7 :
VLC_R7
7.13 km

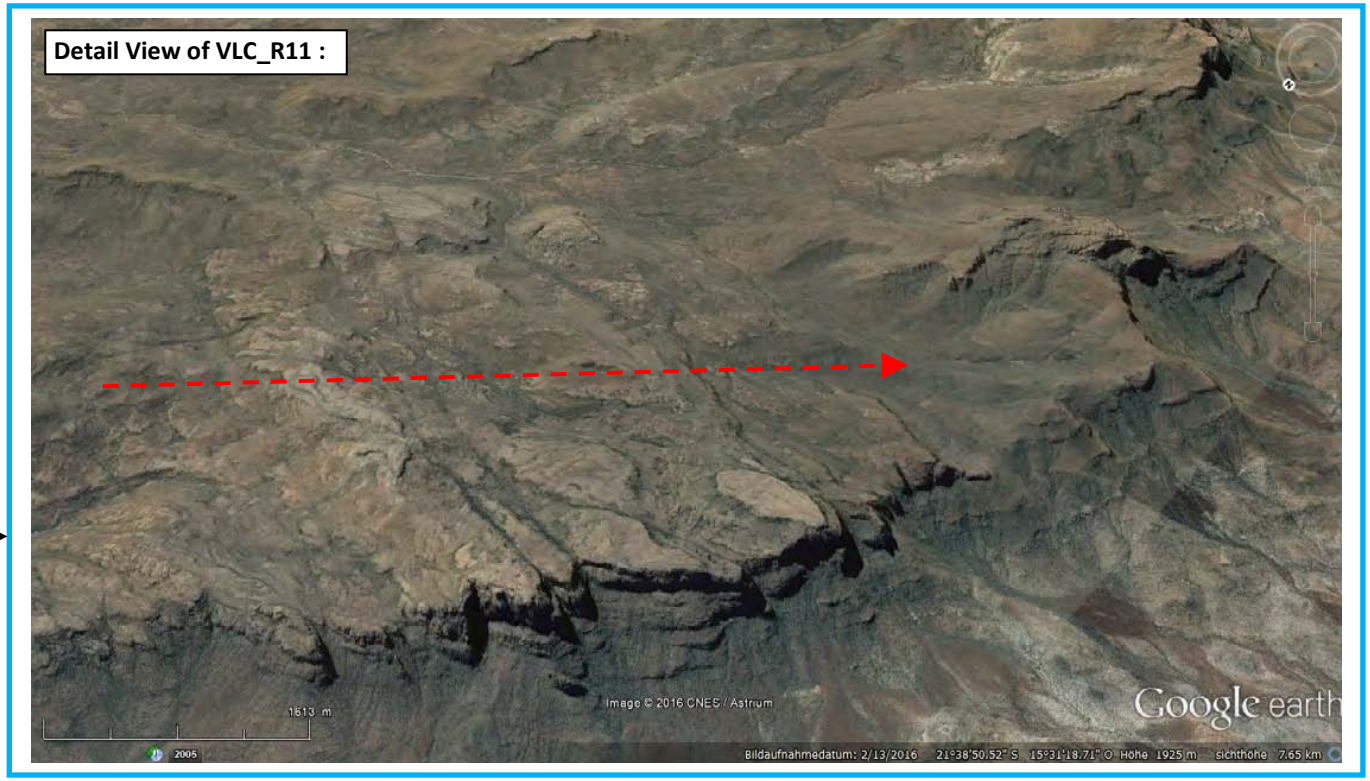

VLC_R8 :
VLC_R8
7.20 km

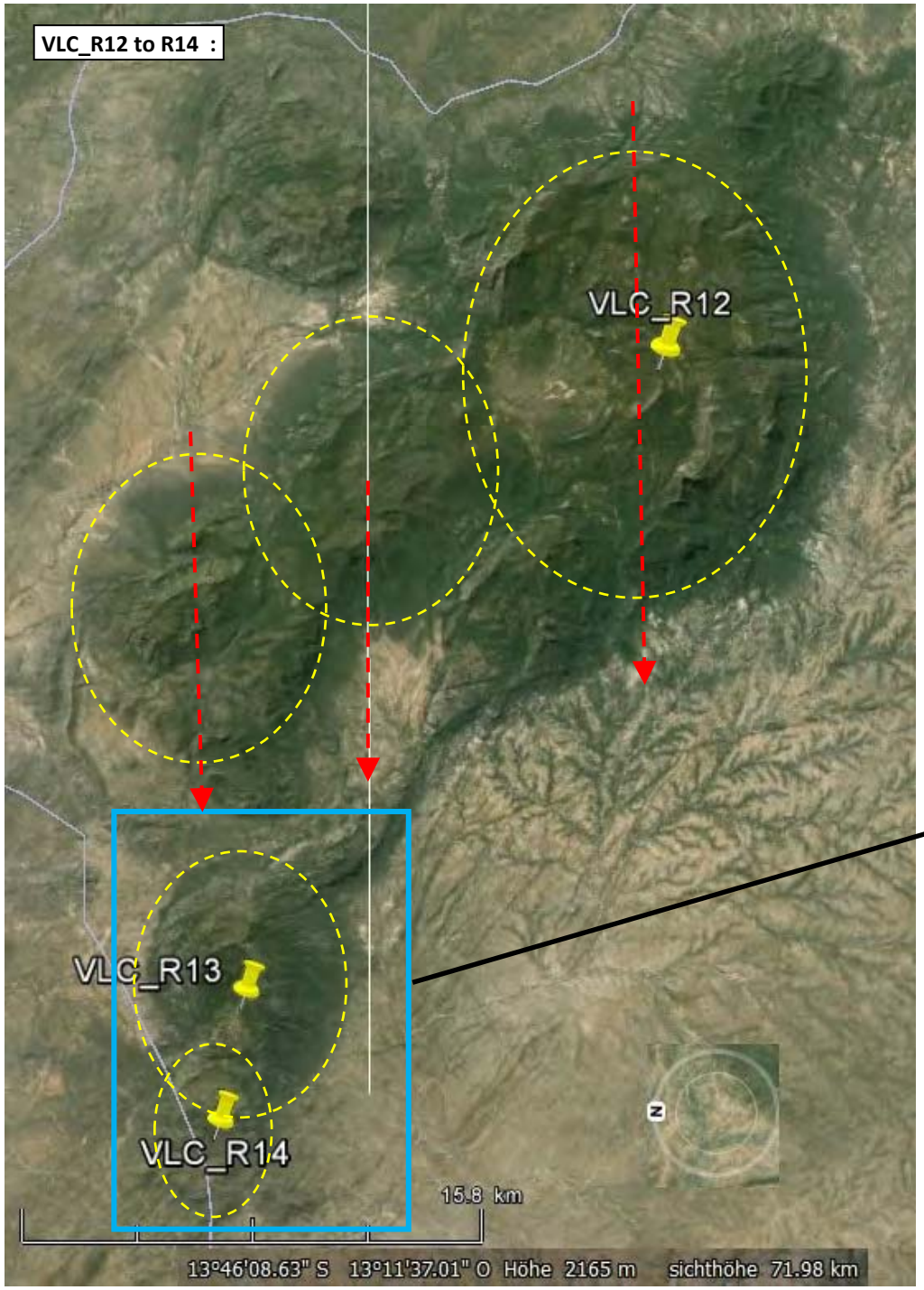

Detail 1 :
1.046 m

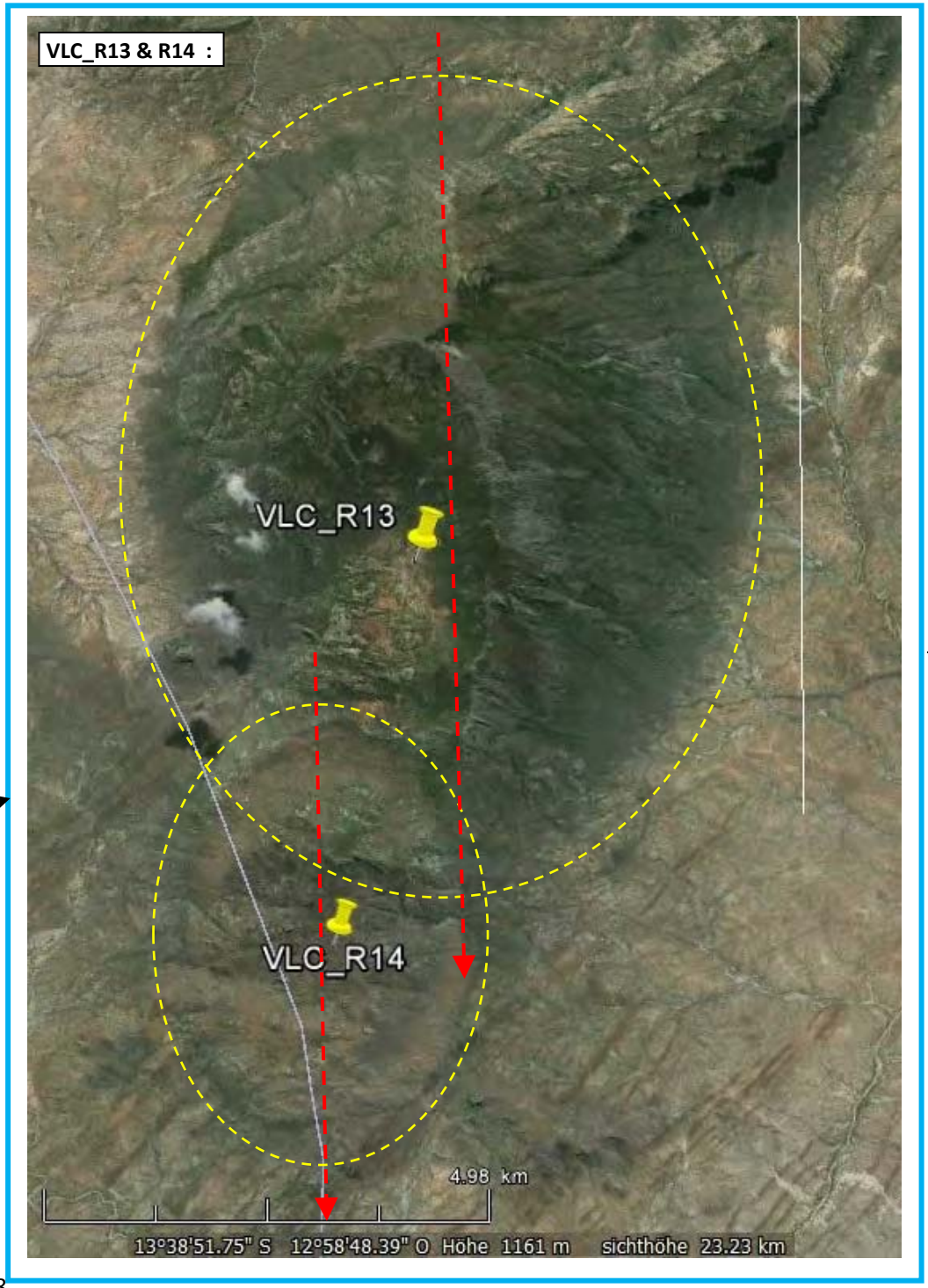

VLC_R10 :
VLC_R10


Detail View of VLC_R10 :
Google earth


VLC_R11 :
VLC_R11

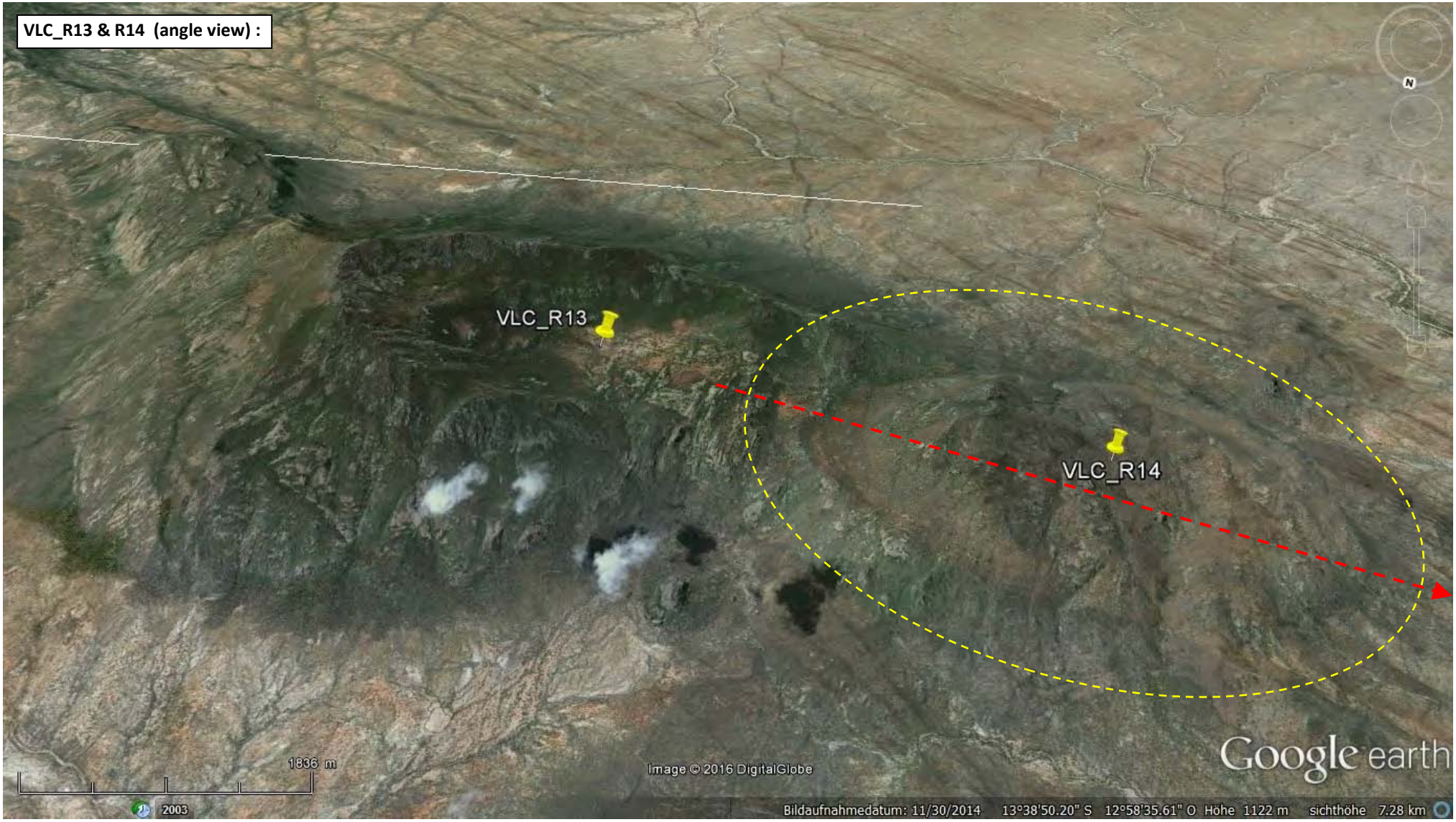

Detail View of VLC_R11 :
Google earth


VLC_R12 to R14 :
VLC_R12
VLC_R13
VLC_R14
15.8 km
13°46'08.63" S 13°11'37.01" O Höhe 2165 m sichthöhe 71.98 km


VLC_R13 & R14 :
VLC_R13
VLC_R14
4.98 km
13°38'51.75" S 12°58'48.39" O Höhe 1161 m sichthöhe 23.23 km

18

VLC_R13 & R14 (angle view) :



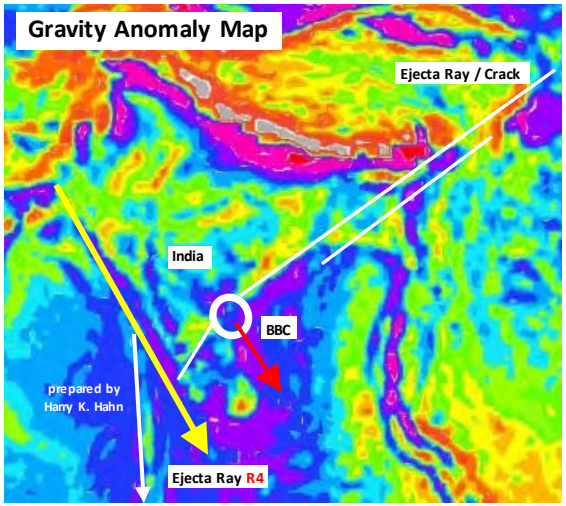
19

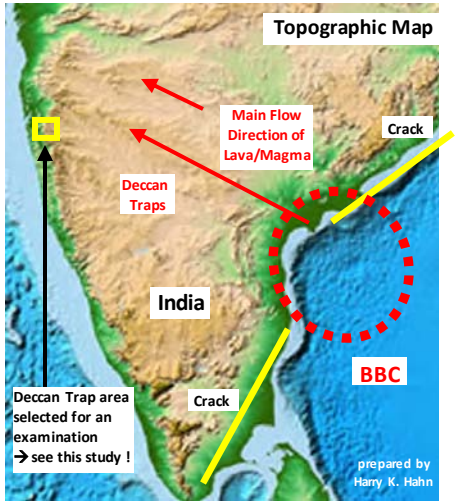
A2 The separation of India from Africa was initiated by a powerful Ejecta Ray (R4) from the PT -Impact Event ~ 253 Ma ago

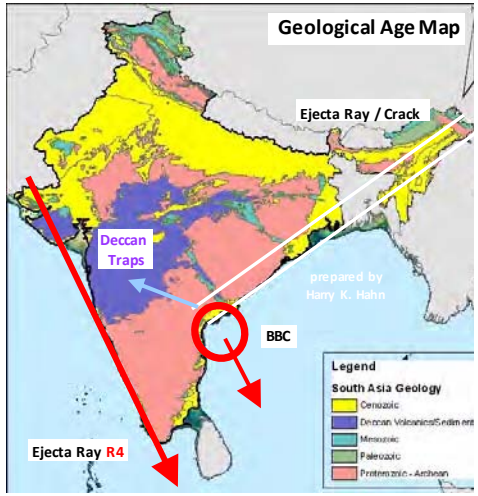
The impactor which caused the Permian-Triassic Impact Crater also produced a number of powerful Ejecta Rays and large Secondary Impactors which caused a global fracture pattern in Earth's crust, which then triggered the break-up of Pangea. The powerful **Ejecta Ray R4** caused an immense crack in the Super-Continent Pangea which defined the eastern border of the African Plate on one side and the western border of the Indian Plate and the Australian Plate on the other side. Another large crack in Pangea's crust was caused by the Bengal Bay Impact which defined India's western border & Australia's NW border and started their separation

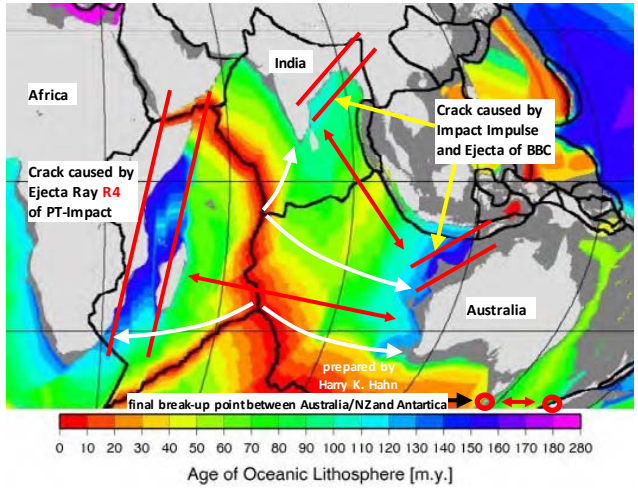
Gravity Anomaly Maps provide evidence that the Indian Plate was formed by Ejecta Rays

The Gravity Anomaly Map of India shows clear evidence of the described **Ejecta Ray R4**. The precise straight purple-colored signature, which indicates the western border of the Indian Plate, provides a first proof that indeed a powerful ejecta ray has separated India from Africa. And there is further evidence for another powerful ejecta ray which started at the center of the BBC and which formed the NE-border of the Indian Plate. Together with the main impact impulse of the BBC the crack caused by this ejecta ray is responsible for the separation of India from Australia. The ocean age map and the major fracture zones in the ocean floor also confirm this scenario. The age of the Deccan Traps (65.7 to 64.9 Ma ago) contradicts this scenario. But it seems that the **Deccan** flood basalts were caused by a much later violent magma eruption from the crack area caused by the BBC. This Magma eruption and the final break-up of Australia from Antarctica may have been triggered by the Chicxulub Impact.





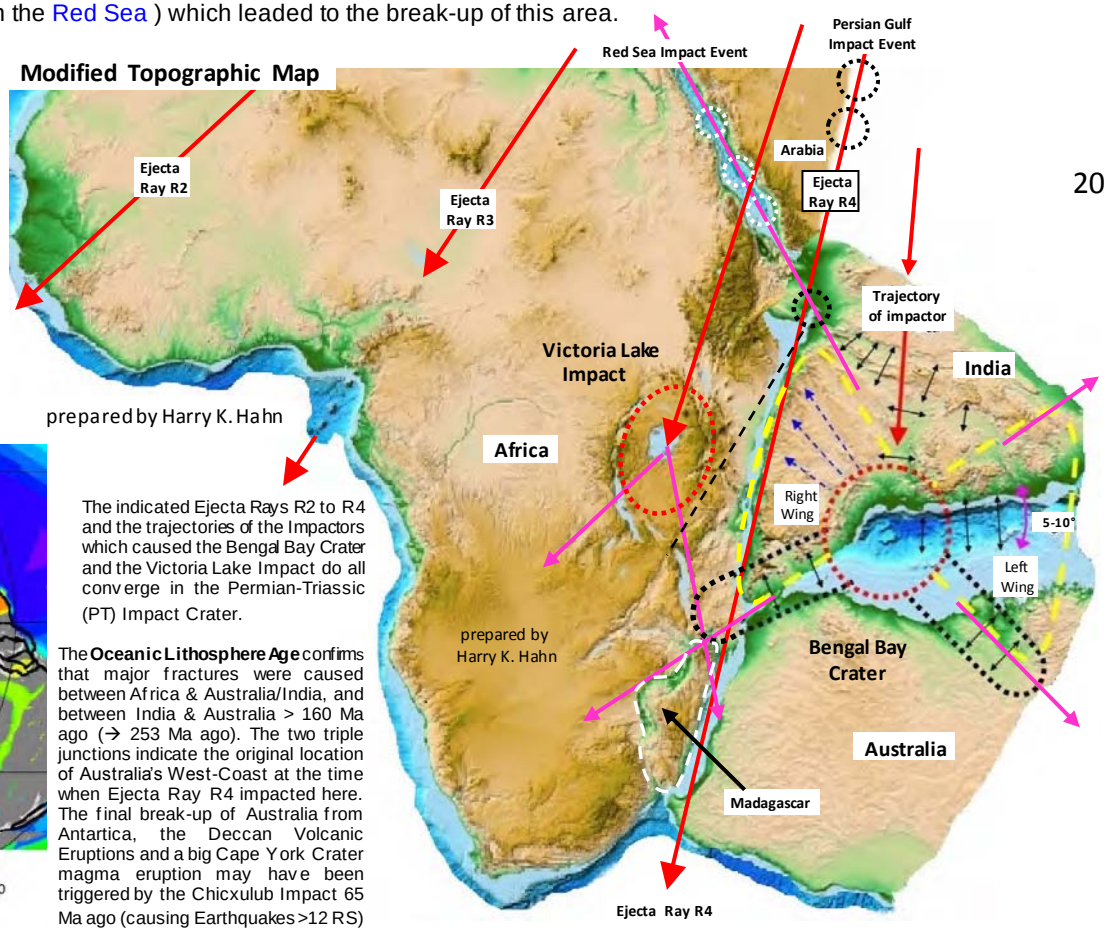




A strong Ejecta Ray (R4) and a large Secondary Impactor caused by the P-T Impact Event leaded to the break-up of India from Africa & Australia (Begin of break-up process : ~ 253 Ma ago) :

This modified Topographic Map shows a probable scenario of the arrangement of these continental plates shortly after the Permian-Triassic (PT) Impact Event. South-America which was still connected to the west-side of Africa, and Antarctica which was still connected to South-Australia and South-Africa at the time of the PT-Impact, are not shown ! Note that the Atlantic Ocean & Southern Ocean, which are partly visible on this map, did not exist at the time of the PT-Impact !

This map shall only demonstrate how Africa, India, Australia and Arabia were arranged to each other, and how this land area of the Super Continent Pangea broke apart, caused by the powerful Ejecta Rays and Secondary Impactors which were ejected from the PT-Impact Crater. Especially the **Ejecta Ray R4** which produced a major crack and the powerful Secondary Impactor which produced the **Bengal Bay Crater (BBC)** are responsible for the break-up of this land area of Pangea. The edges of the ejecta blanket and strong ejecta rays of the BBC caused further cracks in Earth's crust (e.g. between India & Australia, and in the Red Sea) which leaded to the break-up of this area.

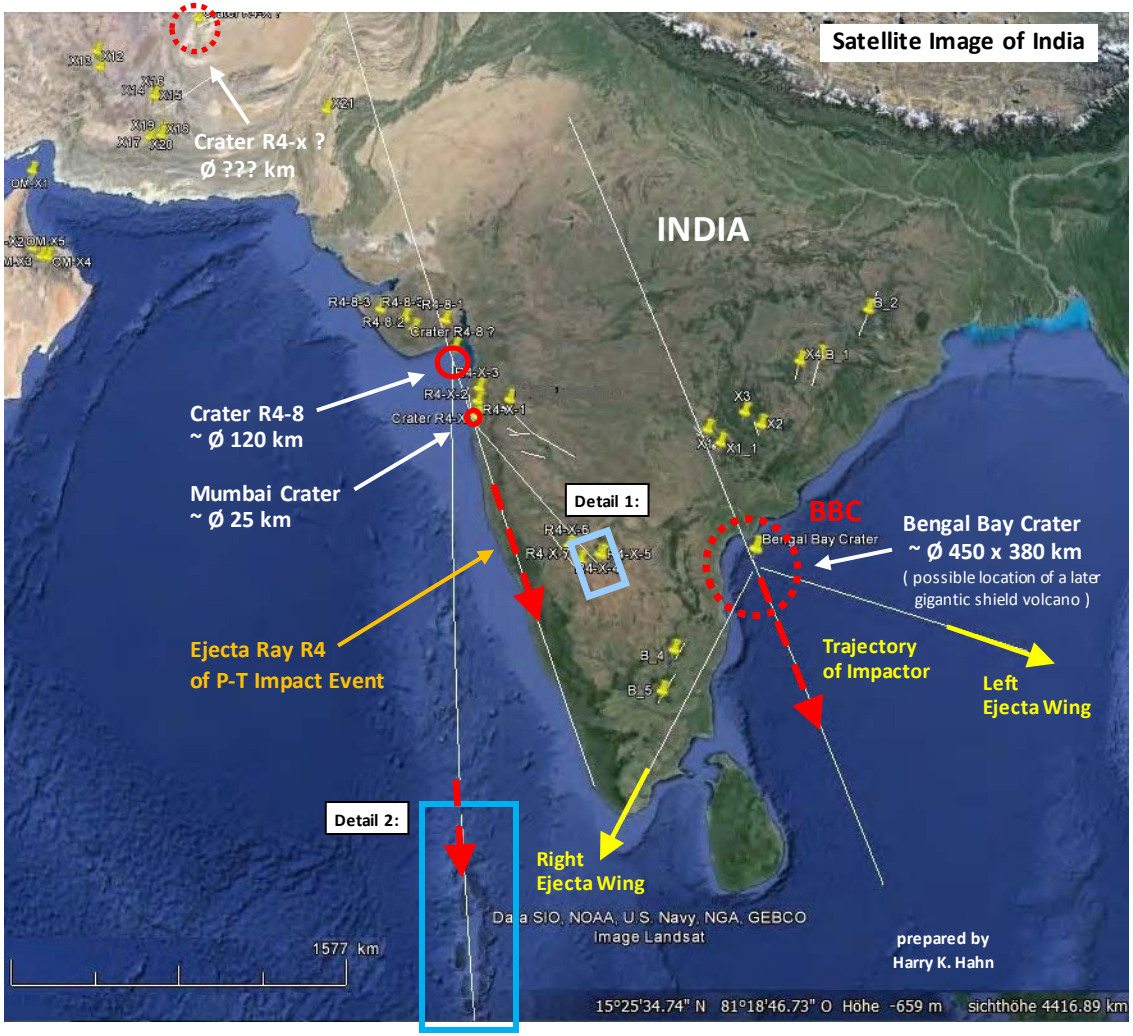


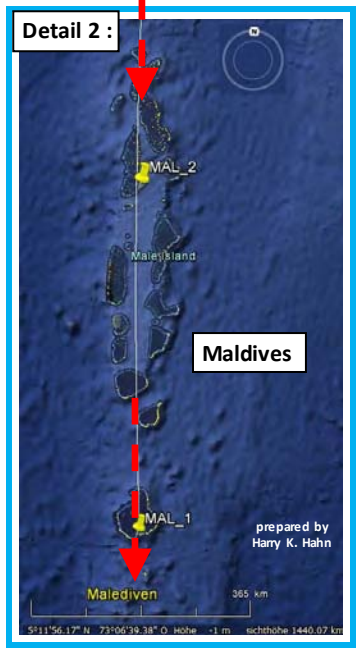
The indicated Ejecta Rays R2 to R4 and the trajectories of the Impactors which caused the Bengal Bay Crater and the Victoria Lake Impact do all converge in the Permian-Triassic (PT) Impact Crater.

The **Oceanic Lithosphere Age** confirms that major fractures were caused between Africa & Australia/India, and between India & Australia > 160 Ma ago (→ 253 Ma ago). The two triple junctions indicate the original location of Australia's West-Coast at the time when Ejecta Ray R4 impacted here. The final break-up of Australia from Antartica, the Deccan Volcanic Eruptions and a big Cape York Crater magma eruption may have been triggered by the Chicxulub Impact 65 Ma ago (causing Earthquakes >12 RS)

Two craters ∅ ~120 km & ∅ ~25 km on the west-side of the Indian Plate were caused by Ejecta Ray R4 from the PT-Impact

The western border of the Indian Plate was formed by Ejecta Ray R4 of the PT-Impact Event. Secondary Impact Structures along this western border of the Indian Plate indicate the location of two craters which lie on the track of Ejecta Ray R4. The first crater (R4-8) with Ø ~120 km is located on the northern end of the linear western border of the Indian Plate. And the second crater with Ø ~25 km ("Mumbai Crater") is located around 240 km south of crater R4-8 , directly on the west-coast of India near Mumbai. There is strong indication that the Iron-Ore Deposits around Sandur are ejecta material which is originating in the Mumbai Impact Crater. This is indicated by the orientation and the drop-shape of this Iron-Ore Deposits (Range). → see detailed images of this and other secondary impact structures on the following pages of this document. The Maldives Maldives, a linear island-chain was formed by either ejecta from Crater R4-8 or by Ejecta Ray R4 itself. This is not clear yet. The ejecta ray which formed the Maldives may have drifted away from the Indian Plate later, because of ocean spreading activity.
Another possible impact crater R4-x was probably also located on the track of Ejecta Ray R4 initially, before it moved west-ward through a gigantic mantle flow (in the Pakistan-/ Iran-area) which was caused when the African Plate separated from the Eurasian Plate after the impact of the ejecta from the PT-Impact Event.
A share of the impulse of the Bengal Bay Impact certainly was responsible for the north-ward acceleration of the Indian Plate, which caused the Himalaya when India collided with the Eurasian-Plate. The Deccan Traps probably were caused by a much later violent magma eruption coming from the crack area caused by the BBC. Maybe these flood basalts came from a gigantic shield volcano which collapsed because of earthquakes (>12 RS) triggered by the Chicxulub Impact , 65 Ma ago.

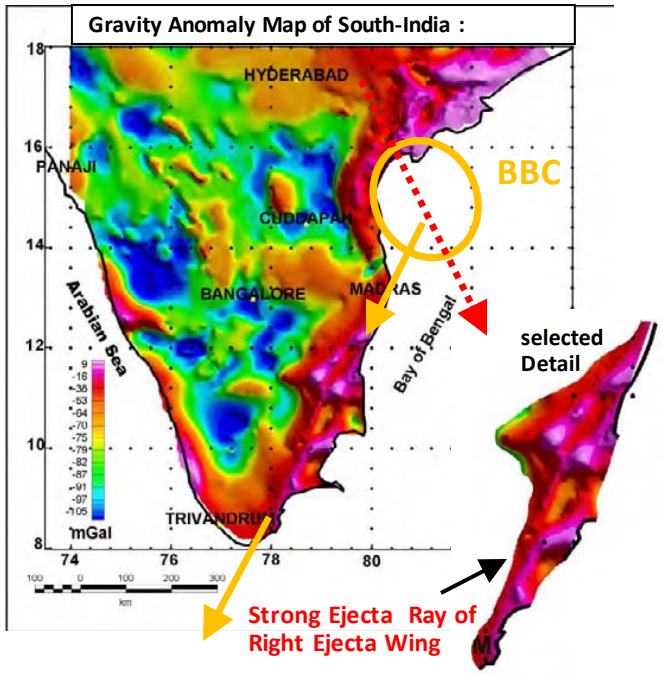


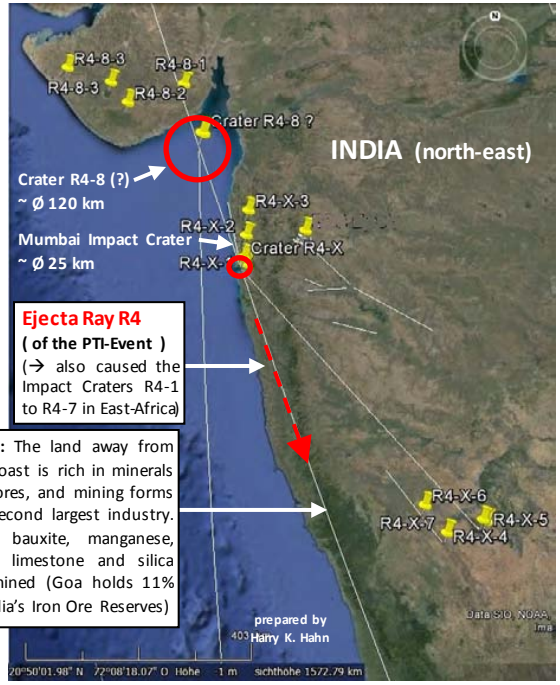


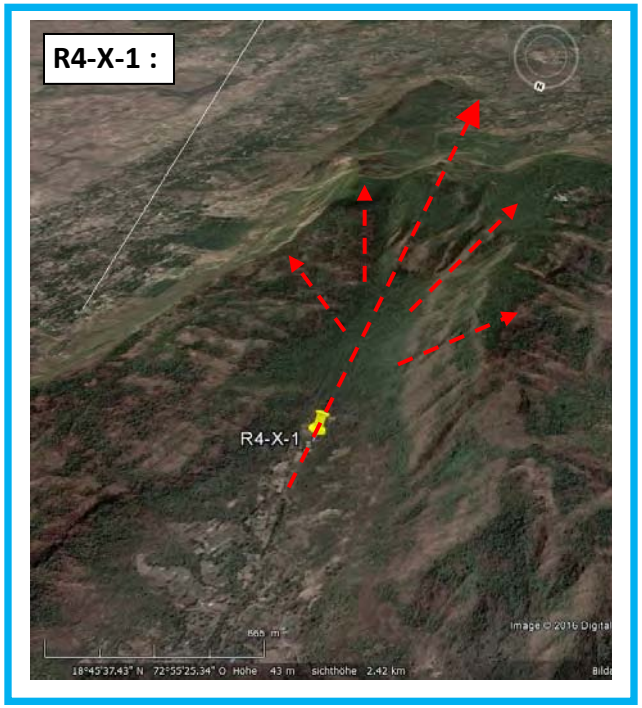
Detail 1 : The Iron-Ore Deposits around Sandur in the Ballari District are ejecta material which is originating in the Mumbai Impact Crater

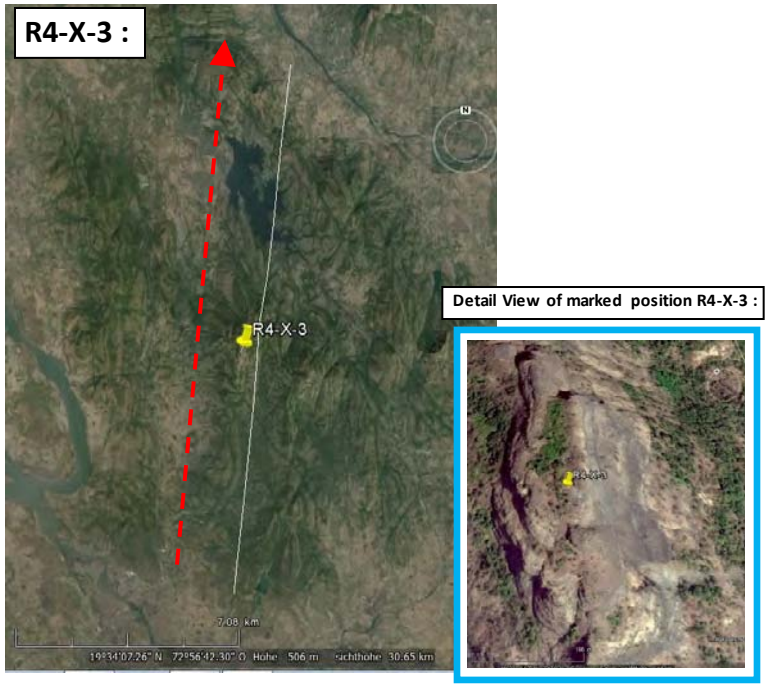
Detail 2 : The Maldives are the result of a strong ejecta ray from Crater R4-8 or a result of Ejecta Ray R4 itself. This ejecta material may also be rich in Iron-ore & other Metal-Ore. (magnetic anomalies on Maldives)

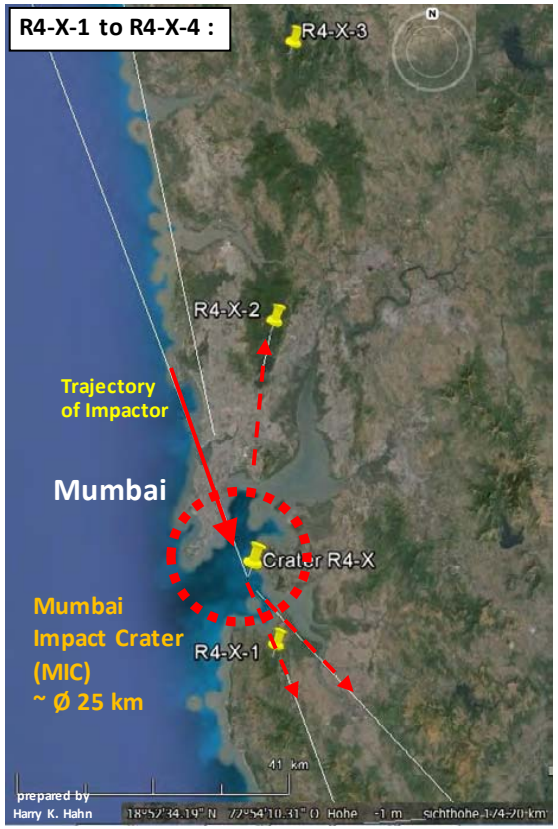
Gravity Anomaly Map of South-India : This map clearly indicates the ejecta ray which formed the south-east border of the Indian Plate. The purple- & red-colored linear structures indicate the ejecta ray (ejecta material) which caused a major crack between the Indian Plate and the Australian Plate 253 Ma ago, which then eventually led to the separation of these two Plates (together with the other much longer crack along the NE-border of the Indian Plate.



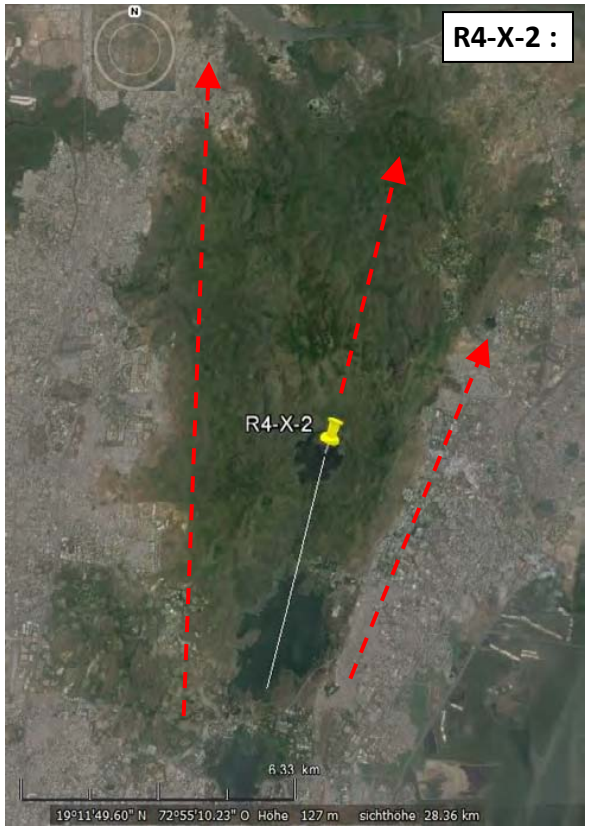

R4-8-3
R4-8-1
R4-8-3
R4-8-2
Crater R4-8 ?
INDIA (north-east)
Crater R4-8 (?)
~ Ø 120 km
R4-X-3
R4-X-2
Mumbai Impact Crater
~ Ø 25 km
Crater R4-X
R4-X-
Ejecta Ray R4
(of the PTI-Event)
(→ also caused the Impact Craters R4-1 to R4-7 in East-Africa)
Goa : The land away from the coast is rich in minerals and ores, and mining forms the second largest industry. Iron, bauxite, manganese, clays, limestone and silica are mined (Goa holds 11% of India's Iron Ore Reserves)
R4-X-6
R4-X-7
R4-X-5
R4-X-4
prepared by
Harry K. Hahn


R4-X-1 :
R4-X-1

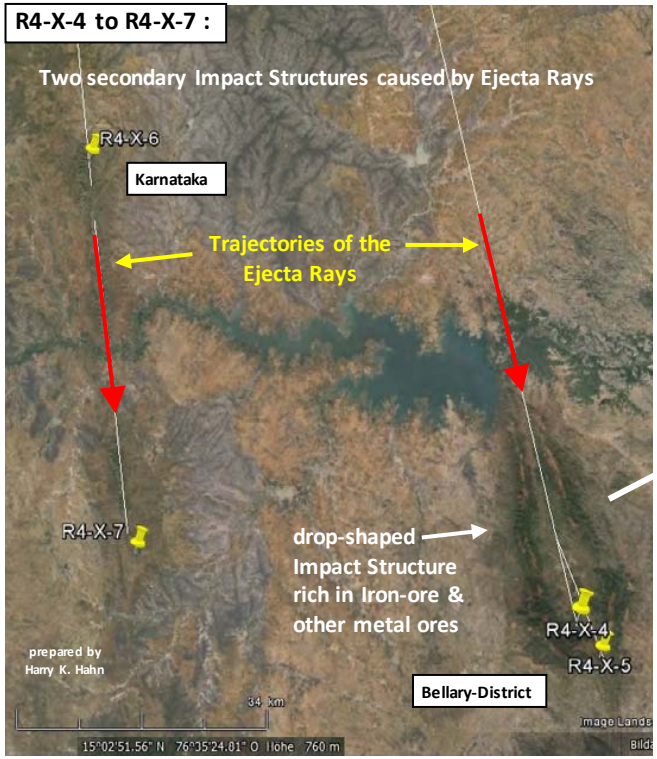

R4-X-3 :
R4-X-3
Detail View of marked position R4-X-3 :

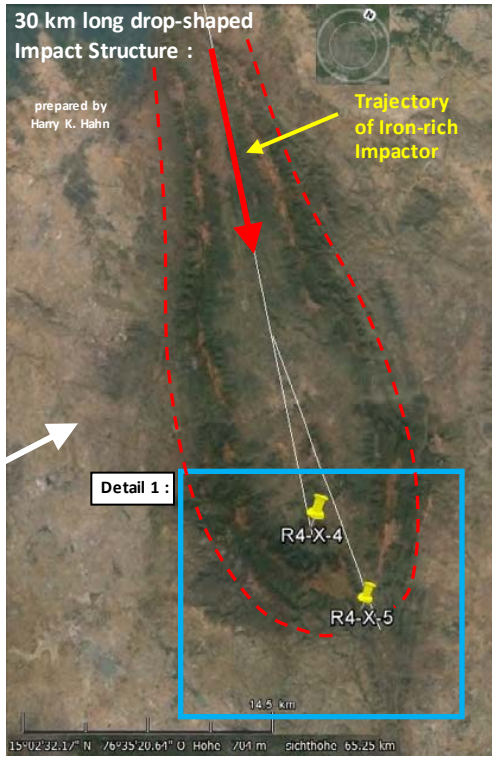

R4-X-1 to R4-X-4 :
R4-X-3
R4-X-2
Trajectory of Impactor
Mumbai
Crater R4-X
Mumbai Impact Crater (MIC) ~ Ø 25 km
R4-X-1
prepared by
Harry K. Hahn

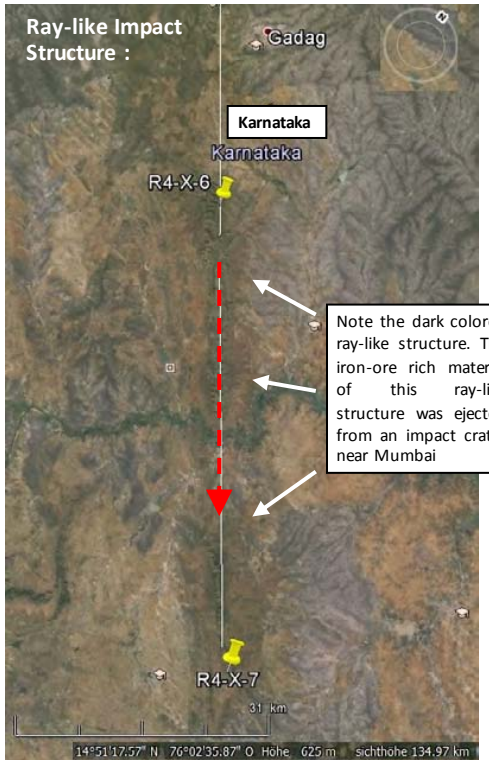

R4-X crater area :
Crater R4-X
Bay of Mumbai
R4-X-1


R4-X-2 :
R4-X-2

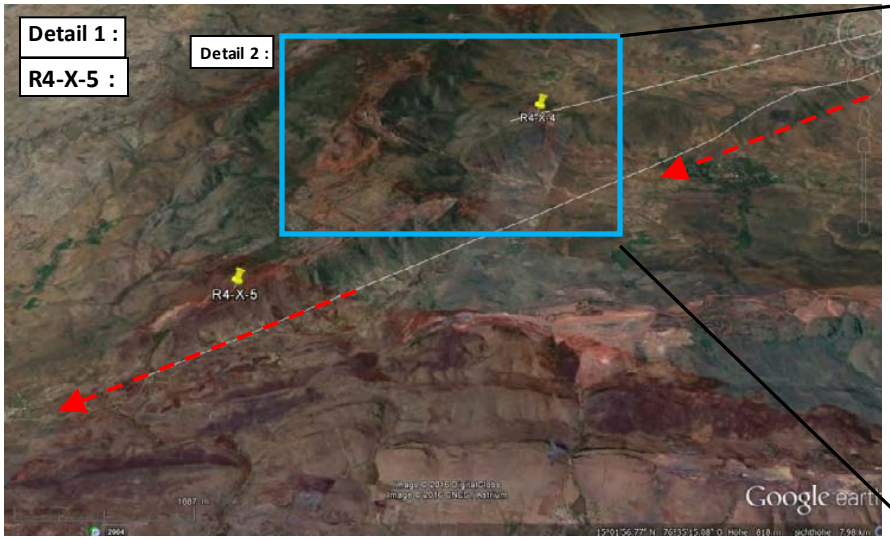
India's Iron-Ore-Reserves are the result of Secondary Impacts caused by ejecta from the Mumbai Crater, the BBC and the P-T Impact Crater in general







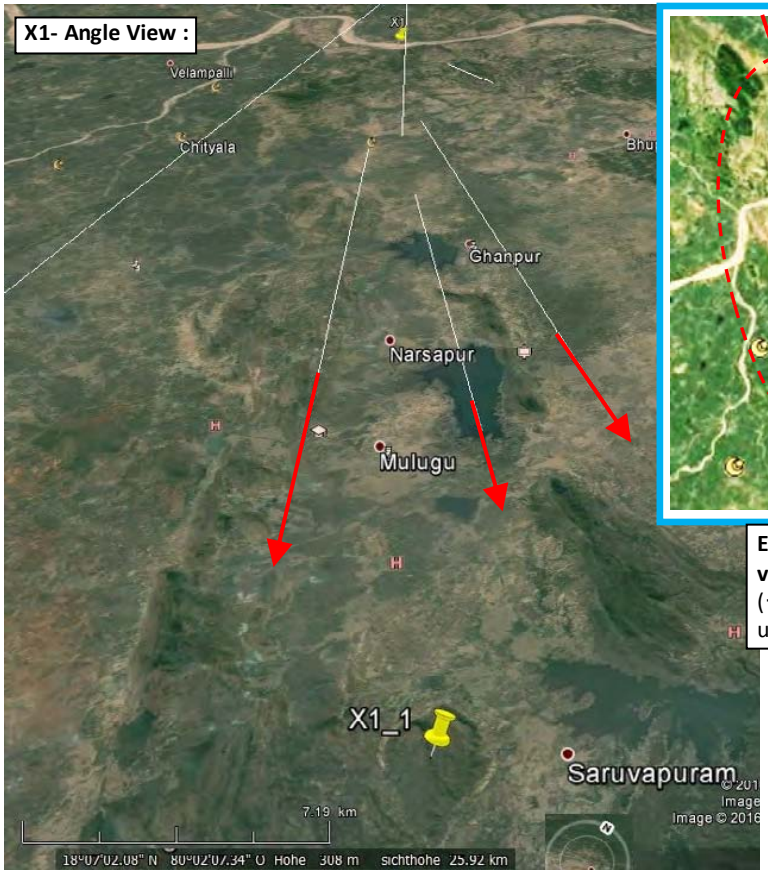
There is clear indication that the Iron-Ore Deposits near Sandur in the Ballari District are ejecta material which is originating in the Mumbai Impact Crater –



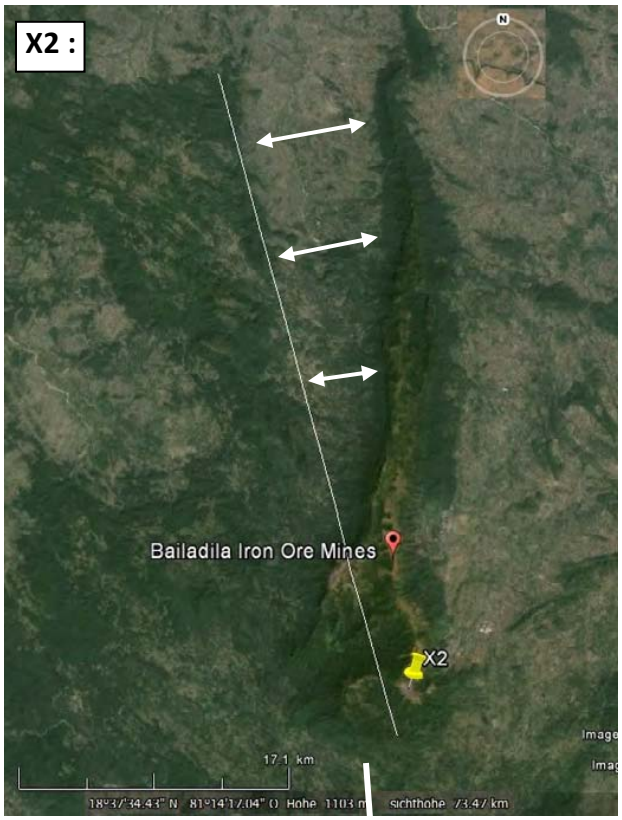
The drop-shape of the mountain range around Sandur (→ iron-ore deposits), its exact orientation and the visible ejecta ray near Gadag lead to the bay near Mumbai.

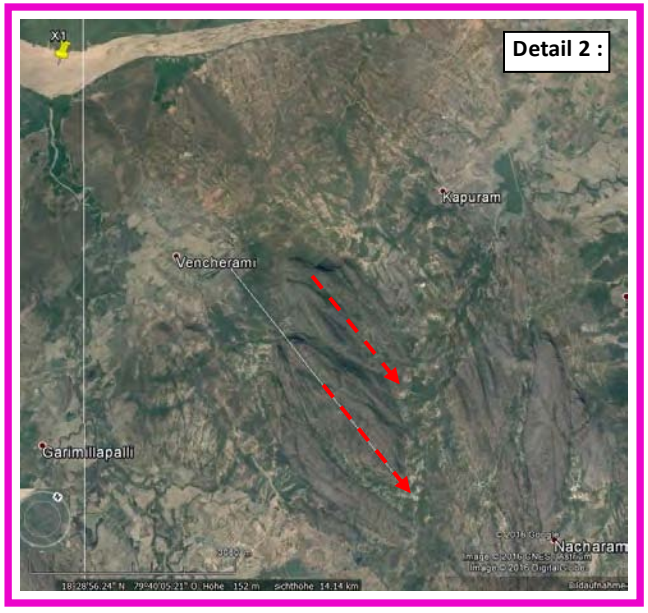
This leads to the logical conclusion that the bay of Mumbai must be caused by an Impact Crater, which was formed by an iron-rich impactor probably originating from the PT-Impact Event.
(this can be concluded from the probable trajectory of the Impactor which caused the Mumbai Impact Crater)

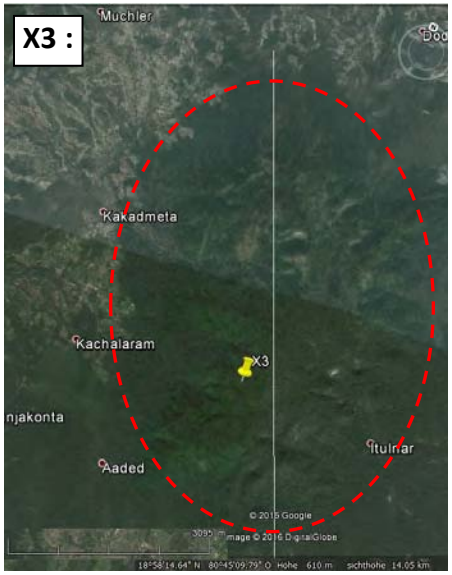
Ballari District is rich in mineral resources. It contains 25% of India's Iron ore reserves. It has both metallic and non-metallic minerals. The metallic minerals include iron ore, manganese ore, redoxide, gold, copper and lead. The non-metallic minerals include andalusite, asbestos, corundum, clay, dolomite, limestone, limekankan, moulding sand, quartz, soap stone, granite and red ochre.



Elliptical Impact Structure visible near Peddapalli (→ contrast enhancement used in the image)



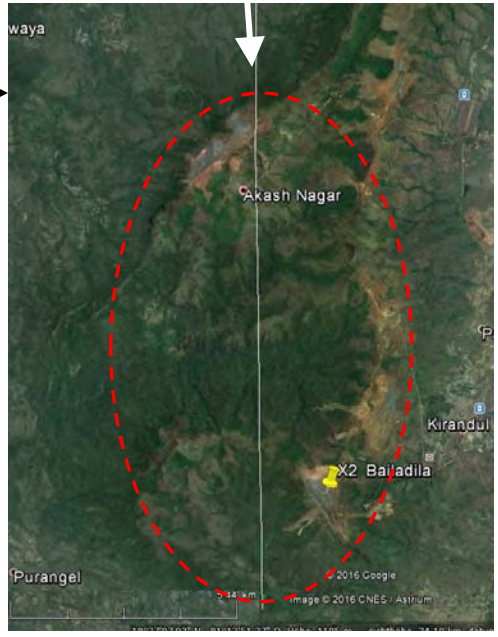




Iron-Ore rich Impact Structure : →

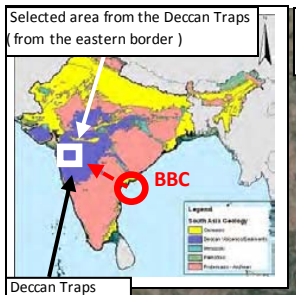
Near Bailadila/India there is another iron-ore rich secondary impact structure which could be a result of the Bengal Bay Crater (BBC). However it could also be the result of another large secondary crater caused by the P-T Impact, or it could be a direct result of the P-T-Impact

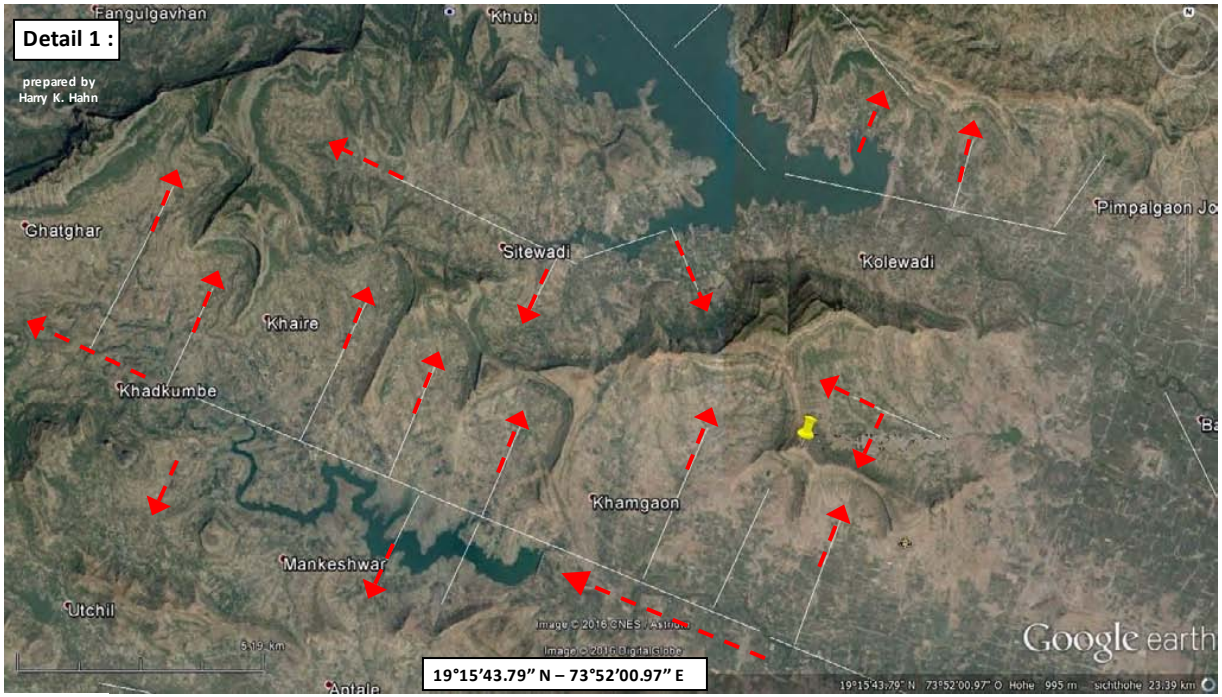
Very high grade Iron-Ore (hematite & magnetite) is located in this drop-shaped secondary impact structure in the Bailadila sector of Chhattisgarh

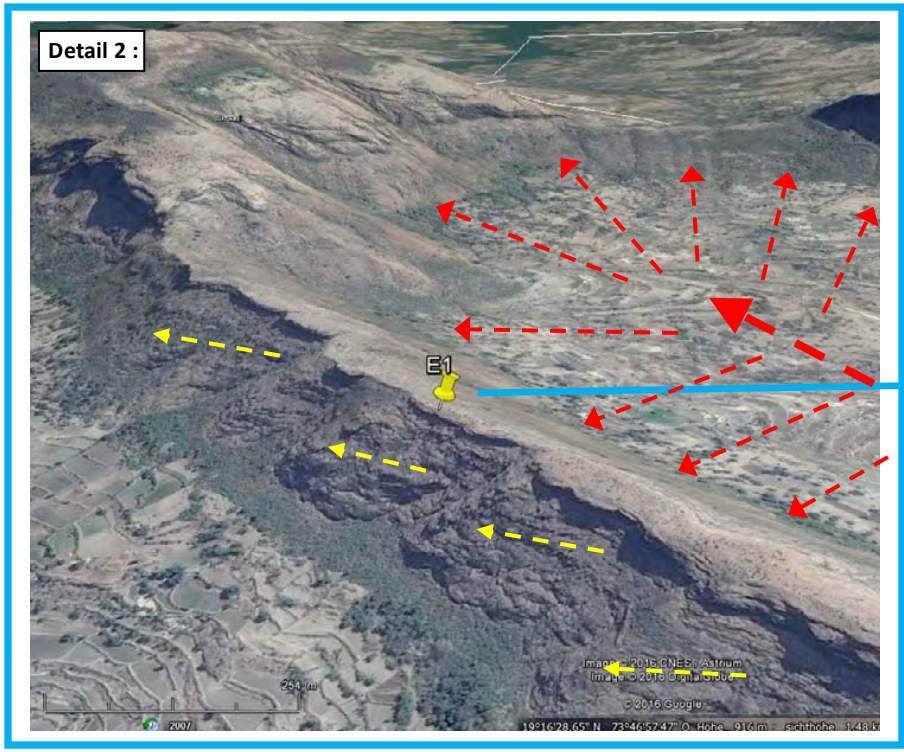


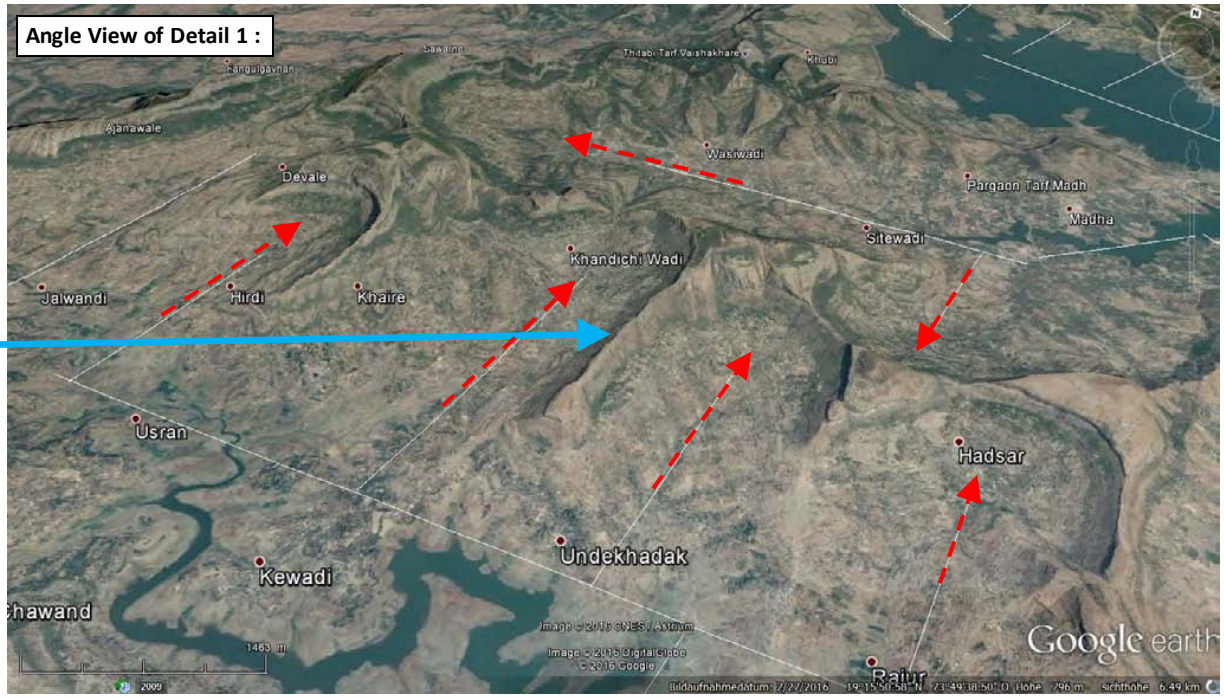
There is structural evidence that the Deccan Traps (flood basalts) in India are an after-effect of the Ø 450 x 380 km Bengal Bay Impact Crater Event

The topographic structures visible in the Mankeshwar-Ghatghar area indicate that they were formed by magma streams which had defined flow directions. It seems that from a larger “magma stream” which formed the main valleys smaller “magma streams” were catapulted outward vertical to the main axis of the large “magma streams” during a magma outburst

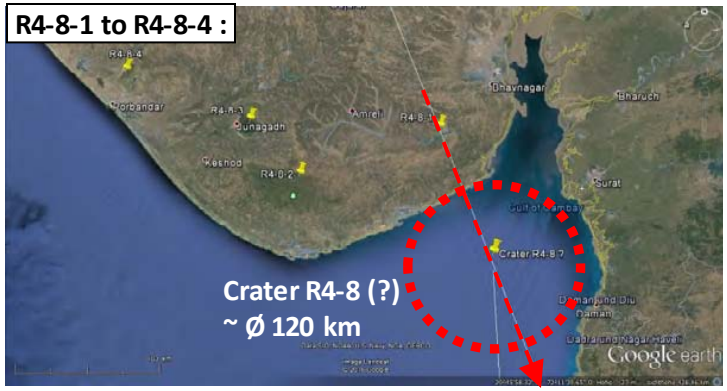








R4-8-1 to R4-8-4 :



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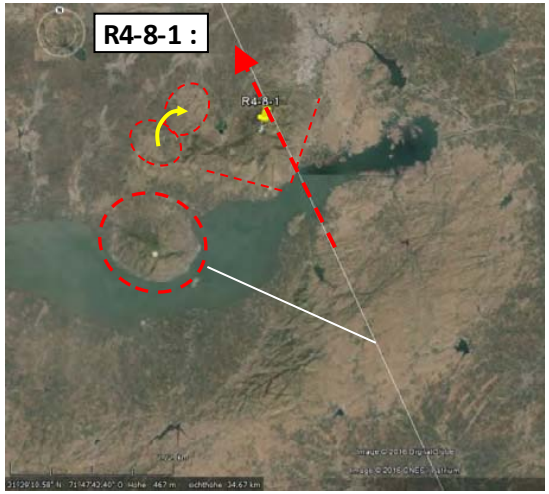

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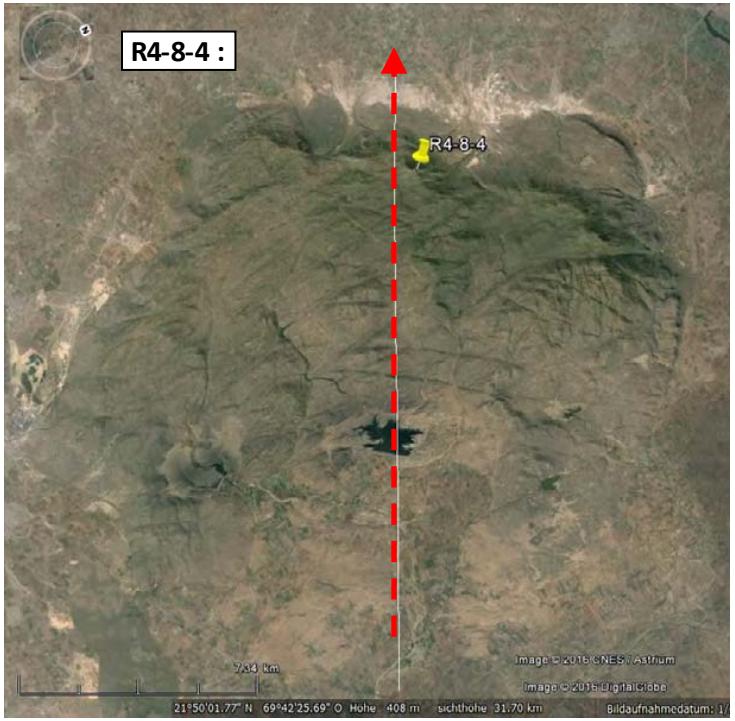

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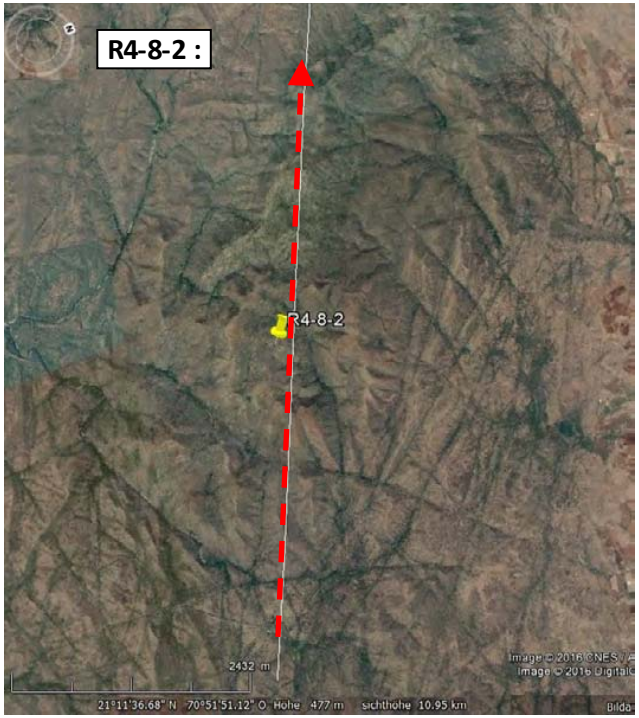
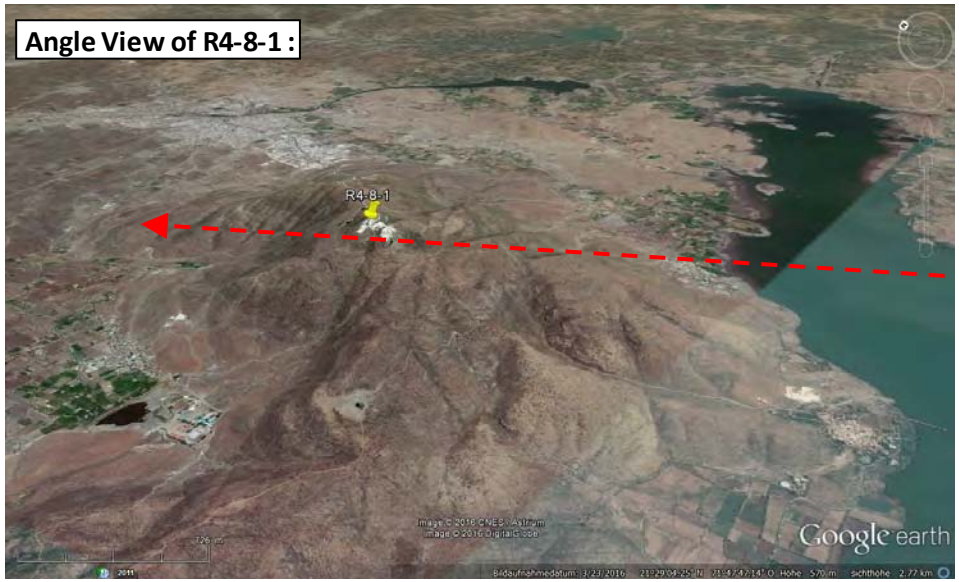
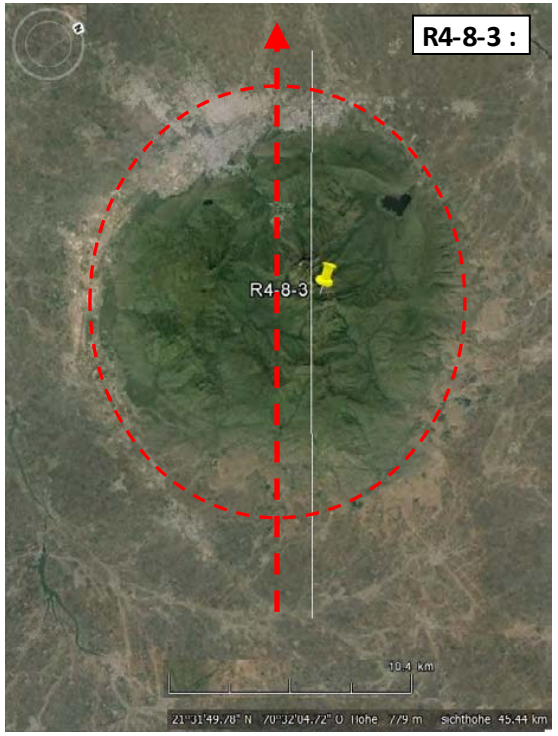


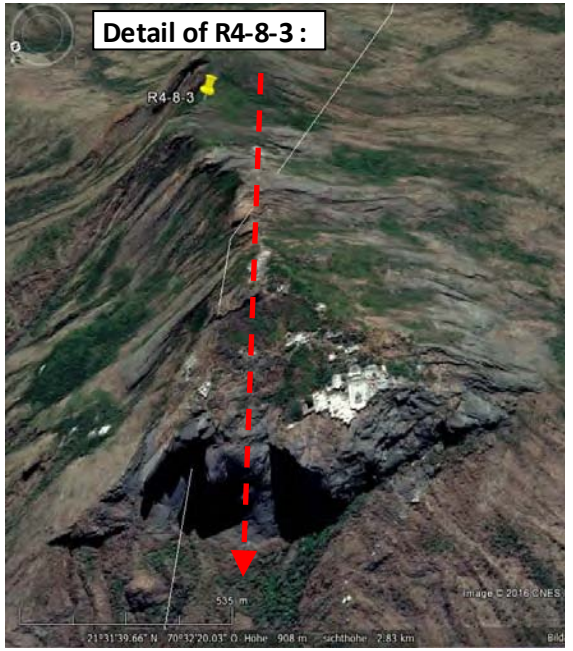
Angle View of R4-8-1 :



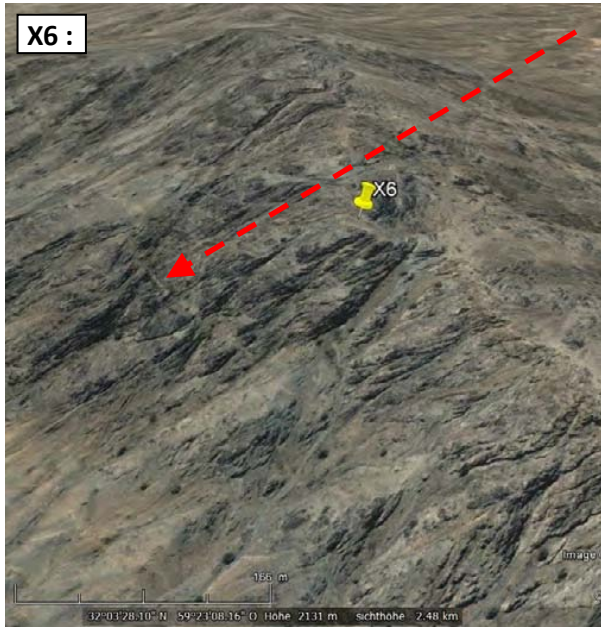
R4-8-3 :

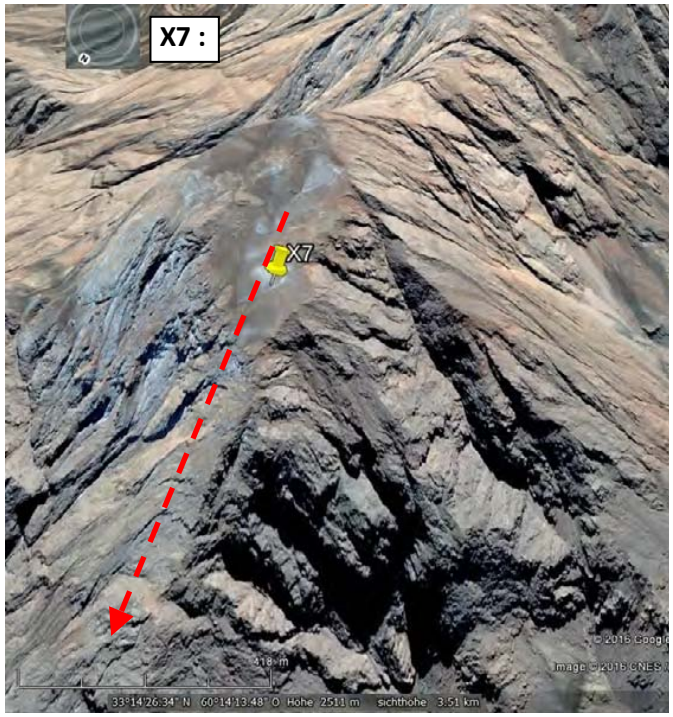


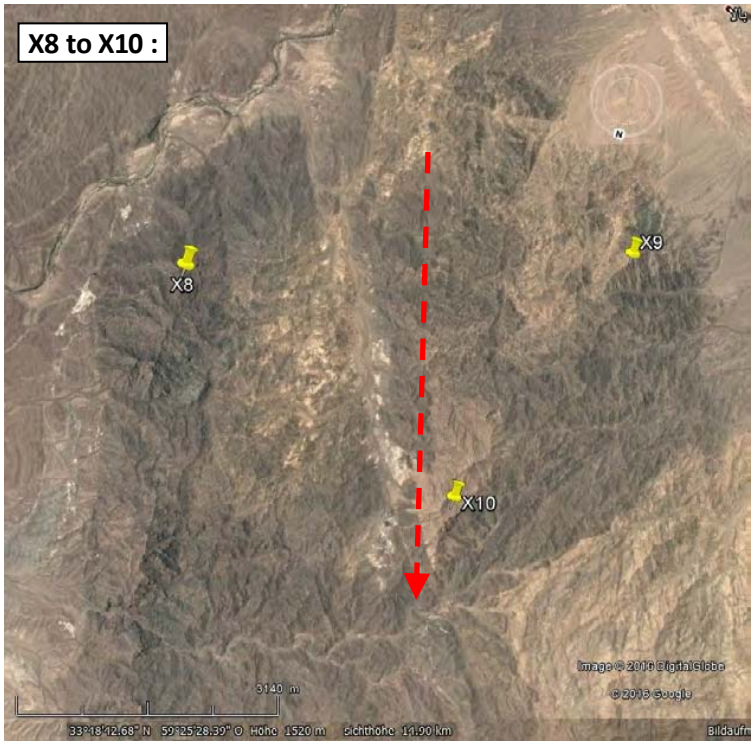
Detail of R4-8-3 :

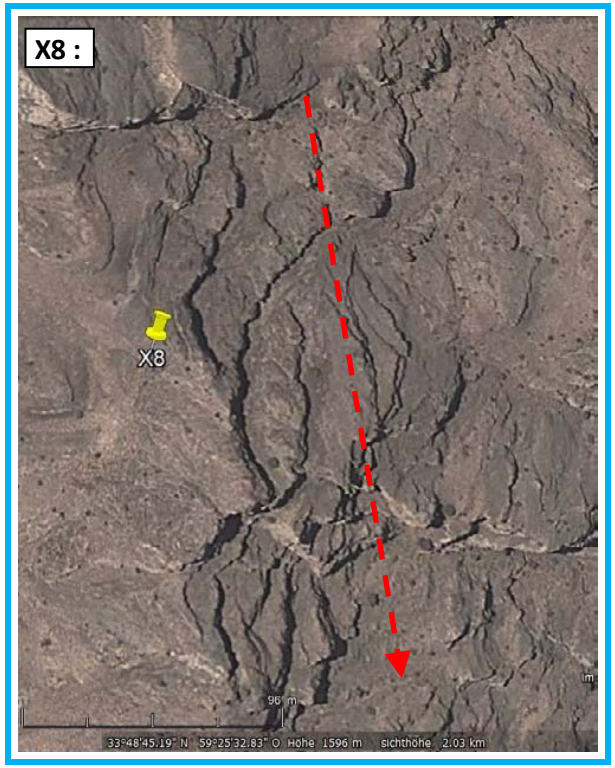


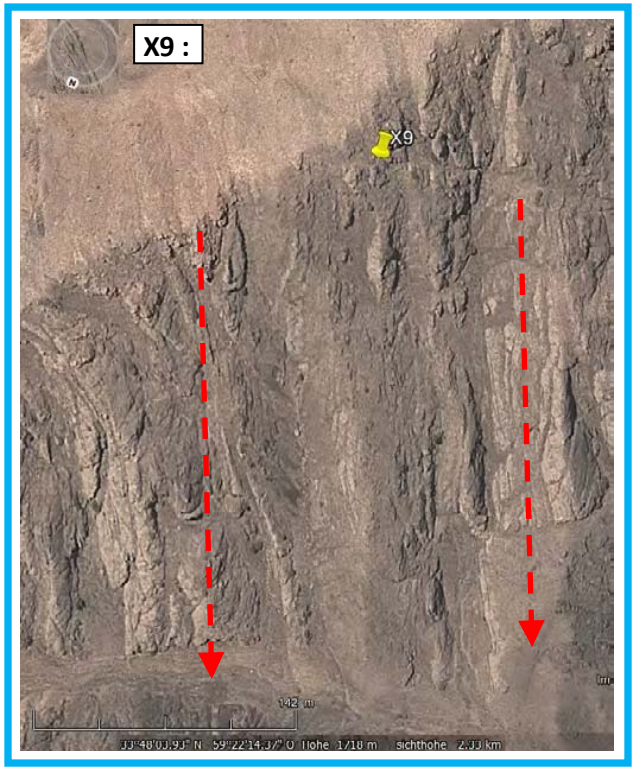
The shown Secondary Impact Structures probably are the result of another Impact Crater R4-X , which was caused by the Ejecta Ray R4 from the P-T Impact Event



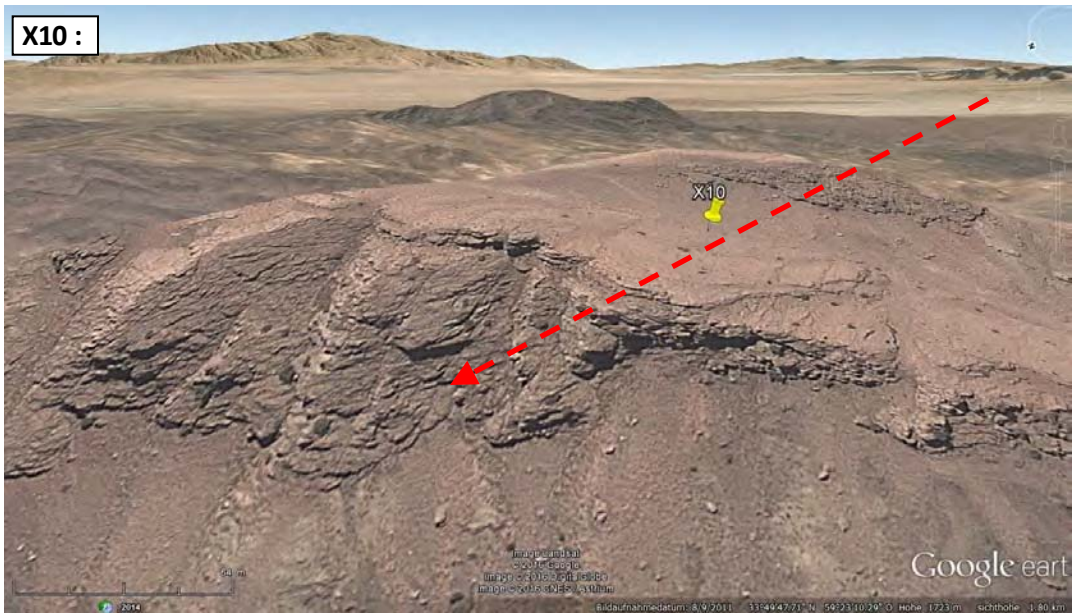






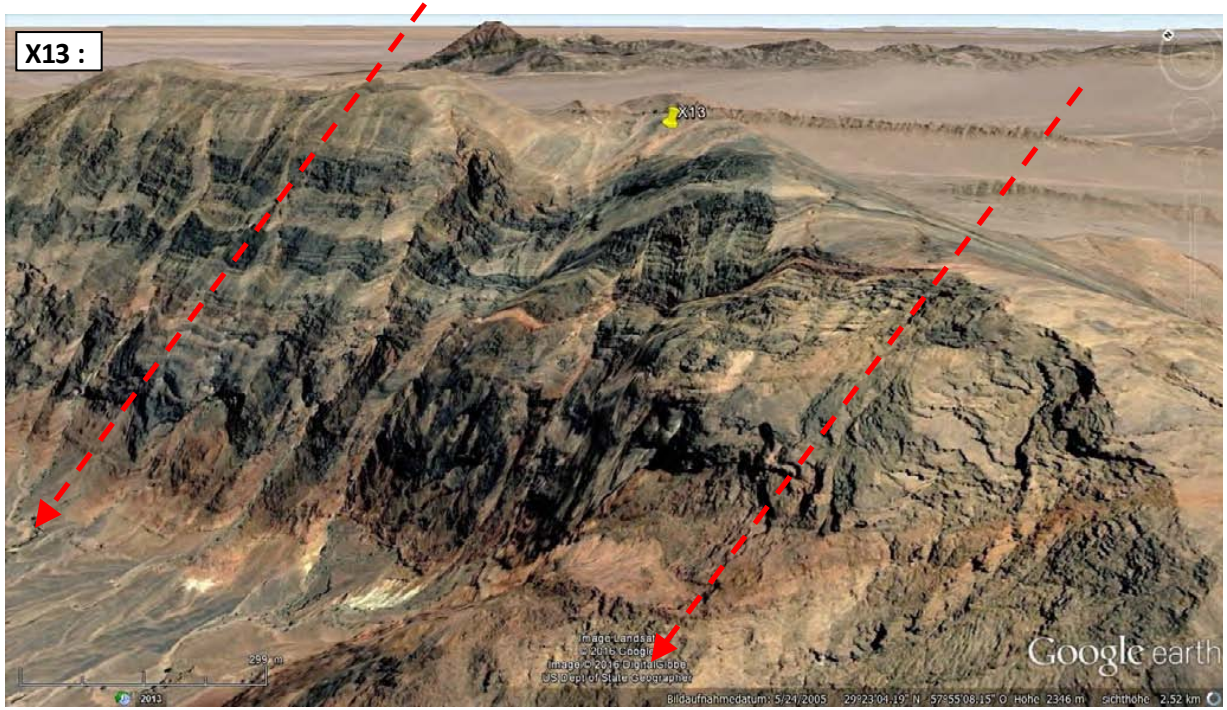


X10 :

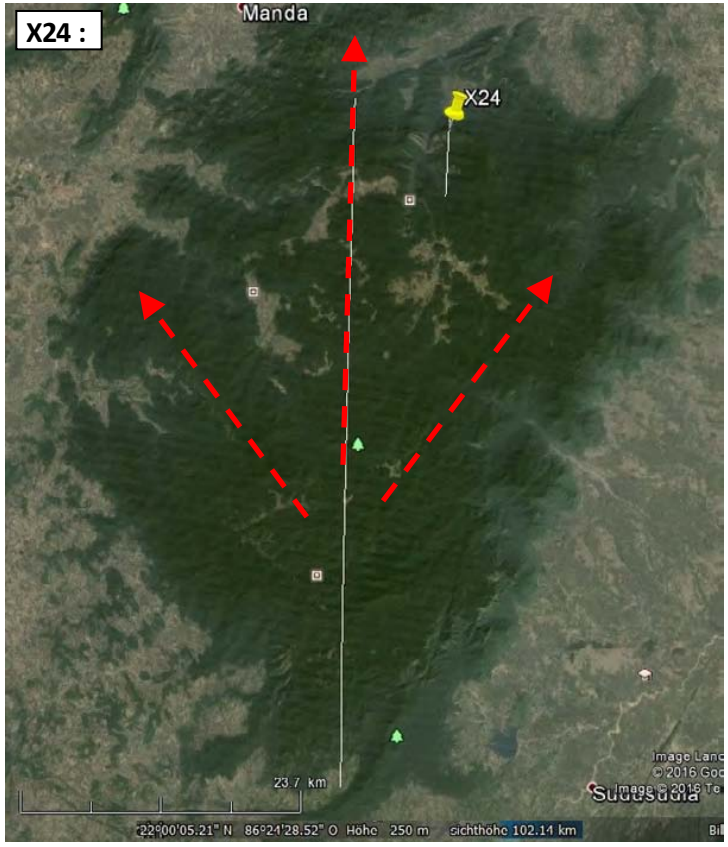


X12 :

X13 :



X24 :



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