

GeoRoute **1** **Yerba Buena > Raco** **DIFFICULTY: LOW**

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CONICET

AN EASY-TO-REACH GEOLOGY

ENGLISH 



AN EASY-TO-REACH GEOLOGY

This geo-touristic route offers a near, nice and simple sightseeing that allows to appreciate some singular geological elements, representative of the first spur of the Andean mountain range. The route runs along the north of San Javier's mountain range, visiting part of a protected area, property of the Tucuman's National University ("Parque Sierra de San

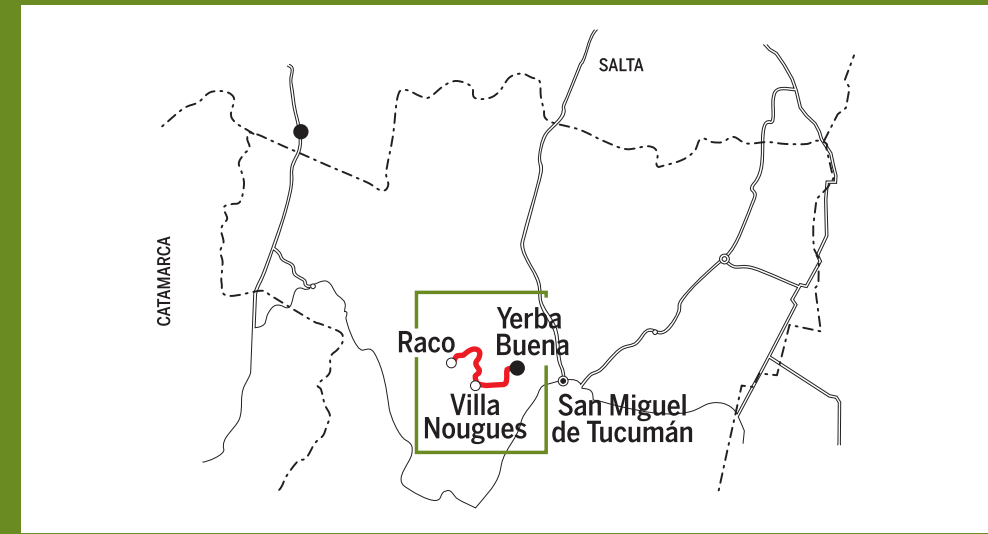
Javier"). This circuit, as well as the geo-touristic route #2 Tafi/Quilmes, constitute the altered areas with the highest risk of anthropic degradation. Here, rocks that represent a sea floor of about 540 million years will be observed, and continental sediments of about 60 million years.



DESCRIPTION OF THE ROUTE

It is recommended to position the vehicle's odometer in zero at the Yerba Buena's mast, so as to locate the offered stops more efficiently. The trip begins in Yerba Buena, taking Solano Vera Ave. towards La Rinconada and from there to Villa Nougues. Once concluded the route, it is possible to return to the city by route 9 (from Tapia) or going back over La Sala and San Javier.

- 1ST STOP**
Located xx km from the beginning of the trip. A landslide of the hillside generated during the aestival period can be seen here.
- 2ND STOP**
At the watertower located xx km from the previous point, a panoramic view from the north of the mountain range, as well as a the hillside it can be appreciated.
- 3RD STOP**
In Villa Nougues the hostelry and the chapel areas are visited.
- 4TH STOP**
Besides the 341 route, at xxx km, the most ancient rocks can be seen.
- 5TH STOP**
Passing San Javier, at the xxx km of the route, you go towards the waterfall of the Parque Sierra San Javier.
- 6TH STOP**
At the xxx km, at about xx minutes by car, we stop over the La Sala bridge.
- 7TH STOP**
Over the xxx km, in a sloping sharp curve and towards the west, we stop to observe the point of interest.
- 8TH STOP**
At xx km and over the hillside some processes of erosion, typical of the area, can be appreciated.
- 9TH STOP**
xxx km near the monastery and along the river bed of the El Siambòn stream that runs by the road.
- 10TH STOP**
The last point of interest is located besides the road, at xx km towards the east of the 340 and 341 provincial road's intersection.



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CHARACTERISTICS

Longitude: 140 kilometres
By vehicle: 6 hours
Maximum altitude: 1.400 m.a.s.l.

- Recommendations:**
- Transitable in private or rented vehicles, bicycles and motorcycles.
 - If you travel by motorcycle, be respectful with the environment.
 - Public transport reaches some points of the route.
 - Do not abandon paths or ways.
 - It can be combined with a visit to "Loma Bola" and the Benedictine monastery (Raco).
 - As a short alternative, it is possible to go up and get down by "El Corte". Good alternative for footpath.

GENERAL ADVICES/ WARNINGS

Respect the flora, fauna and the geological resources of the circuit.
Drive carefully since traffic is frequent, specially at weekends.

If a fire is lit up, do it in authorized areas, and later on, make sure it is entirely extinguished.
Part of the circuit is done by "Parque Sierra San Javier", a protected area that must be respected.

Do not throw litter. Put it away in containers and trash cans in Villa Nougues, San Javier or Raco.
When walking along the route, do it by the road side and in opposite direction to the traffic.

Sandstones
Sedimentary rock formed by the accumulation of mainly Quartz's grains. This rock generated as a result of a fluvial or eolic transport.



Conglomeratic sandstones
Sedimentary rocks constituted by fragments of varied granulometry, where the sand fraction is highlighted. In this case, its origin is continental.



Schists and slates
Metamorphic rocks generated by a sedimentary rock that has varied its mineralogic composition through processes that involve pressure and temperature.



Sandstones with gypsum and limestone
Sedimentary rocks that have been deposited in a lacustrine and fluvial environment, approximately eleven million years (Miocene).



GUIDE FOR ROCK IDENTIFICATION IN THE FIELD



STOP 1

Hillsides in movement
In the hillsides of the San Javier mountain range, slides in summer time are frequent. These slides take place as a result of different factors, which get together as climate and the internal structure of the rock.



STOP 2

A fault raised the mountain range
During the Andean cycle, systems of faults structured the west of Tucumán. One of these great faults is the one that delimits the San Javier mountain range to the east, allowing its upheaval.



STOP 3

The usage of materials
Due to distance and economic factors, many of the constructions in Villa Nougues have been done using the place's resources, with the schists of the San Javier's formation (530 million years).



STOP 4

Outcrops of the San Javier Formation
These rocks constitute the most ancient of Tucumán's province and they were generated at the bottom of a marine stratum more than 500 million years.

STOP 5

Modeling water
This locality is found in "Parque Sierra de San Javier" and it is a classic area in the tourist circuit of the mountain range. In the slope towards the river, reddish continental sandstones of Salta Group can be appreciated (A) (deposited during the dinosaurs' era), sandstones of the Cenozoic Era (B) (approximately 60 million years), and the shales of San Javier formation (C) affected by an intense holding produced throughout 500 million years. Water has modeled the waterfall over the latter.

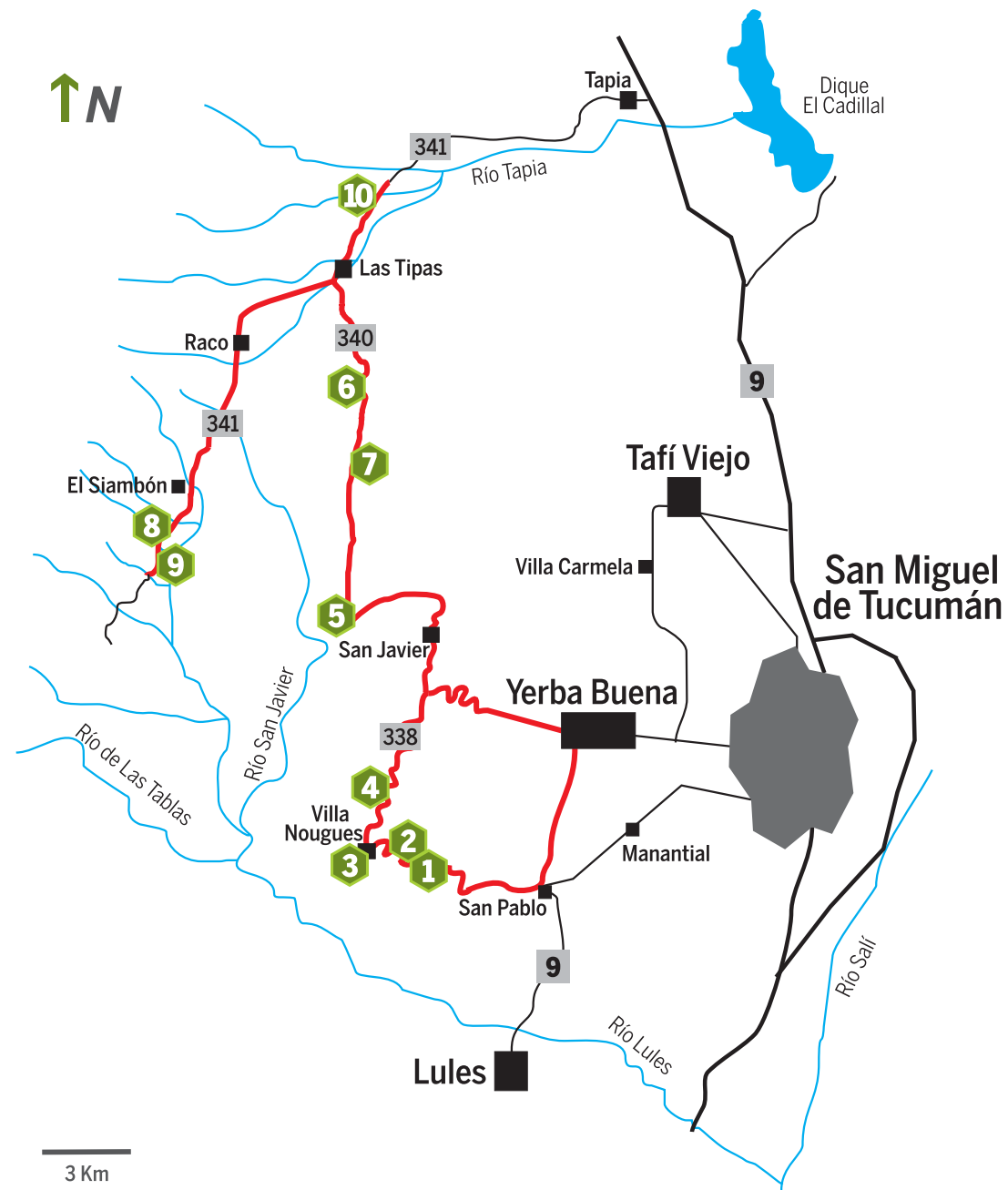


STOP 6

A different Tucumán
The reddish sandstones of the west side of the mountain range constitute the register of rivers developed in an arid climate more than 100 million years in the region.

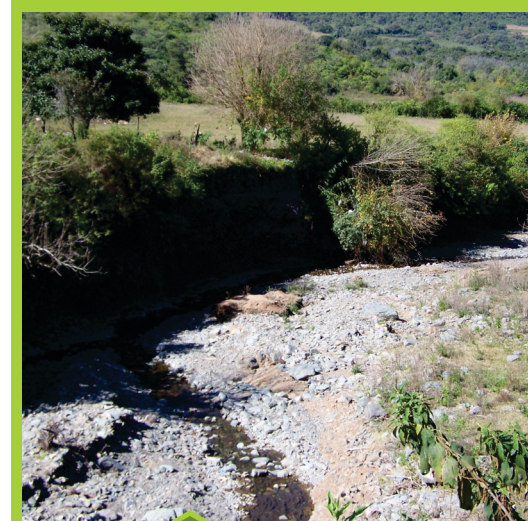


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GEOLOGIC TIME CHART

PRECAMBRIAN	PALEOZOIC						MESOZOIC			CENOZOIC		
	Cambrian	Ordovician	Silurian	Devonian	Carbonif.	Permian	Triassic	Jurassic	Cretaceous	Paleogene	Neogene	Cuaternary
<p>STOPS 4 5</p> <p>Age of rocks forming the main cores of Tucumán ranges.</p> <p>542 millions years ago</p>	<p>There are no rocks of this age in this route</p>						<p>STOPS 5 9 10</p> <p>There are no rocks of this age in this route</p> <p>251 millions years ago</p>			<p>STOPS 1 2 3 6 7 8</p> <ul style="list-style-type: none"> - Erosion and formation of the actual shape of the area. - Sedimentation of multi-colored rocks in the Calchaquí Valley - Rise of the Andes <p>65,5 millions years ago</p>		



STOP 7

The mountain is hurt
The erosive activity of the climatic agents generate degradation processes, generally linked to water, in a natural way or associated to human activities. The picture on the left shows the erosion caused by the San Javier river over a sown field. Likewise, nature tends to heal these situations in different ways, as it is appreciated in the regeneration of the vegetal cover on a landslide of the picture on the right.



STOP 8

Shepherding register
Structures generated by shepherding, named "pies-de-bache" (pie de vaca). These ones modify the original structure of the layer, rich in superficial organic substance, facilitating the action of erosive processes.



STOP 9

An incipient fluvial canon
The erosion of El Siambón stream magnificently cuts through continental sandstones generating a ditch besides the provincial route 341, near the monastery.

STOP 10

Extinct lakes and the generation of natural richness
Ten million years ago the region was covered by numerous lakes where water originated structures called "ripple marks". (A); and great amounts of gypsum were deposited, which are nowadays commercially exploited (B).

