Nature Foundation

Witchelina Nature Reserve

Farina–Old Mount Nor'West Gorge Nature Drive track notes

Witchelina track notes

We hope these track notes will help you to enjoy your nature drive by explaining some key aspects of the landscapes and features you'll be seeing.

The notes are available for you to buy ($12.00 per copy); or if you prefer, you can return your copy to the Reserve Manager at the Homestead, at no cost, when you've finished your drive.

Nature Foundation acknowledges and respects the traditional custodians, the Adnyamathanha, Kuyani, and Arabana People, whose ancestral lands include the area bounded by the Witchelina Nature Reserve.

Nature Foundation pays its respects to their Elders past, present and emerging, acknowledging and respecting the deep spiritual attachment and the relationship that Aboriginal people have to country.

Nature Foundation gratefully acknowledges the assistance of the following the compilation of the 2023 series of Witchelina track notes:

Text content

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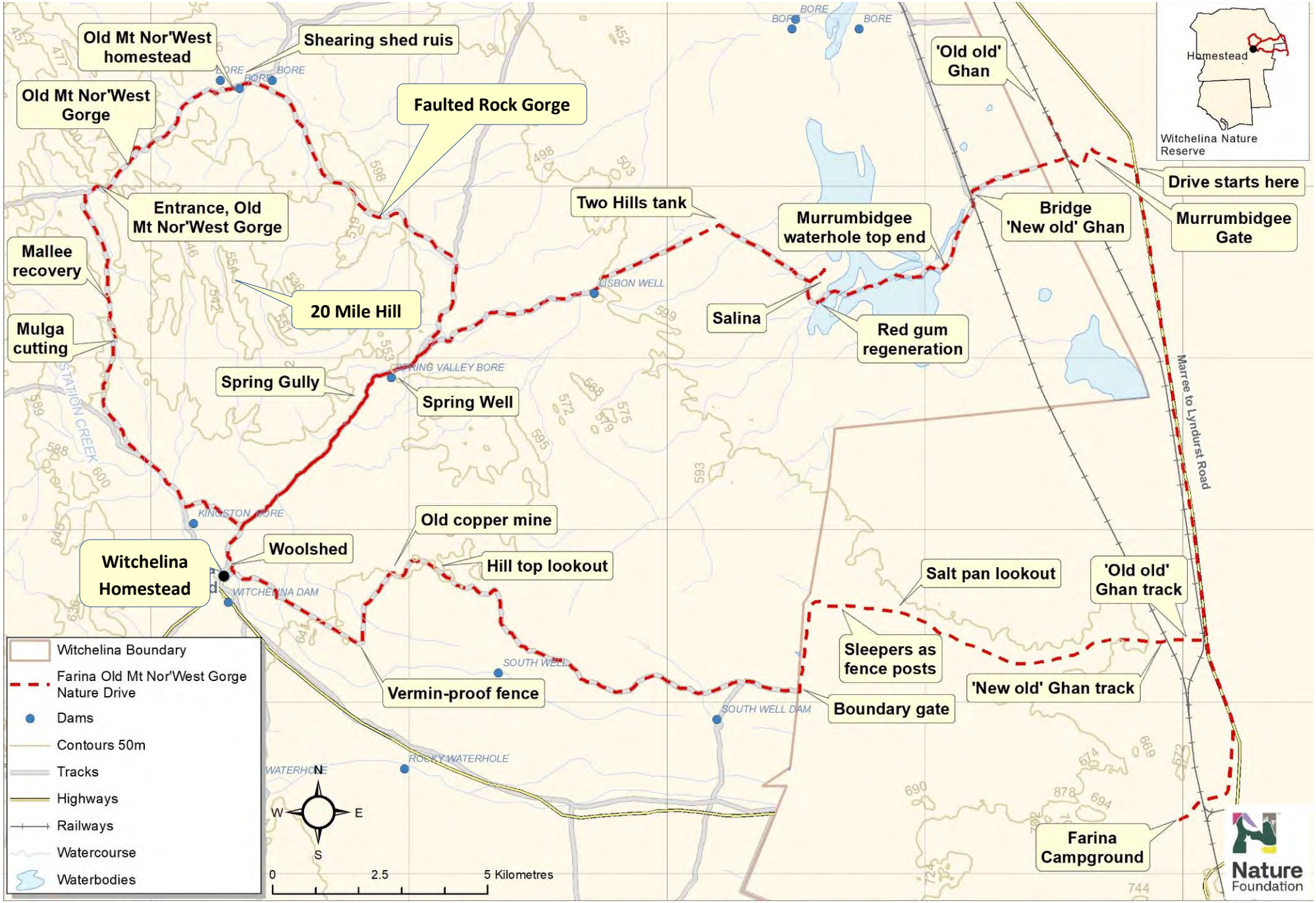
National Aeronautics and Space Administration Earth Observatory [http://earthobservatory.nasa.gov]; Sentinel Hub (*satellite images)*.

Layers of the Earth site in Old Mount Nor'West Gorge


Old Mt Nor'West homestead
Shearing shed ruis
Old Mt Nor'West Gorge
Faulted Rock Gorge
Entrance, Old Mt Nor'West Gorge
Mallee recovery
20 Mile Hill
Mulga cutting
Spring Gully
Spring Well
Two Hills tank
Murrumbidgee waterhole top end
Salina
Red gum regeneration
'Old old' Ghan
Bridge 'New old' Ghan
Drive starts here
Murrumbidgee Gate
Marree to Lyndhurst Road
Old copper mine
Woolshed
Witchelina Homestead
Hill top lookout
Salt pan lookout
'Old old' Ghan track
Sleepers as fence posts
'New old' Ghan track
Vermin-proof fence
Boundary gate
Farina Campground
Homestead
Witchelina Nature Reserve
BORE
LISBON WELL
SPRING VALLEY BORE
KINGSTON BORE
WITCHELINA DAM
SOUTH WELL
SOUTH WELL DAM
ROCKY WATERHOLE
STATION CREEK
Witchelina Boundary
Farina Old Mt Nor'West Gorge Nature Drive
Dams
Contours 50m
Tracks
Highways
Railways
Watercourse
Waterbodies
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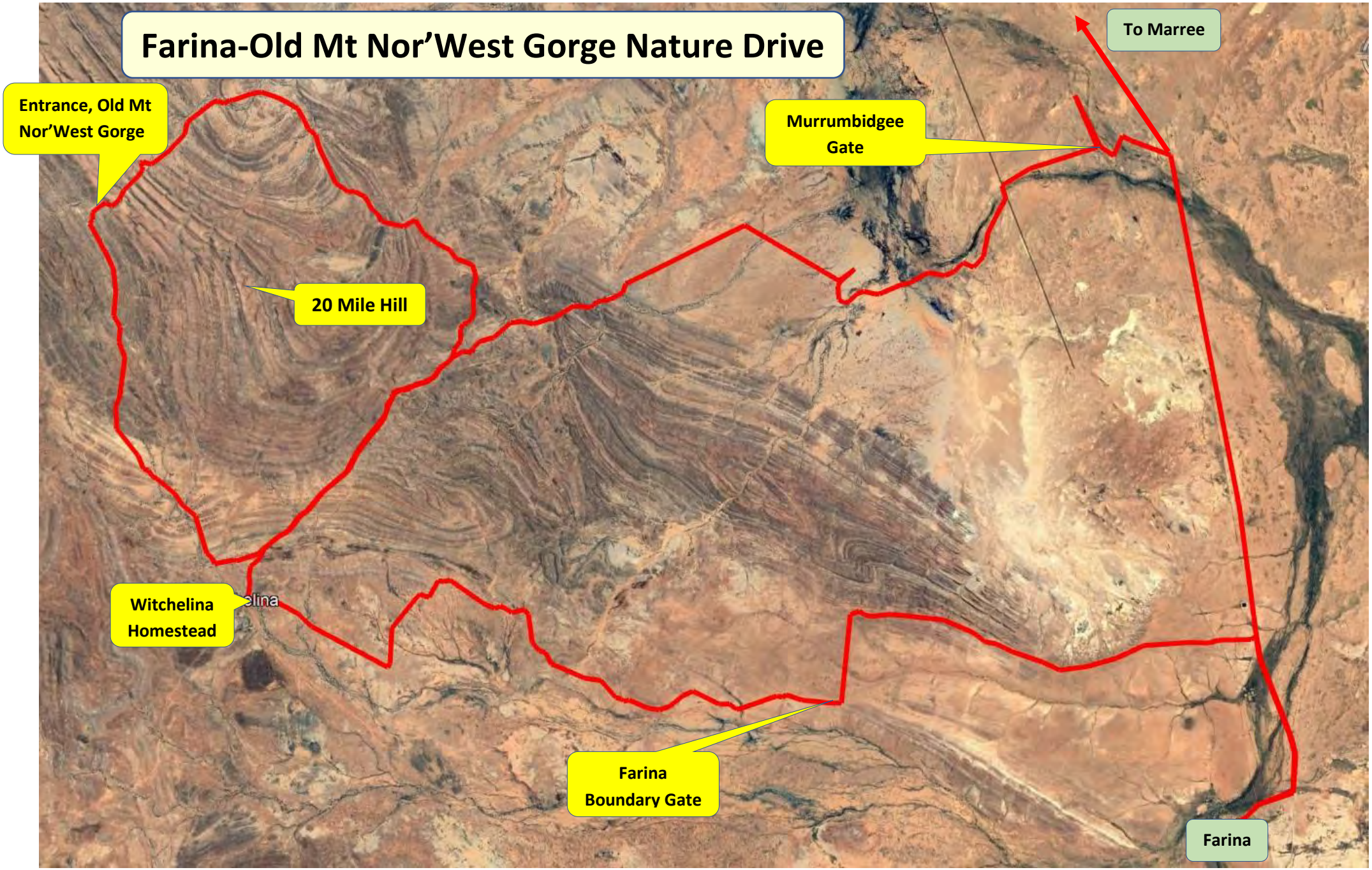
Nature Foundation


Farina-Old Mt Nor'West Gorge Nature Drive
Entrance, Old Mt Nor'West Gorge
20 Mile Hill
Murrumbidgee Gate
To Marree
Witchelina Homestead
Farina Boundary Gate
Farina

Witchelina Nature Reserve

Farina-Old Mt Nor'West Gorge Nature Drive track notes

***Total distance*:** **Approx. 115 kms round trip from Farina Campground, including 93 kms off-road. Allow 6-7 hours.**

***Degree of difficulty*: Easy, but with one short section through the Gorge for which a slow crawl in 4WD low range is recommended.**
Please seek advice from Farina Station Manager before leaving.

Witchelina currently offers six Nature Drives, including loops that can be started from the Witchelina Homestead (referred to in these track notes as the 'Witchelina-Gorge Drive'); one from Farina (the 'Farina-Gorge Drive'); and one from Marree ('the Marree-Gorge Drive').

*The **Farina-Gorge Drive** is marked with red arrows. The Marree-Gorge Drive is marked with black arrows, and the Witchelina-Gorge Drive with lime green arrows. Where two or three drives share a single route, they are marked with all the relevant arrows.*

The **Farina-Gorge Drive** starts at the Farina campground with a 16.5km drive northwards up the highway towards Marree. Turning westwards into the Reserve, the route crosses both the 'Old Old' and the 'New Old' Ghan railway alignments (the difference is explained in these notes). It then crosses a plain before rising into hilly country surrounding the magnificent sandstone and quartzite tiers of 20-Mile Hill, one of the highest points on Witchelina.

Sharing a route for approximately 14 kms with the other two Drives, the Marree Drive then circumnavigates 20 Mile Hill (*see map and satellite image on previous pages*). For much of the route, the red sandy buttresses of rock create a formidable set of barrier ranges. However, the ranges are scythed through by a narrow, straight creek gorge, named after the Old Mt Nor'West Homestead which nestles in one of its downstream bends where the Willawalpa Creek breaks through into more open country.

The Old Mt Nor'West Gorge comprises a bed of stony and sandy areas plus occasional bare rock pavements, interspersed with mostly dry waterholes. Its creation must have witnessed millennia of storms and torrential flash floods which have sculpted the current watercourse. The Gorge walls offer some shade and shelter to eagles, emus and kangaroos; and for part of the year after rain, water-filled pools from which they can drink. During drought years like 2018 and 2019 however, the pools dry up, and even though heavy rains in later years have flushed out the Gorge, you may still see evidence of the impact on animals from the bones and skeletons that are left.

After the Old Mt Nor'West Gorge, the drive takes you through the Homestead precinct of the first European-settled property on Witchelina, the Old Mount Nor'West Station. From the ruined woolshed, the Farina-Gorge and the Witchelina-Gorge Drives share a route south-eastwards and then south westwards for about 17kms.

After the Witchelina woolshed, the route takes you eastwards for about 30kms, joining the highway about 5 kms north of Farina. This last section of the drive is also known as the 'Wet Track', as it provides access between the highway and the Witchelina Homestead precinct when heavy rain makes the main road from Farina to Mulgaria Station impassable.

Basic signs

As you drive, you'll see a few basic signs:

Red arrows show the direction to follow for the Farina-Old Mount Nor'West Gorge Loop.

indicates a feature or point of interest you may like to stop and inspect.

indicates a geological feature you may like to stop and inspect. *Please note: fossicking on Witchelina is prohibited*.

Indicates a site where, in the right season and in favourable conditions, you may have an opportunity to observe water birds.

Text and images below with green shading are botanical notes, numbered to correspond to a 'tree' sign by the side of the track.

You may see some plants mentioned more than once in the track notes, reflecting the diverse environments in which they can flourish or survive.

Depending on seasonal factors at the time of year of your visit to Hiltaba, and on others such as recent rainfall or drought, trees and plants mentioned in the track notes may appear quite different to the photos included in the notes. Some may even have disappeared altogether ! Please bear these natural cycles in mind as you look at the vegetation.

Introducing Nature Foundation

Nature Foundation is an apolitical not-for-profit foundation that invests in conserving, restoring and protecting South Australian landscapes, flora and fauna, to ensure their survival. It is governed by a Board of experienced conservationists, scientists, business and professional people.

Nature Foundation believes that the Witchelina Nature Reserve is such a beautiful and important landscape that we should share it with other people with a love of outback Australia.

Conservation and responsible land management remain our top priority, and we hope your first-hand experience of Witchelina will encourage your support for our work. Please help us by respecting the Reserve's biosecurity. Nature Foundation is considering installation of car vacuuming and washing facilities at the Homestead, but you can already help now by minimising the risk of accidentally picking up seeds on your vehicle, and in your clothing as you walk.

Before you set off

- Please ensure you've signed an indemnity form, paid your entry fee, and collected a gate key (returnable deposit payable).
- Please ensure you have enough fuel for the drive. Fuel is available at Lyndhurst, 60 kms away, and at Marree (80 kms away).
- Bring all food and plenty of water – and a first-aid kit is a valuable safety measure in outback travel.

Your safety is our concern but your responsibility.....

- The Farina-Gorge Drive is only suitable for driving by 4WD vehicles with good clearance.
- Due to uneven terrain, roaming animals, and other factors, the Farina-Gorge Drive is safe to travel only during daylight hours. Please begin your drive on the track before 12 midday.
- A 40 km/hr speed limit applies on Reserve tracks. Treat every watercourse and gutter with caution. It's not possible to signpost every driving hazard - the speed limit is there for your protection.
- Signs clearly show your route from start to finish. For your own safety, and for protection of the Witchelina environment, please do not diverge from the marked track.
- *Please note: mobile phone coverage on Witchelina is extremely limited and unreliable.* Depending on your location, you may be able to contact the Witchelina Homestead on **UHF Channel 3 duplex,** via a repeater located on the Reserve. In northern areas of Witchelina, it may also be possible to make radio contact via repeaters on Muloorina Station (UHF Ch 7 duplex), or Finniss Springs (UHF Ch 8 duplex).

  None of these can be guaranteed however, and if available, access to a satphone or HF radio will provide an extra safety margin. The Witchelina Homestead number is 08 8675 2001; or, if calling with a satphone, 0061 8 8675 2001..
- Please drive carefully and with regard to the weather and other track conditions at the time. A minimum fee of $500 may apply if you need to be recovered !

Witchelina is a remote outback Reserve and presents natural, geological sites and historical points of interest. Ruins, wells, tanks and many artifacts used by previous generations are scattered throughout the property.

These have been left undisturbed for visitors to appreciate. As such, they present potential hazards, and visitors need to take great care when driving and walking around the Reserve.

For safety and conservation reasons, management reserves the right to alter or close sections of the drive, or deny entry to any person.

Conditions of Entry

- Motorbikes or quad bikes are not allowed.
- Camping is permitted only within designated campgrounds.
- Campfires are permitted in the fire rings provided in campgrounds, but please bring your own wood, or purchase a bundle from the Homestead. Dead wood is an important habitat for wildlife, so wood collection is not permitted anywhere on the Reserve.
- Please take all rubbish with you in a plastic bag, including soiled toilet paper unless used in a toilet. There are toilets at the Witchelina Homestead precinct and at the Old Mt Nor'West campground.
- Please respect any Aboriginal sites by leaving them undisturbed, and do not remove any artifacts.
- Fossicking, and removal of any souvenirs are strictly prohibited. Plants and animals on Witchelina are protected, as are all rocks and objects from the property's pastoral and mining history (however rusty or insignificant they may appear !)
- Witchelina is a Nature Reserve. No firearms, shooting or trapping are allowed.
- For visitors' safety, entry to fenced areas (some of which contain hazards such as disused bores or wells), is not permitted. Please feel free to walk and explore in the immediate vicinity of the drive track, but observe all 'no entry' signage.
- Pets may not be brought on to Witchelina. Nature Foundation is obliged by law to lay poison baits for dogs and has a program to control feral cats. There could be baits anywhere on the property at any time.

Thanks for supporting Nature Foundation's care for Witchelina by observing these conditions.

Accommodation and activities for visitors on Witchelina

Accommodation options are available on the Witchelina Homestead precinct, the Shearers' Quarters, and at Old Mount Nor'West Homestead and campground.

Please check Nature Foundation's website for on-line bookings https://www.naturefoundation.org.au/what-we-do/nature-based-tourism/visit-witchelina, or see the Reserve Manager to check availability.

Six nature drives can be enjoyed on Witchelina. Designed for safe self-driving, they are signposted, and interpretive notes and maps are available. The drives are between 32kms to 101kms in length, as round trips from the Homestead, from the Farina Campground, or from the Marree Hotel.

A track access fee is payable. Like accommodation, this fee can be paid on-line before your trip, through Nature Foundation's Bookeasy system. Advance booking has the additional advantage of completing your indemnity form, instead of requiring to complete it on arrival.

Other important information

If you're not already a Nature Foundation member, we hope that your nature drive may encourage you to join our organisation, or make a donation to our work ! A membership application / donation form is attached to these track notes.

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We hope you enjoy your drive !

FARINA-OLD MT NOR'WEST GORGE NATURE DRIVE TRACK NOTES

***Please note**: numbers in* **bold black font** *in the kms column below are cumulative distances. They are approximate and intended as a guide only: any deviation from the route shown on the map will affect the running total. Numbers in* **red font** *show the distance, accurate to about 100 metres, between locations mentioned in the track notes.*

All Google Earth images in the notes are displayed with North along the top edge. A limited number of GPS co-ordinates are included in the left-hand column for the convenience of visitors with an appropriate device.

Some Points of Interest (PoI) along the route are numbered, from an earlier edition of these track notes. These PoI numbers are shown below in blue font.

Kms	Location	Notes
0.0		**Start at Farina Campground. Pay track access fee and collect gate key from Farina Homestead. Sign Nature Foundation indemnity form.** **Travel north on the main road towards Marree for approx. 16.5 kms.**
0.0 **2.1**		**Opposite the Wilpoorinna sign on the main road (54 J 235682 6685739), you'll see a windmill blade sign pointing to the left (westwards) – *see image at left.*** **Zero your odometer now, and from this point follow the red arrows** **Take track to the left, following red arrows for approx. 2.1 kms until you reach the locked gate**. This is the Murrumbidgee Gate, marking the Witchelina/Farina Station boundary. On your drive, you'll encounter some soft sandy sections, and later, steep and deeply rutted creek crossings. High-range 4WD is recommended from this point.

2.1
0.8

Murrumbidgee Boundary Gate - Key access. Please lock gate behind you.

You've just crossed the original narrow gauge (3 feet 6 inches) Great Northern Railway line to Alice Springs, the famous 'Ghan' line. These notes will refer to this original line as the 'Old Old Ghan', contrasting with the 'New Old Ghan' further westwards.

The line reached Government Gums (later named Farina) in 1882, and Hergott Springs (Marree), in 1884. Construction of this line employed hundreds of men of many nationalities; British, Irish, European and Chinese. An example of this labour can be seen on the following short detour.

Turn right and follow fence north for 1.3 km. Note the boundary fence now erected on top of the old line.

2.9
0.5

On the left side of the track, at 800m, there is a short hardwood mile post set at an angle. This had the cast iron numbers "**419**" screwed to it – 419 miles from Adelaide via Terowie *(the numbers you can see on the post now are a modern replica of the originals).*

Continue for another 500m.

1

Dead finish *(Acacia tetragonophylla)*

This small wattle is extremely prickly because it has very sharp points to its phyllodes (leaves). It provides a safe habitat for small birds and reptiles, and is a long-lived and very drought tolerant plant. Thought to have been named Dead Finish because it was the last thing left alive at the end of a drought !

2

Nitrebush (*Nitraria billardierei*)

Another good habitat plant for small birds and reptiles, Nitrebush is also an extremely drought tolerant plant that occurs widely across the arid lands. Often found on salty ground and in watercourses.

It has an insignificant flower, followed by a red, purple or yellow edible berry that can be made into jam, and was a valuable food for Aboriginal people.

3.4
1.3

'Old Old' Ghan ***(PoI #1)***

Here you will see 300m of stone paving on both sides of the line (*photo at left*). The line is built on a floodplain, and the paving was to prevent floodwaters washing out the ballast and undermining the tracks. The line and bridges were washed away enough times to eventually abandon the line, but here, 140 years on, the paving is still performing its job !

The paving consists of locked blocks of dolomitic limestone and siltstone, probably quarried in the Willouran Ranges, not far to the west. The work has stood the test of time (see how straight the edges have remained over nearly 140 years). One theory is that Chinese block shapers were employed on the job – skilled workers employed to assist in construction of the railway.

Of special interest at this former siding is the 'rail tree' (*photo at left*).

This splendid display of railway history was conceived by one of Nature Foundation's Reserve Managers, Greg, and assisted in its on-site creation in 2022 by his mate, Leon.

Greg tells the story: *"I've been scrounging pieces of old railway iron since we bought our block 20 years ago, and noticed a railway iron post clearly branded '1878'. It was the start of a slowly-evolving collection.*

Different parts of the story are contained in stamps on each rail sample. The stamps include the foundry or maker's brand; the size of the iron (measured by weight in pounds [lbs]/yard, the approximate length of each of these samples); and other lettering.

There are six pieces. Leon and I cleaned up each of them, wire-brushed and grinded them, and then welded them to a post we concreted in."

Sample (from top of tree)	Maker/foundry	Date of manufacture	Weight in pounds per yard
1	Hopkins Gilkes & Co, Middlesborough, North Yorkshire, England	1877	40
2	Barrow Hematite Steel Co, Barrow-in-Furness, Lancashire, England	1880	40
3	Barrow Hematite Steel Co. *(as above)*	1884	50
4	Workington Iron & Steel, Cumbria, England	1910	50
5	Bolckow Vaughan & Co Ltd, Middlesborough, North Yorkshire, England	1913	80
6	Australian Iron & Steel, Lithgow or Pt Kembla, Australia	1956	94

Image reproduced by permission of Farina Restoration Project Group

Samples 1-4 were all used on the original Narrow Gauge line (3 feet 6 inches width, or just over 1 metre), from Terowie and Pt Augusta, through Quorn to Alice Springs. You are standing beside what remains of that line (the 'Old Old Ghan'), right now.

Sample 5 is Standard Gauge rail. From the steel 'slices' at the top of the tree, you can see that this rail was double the size of the first two Narrow Gauge samples above. The Standard Gauge was 4 feet 8½ inches, or nearly 1½ metres, carrying much greater loads and giving a smoother, more stable ride. This is still the national gauge.

In 1912 construction of the Trans-Australian Railway from Pt Augusta to Kalgoorlie began. This is a sample of the rails, called '80CR', originally used on that line. After 50 or 60 years use on the Trans line, they were replaced by 94 lb Australian Standard rails (**Sample 6**). Some of the second-hand 80CR rails were then used on the 'Old Old Ghan' railway, (Marree/Alice Springs section), to replace the earlier 50 lb ones.

Sample 6 is Standard Gauge rail that carried the 'New Old Ghan' to Marree from 1958 onwards. This line is about 3 kilometres to the west of here – you'll be passing under it soon, as you continue your drive. In 1980, this 'New Old Ghan' was superseded in turn by the Standard Gauge Tarcoola–Alice Springs Railway, which runs north-south about 350kms to the west of here. The Leigh Creek/Marree section closed in 1987.

*The story of how **Sample 5** ended up on Witchelina reflects a feature of life on stations, where pieces of steel, timber, or various other materials are recycled again and again. Greg found it at the bottom of a scrap steel pile near the homestead. It had a rusty sign plate welded to it, with any lettering or numbers long since gone. It may have been a marker post, maybe 'Station Limit' or a speed instruction, and the rail must have been recovered from the 'Old Old Ghan' line after it was closed.*

So, from bright new steel on the Transcontinental line, 80CR was given a second chance on the Narrow Gauge beyond Marree. Over time, showing too much wear, it was taken out of service, and cut up to become a post to hold a sign. It might have finished up on a dump, but its inclusion in Greg's tree is a kind of resurrection - an honourable end to a hard-working life….

*(More information can be found in **A Brief History of Witchelina,** in Welcome to Witchelina, a companion volume to these track notes, available from the Witchelina Homestead).*

3.4 / 1.3		**Turn around here and retrace your path 1.3 kms, back to the locked gate.**
4.7 / 2.1		**Back at the locked gate, turn right on to the main track.**

3

Native Plum *(Santalum lanceolatum)*

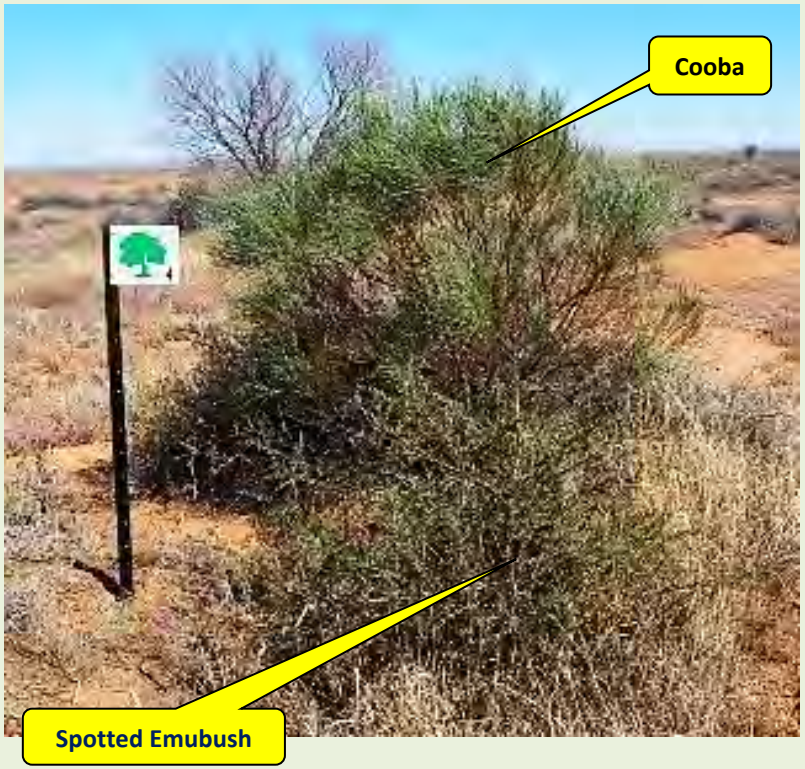
This small, semi-parasitic tree is drought tolerant and occurs widely across the property. It produces small quantities of a fruit that resembles a small plum, and was considered an important food by Aboriginal people.

Emus also find the fruit palatable ! (*photo at left*)

Native Plums belong to the same plant family (*Santalaceae*), as Quandongs and Sandalwoods - semi-parasitic plants that derive their nutrition by attaching themselves to the roots of other trees and plants with underground 'haustorial' roots.

Behind the tree are two chenopods – **Old Man Saltbush** (*Atriplex nummularia* – *photo at right*), which is common on areas which are periodically inundated; and **Spiny Saltbush** (*Rhagodia spinescens*), another drought-tolerant and useful habitat plant.

4



River Cooba (*Acacia stenophylla*)

A bushy weeping shrub that that occurs on flood plains and watercourses (*photo at right*).

Spotted Emubush *(Eremophila maculata*)

A small, hardy, usually compact plant that has showy red flowers in season. There a many cultivars of this plant with different coloured flowers that have been developed as garden plants (*see photos of flowers and seedpods below*)..

6.8
0.3

Siltstones

The bridge in front of you spans Paradise Creek which flows into Lake Eyre.

The rocks on your left are minor folds of red (*haematite)* and yellow (*limonite)* layered siltstones (also called *Ulupa siltstones*), partly coated with layers of salt.

7.1
2.2

(54 J 231895 6684951)

12 span bridge ***(PoI #2)***

The direct line from Pt Augusta to Leigh Creek was started in 1955, to supply coal to the new Thomas Playford Power Station at Pt. Augusta, and then continued on to Marree. This bridge was built in 1957, when the new standard gauge line (4 feet 8 ½ inches) was extended to Marree. These notes refer to this Standard Gauge line as the '*New Old Ghan'*.

The current Ghan line, running north from Tarcoola and well to the west of Coober Pedy, a long way from Witchelina, was opened in 1980.

The narrow gauge ('*Old Old Ghan'*) bridge over Hookina Creek (near Hawker, to the south, *see 1936 photo at right*), was washed away in 1955, and further floods washed out the deviations built around the bridge. Finally, in October 1956, the Ghan from Adelaide was changed to the new line - all freight, stock and passengers to or from Alice Springs were transferred to or from the narrow gauge at Marree.

Drive under the bridge, turn left towards track marker and up the south bank of Paradise Creek.

5

Needlebush or **Water Tree** (*Hakea leucoptera*)

Here is a small grove, on the left hand side of the track. An upright shrub with sharp cylindrical leaves, it has clusters of cream flowers in season. The fruits, which are woody capsules, remain on the tree for years. Very drought tolerant.

Reproducing by shoots from the roots, these plants are usually seen in small groves like this. As its alternative name suggests, in drought times Aboriginal people were able to obtain water for survival from the roots.

6

Narrow leafed Hop bushes *(Dodonea viscosa).*

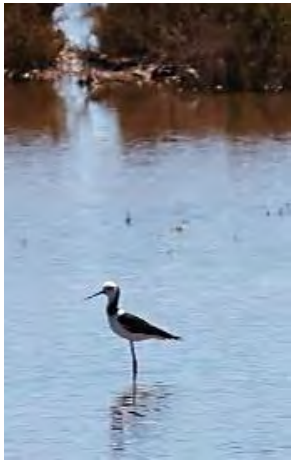
This plant, seen on both sides of the road, has shiny long narrow leaves that are quite sticky to touch. It has an insignificant flower followed by a large fruit capsule with wings, that can be very eye catching as they can be reddish purple, brown, yellow and green.

7

Sandhill Wattle (*Acacia ligulata*).

The dense yellow green shrub is a widespread species found in all mainland states. It has clusters of bright yellow flowers in season. It is one of the main hosts of Cossid moths, whose larvae are often called witchetty grubs.

Nearby is also an **Elegant wattle** (*Acacia victoriae*), a thorny, much branched shrub which is common across the region. Short lived, it can reproduce by both root shoots and seed. The seed is used the bush tucker industry, and is an important food source for emus.

9.3 **0.2**		Follow arrows to the right.
9.5 **1.6**	 *December 2022*  *March 2021*	**Murrumbidgee waterhole** ***(PoI #3)***  Views back to bridge. Murrumbidgee Waterhole is on your right. This is a series of long, shallow pools in the creek bed, which remain full for a few months after the creek flows (*photo at upper left)*, but are more often dry (*photo below left*).  When full, they attract a variety of water birds.  *October 2020*

<table>
<tr>
<td colspan="2">  (No number, samphires are widespread in this area)
  </td>
<td>Samphires (Tecticornia spp)

Seen across this stretch of the flats, samphires are a succulent plant, appearing to be leafless and with inflated fleshy stems.

Widespread across Australia, Samphires are indicative of salty or waterlogged area. They have adaptations that allow them to thrive in the harshest environments and enable them to dominate these areas.</td>
</tr>
<tr>
<td>11.1
0.1</td>
<td>  </td>
<td>From here for the next 2 kms the floodplain can be boggy. Check carefully.</td>
</tr>
<tr>
<td>11.2
0.7</td>
<td>  </td>
<td>Here, the flood plain is completely bare – possibly the result of a combination of water-logging and salinity.

However, after the major rainfall that Witchelina received during the summer and autumn of 2022, there was significant growth of bladder saltbush across much of the plain.
  </td>
</tr>
</table>

11.9
1.2

Large, dead Old Man Saltbush. The mounds were caused by drift sand collecting in the plants when they were growing –a legacy of heavy grazing and past droughts.

8

Red Gum survival ***(PoI #4)***

Flood plains are ever dynamic environments. The **Red Gums** (*Eucalyptus camaludensis),* immediately in front of you have been severely affected by drought. A change of the water table in this area seems to be the cause of the dead young trees. But look upstream (to your left), and you can see some which have survived and regenerated, or popped up in the wetter depressions.

Moving out of the clay plan 'wetland', **Saltbush** (*Atriplex spp*), **Sea Heath** (*Frankenia spp*), and **Bluebush** (*Marieana spp*) all start to appear, and then into another change of vegetation as the salinity levels continue to decrease. **Broughton Wattl**e (*Acacia salicina*), **Harlequin Eremophila** (*Eremophila duttonii),* and **Elegant Wattle** (*Acacia victoriae*) also start to appear, and some **Waterbush** (*Myoporum montanum*), across the creek.

Fruits and toothed leaves of **Waterbush** *(Myoporum montanum)*

Sea Heath *flowers*

Bluebush *fruits*

13.1 / 0.5		Follow arrows past "T" junction to **POI #5**.
13.6 / 0.5		**Salina** ***(PoI #5)*** A Salina is a salt lake - mostly-dry, although after good rains it can fill with water. The photo at left was taken in October 2020. The Salina's crust comprises an irregular yellow surface of fine sand, silt, and mud. It's a very fragile surface: once broken, it can often be enlarged by wind and water which may lead to severe erosion. Nature Foundation asks that visitors walk on it with care. In dry periods, the Salina's surface is criss-crossed with drying cracks in which sparse shrubs and lichen may grow. The surface also provides habitat for small lizards and insects, and may show animal footprints, desert varnished pebbles, and wind-blown debris *Turn around and return to "T" junction.*
14.1 / 0.2		**"T" Junction - follow arrows right towards Two Hills Tank.**
14.3 **2.3**		**Dawn of Life geosite** This unassuming geosite provides a clue to one of the most fundamental changes in Planet Earth's climate and its ability to support complex life, which eventually evolved into ourselves and our biological environment. A little geological background is therefore needed to explain the chain of hillocks and low rocky ridges about 200 metres to your right. The rocks are part of a much longer single NW-SE trending tilted layer which runs for many kilometres. Between 850 million and 500 million years ago, one of Australia's largest and deepest basins of sedimentary layers (known as 'strata'), evolved. The region is called the Adelaide Superbasin: imagine millions of layers of sediments from flooding rivers, lakes, and shallow seas accumulating horizontally on top of each other, like the pages and chapters of a colossal book.

About 500 million years ago, a major mountain chain arose as these 350 million years of accumulated sediments were pushed together, folded and crumpled by vast tectonic plates colliding in the earth's crust. The chain is known as the Delamerian Mountains (named after the village of Delamere, on the southern Fleurieu Peninsula, south of Adelaide). It extends far into the north of South Australia, incorporating the Flinders Ranges, and the Willouran Ranges now forming part of the Witchelina Nature Reserve.

The hillocks on your right are the remnants of a single hard rock layer, rising above the surrounding alluvial soils. They are outcrops of rock called *Nuccaleena Dolomite.* They represent a significant geological boundary between strata that were previously horizontal, and are now tilted steeply to the NE**. This geosite has been called the *'Dawn of Life'* because this boundary marks the start of the geological period that enabled the earliest animals to develop.**

The older strata to the **west** of the rocky ridge contain the earliest forms of microbial life on Earth (known as stromatolites – *see photo at right, taken at a different site*). They formed during a major geological period called the Cryogenian, during which the whole of Planet Earth is likely to have been frozen. This frigid planet was known as '*Snowball Earth*'.

Quite suddenly, around 635 million years ago, the earth's climate became much milder, and the ice melted. This was the beginning of the Ediacaran Period. The rocks to the **east** of the ridge contain the more complex life forms that eventually led to the evolution of life on Earth as we know it.

Another consequence of the folding and fracturing of the rocks 500 million years ago was the percolation up to the surface of fluids at extremely high temperatures and under very high pressure. Flowing through faults and fissures in the sandstone, these super-hot fluids dissolved quartz grains and crystals embedded in the rock, creating the striking white veins frequently seen at sites across northern Witchelina, including this one (*see photo at left*).

You can see how the landscape features resulting from vast and powerful tectonic movements appear from space in the Google Earth image on page 5 of these notes. Further on during your drive, as you approach and pass through Old Mount Nor'West Gorge (40.8 kms, page 38), the once-horizontal, but now crumpled sedimentary layers are often revealed as steep, or even vertical formations (see, for example, the Layers of the Earth photo, on page 3).

*More information can be found in an **Introduction to Witchelina Geology**, in Welcome to Witchelina, a companion volume to these track notes, available from the Witchelina Homestead.*

9

The understory is now being dominated by **Bluebush** (*Maireana spp*).

Rock Emubush (*Eremopohila freelingii*)

This is a very drought-tolerant bush to small tree, with beautiful lilac to pale-blue coloured flowers. It occurs in all Australian states except Victoria, but is rarely found in the nursery industry because it is difficult to propagate

10

Red Mallee (*Eucalyptus socialis*).

These are one of only a few Eucalypt species found on Witchelina. One of the most common and widespread mallees, it has profuse cream to yellow flowers in clusters, and is a good honey and pollen producing tree .

It can grow to 30 metres but is usually up to about 8 metres. Its timber was used by Aboriginal people to make articles such as bowls, and they also used it for medicines. It is said to be one of the mallees that yield water from the roots

16.6 **1.6**		**Two Hills Tank. Follow arrows left.** Take extreme care when walking in this area. Numerous holes.
11		**Native Apricot** (*Pittosporum angustifolium*). Growing throughout inland Australia, the Native Apricot is a resilient and drought resistant shrub or small tree. Small cream flowers are followed by bright orange fruit that splits open to reveal red seeds. The fruit is inedible as it is very bitter, but the seeds are eaten by birds. The tree reproduces by both seed and from root shoots. It is very slow growing and long lived.
18.2 **1.5**		**Through open gateway and follow fence line to Second Tank**. **CAUTION – DEEP GUTTERS – WATCH YOUR SPEED ALONG THIS SECTION**
19.7 **0.3**		Second Tank.
20.0 **0.3**		**First Creek Crossing** – Moving into the hilly country there are nine creek crossings for the next few kilometres. Some are very steep, sharp or deeply rutted. **USE CAUTION, CROSS SLOWLY**

		**Pass Lisbon Well [cement base and trough], approx 150 metres on your left.** The track roughly follows the old black poly pipeline to Spring Well.
20.3 / 0.2		**Second** creek crossing.
20.5 / 0.4		Bore hole and engine base on left, followed immediately by **third** creek crossing.
20.9 / 0.5		**Fourth** creek crossing.
21.4 / 0.4		**Fifth** creek crossing.
21.8 / 1.0		**Sixth** creek crossing.
12 		**Mulga** (*Acacia aneura*) This is a very old specimen. Mulga is a widespread wattle across Australia, and varies enormously in growth habit from a small shrub to a tree over 10 metres tall. It is relatively long-lived for an Acacia (50+ years); it's very slow growing, and it can flower at any time of the year. Mulga was an important food plant for Aboriginal people, and a host for the larvae of the *Icilius* blue butterfly. The timber is very resistant to white ants and was often cut for use as fence posts. You'll be seeing some examples of this practice later on in your drive. 

22.8 / 0.5		**Seventh** creek crossing
23.3 **0.4**		***Photopoint - one picture speaks a thousand words*** The star dropper at this location marks a photopoint. These permanent monitoring points have been established on Witchelina Nature Reserve for tracking the outcome of conservation management activities over time. This is a simple and inexpensive technique to visually record and monitor environmental change, especially the impact of animals and climate change. It involves taking a series of photographs of a fixed area at regular time intervals; consistency in capturing the photo is critical.
13 		**Bullock Bush** *(Alectryon oleifolius*)  The species name (‘*oleifolius*’), is derived from the resemblance of its leaves to those of an olive tree. A large shrub to medium-size tree with one to several main stems. The trunk has deeply furrowed grey to brown bark. -Bullock Bush has very palatable foliage, which is avidly consumed by native, feral and introduced herbivores. Although it spreads from suckers when trees are damaged or after good rains, few young plants establish unless areas are completely protected from grazing. The fact that the tree is still commonly found in the southern arid zone is a testimony to its toughness and longevity. Unless and until the canopy is grazed off or broken down, the trees can live for more than one hundred years, but many have succumbed to grazing, or died from natural, such as fire, wind or hailstorms. Bullock Bush which often grows in clonal colonies of several to one hundred or more individual stems, and regeneration from seed is very rare. Although they are shed each year, the trees are never bare, as the next season’s growth take s place before the older ones are shed. Flowers are tiny and greenish yellow, in small sprays or racemes (groups). The seed, formed within a round green husk, is shiny black, about 5mm in diameter and attached to the husk with a large bright red seed stalk. The heartwood of the bush is a reddish colour, which gives Bullock Bush another of its common names, Rosewood, but unfortunately it is not very durable.

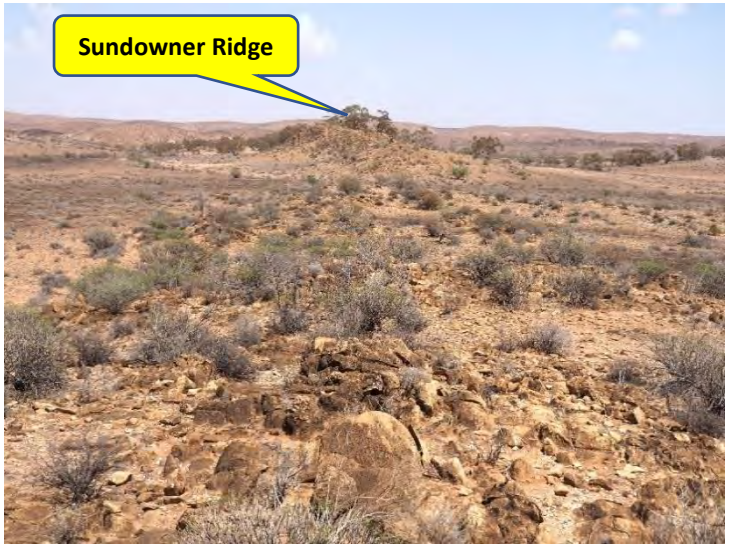
23.7 / 0.9		**Eighth** creek crossing
24.6 / 0.1		**Ninth** creek crossing.
24.7 **0.6**		Another track comes in from the right, from Old Mt Nor'West. **Continue straight ahead.**
25.3 **0.6**		**Spring Well and stone tank** ***(PoI #6)*** Old sheep yards next to the tank were later used for trapping goats. **Caution ! NO ENTRY to well enclosure.** 
25.9 **2.2**		**Spring Gully walk** ***(PoI #7)*** Approximately 570m from Spring Well is Spring Gully. If you wish, you can park by the road and take a 20 minute walk into the small gorge. Note the old slate trough at the entrance to the gully. Water was piped from the spring further upstream. The spring is no longer permanent, and is quite saline when it's running.

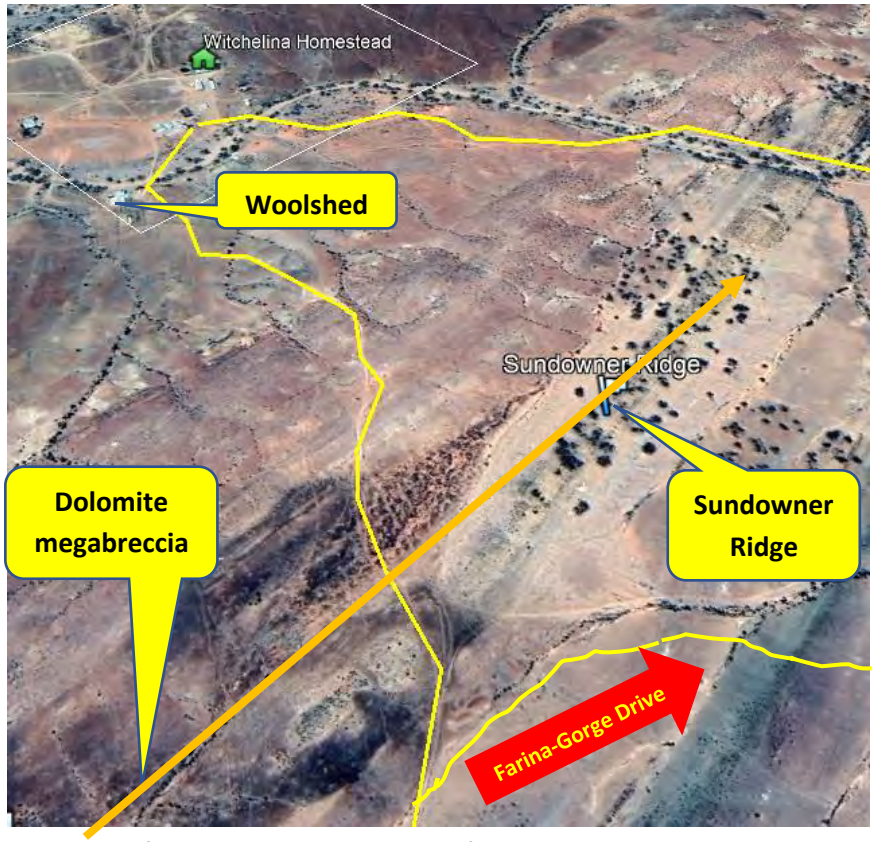
28.1 **0.5**		**Through gateway**. Note the pipe motor bike ramp on the right (*see photo at left*), installed when a new fence was being built. The ramp saves the motor bike rider the trouble of opening and closing gates.
28.6 **2.0**	 	**Exclosure** ***En****closures* are generally designed to keep something in. ***Ex****closures,* by contrast, keep unwanted animals out. This fenced exclosure has been established to monitor the total grazing pressure on this site. It's one of several on Witchelina. The exclosure prevents grazing by large native herbivores (plant-eating animals) such as kangaroos, and introduced invasive herbivores such as rabbits, sheep, cattle and goats. Sheep and goats are no longer a major issue on Witchelina – but in some areas cattle, rabbits and 'roos can still present a problem, especially in wet years. Exclosures have been constructed in different vegetation communities on the Reserve. Some exclosures are designed to keep out specific types of grazing animals while allowing others to enter the fenced area. In this way Nature Foundation can determine the impact of different herbivores on native vegetation. Vegetation within each exclosure, and at paired unfenced sites, is monitored using photopoints and other vegetation assessment methods, including detailed audits of specific areas (*see photo at right*).  Data from this monitoring will help Nature Foundation to effectively manage grazing animals to ensure the protection of native vegetation and habitats on Witchelina.

30.6
0.1

Dolomite Megabreccia

To your left is a small creamy-coloured rubbly outcrop. This, and a couple of other outcrops to the left of the track are extensions of a long, tree-studded ridge to your right (Sundowner Ridge - *see photo at lower left, and Google Earth image below).*





Direction of view in photo at middle left

If you walk up to the site, you'll see slabs of rock which appear to have been 'etched'. The criss-crossing cracks and grooves are the result of chemical weathering and erosion (*see photo at left*).

30.7 / 1.0		**Track forks - follow red arrow to the right.**
31.7 / 0.7		**Through gateway.**

32.4
1.7

T junction - follow arrows right.

Some important things to note about signage from this point !

Directional arrows: *For the next 14 kms, including through the Old Mount Nor'West Gorge, the track follows a route shared by three separate Nature Drives starting from Marree (black arrows), Farina (red arrows), and the Witchelina Homestead (lime green arrows). Please ignore the black and lime green arrows, and follow only the* ***red*** *ones.*

The ochre arrows mark an entirely different drive (the Bungarider), and can also be ignored.

Botanical signs: *For the next 14 kms, up until the Old Mount Nor'West woolshed (46.5kms), the numerical sequence of botanical signs has been set up for the Witchelina-Gorge Drive. The numbers you'll see on the roadside signs correspond to that sequence, but appear in brackets in the track notes below.*

(6)

Needlewoods or **Water Tree** (*Hakea leucoptera). This is another specimen of the tree you saw about 23 kms back, as plant #5.*

This group on the right of the track includes three distinct age classes:- an old mature plant; some medium shrubs; and young shrubs which are root shoots (suckers) coming from the big plant. Their appearance indicates the reduction of grazing pressure on the property. Widespread across all states except Tasmania.

Needlewoods are large perennial shrubs or small trees, with grey cylindrical leaves that have a very sharp tip. The cylindrical leaves are an adaptation to save water loss by reducing the leaf surface area. Attractive white or cream flowers in clusters followed by woody seed capsules with a beak that are retained on the tree (*see photo at right*).

The species is very drought resistant. The flowers produce a high quality honey favoured by bees. Aboriginal people used to make a sweet nutritious drink from them, and, as their alternative name suggests, were able to obtain water from them in times of drought.

(7)

Mulga (*Acacia aneura)*. *This is a younger specimen of the tree you saw about 11 kms back, as plant #12.*

Mulga is another wattle that is widespread in Australia, and varies enormously in growth habit from a small shrub to a tree over 10 metres tall. It is relatively long lived for a wattle (50+years) and very slow growing. It can flower at any time of the year.

It was an important food plant for Aboriginal people, and a host for the larvae of the two spotted line blue butterfly. The timber is very resistant to white ants and was often cut for use as fenceposts. This is a nice example of the tree.

(8)

Bullock Bush *(Alectryon oleifolius*). *This is another specimen of the tree you saw about 10 kms back, as plant #13.*

The species name (‘*oleifolius’*), is derived from the resemblance of its leaves to those of an olive tree. A large shrub to medium-size tree with one to several main stems. The trunk has deeply furrowed grey to brown bark.

Bullock Bush has very palatable foliage, which is avidly consumed by native, feral and introduced herbivores. Although it spreads from suckers when trees are damaged or after good rains, few young plants establish unless areas are completely protected from grazing. The fact that the tree is still commonly found in the southern arid zone is a testimony to its toughness and longevity.

<table>
<tr><td colspan="2">  </td><td>Unless and until the canopy is grazed off or broken down, the trees can live for more than one hundred years, but many have succumbed to grazing, or died from natural causes such as fire, wind or hailstorms. Bullock Bush often grows in clonal colonies of several to one hundred or more individual stems, and regeneration from seed is very rare. Although the leaves are shed each year, the trees are never bare, as the next season's growth takes place before the older ones are shed. Flowers are tiny and greenish yellow, in small sprays or racemes (groups).

The seed, formed within a round green husk, is shiny black, about 5mm in diameter, surrounded by a fleshy red attachment called an aril. The heartwood of the bush is a reddish colour, which gives Bullock Bush another of its common names, Rosewood, but unfortunately it is not very durable.</td></tr>
<tr><td>34.1 / 0.5</td><td></td><td>Track forks – Follow arrow right.</td></tr>
<tr><td>34.6
0.8</td><td> 
 
</td><td>Chips and pebbles
 
On your left, as you drive the next kilometre or so, you'll see a field of brilliant white quartz chips. They have been washed down from the ridges above during times of heavy rain and flash floods that formed temporary creeks on the hill slope.

The quartz started off as grains of sand deposited on the floor of a sea that stretched over this region 750-700 million years ago. Over a long time, the sands were compacted and cemented into very strong sandstones.

Around 500 million years ago, movements deep in the earth's crust caused buckling, folding and fracturing of the rocks, which allowed fluids at extremely high temperatures and under very high pressure to percolate through the sandstone and up to the surface. These super-hot fluids dissolved the quartz grains and crystals, creating the striking white veins and boulders you can see at many locations in the northern areas of Witchelina. The continuing cycle of weathering and erosion has gradually broken down the quartz into the fragmented deposits spread before you.</td></tr>
</table>

35.4 / 1.0		**Through gateway. Follow arrow right.**
(9)		**Rock Emubush / Native Fuchsia** *(Eremophila freelingii)* This is a small tree with beautiful lilac to pale-blue coloured flowers. It plant occurs in all Australian states except Victoria, but is rarely found in the nursery industry because it is difficult to propagate. 
(10)		**Crimson Turkey Bush** *(Eremophila latrobei)* This is usually an erect, many-branched shrub but sometimes straggly or spindly and which usually grows to a height of 2 metres. Crimson turkey bush is well known in cultivation, even though it is difficult to propagate. It is a variable species, is drought tolerant and usually frost tolerant, and it attracts nectar-feeding birds. Widespread in inland areas of all states except Victoria and Tasmania. Several subspecies are recognised. 

(11)

Native apricot *(Pittosporum angustifolium)*

The tree on the left, with drooping foliage, is one of the drought-tolerant species found on Witchelina. In season, its fruits are orange, slightly fleshy, rounded or egg-shaped capsules growing in thick clusters. Despite the outward similarity to an apricot, the fruits are extremely bitter and inedible. It has been reported that Pitjantjatjara / Yankunytjatjara people use the oil from ground seeds as a skin salve. The plant spreads by root shoots (suckers) and the fruit is also spread by birds.

Native Plum (*Santalum lanceolatum*). *This is another specimen of the tree you saw about 31 kms back, as plant #3.*

This tree is of the same *santalacae* family as the Quandong and Sandalwood – semi-parasitic plants that derive their nutrition by attaching themselves to the roots of other trees and plants with underground 'haustorial' roots.

It is drought-tolerant and occurs widely across the Reserve. It produces small quantities of fruit of about 1 cm diameter changing from red (as in the photo at left), to purplish black when mature. The fruit is edible and the explorer, Leichhardt, remarked it had 'a very agreeable taste'. It was also eaten by Aboriginal people, who also mashed the roots and soaked them in water to make a liniment.

36.4
1.6

Mulga cutting (*Acacia aneura***)** ***(PoI #8)***

Mulga fence posts can last for 100 years or more in these dry conditions.

Unlike Mallees, which you'll see shortly, Mulga trees don't recover after cutting. The stumps here are probably many decades old, and their presence is testament to the durability of their timber.

(12)

Harlequin Fuschia Bush
(Eremophila duttonii.)

A bush to small tree with beautiful red and orange coloured flowers. This plant occurs in all Australian states except Victoria, but is rarely found in the nursery industry because it is difficult to propagate. This is an unusually tall and very old example of this plant.

38.0
2.0

Mallee recovery after post cutting ***(PoI #9)***

A property of all Mallees is the ability to re-sprout from the trunk or below the wound after some sort of trauma, such as fire or cutting for fence posts. This is a process known as 'epicormic' budding or growth.

Another important attribute of Mallees is what grows underground - the lignotuber or mallee-root. The trees readily grow or re-grow from this, and it is also a great carbon sink. If allowed to keep growing, even if all the tree above ground is destroyed, the lignotuber continues to grow in size and store more carbon.

The trees you see here are Summer Red Mallee (*Eucalyptus socialis*). They provide good straight posts, but they are subject to white-ant attack so are not as long lasting as Mulga. You can see some of these posts in the old fence lines after you pass through the Old Mount Nor' West Gorge.

Caution ! The next few kilometres of track have numerous steep and deeply rutted creek crossings.

(13)

Broom Emu Bush
(Eremophila scoparia)

About 10 metres to the right of the track is a fine leafed plant that has small attractive violet flowers.

It is highly palatable and is a useful rangeland condition indicator as most animals eat it.

40.0
0.8

The Embankment

The Embankment is a most unusual small ridge which rises spectacularly about 3-4 metres above the main valley floor and runs for over 200 metres in a NNW direction.

It looks very much like a man-made feature such as a railway embankment, but it is a completely natural feature formed by a particularly hard and flaggy sandy quartzite unit surrounded by softer shales and siltstones.

On its north-east-facing surfaces which are inclined very steeply or vertical, you can see the remains of many sets of delicately rippled surfaces (*see photo at right*). These reveal the origin of the rock as a former shallow sea floor or estuarine lake bed where gentle currents gradually developed ripples, identical to those commonly seen today on sandy sea shore or lake beds.

The low and mostly symmetric ripples indicate gentle tidal or current flow under quiet and passive climate conditions which must have prevailed in that ancient environment some 750-700 million years ago, long before the origins of shelly or other fossil life forms inhabiting the planet.

But tumultuous forces tipped these layers on end and broke them up at the time of a great faulting event some 500 million years ago. Evidence of this event is seen in the repeated arrays of shiny white crystalline quartz veins cutting across many of the tilted and vertical layers *(see photo at left. You may have seen similar features at the* ***Dawn of Life*** *geosite, earlier on during your drive – see page 22 of these notes).*

40.8
0.5

We recommend a slow crawl in low range through the Gorge! *Parts of the track are not well-defined as it crosses from one side of the creek bed to another. In places, large rocks make it essential to check your line (walk it if necessary), to reduce the risk of underbody damage.*

Entrance to Old Mount Nor'West Gorge *(PoI #10)*

How did the Gorge form ? Tilting, crumpling, fantastic folds and a raging torrent **

About 500 million years ago, a major mountain chain arose as 350 million years of accumulated sediments from ancient rivers, saline lakes, and inundation by the sea were pushed together by vast tectonic plates colliding in the earth's crust. The chain is known as the Delamerian Mountains (named after the village of Delamere, on the southern Fleurieu Peninsula, south of Adelaide). The chain extends far into the north of South Australia, incorporating the Flinders Ranges, and the Willouran Ranges in which the Gorge is located.

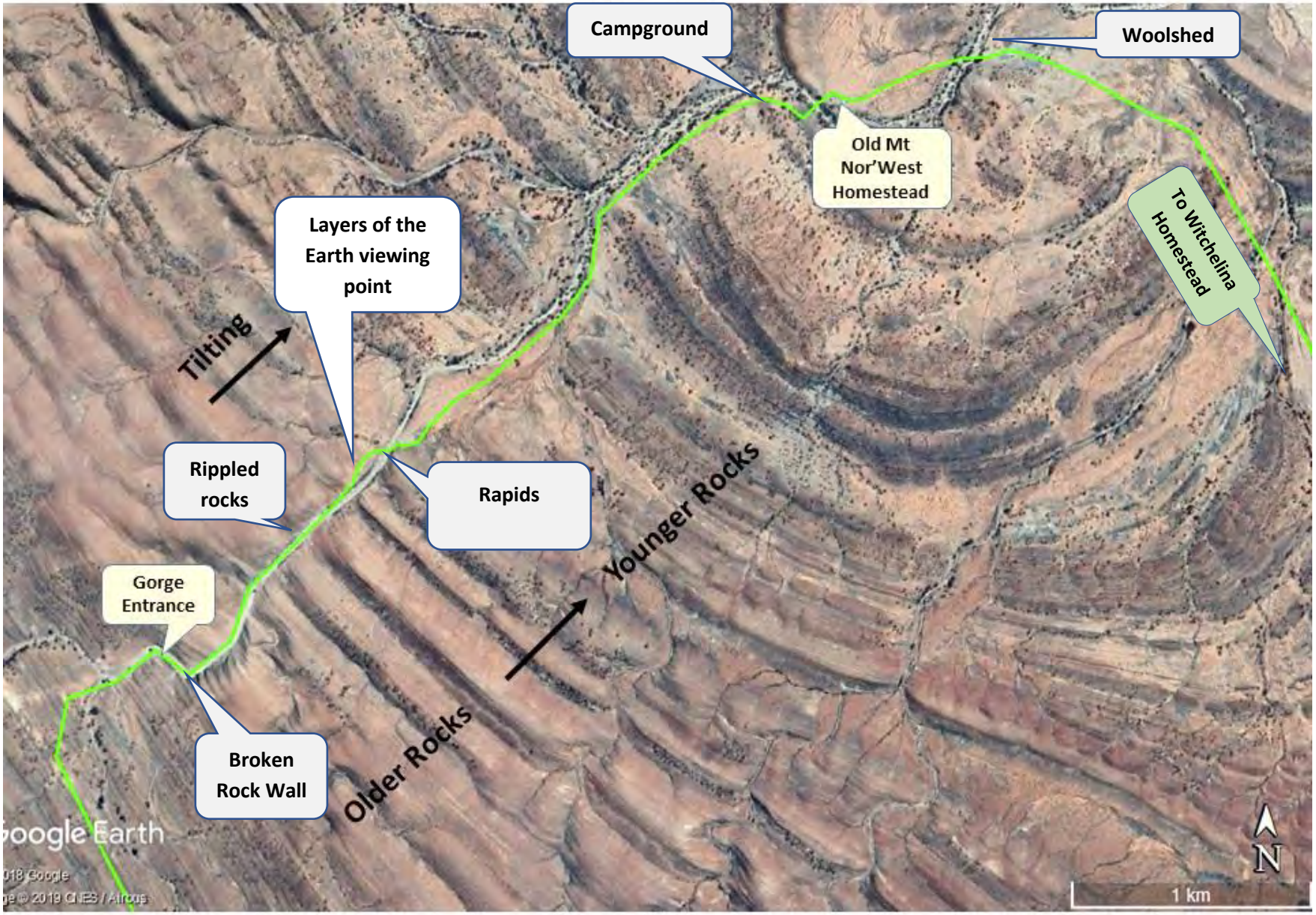
During this mountain-building period, the sedimentary layers concertina-ed up into large folds and slid over each other along thrust faults. The resulting crumpling and cracking of the ancient rocks are on dramatic display as you drive through the Gorge *(see Google Earth image on next page)*.

The massive layers of rusty brown, red, white, grey and cream sandstones and siltstones tilted towards the north-east, appear to have been excavated to allow a raging torrent to escape. The torrent is now the Willawalpa Creek. Maybe long ago, a large lake was trapped behind the ranges running NW to SE in the image on the next page. During one gigantic weather event, it may have suddenly released billions of litres of water to start cutting and eroding this magnificent thoroughfare and waterway.

As you travel through the Gorge, each layer of rock is younger than the last. Each layer may represent tens- or hundreds of thousands of years of geological time, and each shows evidence of processes still common today: water-washed sands, ripples from shallow rivers, and pebbles and scours from the ancient torrents which formed them long ago.

*** More information can be found in an* ***Introduction to Witchelina Geology****, in Welcome to Witchelina, a companion volume to these track notes, available from the Witchelina Homestead*

Old Mount Nor'West Gorge



41.3
1.3

Broken Rock Wall

As it narrows, the creek bed is steered along the base of a most unusual Broken Rock Wall - a thick bed of massive quartzite.

During tilting, the Wall broke into a set of vertical and horizontal fractures which make it appear as if it were constructed by laying large square boulders one on top of the other. The joints are wider spaced and tighter lower in the wall and more open and frequent near the top due to the weathering and erosion which worked on wearing them down over millions of years.

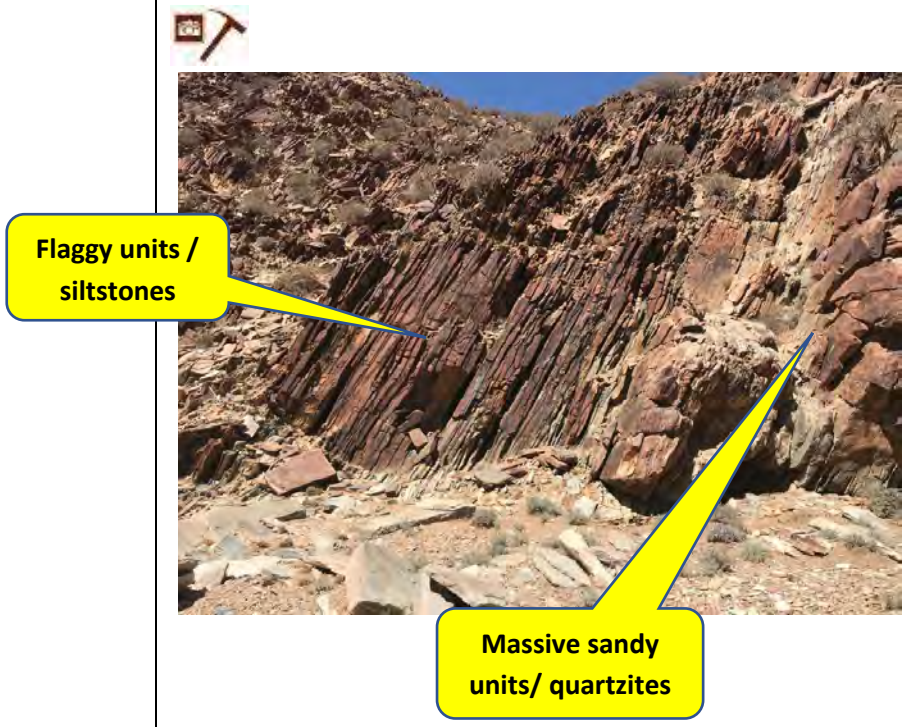
Folds and crinkles

Close up photos from the overhanging caves at the entrance bend in the Gorge show a highly sheared and laminated slaty rock with small folds and crinkles suggesting fault movement along this surface contact.

Bedrock

Stripy solid layers of bedrock within the Gorge attest to the long-term cleaning and polishing of this creek bed, probably by multitudes of ongoing flash floods and torrents.

This is an energetic and very active water course which had neither the time nor the opportunity to meander and wind its way gently through the ranges.



The sandstone and siltstone units which comprise the rocks within the Gorge are repeated alternations of these two major rock types, revealed and laid out like the pages and chapters of a colossal book as they lean steeply upstream to the west.

The regular alternations probably represent cycles of deposition resulting from significant periods of climate change and extreme weather events. The massive units seen on the right of this photo, sometimes termed quartzites, consist of coarser-grained sand which was likely to have been deposited on the sea floor by sudden floods of fast flowing water.

As the climate became warmer, and maybe the sea or lake level rose, quieter depositional environments allowed finer grained silts to be laid down in thin sheets, seen here as flaggy layered units 5-8 metres thick.

A cycle like this might represent tens or even hundreds of thousands of years of deposition. Dozens of these cycles make up the rocks of the Gorge.

Rippled rocks

Halfway along the Gorge, on the north-west (left-hand) side is a steep cliff face on which a magnificent rippled surface is exposed (*see photo at left*).

Some 750-700 million years ago, long before the massive collision of tectonic plates in the earth's crust, this slab of sandy rock was part of a shallow water beach. The same sun shone down on the surface as it does today, but there were no creatures alive on earth to leave the tracks and traces of their existence in the sand.

42.6
0.3

Layers of the Earth viewing point

At this point, the geological cycles, processes and features through which you've just been driving are all brought together in one dramatic display.

Thousands of layers (the youngest to the left, the oldest to the right), are now steeply tilted. But try to imagine them as *horizonta*l beds, gradually building on top of each other through successive depositions over about 1-2 million years.

These are only a fraction of all the layers accumulating over *250* million years before being crumpled and lifted 500 million years ago, to form the parallel ranges you can see in the satellite images on pages 5 and 39 of these notes.

42.9
2.1

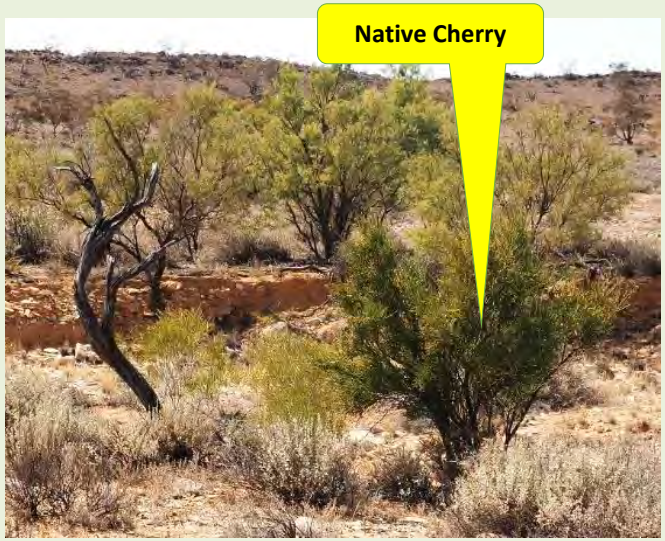
Rapids and waterfalls

At the north-eastern (downstream), end of the Gorge, the last layer of resistant quartzite forms a barrier ridge which is cut across by the creek to form a low set of rocky rapids and waterfalls.

They're mostly dry of course, but after rains, small pools are trapped by the sandstone layers and shallow falls.

After crossing the rapids, you can safely move back into high-range gear if you wish.

(14)



Native Cherry *(Exocarpus aphyllus)*

Like other members of the *Santalaceae* plant family (including Quandongs and Sandalwoods), this is a hemi-parasite that attaches to other shrubs and trees through its roots. It has rigid, striated branches with leaves that have reduced to scales. Its insignificant flowers are followed by succulent red berries.

45.0
0.2

Once were six cylinders….

The origins and history of this old car, and the reason for its last resting place being in this spot, have yet to be established. It's one of several derelict vehicles on Witchelina.

(15)

Limestone Cassia
(*Senna artemisioides ssp oligophylla).*

On the rocky ridge to the right of the track is a small erect shrub with golden yellow flowers during winter. It is widespread and common across northern arid Australia.

45.2 / 0.4

Campground and toilet

45.6
0.7

***Photos at left, clockwise from top**:* Homestead today*;* ruin of original store, office building; industrial remains from the smithy; echo of Sidney Nolan's *Ned Kelly* paintings.

Old Mount Nor'West Homestead and ruins ***(PoI #11)***

Witchelina Nature Reserve today occupies an area of 4,200 sq.km - nearly the same as Kangaroo Island. But a century and more ago, a much smaller area bearing the name was just one of several pastoral leases whose boundaries changed quite frequently as their economic viability and management arrangements ebbed and flowed.

Mount Nor'West Station was one such separate lease during the 19th and early 20th centuries. Established in 1873 by Henry McConville, the Station (at about 1100 km²) was considerably bigger than the 800 km² Witchelina lease of the time, which Mr McConville also owned. However, the large, poorly-watered run proved very expensive to develop, and after a few years he sold the Witchelina portion to the Ragless brothers. The early generations of the Ragless family are credited with establishing Witchelina as a separate run. *(More information can be found in **A Brief History of Witchelina,** in Welcome to Witchelina, a companion volume to these track notes, available from the Witchelina Homestead).*

Mr McConville is described in one account **as a "*fearless and heroic character… a greatly deserving pastoral pathfinder*". But financial difficulties seemed to dog him for much of his life. He was forced to sell his remaining Mt Nor'West Station stake in a partnership with Messrs Tarlton and Rischbieth (both names now attached to major landscape features on Witchelina). And after a life of relentless but ultimately unrewarding pastoral activity, he died aged 72 in 1903, "*with tragic suddenness*", as the account puts it "*while having dinner in a Rundle Street restaurant*".

It's worth taking time to look around the precinct to gain some idea of what life on the station would have been like. As you can see from the 1896 precinct plan on page 47 below, the station was a complex operation, operating at the busiest times with several dozen employees. The current house and some of the infrastructure dates originally from the 1950's or 1960's and later. The house was occupied well after 2000, leading up to the sale of the – by now greatly enlarged - Witchelina lease to Nature Foundation in 2010.

***** Pastoral Pioneers of South Australia Vol II***. Reprinted from *The Adelaide Stock and Station Journal* (1927)

HENRY McCONVILLE.

As you wander around, please remember:

- exercise great caution where you tread – there are numerous tripping hazards and sharp broken objects around the precinct, as well as some sites like the in-ground tank that pose a real risk of injury;
- fossicking, and removal of any souvenirs are strictly prohibited. Plants and animals on Witchelina are protected, as are all rocks and objects from the property's pastoral and mining history (however rusty or insignificant they may appear !)

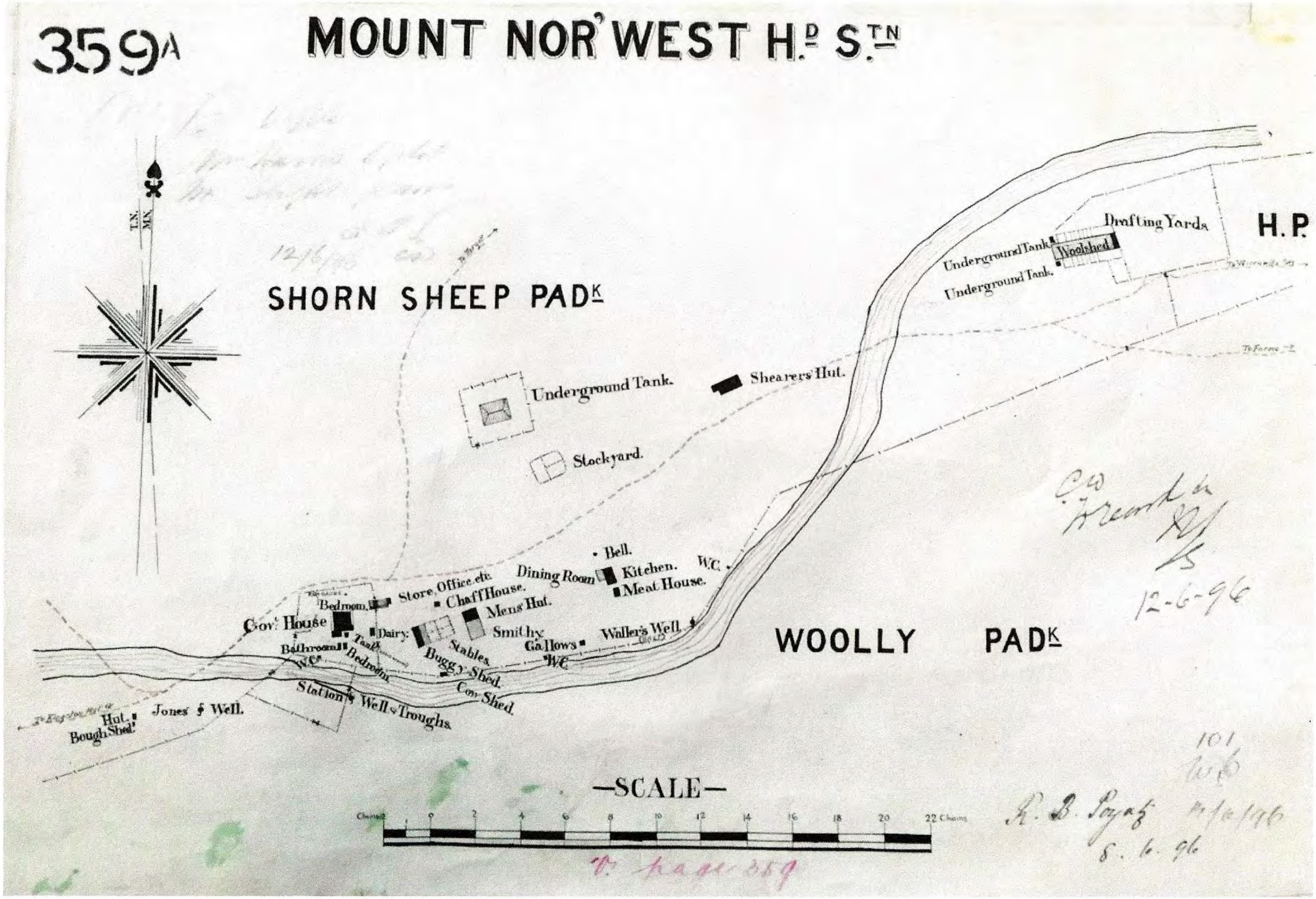
For a property as large and remote as Witchelina, it's remarkable how regularly the Homestead receives visitors with some past connection to it. Many have memories of earlier decades which throw a little anecdotal light on what it was like to live here. Some examples:

1920's (Bush Padre, William Gray): "The late Mrs McIntosh had a fancy for gardening. There is a rockery in front of the homestead… And among these rocks she had quite a variety of plants grown. Young Alan had a goat trained to harness who pulled a little cart. With two kerosene tins in this cart, Alan would go down to the well and bring his load of water for his mother to water these plants as the sun went down…."

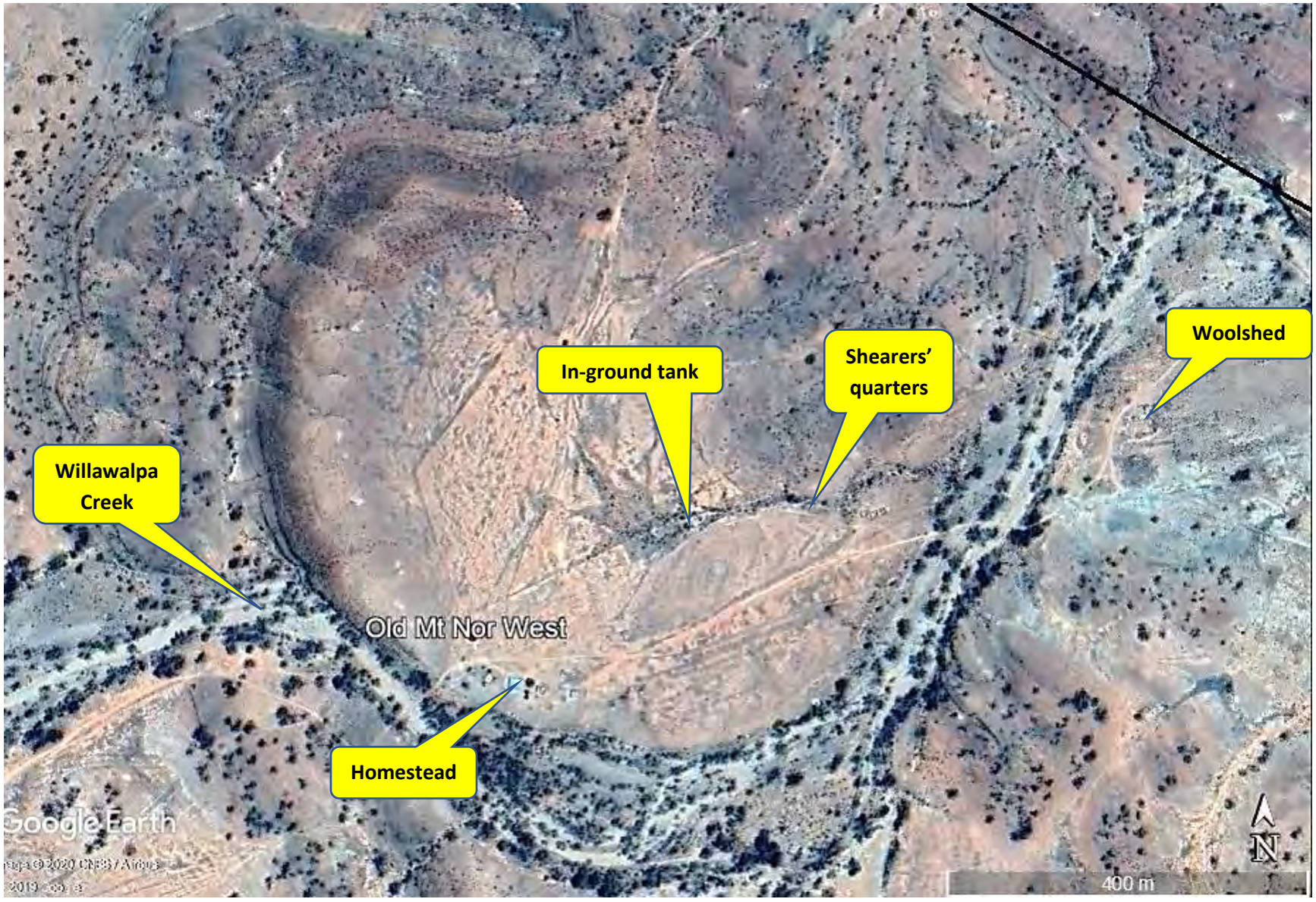
Late 1930's-1940's (Mrs Joy C, who lived at Mt Nor'West Station until the age of 13): *"…she remembers climbing a hill and watching the steam trains in the distance to the east going to or from Marree…[The family] sometimes went into the Gorge for a picnic, to a large flat stone in the middle they called 'The Devil's Table'…"*

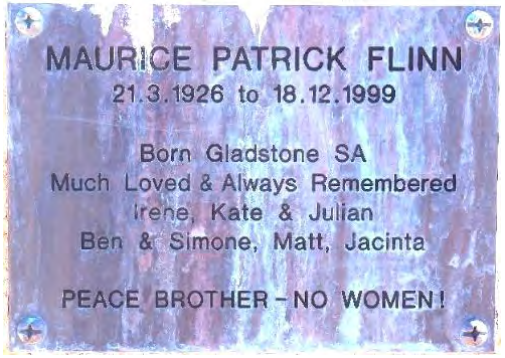
Late 1970's (Mrs Maureen W, who lived on the property for 2 years while her husband worked as a station hand): "we had a good social life… We had 70 people at the housewarming party in 1978. Cricket was played, and much food and beverage consumed… All nearby stations were in contact via Flying Doctor radio, and with no phones, much business and social interaction was carried out over the airwaves… Three times a day the ladies had a natter session (after the RFDS telegrams had been read out and any medical calls attended to)…."

Nature Foundation *has restored the Homestead on this part of the Witchelina Reserve. The house is available for hire, and the precinct now has a designated campground nearby, as well as extensive ruins of shearers' quarters and a woolshed.*


359A
MOUNT NOR'WEST H.D S.TN
SHORN SHEEP PADK
WOOLLY PADK
H.P.
Drafting Yards
Woolshed
Underground Tank
Underground Tank.
Underground Tank.
Shearers' Hut.
Stockyard.
Bell.
Dining Room
Kitchen.
Meat House.
W.C.
Store, Office, etc.
Chaff House.
Mens' Hut.
Bedroom
Gov.t House
Dairy.
Smithy
Gallows
Waller's Well
Bathroom
Tank
W.C.
Bedroom
Stables
Buggy Shed
Cow Shed
Station
Well & Troughs
Jones' Well
Hut
Bough Shed
T.N.
M.N.
12-6-96
—SCALE—
22 Chains
v. page 359

This Google Earth image of the area immediately surrounding the Old Mount Nor'West Homestead precinct shows the dramatic amphitheatre-like basin in which it lies. The in-ground tank is roughly at the centre of the basin, ideally located to collect water from the surrounding hillsides. The black line at the top right-hand corner of the image marks the Old Mt Nor'West Fault .





(Above) On a hill immediately to the west of the Homestead stands a cairn, with an intriguing plaque in memory of Mr Maurice Patrick Flinn. Mr Flinn used to visit Witchelina during the 1990's to go shooting.

You're welcome to walk up the hill to get a great view of the precinct and the amphitheatre/basin.

But no driving up there please !

(Above) Shearing implements.

(Below) In-ground tank, half-full of water after summer rain (February 2020). The runged plank at the far end is intended to provide an escape route for any kangaroo falling into the tank when it's dry.

(Above and below) Ruin of shearers' quarters. At the western end of the quarters are the remains of a very large bread oven and a row of coppers needed to daily wash the teams' clothes.

Track from the Homestead continues straight ahead to the Willawalpa Creek

As you enter the creek bed (usually dry), you may notice a purple sign on a dropper to your left. This marks the start of one of several Buffel Grass eradication sites on Witchelina. Debris often accumulates at the base of the dropper – the creek, when it flows, can transport seeds from one localised site to others far down the watercourse.

Buffel Grass *(Cenchrus ciliaris),* is a perennial tussock grass which competes with native species and constitutes a significant fire hazard. In the tropical north, Buffel Grass is regarded as useful pasture for cattle - indeed, the plant was originally introduced to northern Australia as a benefit for pastoralists. In the south, it is a proclaimed environmental weed.

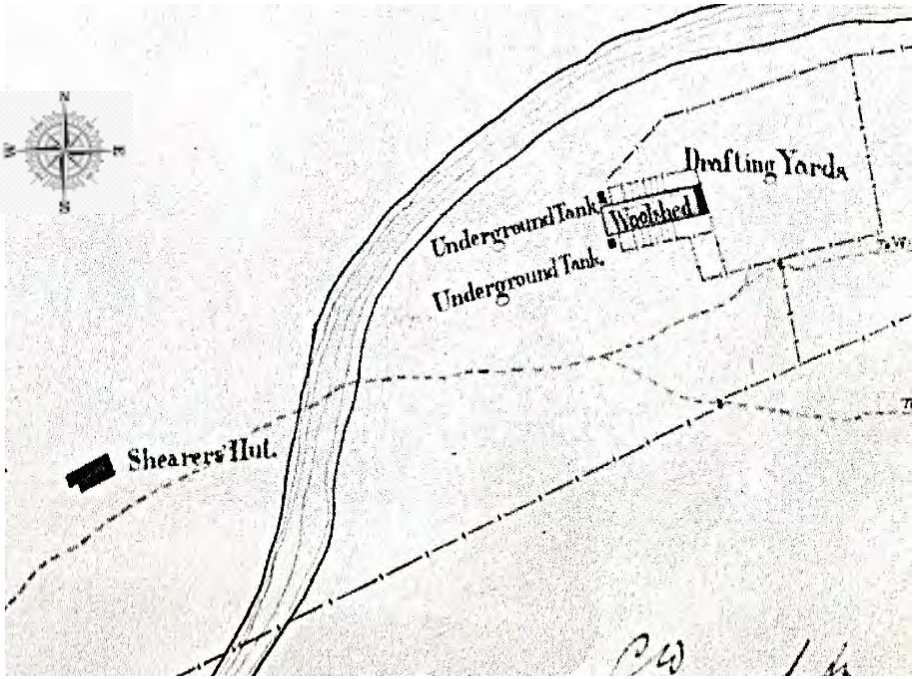
On Witchelina, Buffel Grass is one of the major pest plants that Nature Foundation is trying to control (complete eradication is probably not achievable). While repeated spraying has significantly reduced the growth of this weed, sites like this and downstream need regular monitoring, especially after rain in case there have been fresh germination episodes.

46.3
5.0

After crossing the creek, the track forks, just before the woolshed ruins. **The Witchelina- and Farina-Old Mount Nor'West Gorge loops separate here from the Marree loop which continues northwards.**

Old Mount Nor'West woolshed ***(PoI #12)***

The 'mud map' at right is a detail from the 1896 Mount Nor'West Station plan on page 47 above.



The shed would have been built in the 1870's, when Henry McConville established the property. It originally had 24 blade shearing stands which were then converted to mechanical shearing when the technology was introduced around 1918.

The 24,000 sheep on the run would have taken about ten days to shear, with the shearers averaging 100 sheep a day. The total bales produced would have been around 600, and at today's prices, would have been worth about $1.2 million. Along with the 24 shearers, another 20 shed hands, woolrollers, pressers, woolclassers and cooks, would have been required to complete the annual shearing. The Expert, as the shearing contractor's representative, would've overseen the entire operation.

The shearing workflow was something like this *(thanks to one of the Reserve Managers' team, Greg Bannon, for the following account)*:

1. the sheep entered the shed from extensive drafting yards on the eastern side (*see 'mud map'*). They were guided into 'catching pens' on the shed floor, from which the shearers pulled them out across the board for shearing on their respective stands.

2. After being shorn, the sheep were pushed into 'let-out' or 'count-out' pens (the little pens you can see outlined along the northern and southern edge of the woolshed in the 'mud map'). Each shearer had his own let-out pen, accessed by the sheep through 'portholes', divided into two in the wall. In the northern wall here, six 'portholes' are still standing (some still have the upright dividing timber – *see photo at right*). The southern wall, now collapsed, had the six divided 'portholes' for the other twelve stands.

3. At the end of each 2-hour work period, or 'run', the Expert would count the sheep in the 'let-out' pens to determine the final individual daily tally of each shearer.

   The more sheep a shearer shore, the more he was paid. With 2 shearers sharing a single catching pen, but having their own 'let out' pen, it could be a highly competitive work environment. Some sheep are easier to shear than others and the shearer paces himself during each run. He might start with some of the tougher ones in the catching pen and have his eye on an easier one (it might be barer, for example, with less wool on the head, legs, or belly); and the shearer would think "*I'll do that one next and have a bit of a breather*", only to be annoyed because the other bloke caught it while he was struggling with a tight, wrinkly bastard !

   As the song '***Click go the Shears'*** has it, "*The ringer looks around and is beaten by a blow, and curses the old snagger with the bare bellied joe"* (*joe* = a ewe)

4. The shorn fleeces were cleaned up and placed into a woolpress for baling (*see photo at left*). In the ruins of this shed, you can see the raised area on the western end where the woolpress used to be. The bales were rolled out of the shed through large double doors (you can see the massive wooden lintel where they used to be), and loaded on to a dray, or later a truck, for transport to the railhead.

A massive woolpress stands on a rise near the Witchelina Homestead (*photo at right*). The press, built by the Adelaide engineering firm Forwood, Down & Co, was purchased new for installation in the Mt Nor'West Station woolshed. In 1975/76 it was acquired by the Booleroo Historical Society, and returned to Witchelina in 2013, on long-term loan to Nature Foundation.

5. It was important to keep the woolshed floor as clean as possible. The sunken area in the middle of the shed was covered by wooden grating, with floor joists supported on the stone piers you can still see (*see photo at right*). Droppings and urine drained underneath, and occasional cleaning out would have been done by lifting sections of the grating then raking, shovelling and barrowing out.

In amongst the ruins, it's not easy to imagine the Mt Nor'West Station precinct as a busy industrial site. But the scale and diversity of the buildings that once were here, and the litter from decades ago, evoke a past human presence that's at once fascinating, challenging (how would we have fared in this harsh and remote environment ?), and even moving. Here are some images which perhaps give some sense of it all.

Clockwise from upper right: dam sinkers' smoko (1930); dam sinkers' camp (1930); beer and smokes; Mt Nor'West Station mens' quarters (1930).

Black and white photos by permission of State Library)

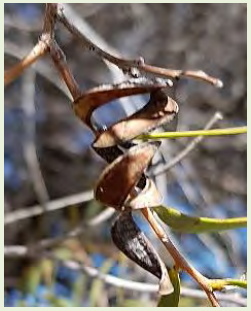
46.3 **5.0**	After inspecting the woolshed ruins, **follow the red arrow to the right.** From here on, almost to the Witchelina Homestead, the track follows a route shared by the Witchelina-Gorge drive. However, please <u>ignore the lime green arrows</u>, and follow only the **red** ones.

16

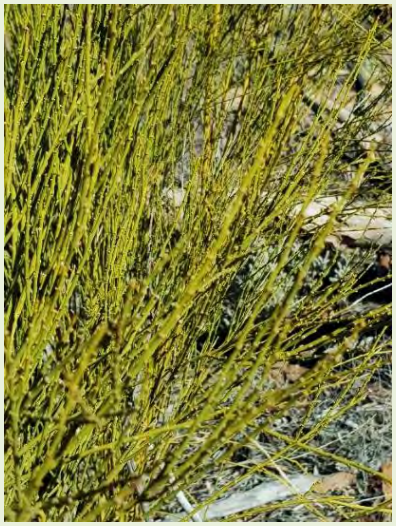
Umbrella Wattle (*Acacia oswaldii)*

About 30 metres to the right of the track, this tree is very long lived and slow growing and is found throughout the dry areas of South Australia.

Because it is slow growing the seedlings are susceptible to grazing for many years. It has a large and distinctive curly seedpod and large glossy black seed.



17



Desert Broom Bush (*Templetonia egena*)

On the far side of the gully in front of you, to the right of the track, this shrub is a member of the pea family, and a very important food for small butterflies and other insects. It has tiny brown and yellow pea flowers.

18

Bladder Saltbush (*Atriplex vesicaria)*

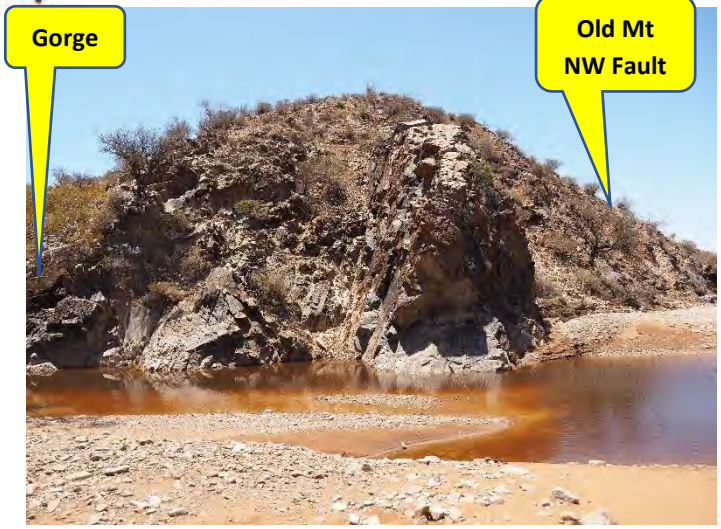
Bladder Salt Bush grows in association with Old Man Saltbush. It is a long lived perennial that is highly valued in the grazing industry. It has separate male and female plants and produces large amounts of seed in good seasons. Saltbushes are identified by the shape of their seed.

Old Man Saltbush (*Atriplex nummalaria)*

Large woody shrub that grows to 3m in height and diameter but occasionally more. Male and female flowers occur on separate plants. It can range from erect to sprawling in growth form. It provides a useful forage resource particularly in times when other feed is scarce and can be found on both saline and non-saline soils. It occurs naturally in many parts of the pastoral region, and in some cases has been successfully re-established in these regions.

Old Man Saltbush

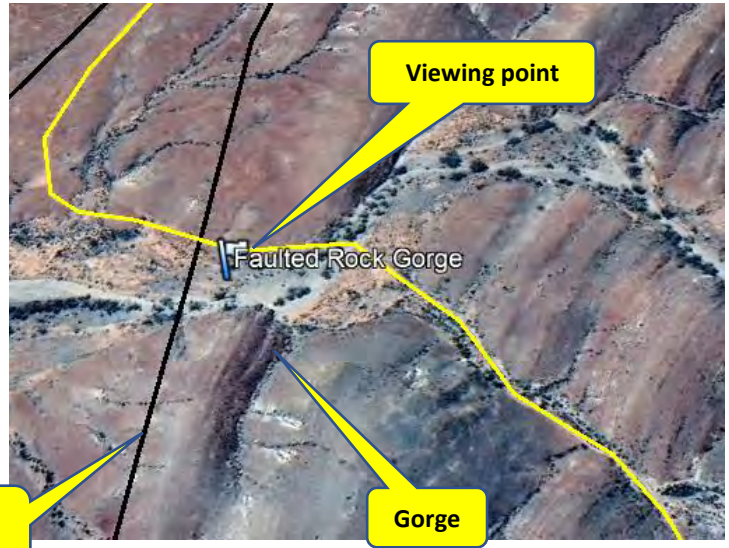
51.3
1.0

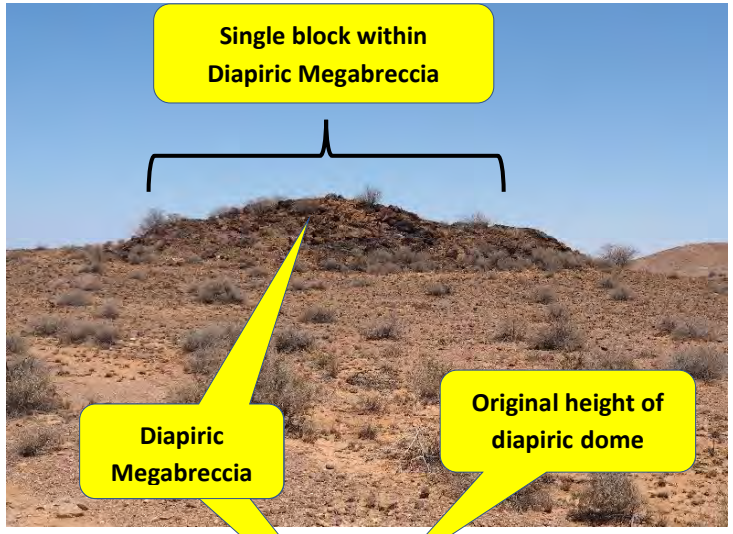
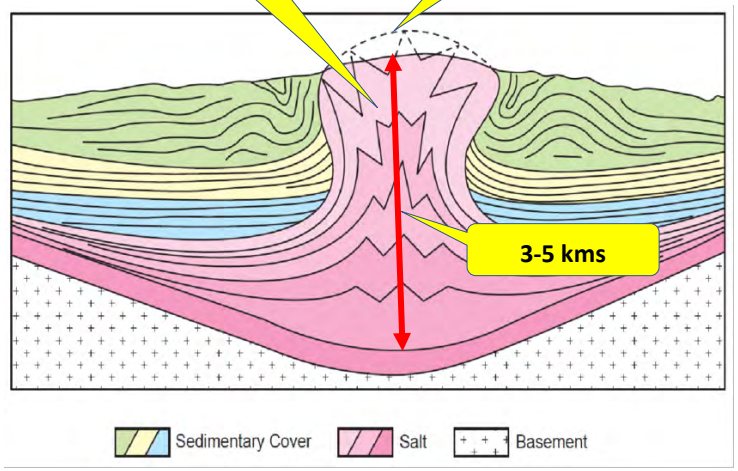


Faulted Rock Gorge

Two major faults converge at this creek crossing, and form massive cliffs of highly fractured quartzite.

Google Earth image at right looks down on the site from the north; ground view at left is from the south, near the viewing point.



52.3 **1.1**	 	**Diapiric Megabreccia**  *Breccia* is an Italian word meaning "broken rocks". A *mega*breccia is thus an enormous breccia, often many kilometres in size. Geological breccias form in a number of ways but are always made up of broken angular fragments of rock. The fragments may be small *(see photos at right and below),* or tens of metres across, like the megabreccia block at this site, to the right of the track. A *diapir* is a domed rock formation in which a core of rock has moved upwards to pierce the overlying strata (*see diagram at lower left).* At this site, a relatively low-density mixture of salt and mud was pushed up through the denser overlying strata. The gross weight of the strata generated pressure to force the lighter material to rise. Caught up in the mixture were both large blocks and small fragments of rock (the *breccia*). Over millions of years, the salt dissolved leaving the mud, breccia and isolated blocks you can see today. Keep an eye out for Bearded Dragons, which frequent sites such as this. 
53.4 / 2.6		**Willawalpa Junction. Follow red arrow to the right.**
56.0 / 0.6		**Track comes in on left from Murrumbidgee Swamp. Follow red arrow to the right.** **You have already driven the next 6 kms during the earlier stages of your drive.**

56.6 **0.6**		**Spring Well and stone tank** Old sheep yards next to the tank were later used for trapping goats **Caution ! NO ENTRY to well enclosure.** 
57.2 **2.2**		**Spring Gully walk** Approximately 570m from Spring Well is Spring Gully. If you wish, you can park by the road and take a 20 minute walk into the small gorge. Note the old slate trough at the entrance to the gully. Water was piped from the spring further upstream. The spring is no longer permanent, and is quite saline when it's running.
59.4 **0.5**		**Through gateway**. Note the pipe motor bike ramp on the right (*see photo at left*), installed when a new fence was being built. The ramp saves the motor bike rider the trouble of opening and closing gates.

59.9
2.0

Exclosure

En*closures* are generally designed to keep something in. ***Ex****closures,* by contrast, keep unwanted animals out.

This fenced exclosure has been established to monitor the total grazing pressure on this site. It's one of several on Witchelina.

The exclosure prevents grazing by large native herbivores (plant-eating animals) such as kangaroos, and introduced invasive herbivores such as rabbits, sheep, cattle and goats. Sheep and goats are no longer a major issue on Witchelina – but in some areas cattle, rabbits and 'roos can still present a problem, especially in wet years.

Exclosures have been constructed in different vegetation communities on the Reserve. Some exclosures are designed to keep out specific types of grazing animals while allowing others to enter the fenced area. In this way we can determine the impact of different herbivores on native vegetation.

Vegetation within each exclosure, and at paired unfenced sites, is monitored using photopoints and other vegetation assessment methods, including detailed audits of specific areas (*see photo at right*).

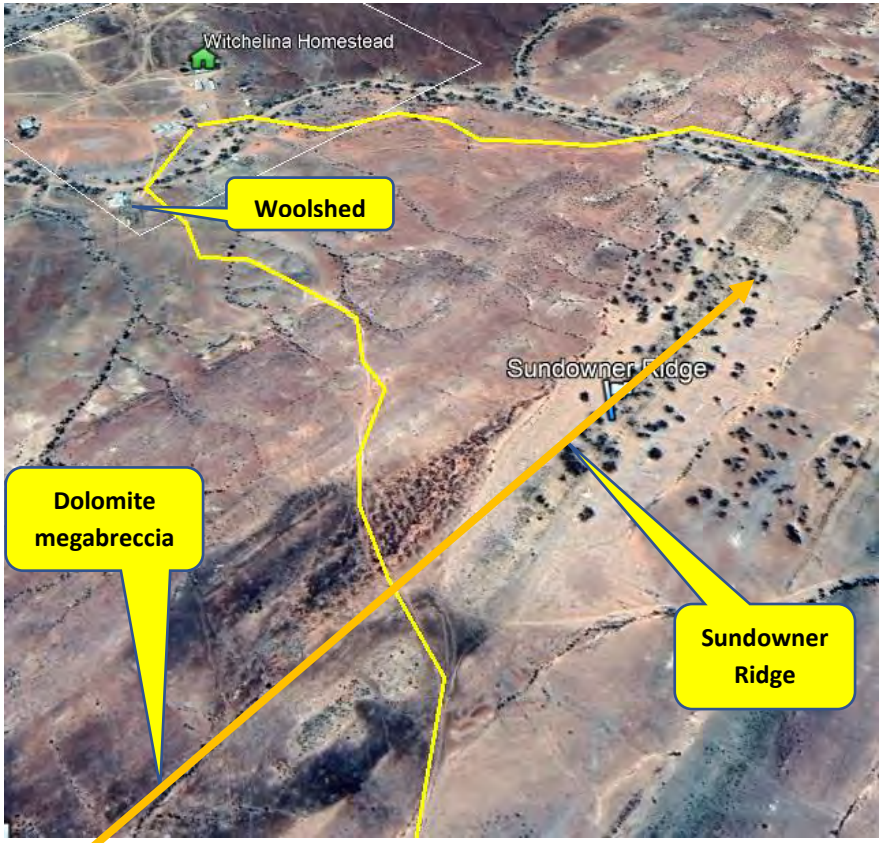
Data from this monitoring will help Nature Foundation to effectively manage grazing animals to ensure the protection of native vegetation and habitats on Witchelina.

61.9
0.1

Dolomite Megabreccia

To your left is a small creamy-coloured rubbly outcrop. This, and a couple of other outcrops to the left of the track are extensions of a long, tree-studded ridge to your right (Sundowner Ridge *see photo at lower left, and Google Earth image below).*

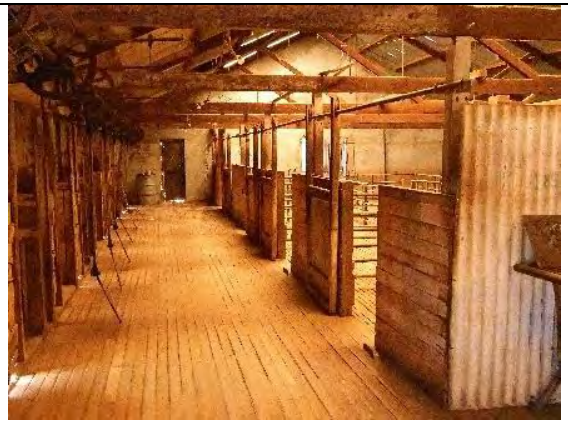
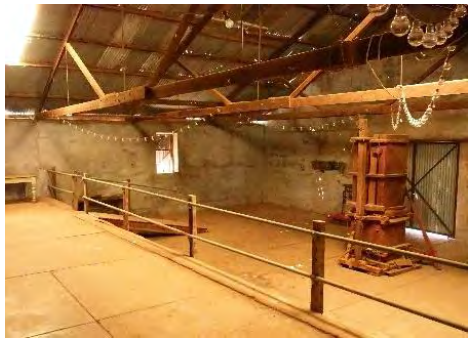
If you walk up to the site, you'll see slabs of rock which appear to have been 'etched'. The criss-crossing cracks and grooves are the result of chemical weathering and erosion (*see photo at left*).



Direction of view in photo at middle left

62.0
1.1

Follow the red arrow to the left, and continue towards the Witchelina Homestead precinct.

63.1 **0.1**		**Go through the gate and keep straight ahead to the parking area in front of the woolshed door.**
63.2 **0.4**	 (*At left*) the board *(At right)* interior pens   *You may notice strings of lights suspended from the ceiling above the woolroom floor. Nature Foundation uses this space for membership- and other social gatherings of up to 70 guests.*	**Witchelina woolshed**  Like most pastoral properties, Witchelina had its share of boom and bust years. In 1901/02 for example, 30,000 sheep were shorn (the highest number in the property's history), with up to 75 men employed at shearing time. Contrast with around a century later, in 2004, when 10,700 were shorn. This woolshed (also called the 'shearing shed'), was built in 1878, early on in the station's development, on the northern side of Station Creek. The yards had a capacity for holding up to 600 sheep. Originally built for blade shearers, the shed would have been converted to mechanical shearing around 1920, with overhead gear powered by a diesel engine (you can still see some of the overhead gear above the board where the shearers worked, and the stationary engine which powered it as you enter the shed). The interior was destroyed by fire in 1888 as a result of some careless burning of dead sheep; but the walls remained strong and the shed was rebuilt, remaining in use up to the end of pastoral operations. The last clip was baled in 2009. *(More information can be found in **A Brief History of Witchelina,** in Welcome to Witchelina, a companion volume to these track notes, available from the Witchelina Homestead).* ***Thanks to Nature Foundation's General Manager, Properties, Chris Reed, for the following account*:** The woolshed, is known as the factory of the pastoral run. The Witchelina shed is unusual in that it has a straight board with nine shearing stands in line. This design would've made life particularly busy for the roustabout on the last three stands (or, more precisely, the 'picker up' - *see the list below of jobs performed by different categories of woolshed roustabouts*). If each shearer shore 100 sheep, the roustie would've had to run 25 kms a day just to pick up 300 fleeces, as well as sweeping up and cleaning away the separate belly wool from each sheep.

Tom Roberts: *Shearing the rams* (1890). By permission of National Gallery of Victoria.

The more sheep a shearer shore, the more he was paid. The easier the sheep, the higher his daily tally, and the bigger his final cheque. A recent visitor to Witchelina, a shearer with past experience of this woolshed, recalls looking at the sheep in the pens and licking his lips thinking 'here's a go, 200 to 250 a day in these flyers'*; only to find, on pulling out the first one, that the wool had a lot of sand in it, playing havoc with the combs and cutters on his handpiece. To his disgust, he only managed 125 a day….*

The vertical sliding portholes next to each stand along the board are used to provide some protection when cold winds blow into the shed on to the backs of the shearers.

Another interesting feature of the shed is that a tunnel has been built under the woolroom and wooltable floor, through to the interior pens beyond, covered with wooden grating. The manure from the sheep would fall into a space under the floor, and could be cleaned out with wheelbarrows through the tunnel exiting the shed under the loading ramp on the creek side (*see photo at left, taken soon after the woolshed's construction in 1878*).

This shed would have had nine shearers, including at least one learner as required by union rules. They were supported by an even larger workforce whose functions and tasks are still essential for the operation of shearing sheds today. The team comprises:

Tarboy - usually a lad summoned by a shearer, who mans the tar stick and administers a disinfectant and anti-maggot mixture painted on a cut or flyblown sheep;

Pickerups - who pick up the fleece once it has been shorn and then take it to throw on the wooltable.

Woolrollers - who stand next to one of two wooltables and remove the shorter, burr-ridden and sweaty bits. These are called 'pieces' and are thrown into a special bin.

Piece pickers - who sort through the pieces, picking and grading them into two lines of wool.

Woolpresser - who presses the wool into 200 kg bales. In big sheds today, up to 50 bales a day will be pressed. Originally done in wooden, mechanical presses (like the one you can see in this shed), this task is now performed by a hydraulic steel press.

Woolclasser - who classes the wool into different lines, using objective visual measurement of length, strength, colour, condition and style. He also manages the wool processing in the shed, overseeing all of the roustabouts and the woolpresser.

The Expert - the boss of the shed and the shearing contractor's representative. Jobs include grinding of the shearers' combs and cutters twice a day, penning the sheep into the catching pens, counting out each shearer's sheep after each two-hour run, and then working out the individual daily tallies of each shearer. The Expert also has the key responsibility for paying the team at the end of the contract.

63.2 / 0.4		**When you've finished visiting the woolshed, please make sure the door is shut; return to your vehicle, and drive back through the open gate you passed through before. Turn right, following the red arrow.**
63.8 / 0.3		**T junction – follow red arrow straight ahead.**
64.1 / 3.1		**Fork - follow red arrow left.**
67.2 / 0.1		**Track bears left at red arrow.**
67.3 / 0.9		**Turn left through open gate, and follow fence line for approx. 900 metres**
		**Vermin Proof Fence** ***(PoI #14)*** In the late 1800's, before the "Dog Proof Fence" was erected, the landholders often fenced part of their properties with netting to protect stock, particularly lambing ewes, from dingo attack. They were much more expensive than conventional fences and required more maintenance but the higher survival rates more than made up for the cost.
68.2 / 1.2		**Follow red arrow right, moving away from Vermin-Proof Fence.**
69.4 **1.6**		**Old copper mine** ***(PoI #15)*** **TAKE CARE AT THE MINE SHAFT. OBSERVE SIGNAGE** 

71.0 **8.7**		**Viewing point** ***(PoI #16)*** *Some mobile phone coverage may be found here.* With binoculars it may be possible to see Samuel Parry's cairn on Termination Hill to the south (*the green arrow in the photo at left*), and George Goyder's cairn on Twenty Mile Hill to the north, built in the late 1850's. Goyder established a baseline between the two points, a vital reference for his triangulation surveys to set leasehold boundaries for the pioneer pastoralists. He later became South Australia's Surveyor General, famous for 'Goyder's Line', which defined the limit of suitable cropping land in SA based on reliable annual rainfall.
79.7 / 1.4		Junction – follow red arrow.
81.1 **1.9**		**Farina boundary** ***(PoI #17)*** **This is the first Farina gate you'll pass through. PLEASE ENSURE GATE IS CLOSED BEHIND YOU.** **Follow red arrow left - you are now on Farina Station. The track runs for approx. 2 kms along the fence on your left. Ignore any of the station tracks leading off to the right.**

83.0 / 0.8		Follow red arrow right.
83.8 **1.4**		**Sleeper posts** ***(PoI #18)*** Railway sleepers from the 'Old old' Ghan have been re-purposed here as fence posts. 
85.2 **4.2**		**Viewing point** ***(PoI #19)*** Salt pan lookout**.**
89.6 **2.4**		**2ND Farina Gate** **PLEASE LEAVE GATE AS YOU FIND IT – if closed, please make sure it is secure.** **Gate may be locked. Find the padlock marked 'Nature Foundation', and use the same Witchelina padlock key that you used at the beginning of your nature drive.** In this area, you may notice some numbered signs painted on old railway plates *(see photo at left)*. These belong to drives marked out by the owners of Farina, for visitors to their station. They can be ignored for the purposes of your Farina loop nature drive. **Follow red arrow. Soon, the track runs along a fence line on your left.**

92.0 **0.05**		**3rd Farina gate – new steel gate. PLEASE LEAVE GATE AS YOU FIND IT – if closed, please make sure it is secure after you've passed through.** **Follow red arrow.**
91.95 **0.8**	 *Cutting to right of your track*	**'New Old' Ghan.** ***(PoI #20)*** This is the track alignment for the Standard Gauge railway, built in 1956 – a more direct route for diesel locomotives from Pt. Augusta to Marree for the Ghan and coal trains from Leigh Creek.  *Embankment to left of your track*

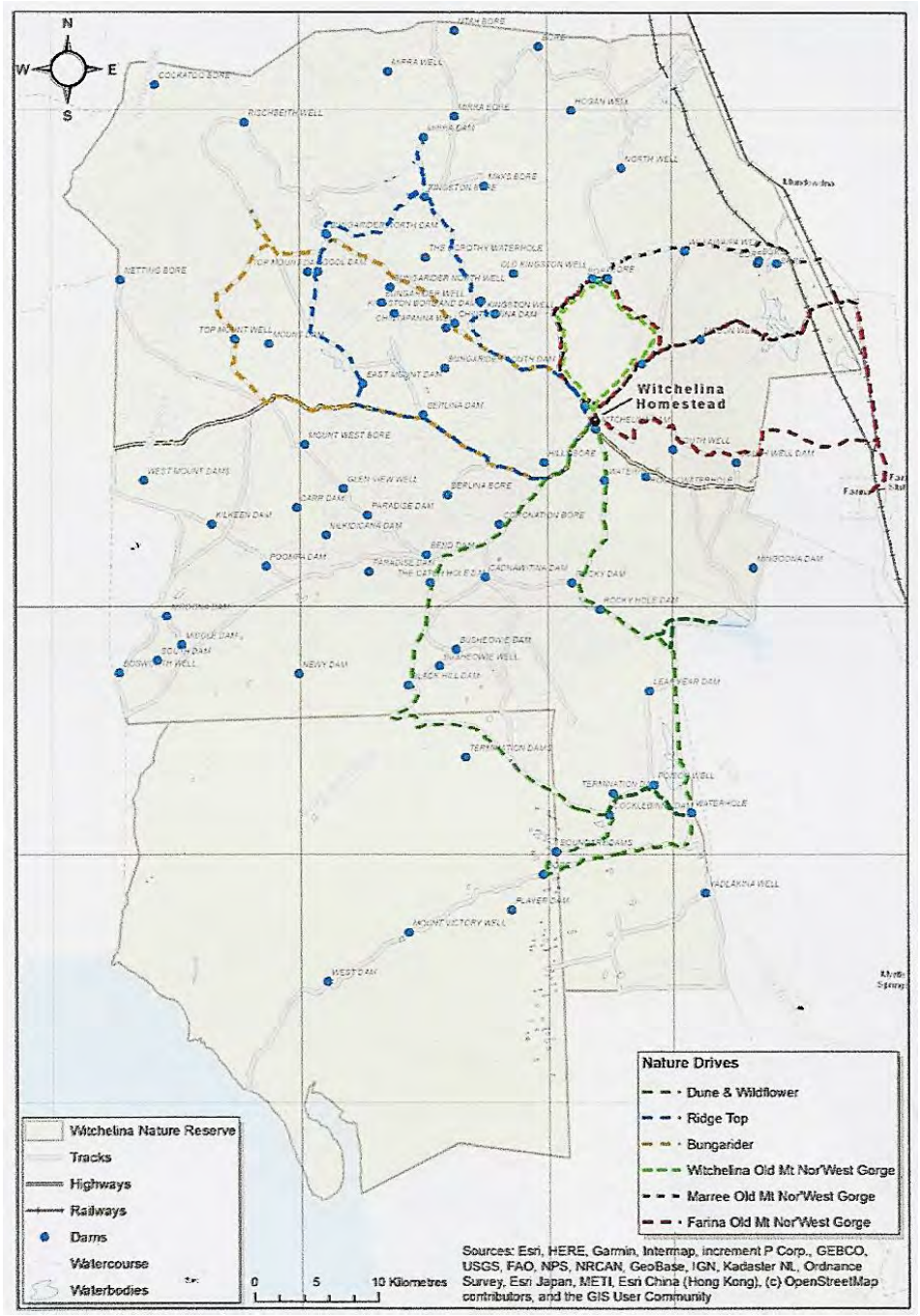
92.8 **0.1**		‘Old Old’ Ghan ***(PoI #21)*** Building of the original narrow gauge railway started in Pt. Augusta in 1878 and reached Farina 1882, closely following the Flinders Ranges to be close to water sources for steam trains. Photo at left shows the faint remnant of an ‘Old old Ghan’ embankment, to the left of your track.
92.9		**Keep straight ahead until you reach the main Lyndhurst-Marree road, and turn right. This is the end of the off-road section of the Farina-Old Mt Nor’West Gorge Nature Drive.** Farina campground is approx 5.4 kms away to the south.

We hope you’ve enjoyed your drive !

Please return your key to the Farina Station Manager, and collect your deposit.

Track notes are available for 6 Witchelina Nature Drives

- ❖ Ridge Top
- ❖ Bungarider
- ❖ Dunes & Wildflowers
- ❖ Witchelina – Old Mt Nor'West Gorge
- ❖ Marree - Old Mt Nor'West Gorge
- ❖ Farina - Old Mt Nor'West Gorge



Membership/Renewal

Name:		**Title:**
Address:		
Suburb/town:		**Postcode:**
Postal Address: (if different from above)		**Postcode:**
Mobile:	**Home Phone:**	
Email:		

Name:		**Title:**
Address:		
Suburb/town:		**Postcode:**
Postal Address: (if different from above)		**Postcode:**
Mobile:	**Home Phone:**	
Email:		

Membership Options

As a **Member,** you will receive newsletters, event updates, discounts on event fees, the annual report and the right to vote eg on matters for annual or special general meetings. N.B- new members or members that have lapsed more than 90 days need to be considered by the Board. We will contact you once confirmed.

Please select (tick) the type of Membership you prefer

Type of Membership	**2023 Membership Fees**				**Fees Due**
	1 Year	Tick	Life	Tick	
Individual	$50.00		$1500.00		$
Couple	$80.00		$2400.00		$
Organisation	$220.00		N/A		$

	Membership Total	$	
Donation: If you wish to add a donation, please nominate the amount here	**Donation total**	$	
	TOTAL	$	

** Organisation membership includes 10 copies of each* Nature Matters *newsletter and 3 copies of the annual report*

Your newsletters, annual reports and regular e-news updates will be sent to you by email. You can unsubscribe at any time. *This helps us to reduce paper usage and costs for the benefit of the environment*
Please contact the office if you need to receive correspondence via Australia Post.

We offer online payments on our website www.naturefoundation.org.au

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We recommend that you email Nature Foundation at info@naturefoundation.org.au to advise of the EFT transaction

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Phone (08) 8340 2880 Email info@naturefoundation.org.au