

Exploration and drilling Na Vakadidike kei na Kelikeli

The Namosi Joint Venture (NJV) has been granted a Special Prospecting Licence (SPL 1420) by the Fiji Government to explore for minerals. The licence area is primarily in Namosi and Naitasiri Provinces.

Exploration approach

The NJV initially uses geological mapping, soil and rock sampling, aerial surveys and assessment of historical exploration data to define target areas of interest within the SPL 1420 area.

A drill rig is then transported to the chosen site to collect underground rock samples which are analysed to understand the mineral type, size, depth and quality. Minerals are not taken out of the samples and sold (it is not mining).

The drilling locations can be remote and in difficult terrain. Where possible, the NJV uses existing roads to access these areas. However, due to the limited roads in the SPL 1420 area, new access tracks and drill rig sites are sometimes required to be constructed to ensure safe access, assembly and operation of the drill rig. Environmental assessments are undertaken and landowners consulted before any work commences.

Sa solia na matanitu o Viti kina Kabani na Namosi Joint Venture (NJV) na laiseni ni vakadidike ka vakatokai na Special Prospecting Licence (SPL 1420), o ya me na vakadikeva na iyau bula e loma-ni-qele. Na laiseni qo e kovuta yani na yasana vakaturaga ko Namosi kei Naitasiri.

Na Qaravi ni Vakadidike

E taurivaka na Kabani na veimape e so ni vakadidike sa tu rawa, na soveya mai macawa kei na vakadeuci ni veitukutuku makawa ni vakadidike ka vakayacori e na vanua e vauca na laiseni na SPL 1420.

A vakau kina vanua ni kelikeli na misini ni qivaqiva, me lai qivati mai na vatu ka me mai vakadikevi, ka kilai kina se mataqali iyaubula cava e tiko e na loma-ni-qele, na kena levu kei na kena i vakatagedegede. E sega ni dau volitaki na iyaubula e vakadikevi (O ya e sega ni Kelikeli).

Na vanua e lai qivati e rawa ni vanua yawa sara kina loma ni vanua ka tu talega e na vanua e sukusukura ka drerde ni lakovi. E vakayagataka na Kabani na veigaunisala e sa tu rawa me rawa ni qarava kina na cakacaka. Ia, me vaka ni lailai walega na sala era tu, e dau taya tale na kabani na veigaunisala vou e so me yaco yani kina vanua ena laki qivati, ka umani koto e na laiseni. Qo me rawa ni taqomaki talega kina na bula, na vanua me biu vata kina na i qiva, kei na vanua e qaravi kina na cakacaka. E na tauri talega na matailalai ni tukutuku me baleta na veika bula e ra wavelita na vanua e na vakayacori kina na cakacaka, ka ra vakasalataki taumada na Taukei-ni-qele ni bera ni tekivutaki na cakacaka.

Mobile drill rig



Drilling overview

Previous exploration companies have drilled around 370 holes in the Namosi area over the last 40 years.

The NJV has drilled over 120 holes since 2008, mostly within the Waisoi area. Most drill holes are hundreds of metres deep and some are more than 1,000 metres deep. The size of the diamond drill holes is very small, with most holes about 15 centimeters wide at the surface and reducing in size as the hole goes deeper.

The NJV uses the diamond core drilling technique to more easily cut through hard rock and allow solid rock samples to be collected for analysis.

A mobile drill rig is assembled as close to the target mineral area as possible. Drilling can take place over a period of days or even weeks. A metal or hard plastic casing is used to stabilise the top of the drill hole and control the flow of water during drilling.

When drilling has been completed, the casing is left in place to allow for the hole to be drilled again later if required. Where no more drilling is needed, the hole is capped below the surface. If underground water was present during the drilling process, the drill hole is plugged to prevent water flow to the surface.

Drill rig operating in Namosi



Na i Tukutuku ni Qivaqiva

Rauta ni 370 na qara e ra sa qivati oti e na loma ni yasana o Namosi mai vei ira na veikabani e so, o ya e na loma ni 40 yabaki sa oti.

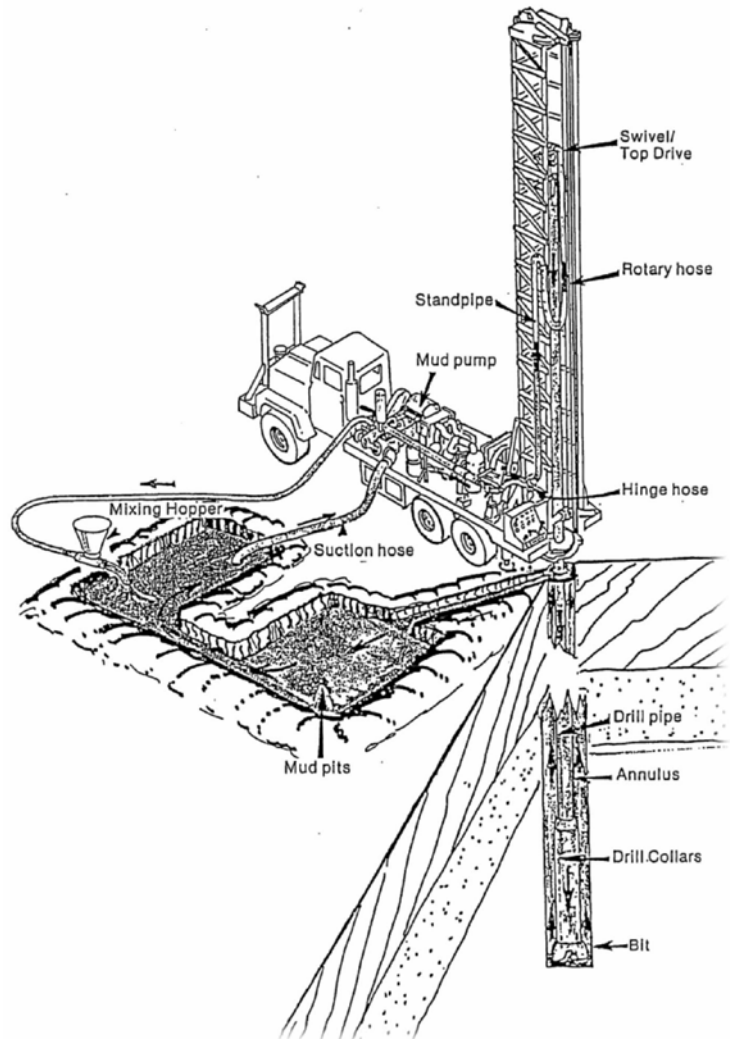
Ia na Kabani na NJV, sa qiva oti e sivia ni 120 na qara me tekivu mai na 2008, ka levu ga na cakacaka qori a vakayacori mai Waisoi. Na balavu ni qara ka ra qivati qo e rauta ni 100 vakacaca na mita e loma-ni-qeke ka vica e sivia sara tiko na dua na udolu na mita na titobu ni qivaqiva. Na neitou mata ni qiva daimani era lalai toka ga ka e rauta tikoga na 15 na sentimita na raba ni qara e dela ni qeke ka lailai sobu ni sa laki titobu na qara.

E vakayagataka na Kabani na misini ni qivaqiva daimani, me curuma kina na veivatu e loma-ni-qeke ka kauta mai ki cake na sabolo me ra mai dikevi.

E vakayagataki na misini ni qivaqiva e dau veikauyaki ka lai vakadaberi me volekata toka yani na vanua e taketetaki. E na taura e vica na siga se vakamacawa na qivaqiva. E vakayagataki na i ubi kaukamea se palasitika e na vanua e dabe kina na misini me rawa ni vukea na vakadrodroi ni wai ena gauna ni qivaqiva.

Ni cava na qivaqiva, sa qai biu tu na iubi o ya, me rawa ni vakatakila tiko na qara kevaka e na mani qivai tale e na dua na gauna e muri. Ni sa sega tale ni dua na qivaqiva e vakayacori, sa qai dau sogo na qara, ka vakayacori o ya volekata toka ga na gusu ni qara e loma-ni-qeke. Kevaka a tiko na wai e na gauna ni qivaqiva, sa dau qai sogoti me tarova na kena lako mai ki cake na wai.

Typical drill rig components



Drilling fluids

Drilling fluids are used to cool and lubricate the drilling equipment, lift fine rock cuttings to the surface and stabilise the wall of the drill hole.

Drilling fluids are mostly water mixed with very low concentrations of drill additives. The mixture looks like muddy water and is stored in plastic-lined, in-ground sumps near the drill rig. The solids settle to the bottom of the sump and the drilling fluid can be re-used as required.

The NJV uses a combination of naturally occurring and water-based drill additives which are not toxic to humans or animals, are biodegradable and will not bio-accumulate. These drill additives easily breakdown with naturally occurring bacteria and sunlight. During this process, the drilling fluid may appear dark in colour and have an odour which goes away as the breakdown process proceeds.

Drilling additives

The four main drilling additives used by the NJV are:

Polymers - used to thicken the drilling fluid to help lift cuttings out of the hole and stop the drill hole from collapsing.

Polymers are used around the world to drill drinking wells and some are approved worldwide to treat drinking water and as food additives.

Lubricants - used to reduce friction and allow the drilling string to spin as free as possible. Lubricants also increase the rate of penetration and enhance the life of pumps and drill bits.

The main ingredient used in our lubricants is vegetable oil. The chemistry used to stabilize the lubricants is indirectly used in a wide range of food, pharmaceutical and cosmetic industries.

Bentonite - used to thicken the drilling fluid and form a stable layer on the wall of the drill hole.

As a naturally occurring mineral clay, Bentonite poses no risk to the environment. It is used in many different applications, including toothpastes, washing powders, pharmaceuticals, stock foods, paints, beer and wine. It is also widely used to seal dams and land fill sites.

Lost Circulation Materials - such as swelling polymer crystals are often mixed with bentonite to prevent loss of drilling water into cracks in the drill hole wall while drilling. A special form of shredded paper, commonly used in home insulation, along with cotton seed hulls and saw dust is also used.

Na Waiwai ni Qivaqiva

E taurivaki na waiwai ni qivaqiva me rawa ni vakabatabata-taka na misini ka yavala tiko kina vaka-vinaka, me laveta talega na vatu e musu ki dela ni qele ka vakacokotaka na qara e qivati me kakua ni kasura.

Na waiwai ni qivaqiva e caka ga mai na wai droka, qai veiwaki kei na so na wai ni qivaqiva tale e so me vukea na qivaqiva. E vuvu tu ga na kena i rairai ka maroro ena qara ka viribaiti ena palasitika ka keli tu e na vanua e vakayacori kina na cakacaka, ka lutu na kosakosa ena boto ni qara kei na palasitika ka vakayagataki na wai e na gauna e gadrevi kina.

E vakayagataka na Kabani na NJV na wai ni qivaqiva ka levu ga kina na wai ka sega talega ni rawa me vakagagai kina na tamata se manumanu, e rawarawa na kena waicala ka sega ni na lai tu me soqoni me levu. Na wai ni qivaqiva oqo e totolo sara na kena waicala e na gauna e veitaratara kina kei na manumanu somidi na 'bacteria' se cilava na matanisiga. E dau yaco me veisau na kena roka me buto se loaloa, dinaga ni dau boi ia e dau yali yani e na gauna sa waicala kina.

Na Wainimate ni Qivaqiva

E Va na wainimate e vakayagataka na Kabani na NJV:

Na '**Polymers**' e vakayagataki me vakasosokotaka na wai ni qivaqiva ka vukea na kena laveti mai na qele kei na vatu e qivati ka tarova talega na kasura ni vanua e qivati.

E taurivaki e na veiyasai vuravura na 'Polymers' me dau qivati se keli kina na tobu ni wai-ni-gunu ka so e vakadonui sara e vuravura me vakawainimate-taki kina na wai-ni-gunu kei na kakana e laukana.

Na '**Lubricants**' e vakayagataki me vakalailaitaka na tatao se kakasa ni misini ka vukea me cowiri galala na wa ni misini ni qivaqiva. Na waiwai qo e bula balavu kina na misini ka tosoya cake talega na titobu ni vanua e rawa ni yacova e loma ni qara.

E waki vata vakalevu kei na waiwai ni qivaqiva na 'vegetable oil'. Na kena mai taurivaki ena 'Lubricants' e laurai vata toka kei na kena sa vakayagataki e na levu na kakana, na wai-nimate kei na i yaya ni sasauni.

Na '**Bentonite**' e vakayagataki me vakasosokotaka na waiwai ni qivaqiva ka taracake e dua na i ubi ka vakadeitaka na lalaga ni qara e qivati.

Na Bentonite e sega ni rawa ni vakacacana na Veika bula e ra vakavoliti keda. E vakayagataki vakalevu e na veika e so me vaka na wai ni masi ni bati, na pouta ni savasava, wainimate e so, e vakayagataki e na kakana, na iboro, na yaqona ni valagi kei na waini. E dau vakayagataki talega me dregati kina na i vakaso ni wai kei na vanua bulu e so.

Na ka e vakatokai na '**Lost Circulation Materials**' me vaka na 'polymer crystals' e waki vata kei na 'Bentonite' me tarova na drodro ni wai e na kaca e na loma ni qara. E vakayagataki talega e dua na mataqali pepa ka ra dresulaki vakamatailalai ka dau vakayagataki vakalevu e na veivale me i tatara kei na sore ni vauvau kei na kuvu ni varovaro.

Environmental management

Environmental management plans are developed to identify and outline controls for potential environmental impacts during the construction of access roads and drill sites, and during operation of the drill rigs.

The NJV applies and measures these controls to look for ongoing improvements in all aspects of our exploration and drilling activities to reduce environmental impacts.

Drill holes are stabilised to control the flow of water during drilling. When drilling is complete, all holes are capped below the surface. Some holes are also plugged if required, generally where underground water was present during the drilling process.

All disturbed surface areas are rehabilitated after the exploration activity is completed. This is a staged process and generally involves returning the disturbed surface area to a stable re-vegetated site.

Exploration access procedures

The NJV has signed a number of access and compensation agreements with Mataqali's within which we are operating. These agreements outline land access, notification and compensation procedures for mineral exploration activities undertaken by the NJV within the SPL 1420 area.

Na Taqomaki ni Veika Bula

E dau vaka rautaki na i tuvatuva ni veika bula wavolita na vanua me rawa ni laurai rawa ka kilai na revurevu ni cakacaka me vaka na ta gaunisla, na vanua kei na cakacaka ni qivaqiva.

E taurivaka na Kabani na NJV na veitikina kece me qarauni kina ni cakacaka ni qivaqiva kei na kelikeli, e na lailai sara na vakacaca e yaco kina veika bula era tu wavolita na vanua e qaravi kina na cakacaka.

E qarauni na qara e qivai me kakua ni drodro mai kina na wai. Ni cava na qivaqiva, e ra dau sogoti kece na qara ka so e ra biu kina na ivakasoso ni qara, vakabibi kevaka e kunei na wai ni tiko e loma ni qara e na gauna e vakayacori tiko kina na cakacaka.

E na dau vakacokotaki na veivanua kece e vakayacori kina na cakacaka ni oti na qivaqiva se kelikeli. E vaka-iwasewase na cakacaka qo, ka okati eke na kena laurai me teivaki tale na vanua e caka kina na kelikeli.

Na ituvatuva ni kena curumi na vanua

Rau sa sainitaka vata na Kabani na NJV kei na Komiti ni taukei-ni-qele e na Tikina o Namosi e dua na veidinadinati, ka tuvai tu vakamatata na i vakarau ni kena curumi se butuki yani na qele kei na i tuvatuva ni saumi ni lavo e na cakacaka ni vakadidike e vakayacora na Kabani na NJV e na loma ni vanua e virikotori e na laiseni na 'SPL 1420'.

Raica na pepa ka kena iulutaga 'NJV Exploration Access and Compensation' me baleta na itukutuku ni kena butuki na qele kei na i vakarau ni saumi ni lavo.

Drill pad area during operations



Rehabilitated drill site after 10 months

