WELLINGTON CAVES

Plan of Management

December 2008

Wellington Council

ACKNOWLEDGEMENTS

Edited by the Wellington Caves Advisory Committee with the welcomed assistance of other Council staff, the Department of Lands and Mr Don Ramsland, Former General Manager, Wellington Council.

Particular thanks are extended to Dr. Armstrong Osborne, Senior Lecturer from the Faculty of Education and Social Work at the University of Sydney and Mr. Andy Spate, formerly Project Officer, Karst, NPWS who have written parts of this Plan of Management and/or provided valuable specialist advice. The plan was greatly improved by suggestions made by members of the NSW National Parks and Wildlife Karst Advisory Committee.

PUBLIC EXHIBITION

Wellington Council should resolve, on (date to be determined) to recommend that the draft Wellington Caves Reserve Plan of Management be placed on public exhibition for a period of twenty eight (28) days.

The period of Public Exhibition should be from (date to be determined).

Comments on the draft Plan of Management should be in writing and forwarded before close of the exhibition period to Department of Lands by post to PO Box 865, Dubbo, NSW. 2830 by facsimile to (02) 6882 6920 or by e-mail to CLDubbo@lands.nsw.gov.au.

This plan, incorporating any amendments, should be referred for endorsement by resolution of Wellington Council on (date to be determined).

This plan should be submitted for adoption on behalf of the Minister for Lands, under delegation during (date to be determined).

DEFINITIONS

The definitions used in this plan are those used in the Crown Lands Act, 1989, the Environmental Planning Assessment Act, 1979, the Wellington LEP, 1995, the Environmental and Planning Model Provisions (1980) and the Australian Natural Heritage Charter. Where there is any inconsistency the most recently published definition will prevail.

RELATIONSHIP TO OTHER PLANNING INSTRUMENTS

The current LEP, empowered under the provisions of the Environmental Planning & Assessment Act, 1979 as amended (EPAA), deals with permissible activities in its Zone Table. The LEP also includes a Schedule of Heritage Items; the Caves Reserve is listed on this schedule.

The Caves Reserve is also listed on both the NSW State Heritage Register and the Register of the National Estate. Listing on these registers invokes a legal responsibility to consider the Burra Charter under Section 79(C) of the EPAA, and to consider the Burra Charter in the preparation of this PoM. The Australian Natural Heritage Charter (Cairnes 2002) is also of relevance to the preparation of this PoM.

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EXECUTIVE SUMMARY

This Plan of Management extends for five years and describes the physical attributes of the Wellington Caves Reserve and why the site is of national heritage significance. It highlights a number of management issues including the need to adopt conservation protocols like the Burra Charter and the Australian Natural Heritage Charter.

This Plan of Management seeks to promote enjoyment, recreation and understanding of the Reserve's natural and cultural heritage.

The Plan of Management also deals with the relationship between the Department of Lands, Trust Manager and the Wellington Caves Advisory Committee. Also included is a Statement of Management Objectives. The administrative structure is also addressed, along with proposed revenue generation approaches and sources.

Appendix 5 sets out a works program for projects that the Caves Advisory Committee considers need to be completed in the years up to 2020. It is envisaged that the Trust Manager (Wellington Council) will establish strategic rolling plans for both capital and conservative works and that Wellington Council will have the task of reviewing and updating such plans at least annually.

A full revision of the Plan of Management would become necessary if there were to be a major change in either the public's need, or the State Government's direction, to the management of Crown Reserves.

1 INTRODUCTION

The caves are important for their scientific and historic value. The limestone is part of the early Devonian Garra Formation and contains fossils of marine invertebrates, many of which are type species. Fossil bones of many vertebrates, mostly mammals, are found in sediments that were deposited in caves and fissure over the last two million years. and are thought to have a minimum age of 128,000 years before present (BP). This includes type species for a number of marsupials that were part of the extinct megafauna. The caves are therefore an important type locality for both Devonian and Quaternary fossil species.

The Wellington Caves Reserve is managed by Wellington Council, as Trust Manager for the Minister of the Department of Lands. The Trust Manager is responsible for management of the Caves Reserve in a manner that is environmentally, culturally and commercially sustainable.

Under the provisions of the Crown Lands Act 1989 and the provisions of the Local Government Act 1993, the Trust Manager is now required to review the previous Plan of Management (PoM) which was prepared by Wellington Council as Trust Manager for the NSW Department of Lands in 1999.

The procedure following the review is to place the draft PoM on exhibition in accordance with the above mentioned Acts, following which the Department of Lands, in conjunction with the Trust Manager, will give due consideration to any submissions received and will make amendments as deemed necessary. Substantial amendments will require the plan being exhibited for a further term prior to being adopted. Once a PoM has been adopted, only activities which are in accordance with the PoM may be undertaken on the Reserve.

1.1. Significance of the Wellington Caves Reserve

- The values and significance of this site were recognised by its listing on the Register of the National Estate. A nomination is being prepared for listing of Wellington Caves in the National Heritage List under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1990.*

- The Wellington Caves Reserve is an important regional tourist attraction. The Reserve is one of six show cave sites within New South Wales and the only site away from the Eastern Highlands. Some 45,000 people visit the site and its caves each year and their patronage makes a valuable contribution to local economic activity.

- The Wellington Caves are one of the most significant mammal fossil sites in the world and they contain the largest deposit of Plio-Pleistocene mammal fossils in Australia. It was at Wellington Caves that fossils of Australian marsupials were first discovered in 1830. The discoveries attracted international scientific attention during the nineteenth century and were important in the development of evolutionary ideas by Charles Darwin (Dugan, 1980). Since their discovery the fossils and the deposits in which they occur have been studied by Australian, American and European scientists and continue to be studied by a number of workers. A great diversity of vertebrate fossils including reptiles, birds and mammals are found at Wellington Caves and the caves are the type locality for many extinct species including *Diprotodon optatum.*

- The thinly-bedded limestones of the Garra Formation at Wellington Caves contain a rich and diverse fauna of Devonian marine invertebrate fossils. The sequence is used for international stratigraphic correlation and is the type locality for many fossil organisms.

- The Phosphate Mine preserves a rare example of early twentieth century mining technology. It illustrates a mode of life which has passed into history and which now forms part of the Reserve's historic cultural heritage.

- The sequence of sediments in the Phosphate Mine has a complex stratigraphy and contains a number of unusual rock types. Sections exposed in the Phosphate Mine tunnels provide a rare opportunity to study the stratigraphy, sedimentology and mineralogy of cave deposits.

- A diversity of karst solution features have developed on the massive limestone at Wellington Caves. Cathedral Cave is a representative example of cave development by thermal water. The water-filled portion of Lime Kiln Cave (McCavity) has characteristics which make it unique among caves explored by cave divers in Australia.

- The subterranean waters of the caves are the home of a highly significant invertebrate community. The degree of significance of this community justifies national recognition and potentially international recognition through a convention such as the Ramsar Convention.

- The caves are minor roosting sites for the threatened Bent-wing Bat (*Miniopterus schreiberisii*) and the cave waters contain a large population of syncarid crustaceans that are considered to be "living fossils".

- Wellington Caves were the first caves in Australia to be surveyed by a professional surveyor during the 19th Century and are associated with the work of a number of significant scientists, naturalists, explorers, commentators and artists including:-

Sir Richard Owen	Baron G Cuvier	W. Pentland	T. L. Mitchell
William Clift	Count P.D.E. Strzelecki	S. Stutchbury	J. Oxley
G. Kreft	A.M. Thomson	E. P. Ramsay	J. D. Lang
Augustus Earle	R.A.L. Osborne	M. Archer	M.L. Augee

- The levels and behaviour of carbon dioxide and water within the caves are so curious that the site deserves to a focus of research into these phenomena.

- The Reserve is the most significant site in New South Wales for the specialist sport of cave diving. Cave divers exploring the caves have made important contributions to knowledge about the caves and their aquatic inhabitants.

1.2 LOCATION

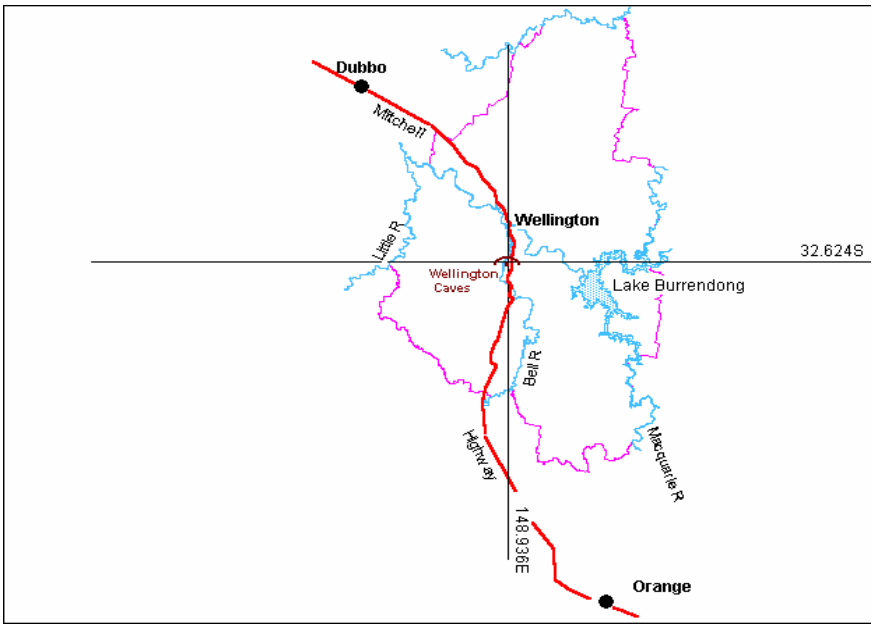

Figure 1. Regional Plan

The town of Wellington is located between the regional centres of Orange and Dubbo in the central west of NSW (148.936^{o} E, 32.624^{o} S) (Figure 1). The Wellington Caves are located on the eastern side of the Catombal Range in the Bell River Valley, 7.3 kilometres south of the Town of Wellington (Figure 2).

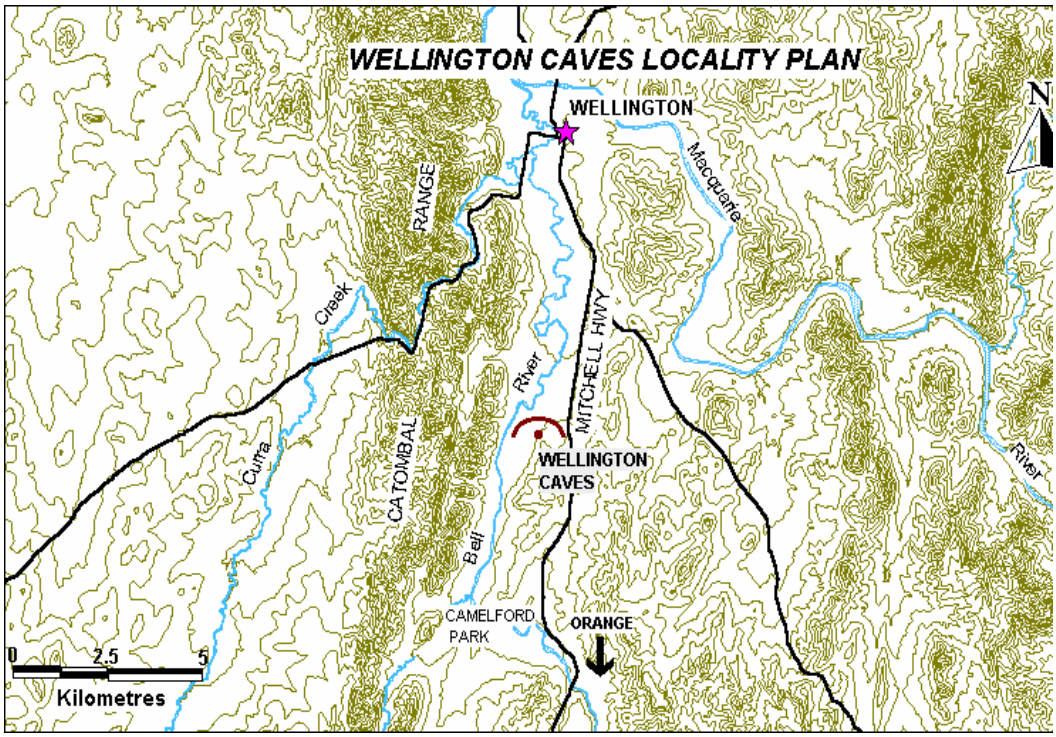

Figure 2. Wellington Caves locality plan.

1.3 History of Discovery, Exploration and Management of the Wellington Caves

The Reserve is located within the Wiradjuri tribal area. Two carved trees have been recorded on the Reserve, although their current location is unknown.

The first European to reach the Bell River valley was Lt John Oxley who arrived 18 August 1817. Substantial European occupation commenced in 1823 when one of the four convict settlements established in NSW was located at Wellington between 1823 and 1837.

The first European record of the caves consists of a series of sketches made by landscape artist Augustus Earle in 1826. These depict features of Cathedral Cave, which he describes as “Mosman’s Cave”. The first written account of Cathedral Cave is found in a letter by explorer Hamilton Hume dated 4 December 1828.

Fossil bones were discovered in Breccia Cave (now called Mitchell Cave) by John Rankin in May 1830. The discovery of these bones attracted international scientific attention, particularly when it was recognised by Sir Richard Owen that the bones were fossils of extinct relatives of modern Australian marsupials, not those of elephants as had been originally supposed.

As a result of the fossil discoveries Surveyor General Major Thomas L Mitchell visited the caves in June 1830 to collect more specimens and prepared the first professional surveyor's map of the caves during the nineteenth century.

In 1858 Lime Kiln Cave was discovered.

In 1869 a major fossil collecting expedition was mounted to Wellington Caves by the Australian Museum under the leadership of Gerrard Kreft. Kreft was accompanied by A.M. Thomson (first Professor of Geology at the University of Sydney), who applied surprisingly modern ideas to the formation of the caves. Major excavations in Mitchell Cave resulted in "several cart loads" of earth being removed.

While the palaeontologists were digging for fossils, increasing numbers of tourists were visiting the caves. In 1876 the *Sydney Morning Herald* reported vandalism in the caves. In 1884 a reserve for the Preservation of Caves was dedicated, under the control of the Department of Mines. In 1883 Sibbald, a former employee of the Australian Museum, was appointed caretaker and in 1887 the caretaker's cottage (now visitors centre) was built.

The last major nineteenth century fossil expedition, led by E.P. Ramsay of the Australian Museum, took place in 1881. Deep pits were dug near the Altar in Cathedral Cave and thousands of specimens were excavated from Mitchell Cave.

In 1889 Gas Pipe Cave was discovered.

The Australian Museum took control of the Reserve from the Mines Department in 1894. In 1898 the first local trustees were appointed. In 1908 the trusteeship was transferred to the Macquarie Shire Council. In 1906 Gas Pipe Cave was opened for tours and steps were constructed in Water Cave (also known as Anticline Cave). Gaden Cave was discovered in 1900 but not opened to the public until 1909.

The phosphate mine operated from 1914 to 1918. Macquarie Shire Council opposed an application to the Mining Warden's Court by NSW Phosphate Co Ltd. It argued that mining would be detrimental to the Caves. The Warden was not persuaded by Council's argument and granted consent to mine in December 1913.

It was proposed to use the phosphate as fertiliser to revive exhausted soils of the surrounding wheat growing area.

Development of the mine followed with the phosphate ore removed by way of a small underground rail system to a loading point where a horse drawn tipping dray delivered the phosphate to a rail siding believed to be at Apsley. The phosphate obtained from Wellington was

low grade compared to elsewhere and reserves were much less than claimed. The mine closed in 1918 (Anderson 1991).

Electric lighting was installed in the show caves in 1926.

From about 1870 to 1931 a racecourse occupied the floodplain where the golf course is now situated.

The kiosk was constructed in the 1934 and the caravan park was constructed in stages over the 1960s and 1970s, with cabins being added in 1978. The caravan park manager's residence was constructed in 1990/1.

A heritage study of the Phosphate Mine and its immediate environment by Godden Mackay (1995) identified thirty five items of cultural heritage significance. These items include portals and roof timbers, various shafts of particular scientific interest, mining artefacts and foundations of external buildings. There has not been a cultural heritage survey of the remainder of the Reserve.

In 1988 the Water Cave was rediscovered. It was one of the first caves discovered early in the 19th century and closed during redevelopment of the Caravan Park in the 1960s. This Cave is being developed as a self guided attraction.

A reasonably extensive makeover of the Gaden Cave was undertaken in 1990/2. The entrance was relocated to its original position, a pathway lowered to allow removal of a cage which separated visitors from speleothems and lighting in the cave was redesigned.

The major new attraction to the Reserve was the opening of the Phosphate Mine in April 1996. The mine was restored at a cost of $750,000, of which $350,000 was provided by way of a grant and the balance by way of a loan. The mine had been closed since mining ceased in 1918. Restoration of the timbers within the mine and installation of pathways and lighting allowed public access and interpretation of a site significant for its cultural heritage and fossils.

The next project should be refurbishment of the Cathedral Cave as the existing technology does not effectively display many of the Cave's features. Upgrading of cave infrastructure and the opportunity to introduce modern lighting techniques make refurbishment one of the highest priorities identified in this Plan of Management.

2. TERMS OF REFERENCE

This Plan of Management will be known as:

"WELLINGTON CAVES RESERVE – PLAN OF MANAGEMENT 2008".

On adoption the draft plan will replace the existing Plan known as: "WELLINGTON CAVES – PLAN OF MANAGEMENT 1999".

Following public exhibition, the Plan will be taken into consideration in the assessment of any proposed works, as required by Section 79(C) of the EPAA. 1979 (as amended).

3 THE RESERVE

3.1 STATUS

The land to which this PoM applies is Reserve No 120078 (Figure 3) for Public Recreation & Environmental Protection (gazetted on 1st December 1989) comprising Lots 333 (Golf Course), 334 (Caves) & 335 (Caravan Park) DP 728718, Portion 302 DP 756920 & Lot 2 DP 792995 (totalling 154.98 hectares). This PoM does not include Portion 315 DP 756920, on which the Golf Course Club House is located (as it is not part of the Caves Reserve), or Lot 2 DP 850361 (purchased by Council in 1997 from Evison to accommodate the Japanese Garden) which is freehold land owned by Wellington Council.

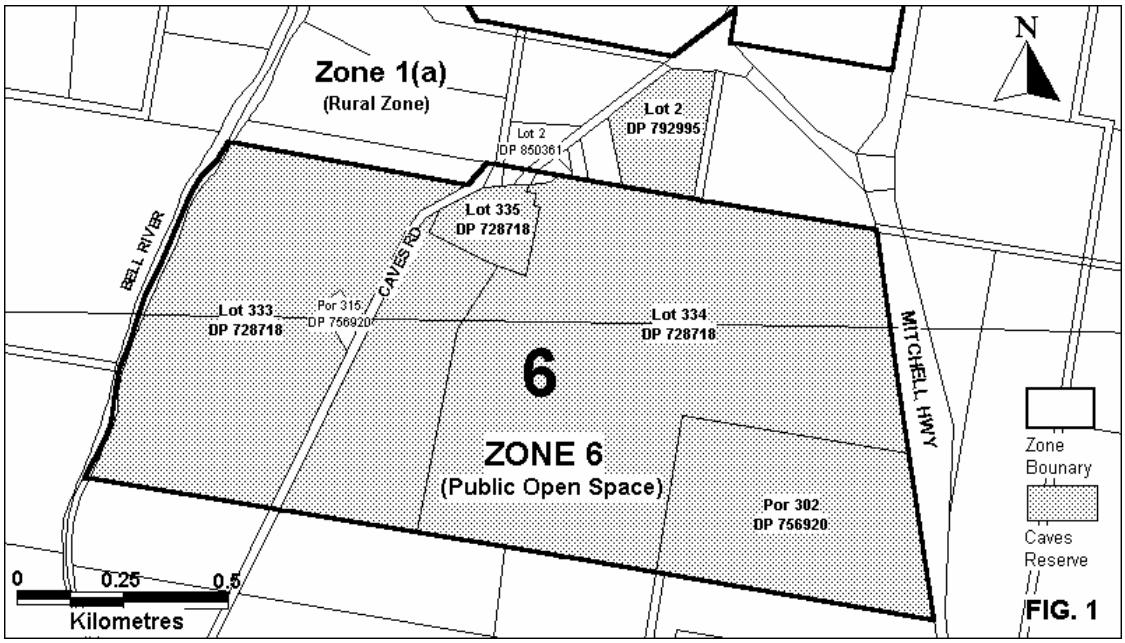

Figure 3. The Reserve

3.2 TERRAIN

The eastern two thirds of the Reserve is undulating terrain rising some 40 metres above the flood plain. Two parallel limestone outcrops lie on a north/south axis and cover about 26 hectares. Most of the eastern two thirds of the Reserve is covered with a depauperate White Box /

Yellow / Box / Blakely's/ Red Gum Woodland' listed under the NSW *Threatened Species Conservation Act 1995,* as an Endangered Ecological Community. The show caves and their attendant facilities are located mid way along the northern boundary of the Reserve (Figure 4).

The western third of the Reserve is a flood plain on the eastern side of the Bell River. The flood plain alluvium is highly permeable and water exchanges between the river and the alluvium are believed to readily occur. An 18 hole golf course occupies much of the flood plain

Figure 4. The areas outlined in white are significant areas of limestone outcrop and surface karst features

3.3 GEOLOGY

Bedrock Geology

The oldest rocks outcropping in the Reserve are deep-water marine sediments of the Ordovician Oakdale Formation (Scott et al., 1996). These occur in a narrow band in the eastern part of the Reserve adjacent to the Mitchell Highway.

The remainder of the Reserve is underlain by limestones of the middle Devonian Garra Formation (Strusz, 1965) which have a faulted boundary with the Oakdale Formation. The Garra Formation consists of both massive and thinly-bedded limestones. The thinly-bedded limestones contain abundant marine fossils including trilobites, corals, brachiopods, sponges and conodonts which are used for international stratigraphic correlation.

While the Garra Formation as a whole generally dips to the west in a syncline, passing under the Catombal Range (Figure 5), it is locally

deformed by smaller scale folding and faulting. Outstanding examples of folds are seen in the eastern wall of the main chamber in Cathedral Cave and in Water Cave which formed along the axis of an anticlinal fold.

The massive limestone is purer than the thinly bedded limestone. With the exception of Water Cave, all significant karst features in the Reserve are developed in the massive limestone which outcrops in two north-south trending ridges. The main outcrop in which the show caves and the Phosphate Mine have formed is at the northern end of the western ridge.

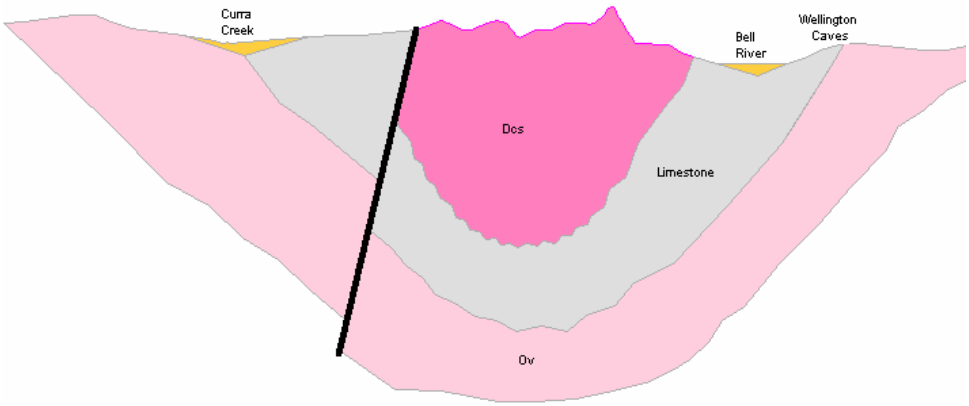

Figure 5. Section through the Catombal Range looking North. Note the considerable vertical exaggeration

Surface Geology

In most of the golf course and the western part of the caravan park, the limestone is mantled by the Bell Valley Alluvials (sands and gravels) which fill the deeply-incised bedrock channel of the Bell River. This alluvium contains significant aquifers, which are the principal source of domestic and irrigation water for the Caravan Park and Golf Course.

In the area between the two limestone ridges an irregular bedrock surface is buried by variable, and in places considerable thickness of, silts and gravels. The origin of these deposits and the nature of the buried landscape in the bedrock is currently being investigated. While some of the buried features appear to have a karst origin, others may be valleys eroded into the bedrock by streams.

Cave Sediments and Minerals

The Phosphate Mine exposes a complex sequence of sediments deposited in the cave environment. The walls of the mine passages

provide a rare and outstanding opportunity to study the stratigraphy of sections through these deposits. Among the unusual rock types found in the mine are sandstones composed of fine bone fragments, conglomerates and phosphate rocks (Osborne, 1983, 1994, 1997).

Unusual forms of calcite and apatite, eg nodules and crystal skeletons, and some unusual phosphate minerals such as crandallite, are found in the mine (Osborne, 1983).

3.4 GEOMORPHOLOGY

There is a long history of research into the geomorphology of the Reserve and its setting (eg Colditz, 1943; Frank, 1971; Osborne 1983, 1997). A synthesis is given in Houshold et al. (1990). Interest in the Reserve is dominated by the caves and the Phosphate Mine and their fossil faunas. However, there are many other karst features of note.

“Karst” is the term given to landforms developed by solution of the bedrock. The most obvious forms are probably caves but features such as the small scale solution flutes found on exposed bedrock are also of karst origin. Karst terrains are characterised by little or no surface drainage with rainfall and runoff sinking rapidly into the limestone mass. The actual process of developing karst features is complex but relies on adequate water and fluxes of carbon dioxide moving through the soil and into the rock mass. Healthy vegetation communities are essential to maintain the processes through interaction with soil ecosystems.

Inside the caves, reversal of the solution processes causes water to give up its dissolved limestone to create stalactites, stalagmites and similar forms. The famous “Altar” in Cathedral Cave is a dramatic example of a complex underground karst feature. There are many caves on the Reserve with Cathedral and Gaden Caves and the Phosphate Mine being open to the public. The Phosphate Mine is a karst cave which is filled with phosphate rock and sediment containing fossil bones of considerable significance. Mining of the phosphate for fertiliser and industrial uses has revealed the complexity of the karst system. Other caves within the system include Water Cave in the caravan park and a whole series of underwater caves such as Limekiln which can only be explored by divers wearing underwater breathing apparatus. Interestingly, the presence of stalactites and similar features below the present water levels indicates that the caves were dry for extended periods in the past.

A further unusual feature of the Wellington Caves are the high levels of carbon dioxide of unknown origin found in the cave atmospheres (Houshold et al. 1990). Occasionally carbon dioxide levels can interfere with show cave operation (Osborne 1981) and make exploration of other caves on the Reserve difficult or impossible. Monitoring of carbon dioxide levels within the show caves should continue.

3.5 PALAEONTOLOGY

Wellington Caves is a highly significant locality for fossils of two vastly different ages. The thinly-bedded limestones of the Garra Formation contain a highly significant fauna of Devonian marine invertebrate fossils, and the sediments in the caves and the Phosphate Mine are the largest deposit of Plio-Pleistocene mammal fossils in Australia.

Palaeozoic Fossils

The limestones of the Garra Formation contain a rich marine invertebrate fauna which includes corals, sponges, stromatoporods, crinoids, trilobites, brachiopods, molluscs and conodonts which inhabited a shallow tropical sea some 380 million years ago.

Some of the fossil groups, such as the conodonts, show significant changes over time. This has allowed the sequence at Wellington Caves to be used internationally for dating rocks by their fossil content (biostratigraphic correlation).

Cainozoic Fossils

Two main units of fossil-bearing sediments are exposed in the Phosphate Mine. The fossils from these have been attributed by palaeontologists to three local faunas.

The oldest local fauna, the Koppa's Pond Local Fauna (D. Nipperas, pers. comm.), is found in the Graded-Bedded Unit (Osborne, 1983). This fauna consists of a range of rodents and small marsupials. The fossils are tiny bone fragments, probably from the guano of the extinct Ghost Bat (*Macroderma koppa),* living in early Pliocene (3-5 million years ago) or late Miocene (5-10 million years ago) times.

The Big Sink Local Fauna (Hand, Dawson & Augee, 1988) is preserved in the Big Sink Unit (Osborne, 1983). This fauna, with a probable late Pliocene age (2-3 million years ago), contains a range of both large and small animals including the extinct Ghost Bat (*Macroderma koppa).*

Most of the vertebrate fossils from Wellington Caves, including those first discovered, were found in deposits of red cave earth of Pleistocene age (950,000 to 750,000 years ago). This red earth, the Bone Cave Breccia Unit (Osborne, 1983), contains the Wellington Local Fauna. The Wellington Local Fauna contains a great diversity of fossils including those of amphibians, reptiles, birds, rodents, bats and marsupials.

As well as a great range of small animals the Wellington Caves Local Fauna contains megafauna such as *Diprotodon* and the marsupial "lion", *Thylacoleo*.

Since their discovery in 1830 there has been continued scientific interest and controversy about the Wellington fossils. It has been suggested that Darwin's evolutionary theories were influenced by the discoveries at Wellington Caves (Dugan, 1980).

How the bones came to be in the caves and how such a number and variety of bones could have accumulated remains an area of speculation. It is now thought that much of the red earth originated as dust blown by the wind from central Australia during arid Ice Age conditions. The red earth and the bones were washed into the caves from the surface.

3.6 HYDROLOGY

The annual rainfall at Wellington currently averages about 640 mm year; there is a considerable excess of evaporation over rainfall. Over the last 40 years, the distribution is changing with summer rainfall increasing and winter rainfall decreasing. These climate trends may be within long-term climatic cycles (>100 year time frames). Karst processes are driven by water and soil carbon dioxide – healthy karst systems need healthy vegetation and soil systems and it appears likely that the rainfall trends noted will lead to increasing health of the systems on the Reserve.

There are no permanent streams on the Reserve although several erosion gullies drain to the north. To the west the Reserve is bounded by the Bell River. The only influence on the Reserve of surface hydrological conditions will be occasional floods of the Bell River which, exceptionally, floods across the golf course to the break of slope in the caravan park – i.e. the modern flood plain (Figure 6). High levels in the Bell River will also recharge the Bell River alluvial aquifer.

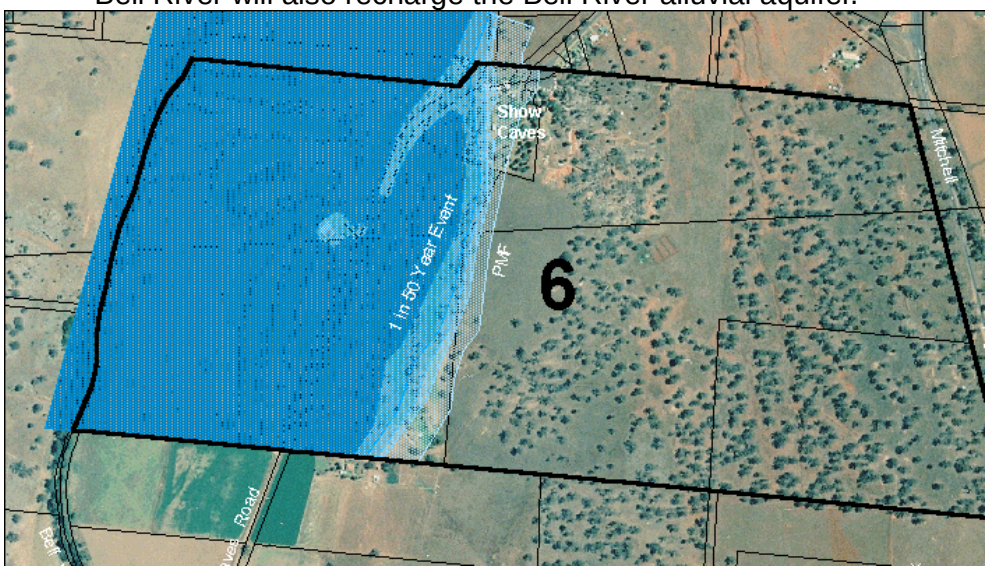

Figure 6. Predicted extent of 1 in 50 year flood event.

The underwater hydrology of the Reserve is superficially simple but there are hidden complexities. There are at least three aquifers present and some dynamic puzzles (Houshold et al. 1990). Recent drilling through unconsolidated material immediately to the east of the Caves complex did not encounter water at levels well below the standing water levels in the caves, bores and river at low flows. Standing pools, some very large, occur within caves in the Reserve – the level in Cathedral Cave is one to two metres below the levels in the bores and the River. Large volumes of water are available from the Bell River alluvials. There is at least one perched watertable within the limestone as demonstrated by Donovan's Spring to the south of the Reserve.

The degree of interconnectedness between the aquifers appears to be small with changes in the standing levels reacting to high levels in the River and alluvials with some sort of "piston" effect. There appears to be little mixing between the karstic and alluvial aquifers although their water quality characteristics seem to be similar. The interconnectedness presents dangers in that potential pollutants could enter the karst systems and adversely impact upon the highly significant aquatic animals. The lack of mixing means that pollutants entering the system through the limestone may have long residence times and prolonged impacts.

There is a need to carefully monitor possible point and diffuse pollution sources in and around the Reserve and to develop contingencies to deal with hydrocarbon and agricultural chemical spills. Disposal by dilution is not an option for much of the Reserve. The program of monitoring water levels within Cathedral Cave should be continued.

The lack of knowledge of the dynamics of the karst hydrological system and the possible consequences of pollution indicate that ongoing research is needed

3.7 FLORA

Much of the native vegetation of the Reserve is a Grassy White Box Woodland community (Rawling, 1990 p.2). This woodland has been disturbed by quarry activities immediately west of the highway. Disturbance has also occurred as a result of mining, grazing and cultivation. There should be an understorey to the woodland, yet there is only the recent recruitment of juvenile tree species. Apart from these very young trees the woodland community looks to be of a similar age. The site may have been completely cleared last century as there do not appear to be any old trees (habitat trees). What trees that are there today only occupy land which cannot be cultivated. Early photos of the valley show the Caves Reserve to be well covered with trees.

Trees of a similar age present a management problem, they are all likely to die at a similar time. Ideally the age of the community should

be evenly distributed. Age distribution is important from another perspective; only trees older than about 100 years have hollows large enough to accommodate arboreal fauna.

A distinct community of native vegetation grows on the limestone outcrops. This is dominated by Kurrajong and White Box with *Clematis* and *Hardenbergia* climbing over the limestone. A few juvenile *Callitiris* are found in the northern part of the Reserve.

The limestone community has been significantly degraded in the area between Gas Pipe Cave and the Phosphate Mine entrance. This has resulted from over-grazing in the former animal enclosure and disturbance during the mine rehabilitation process. Appropriate indigenous plants should be reinstated in this area during the life of this Plan.

Exotic vegetation is invading the Caves Reserve. Wild African Olive is recolonising the surface immediately above the caves and birds appear to be spreading the seed further afield. Century Plants are recolonising among outcropping limestone above the roof of Cathedral Cave and upslope of the kiosk. Saffron Thistle infests the 'cultivation area' and broad leaf weeds readily colonise any disturbed site.

The Caves Caravan Park, the Golf Course and the Japanese Garden are all sites containing introduced species.

To the west of the golf course there has been a history of cultivation. The quality of riparian vegetation on the banks of the Bell River is unknown although Rawling reports bank erosion, weeds and thistles between remnants of senescent River Red Gum and Sheoak. Vegetation mapping is required to establish exactly what is happening on the Reserve and advice sought on how to best manage exotic flora. The Century Plants, African Olive and Tree of Heaven which were removed prior to the opening of the Phosphate Mine are all regenerating.

Anderson (1991) describes five vegetation zones and a list of species provided by workers from the Lake Burrendong Arboretum:

- a riverine zone of River Red Gum and River Sheoak,
- the golf course zone which grades from River Red Gum to Yellow Box to White Box on the footslopes,
- the caravan park zone of introduced species,
- the caves zone of introduced species (predominantly African Olive), and
- the cattle lease zone which is a woodland with an understorey of introduced species (the Grassy White Box Woodland community).

The boundaries identified by Osborne (2000) may benefit from some refinement but the overview is essentially correct. Anthropogenic impact on the native flora has been endemic and profound.
Consideration should be given to the future management of flora based on four sectors (Figure 7):

Sector 1 - The golf course and disturbed floodplain

Sector 2 – The cave, exposed karst and the field of fossils

Sector 3 – The grassy white box restoration area

Sector 4 – The kiosk and caravan park

Figure 7. Management sectors

3.8 FAUNA

Little is known about the fauna of the Reserve under pre-European conditions. It is likely that since European occupation, reptiles and small mammals have been displaced by competition from domestic stock, by direct predation from foxes and cats and by changes to the vegetation communities resulting from land use changes. A search of the NPWS Atlas of NSW Wildlife reveals the presence of a number of species classified as “Endangered” or “Vulnerable” within ten kilometres of the Reserve. These species include the Tiger Quoll, Superb Parrot and the Glossy Black Cockatoo. However, none of these species have been recorded on the Reserve itself.

Cave dwelling bats, such as the Eastern Bent-wing Bat (*Miniopterus schreibersii*) use some of the caves opportunistically, so the Wellington

Caves may not be critical to their life cycle. This bat is classified on Schedule 2 of the Threatened Species Conservation Act 1995 as "Vulnerable". In addition to the Bent-wing Bat there is almost certainly a number of "forest" bats using the Reserve. Bats are occasionally seen in Cathedral Cave and there was a minor roosting site in the Phosphate Mine (Dovey, 1995).

Eberhard and Spate (1995) conducted a survey of cave invertebrate fauna at Wellington. Only a few species of terrestrial cave-dwelling animals were ever found. However, the aquatic fauna is diverse and of very considerable interest. The aquatic fauna includes a number of "living fossils" endemic to the Reserve. Most of these species await formal scientific description. Thurgate et al. 2001 discuss the aquatic fauna in NSW caves and emphasise the importance of Wellington Caves in this regard.

In April 1990 Dr Michael Augee set one hundred traps throughout the Reserve and caught five common house mice. A following scat survey and spotlighting identified rabbits, foxes, cats, rats, possums, echidnas, common native birds, sparrows and assorted skinks. Anderson describes the species diversity of surface fauna as depauperate (Anderson, 1991 p.120).

4 RESERVE MANAGEMENT

4.1 Management Objectives

- Preservation and conservation of the Reserve's natural heritage by management in accordance with the principles detailed in the NSW Crown Lands Act, 1989 and the Australian Natural Heritage Charter.

- Preservation and conservation of the Reserve's cultural heritage by management in accordance with the Burra Charter.

- Implementation of catchment management principles which take into consideration both surface and subsurface hydrology.

- Management of the flora in conjunction with the CMA and the Burrendong Arboretum Trust.

- Provision of quality interpretation on site for visitors.

- Provision of educational opportunities for school groups.

- Promotion of scientific research in a manner that retains custody of fossils and other specimens and results in the public domain.

- Provision of quality facilities and services which enhance visitor enjoyment and understanding of the Reserve.

- Establishment of such regulation as is necessary to manage appropriate use of the Reserve and adoption of policies and procedures that maintain environmental, cultural and commercial sustainability.

4.2 Administrative Structure

Day to day operation of the Wellington Caves Reserve shall be dealt with by Wellington Council staff or their appointees. Wellington Council was re-appointed Trust Manager of the Reserve by notification in the NSW Government Gazette on 1 December 1989.

The management of Crown Lands as a single reserve allows for the local generation and reinvestment of revenue to offset the ongoing requirements of reserve management. This is in concert with the initiatives of the State Government to encourage both entrepreneurial activity and local management of the State's resources.

This administrative structure has various strengths for management. These include:

a) The guarantee of operational and financial independence for the Trust. This ensures the continuity of management programmes and budgeting.

b) A reduction of administrative costs for the Department of Lands and thus, for the State generally. Other than consultation on management procedure and any assistance that the Trust may require from time to time, the Trust operates independently of the Department of Lands within the guidelines provided by the Plan of Management in accordance with the principles of the Crown Lands Act 1989.

c) The administrative structure is locally accountable and increases public acceptability of the Reserve and its management. Under the Trust system, local authorities, interest groups and participating individuals have a direct input to management. Local issues are resolved as they arise for the net benefit of the local community. This in turn will encourage a high degree of community "ownership/land ethic" for the Reserve.

If the Trust Manager were to grant a lease or licence over part of the Reserve, the Trust Manager will insure that the lease or licence holder(s) use the land in accordance with the management objectives of this plan. Such a lease or licence requires the approval of the Minister and must contain conditions that require compliance with the management objectives of this plan.

4.3 Revenue Generation

The implementation of this plan involves both development and maintenance costs. While development can be staged to partially offset funding requirements, constant and guaranteed sources of funding are required.

Revenue will be obtained from a series of sources

Firstly, if the Trust Manager were to grant a lease or licence over part of the Reserve, revenue received from such leases or licences are to be used for funding wages, maintenance and development works within the Reserve.

Revenue raised as rental or occupation fees for parcels of Crown Land within the Reserve will be paid to the Trust. The Trust then uses this income to hire or contract personnel to carry out management activities under its supervision. Management issues are resolved at a local level by the Trust with guidance from outside specialists when required, in accordance with the aims and objectives of this Plan of Management and the Crown Lands Act 1989.

Secondly, application can be made by the Trust to the Department of Lands for Funds and to other State/Federal Departments such as NSW Tourism and the Catchment Management Authority. However, the bulk of funding for maintenance and development will be borne by the Trust as revenue-generation systems come online.

Thirdly, some form of Corporate sponsorship could be sought to sponsor major development of facilities if this proves to be appropriate.

If the Trust Manager were to grant a lease or licence over part of the Reserve, each year the Trust Manager will prepare a budget based on revenue received and programmed works.

Business plans which address the commercial potential of the various business units within the Reserve are being developed by the Trust Manager.

4.4 Wellington Caves Advisory Committee

The Trust Manager will establish a "Wellington Caves Advisory Committee" under Section 355 of the New South Wales Local Government Act, 1993 (as amended) to provide advice to the Trust Manager

a) on various scientific and technical matters relating to this Management Plan.

b) the composition of the Committee shall reflect scientific, recreational, community and departmental interests.

c) the Committee shall meet at least quarterly.

d) the Trust Manager shall implement a constitution for the Wellington Caves Advisory Committee. (See Appendix 1)

4.5 Friends of Wellington Caves

The Trust Manager may establish a "friends" group (Friends of Wellington Caves) as a sub-committee of the Wellington Caves Advisory Committee

a) the Convenor of the "Friends of Wellington Caves" group shall be a member of the Wellington Caves Advisory Committee.

b) the activities of the "Friends of Wellington Caves" group shall be determined and supervised by the General Manager (or his nominee) and the group Convenor.

c) fees and conditions for the "Friends of Wellington Caves" group shall be determined by the Trust Manager

5 MANAGEMENT FRAMEWORK

The Plan of Management for the Wellington Caves Reserve endeavours to focus strategic development aimed at expanding tourism, recreation, education and scientific research whilst at the same time protecting the area from inappropriate forms of land use.

An overriding factor of the management task of the Reserve is to encourage environmental approaches that not only provide for future usage but are also cognisant of the limitations that arise from the hydrology and geology within the Reserve.

All development and change must therefore be measured against the goals of environmental balance and ecological sustainability, and the use of the best available technology to reach those goals.

5.1 SITE MANAGEMENT

Land use on the Reserve has evolved in a manner which has yet to reflect a full understanding of site analysis or land capability.

In years past much of the development on the Reserve has been undertaken without an understanding of or the benefit of first seeking out appropriate technical, heritage, planning or architectural advice.

Future site planning should provide for ecologically and environmentally sustainable management that encompasses ongoing economic viability.

Future site management should be on the basis of the following four zones:

SECTOR 1 - The Golf Course and disturbed floodplain

Being located on the banks of the Bell River, this area is an extremely environmentally sensitive area.

SECTOR 2 – The cave/karst area and Field of Fossils

Care should be taken to ensure that the installation of reticulating infrastructure or the construction of built forms have a minimum impact in this zone.

SECTOR 3 – The Grassy White Box restoration area

This zone, which covers much of the eastern part of the Reserve, supports an endangered vegetation community which is also a constraint confining land use.

The “cultivation paddock” comprises red plastic clay which is approximately 10 to 15 metres deep. There is some flexibility offered by this area in terms of prospective land use - much of it drains to the north and off the karst. Other complementary land capability units may be identified as mapping and assessment of the Reserve continues.

SECTOR 4 – The Kiosk and Caravan Park

The Caves Road turn off from the Mitchell Highway, the car park at the entrance to the Reserve, the Kiosk and Caravan Park provide the first impressions that the visitor has of the site. These impressions are acquired at a critical “point of sale” threshold and careful consideration should be given to creating a sense of arrival.

This is the area where the majority of the built infrastructure has been located.

Before any further built infrastructure upgrade is undertaken it would be appropriate to review the layout of the whole area to establish if there should be any variation to the layout of the existing built infrastructure, utilities and other services.

5.2 Karst Management

As the Reserve has primarily been set aside for Public Recreation and Environmental Protection, presumably with the intent of preserving the caves and other natural features on the hill above the floodplain and for the golf course (formerly a race course) below, it follows that protection of the karst system must be one of the primary objectives of management of the Reserve.

The Reserve is an artificial 'island' in part of a karst hydrologic system based on the limestone and on the Bell River Alluvium. The hydrologic relationships between the karst and the sands and gravels are not well understood and are clearly complex. Management of the surrounding lands is not under control of the Trust and thus the Reserve environments are affected by other land uses.

On the Reserve management of natural features will be guided by the IUCN Guidelines for Cave and Karst Protection (Watson et al, 1997), the Australian Natural Heritage Charter (Cairnes, 1996) and this Plan of Management. The Plan divides the Reserve into four sectors although all sectors are hydrologically and spatially interconnected. The sectors and karst management concerns for each are set out below:

Sector 1 – The Golf Course and disturbed flood plain

Extraction and possible pollution, by fertilisers and herbicides, of ground water may impact on the karst system. Fire is not considered an issue. Similar concerns arise from the Golf Clubhouse inholding.

Sector 2- The caves/karst area, limestone outcrop and Field of Fossils

Pollution by fertilisers, herbicides and hydrocarbons; impacts of infrastructure past, present and future; weed invasion, changed hydrology including concentration of runoff, and visitor impacts are all potential issues. Fire, although unlikely to be intense because of low fuel loads, may directly impact on small-scale karst features. Fire management is discussed in Appendix 2.

Sector 3 – The Grassy White Box (Box-Gum Woodland) restoration area

This area of patchy timber, scattered shrubs, grasses and weeds has formerly been cultivated in parts. Fire is the major issue here although not of extreme concern. Proposals to restore this area will only enhance the natural environment including that of the karst hydrologic system. The Box-Gum Woodland is a constraining land use as it is listed as an *Endangered Ecological Community* under NSW legislation and as *Endangered* under Commonwealth statute. This community and its

restoration will be guided by the 'Grassy Ecosystems Management Kit' (Sharp et al, 2005). Fire management is discussed in Appendix 2.

Sector 4 – The Kiosk and Caravan Park

Pollution by fertilisers, herbicides, sewage and hydrocarbons; groundwater extraction and concentration of runoff. Fire, other than in buildings, is not considered an issue because of low fuel loads.

Infrastructure impacts on the natural systems of the Reserve are addressed in the following sections. As always in karst terrains any development must be considered in light of the need to preserve natural systems of water, soils and vegetation that operated to produce the karst systems.

5.3 Weed Control Plan

A weeds control plan has been prepared and is appended to this Plan of Management – see Appendix 3.

5.4 Pest Control Plan

A pest control plan has been prepared and is appended to this Plan of Management – see Appendix 4.

5.5 Fire Management Plan

A fire management plan has been prepared and is appended to this Plan of Management – see Appendix 3.

5.6 Infrastructure

5.6.1 General

The Caravan Park, Kiosk, Caves and Golf Course already have a high level of developed infrastructure but they need continual upgrading to meet the ever increasing consumer demand.

As the existing utilities have been incrementally extended over the years it is doubtful if there is much that complies with contemporary design standards.

There is a need for asset mapping to be undertaken and an inventory prepared that can be used as the basis for future planning.

Financial constraints limit the opportunities to upgrade existing utilities to contemporary standards. The prospect of new facilities or redevelopment of existing facilities suggests that infrastructure capacity requirements should be considered prior to taking any action in relation to any or all of those proposals.

Installation of utilities underground in karst environments is expensive as outcropping limestone may require that a trench deviates by a less direct route than would normally be the case or requires extensive rock breaking. Conventional methods of excavating trenches may also be ineffective. It is essential that a carefully prepared design and budget be prepared for any such utilities upgrade taking into account all relevant geotechnical and environmental issues.

5.6.2 Water Supply

Dependant upon future development, it is possible that a new bore, water disinfection system, rising main and reservoir would be required to meet flow and capacity requirements for potable use and effective fire protection. Whether a new reticulation system should be a stand alone system or an extension of that which services the town of Wellington would best be addressed if future proposals became the subject of a feasibility study.

However, in the 2007 drought the irrigation and fire main bore ran dry and the bore supplying potable water fell to dangerously low levels. It would appear that town supply would be the most reliable option.

5.6.3 Sewerage Disposal

With regards sewer utilities, a gravity reticulation to a pump station, and thence by rising main to the treatment works in Wellington, has been installed as the most appropriate method of sewage disposal.

The gravity reticulation network may require significant upgrading if major extensions including the redevelopment of the properties fronting Caves Road or the golf course, ever eventuated.

5.6.4 Power Supply

The updating of the power supply and removal of any unnecessary structures and wiring within the tourist caves should be identified as part of any major refurbishment proposal.

5.6.5 Caves

Cave aesthetics should be about creating and capturing the right atmosphere during cave tours. Hence there is a need for any of the necessary underground infrastructure to be thoughtfully designed and installed in accordance with accepted standards.

Infrastructure within the Caves includes services such as lighting, power and water. There are also steps, handrails, paths and security gates.

Most of these assets, particularly in Cathedral Cave, are now reaching the end of their viable life.

Some care should be taken with their replacement. Armstrong Osborne has prepared upgrade plans that include suggestions from Neil Kell in relation to innovative lighting design.

There are both heritage and architectural considerations also.

5.6.6 Access, Roads and Carparking

Traffic management, particularly in the caravan park and kiosk precinct, is critical to marketing objectives.

Ideally this should start at the Mitchell Highway turnoff. It is most important that the design and placement of traffic management infrastructure is undertaken in accordance with a well conceived site plan that has a broader view than that of simply traffic management alone.

5.7 Site Interpretation

5.7.1 General Interpretation

Interpretation is the process of building a bridge between the visitors and all aspects of the site they are visiting. Thus, interpretation includes any of those processes and actions which help the visitor to enhance their appreciation and understanding of their own experience. Interpretation must engage the visitor, provide entertainment and excitement but still underscore the significance and dignity of the place.

Interpretation is not simply added to the Reserve by site interpreters, signs, exhibitions and other interpretive devices, since every act of management has an interpretive impact on the visitor. There is presently no specific interpretation plan for the Reserve. Aspects of interpretation were dealt with in previous reports such as Anderson (1991) and Hamilton-Smith & Osborne (1995).

A specific Interpretation Plan should be developed during the life of this Plan of Management and should, as a minimum, expand on the following:

a) <u>Cave Guides and Guide Training</u>

The site interpreters are a primary interface between visitors to the Reserve and its natural and cultural history. A good site interpreter will excite and enthuse the public, while a poor site interpreter will turn them, and all they speak to, away. Adequate induction and ongoing

training should be provided to the site interpreters, along with access to reference material and specialised advice as required. The Caves Advisory Committee should oversee cave interpretation and cave guiding.

Staff administering the Reserve should understand those parts of this PoM that are their direct responsibility and this should be re-enforced through their position descriptions.

b) Development of New Types of Tours and Experiences

Hamilton-Smith & Osborne (1995) proposed that a range of theme tours and activities should be developed, covering all of the significant aspects of the Reserve. The Interpretation Plan should address the effective interpretation of all aspects of the Reserve, including areas not currently interpreted such as the "Field of Fossils" and the Grassy White Box Woodland.

New theme and specialty tours targeted at specific audiences and tours outside normal hours could be developed including:

- Adventure tours
- Palaeontological tours
- Photographic tours
- School groups
- Water Cave
- Fossil Trail/Walking Paths

There is also the opportunity to develop a range of specialty events such as weddings and musical events. Ideal venues for these include the Cathedral Cave and the Japanese Gardens.

c) Signs, Pathways and Fixed Interpretive Aids

A consistent interpretive signage regime that lends itself to both guided and non-guided visitation should be adopted. Walking paths with interpretive signs and other types of advanced technical facilities should be progressively developed. Use of audio guides and other aids should also be investigated as a way of expanding visitation opportunities.

d) Opportunities for People with Disabilities

The Phosphate Mine development has been a great benefit to the Reserve, being developed specifically for access by people in wheelchairs. This has proved to be of benefit to a range of visitors, allowing access by children in strollers and by people who have difficulty with walking.

Future development of interpretative facilities should build on this advantage wherever possible, and depending on available resources, by clever design that takes into account the needs of those with sensory or physical impairments.

e) Web-Site

The Wellington Caves desperately needs its own stand alone web-site and email access that is linked to other local and regional tourist attractions. Linking with Council's main office by way of a satellite link is quite feasible.

An informative, attractive and properly interactive web site capable of being readily modified and updated is essential for both marketing and interpretation. But there needs to be a common theme running through any onsite interpretation signage, web site content, promotional material and media advertising campaigns.

Funding for the establishment and ongoing maintenance of a user friendly web site is a critical component for inclusion in future capital and maintenance works programmes.

f) Promotion

Promotional material taken from the site has an important role in encouraging both new and repeat visits

Quality souvenirs, pamphlets, photographs and books add to the visitor experience while poor material detracts both now and into the future.

Quality pamphlets about various aspects of the caves and a quality book should be developed as part of ongoing promotional and marketing campaigns.

5.7.2 Tourism

Guided tours have been conducted at Wellington Caves for more than 120 years. The Caves Complex still remains one of the major tourist attractions in the Central Western region of New South Wales.

With a current average of 45,000 people touring the Caves and Phosphate Mine annually, Wellington has the second highest visitation of any caves system in the State.

Visitor numbers have increased threefold over the past thirty five years (Figure 8), with an acceleration in attendances in the late 1960s and mid 1970s. However, a decline in the late 1980s and early 1990s indicated that like many attractions, Wellington Caves needed to reinvent itself or to provide new features to bring tourists back.

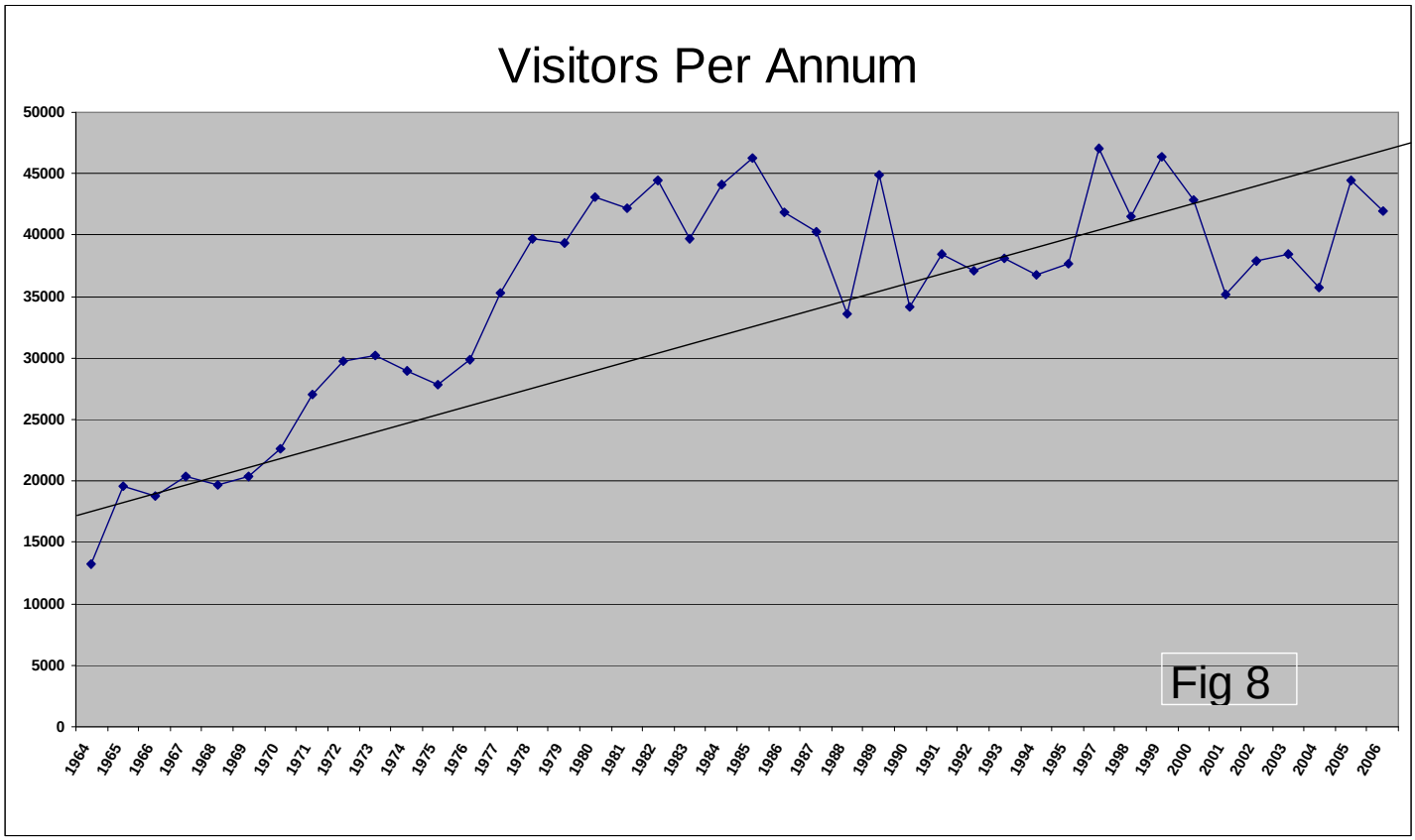

Figure 8. Annual visitation 1964-2007

This was achieved with the opening of the Phosphate Mine in 1996. During its first year of operation in 1996-97, the Caves complex achieved a record visitation and in 1998-99 the second highest visitation in the complex's history was recorded.

It will be essential in coming years for another major "restoration" or the development of a new experience to continue the upward trend in visitor numbers.

However, the number of people touring the Caves should continue to be monitored closely as there may be environmental thresholds above which the number of visitors should not pass.

An overall business plan is being developed to unify the environmental, management, marketing and commercial objectives in a viable way.

5.7.3 Educational/Scientific Issues

Due to the Caves strategic location on north-south and east-west transport routes school groups are a particular market segment that can provide a base load of visitors during school terms from both visitation and accommodation aspects.

The organisers of school groups are particularly attracted to curriculum relevant activity programs. Programs should be developed to target NSW Science and HSIE (history/geography) curricula from K-12 and relevant Queensland curricula.

The provision of a purposed designed area to be set aside for activity work by school and other special group visitors is considered to be essential. This needs to be undercover and additional to existing space in the Visitors Centre.

5.8 Complex Development

5.8.1 Visitation (Day Use) Areas

Caves

There are many identified caves in the Reserve. Most are quite small features. The six caves of significant size are Cathedral Cave, Gaden Cave, Mitchell Cave, Lime Kiln Cave, Gas Pipe Cave and the Water Cave (Figure 9).

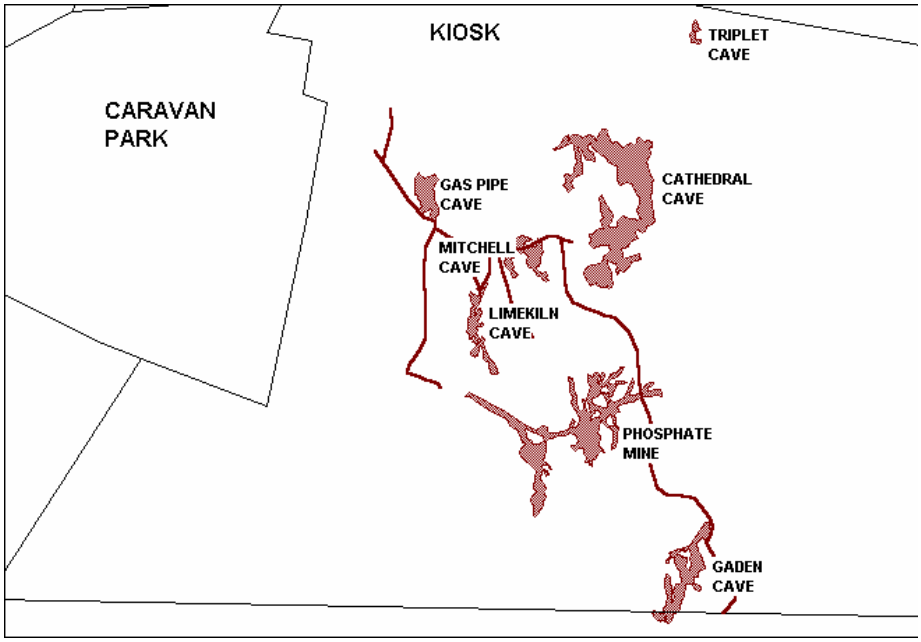

Figure 9. The show caves

Within the Caves there are services like lighting, power and water. There are also steps, handrails, paths and security gates. Most of these assets, particularly in Cathedral Cave, have provided a utilitarian role for some years and may now be at the end of their viable life.

Considering the utilitarian appearance of these assets, replacement should be undertaken with some sensitivity to aesthetics.

Aesthetic issues are not only about building forms and their character, or matching landscaping periods to building periods. Aesthetics are also about creating atmosphere, and capturing the right atmosphere during cave tours would be closely associated with how thoughtfully the necessary underground infrastructure has been designed and installed.

Two caves, Cathedral Cave and Gaden Cave, are developed and operated as guided show caves. Cave tours can cause impacts on the subterranean environment such as compaction of the cave floors and the production of lampenflora on speleothems (Watson et al. 1997 p.10).

Cathedral Cave is in urgent need of a major refurbishment. All of the cave furnishings, paths, steps, railings and electrical services etc are in poor condition and fail to meet public expectations. The present arrangements are a major obstacle to proper conservation and interpretation of the cave.

The Wellington Caves Master Plan Report (Henshelwood & Worboys, 1980) recommended refurbishment of Cathedral Cave but no action has yet been taken. A major refurbishment of Cathedral Cave to international best practice standards will be undertaken as a matter of priority when funds become available.

Gaden Cave underwent a major, although incomplete, refurbishment in 1991-92, and a small section of lighting in Gaden Cave that was not finished requires upgrading.

A programme of works to upgrade the entrance and access to the Water Cave is currently being undertaken by the ‘Friends of Wellington Caves” as funding and volunteers time constraints permit.

Cavers and scientists make a small number of visits to the undeveloped caves in the Reserve under a permit system. The State Emergency Service holds cave rescue exercises in both the show caves and the undeveloped caves.

Cave divers undertake restricted diving activities in the water-filled chambers of caves in the Reserve, particularly the McCavity section of Lime Kiln Cave. Diver safety is one issue and preservation of underwater caves is another particular area of concern. Experienced

cave divers contribute much new information about the physical characteristics and fauna of the underwater cave environment.

Phosphate Mine

The Wellington Caves Phosphate Mine was rehabilitated and opened as a tourist mine in 1996.

The mine tours operate under the supervision of Council and are regulated by the provisions of the Mining General Regulation, 2000. The is no differentiation between “tourist” and “operating” mines. As such, Council is tied to various mining regulation and inspection regimes that it is necessary to carry out at specific times i.e. daily, monthly, annually

Mine regulations require visitors to wear hard hats.

5.8.2 Kiosk

Following major storm damage in 2003, a major refurbishment and extension of the Kiosk was undertaken with disabled access also being provided. Provision was made at that time for a future extension to the west over the current outdoor area.

At the same time the opportunity was taken to relocate and fit out a new food preparation area, expand the counter service facilities and upgrade all furniture and fittings including online computer equipment.

The Caves Road turn off from the Mitchell Highway and the carpark at the entrance to the Reserve are the first impressions that the visitor has of the site. These impressions are acquired at a critical “point of sale” threshold where careful consideration should be given to creating a sense of arrival.

Following advertising and promotion, the next visitor experience is likely to be directional signs on the Mitchell Highway at the Caves Road turnoff.

A suggestion has been made that the Caves Road could build expectation by having an avenue of trees leading to the Caves car park. A formal car park entrance would enhance a sense of arrival.

5.8.3 Caravan Park and Cabins

The caravan park can accommodate approximately 1000 people. It has 26 campsites, 34 van sites, 18 cabins and a small swimming pool. There are onsite vans available for rental.

A survey of the facility is required to establish the extent of any non compliance with the requirements of the Local Government (Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 1995.

If a utilities infrastructure upgrade is required, it would be appropriate to review the layout of the caravan park before any upgrading works were planned to establish if there are any benefits to be gained from a variation to the layout of services.

5.8.4 Interpretative (Education) Centre

Purpose built displays were installed in the Visitors Centre in 1996-1997. The display describes the aspects of the caves, geological history, fossil deposits and scientific history of the Reserve.

Text panels in the display have become discoloured due to high temperatures in the display cases and the building generally.

Routine maintenance including painting both inside and out, the installation of a cooling system and replacement of discoloured panels should be included in a prioritised maintenance programme.

As with any commercial attraction, there is a need for an ongoing program of development and renewal. Essentially a facility must "rebadge" itself corporately, or include new features, every three to five years to enable it maximise revisitation.

The story of Wellington Caves is important enough to warrant establishing an on site museum, complete with exhibitions, collections, archives, library and research staff and facilities.

First steps in this direction have been taken with the exhibition in the Visitor's Centre.

Dr Michael Augee has been appointed as Honorary Curator of fossils, mine artefacts, minerals and archive material that are now stored at the caves.

For the first time since 1830, fossils are returning to the caves or staying on site. Proper collection and storage facilities are now required ahead of the provision of permanent display facilities.

The Trust has secured several casts and reconstructions from the recent Australian Museum's "Lost Kingdoms" exhibition. Casts of *Thylacoleo* and *Diprotodon* have been installed in the Phosphate Mine. A reconstruction of *Wonambi* has been placed in the Big Sink.

Planning for a museum at Wellington Caves should begin during the life of this Plan of Management with the development of concept and implementation plans. Co-operation, assistance and funding should be

sought from the Australian Museum, the NSW Ministry of Arts and other State and Federal funding sources. As well the Trust should be exploring the avenue of securing corporate sponsorship from the commercial sector.

5.8.5 Golf Course

The golf course has 18 holes, club rooms and a modest membership. However, it is believed that there is scope to increase usage of the golf course and the Caves facilities through the marketing of package tours and the like.

The club house is located on a separate freehold block wholly within the Caves Reserve. Issues arising from the golf course include such items as irrigation of fairways, fertiliser use, introduced tree species, effluent disposal, signs and traffic management.

5.9 Safety Issues

All future works, both within tourist caves and on the surface area, should focus on providing safe public access, appropriate levels of illumination and an adequate degree of visitor comfort.

The safety of the public and staff should always be considered as top priority when allowing access to cave areas.

High CO_2 levels have been recorded in the tourist caves and safety strategies have been developed and implemented at a staff level.

Monitoring of CO_2 levels in both Cathedral and Gaden Caves is carried out regularly.

Flooding can occur in the show caves, with records showing that there is a time lag of some eight to fifteen days between rises in the water levels in the Bell River and the show caves. However, at no time is public safety ever compromised as the configuration of the caves allows no chance of water levels rising between the caves entry points and the lowest areas.

Modern communications systems are being progressively introduced to all parts of the complex in conjunction with any upgrading works to ensure a rapid response to all emergency situations.

5.10 Research

There is a pressing need for every opportunity to be taken to link site interpretation to the ongoing work of scientists and historians, particularly that which ties in with contemporary environmental issues.

Wellington Caves has a story to tell, it is not just a place where things happened in the past. Recent research is providing new stories to tell and links to present day concerns such as climate change need to be highlighted.

4.11 Access permits

Access to caves, other than in conjunction with guided tours, will require a permit for group or individual entry. The caves to be entered must be specified prior to each use. Such permits will be at the discretion of the Trust Manager acting with advice from the Caves Advisory Committee.

4.12 Other features

4.12.1 Wellington – Osawano Japanese Gardens

Constructed on freehold land adjoining the Wellington Caves Reserve, the Wellington – Osawano Japanese Gardens were the result of a gift of $270,000 from Wellington's Japanese Sister City, Osawano.

Designed and built by Wellington Council staff, the gardens were officially opened by the Mayor of Osawano Machi, Mr Tadao Nakasai, on 21 November 1999.

4.12.2 The Gateway

Located at the intersection of the Mitchell Highway and the caves Road some five kilometres south of Wellington, this distinctive "environmental artwork" has become a significant local and regional landmark. Not only does it identify the turnoff to the adjacent Wellington Caves, it also signifies travellers' arrival in Wellington.

4.12.3 Scenic Opportunities

The Catombal Range to the Bell River Valley creates a beautiful vista which enhances the context and setting of the Reserve. These landscape values should be protected in some way as they contribute significantly to the visitor's experience. Overseas visitors would particularly value the unique character of Australian landscapes.

In conjunction with the current revision of the Wellington LEP 1995 it may be appropriate to consider a buffer zone around the Reserve to protect adjacent landscape values in conjunction, as well as establishing a "tourist precinct" for the Reserve and adjacent commercial/residential freehold land.

6 CAPITAL/MAINTENANCE WORKS – PLANNING AND IMPLEMENTING PRIORITIES

Wellington Council's Annual Corporate/Strategic Management Plan contains details of funds allocated by Council as Trust Manager for both rolling capital and revenue works programmes proposed in respect of the Wellington Caves Reserve.

However, where funds allocated are contingent on attracting grant funds or private sponsorship, work on those particular items cannot be commenced until such funding has been approved and/or the funds made available to the Council.

Major projects for which funding will be sought include (in order of priority):

- Refurbishment of Cathedral Cave
- Educational/Interpretive Centre for karst, fossil and environmental issues
- Connection to town water supply
- Restoration and maintenance of environmental integrity
- Creation of an outdoor "Megafaunal Park"

Details of these are set out in Appendix 5.

Development applications may be needed and Ministerial consent may be required prior to any work being undertaken.

7 PLAN REVIEW

This five year Plan of Management, whilst it presents a broad basis for the management of Crown lands within and Council lands adjoining the Wellington Caves Reserve and provides for a series of specific actions related to identified needs and priorities, should not be taken as the end point in the forward and strategic planning process.

From time to time new management issues and objectives will arise that require strategies not already identified. Smaller issues, including operational and temporary user conflicts, should be able to be resolved in the context of day-to-day management by Wellington Council staff on behalf of Council, as Trust Manager.

However, the introduction of new activities or medium to longer term changes in use patterns will require the formulation of wider and/or different management objectives and strategies. In such an eventuality the Plan of Management may need to be amended to take into account such activities or changes. Where amendments are significant, the amended Plan of Management will be required to be displayed for public comment by the Department of Lands.

It is envisaged that the Trust, through the Wellington Council, will establish strategic rolling plans for both capital and conservative works and that

Wellington Council will have the task of reviewing and updating such plans at least annually.

A full revision of the Plan of Management within five years would become necessary if there were to be a major change in either the public's need, or the State Government's direction, to the management of Crown Reserves.

As a statutory document this Plan of Management has a life of five years should be reviewed in 2013.

However, any major changes to the manner in which the Reserve is to be operated i.e. leased to a private operator rather than being an in-house Council function would need to be the subject of public exhibition and an invitation for public comment prior to any determination in this regard being made.

Any lease or licence requires the consent of the Minister and consultation with the Department of Lands.

8. REFERENCES

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APPENDIX 1
Wellington Caves Advisory Committee Constitution

CONSTITUTION OF THE WELLINGTON CAVES ADVISORY COMMITTEE

1. APPOINTMENT

The Wellington Council resolved at its meeting held on 27th October, 2004, to appoint a Wellington Caves Advisory Committee under the provisions of Section 355 of the Local Government Act 1993, (as amended) to:

Advise Wellington Council on undertaking the functions of Trust Manager, with particular attention to matters pertaining to the preservation and maintenance of the Wellington Caves Reserve.

Report to the Economic Development and Strategic Services Committee of Council.

Provide a forum for raising issues of concern regarding preservation, maintenance and interpretation of the Wellington Caves.

2. OBJECTIVES OF COMMITTEE

To advise Council on the care, control and management of the Wellington Golf Course and Caves (Reserve 120078) Reserve Trust.

To raise public awareness of the Wellington Caves Reserve..

To provide relevant information to interested organisations and individuals.

To promote the Wellington area through exhibiting the Caves and Phosphate Mine.

To examine costs relating to preservation when necessary.

3. TERM

The Committee shall cease to hold office at the expiration of three (3) months after the general election of Council next following upon the appointment of the committee, subject to:

- The Committee may be dissolved by Council at any time;
- Any authority conferred by Council under this resolution may be withdrawn by Council by a subsequent resolution either wholly or in part.

4. MEMBERS

The membership of the Committee shall reflect both community and scientific interests and shall consist of:

- The Mayor, ex officio;
- The General Manager, ex officio;
- Experts with experience in speleology, karst management, palaeontology or related disciplines (maximum 5)
- One representative nominated by the Department of Lands;
- Citizen representatives (maximum 2);
- One Councillor, appointed by Council;
- The Caves Manager;
- One cave guide appointed by the General Manager;
- One senior Wellington Council staff member concerned with promotion or tourism, appointed by the General Manager.

4.1 In each year, the Committee shall elect one of its members as Chairman and another as Vice Chairperson at a meeting to be held in November or the next available meeting following a general election of Council.

4.2 Prior to the first meeting of the Committee following the expiration of the term of the Committee as set out in Clause 2, the public shall be invited to nominate for the citizen representatives on the Committee.

4.3 Council or Community members can only be appointed or removed from office by Council resolution.

5. QUORUM

The number of members competent to transact the business of the Committee shall consist of five (5) members, one of whom shall be a Councillor.

6. PROCEDURE

(a) The Committee may regulate its own procedure (subject to Council concurrence) and in particular may determine:

- Frequency, place, time and notice of ordinary meetings;

- To appoint sub-committees to exercise and perform functions of an investigatory nature and to report to the Committee provided that the Committee is unable to delegate any power, authority or duty to the sub-committee;

- Special Meetings of the Committee may be called by the Mayor, Chairperson, General Manager or by notice signed by at least three (3) members of the Committee.

(b) In the event of equality of voting the Chairperson shall not have the casting vote. In this case the recommendations voted equally upon shall be presented to the Corporate Services Committee for determination.

(c) The Annual General Meeting of the Committee shall be held in November of each year or the next available meeting after the general election of Council has been held.

(d) Meetings shall be held on an at least quarterly basis.

(e) Administrative/Secretarial support shall be supplied by Council and the General Manager or his nominee shall be the Committee Secretary.

(f) The procedure for the Committee shall be reviewed in August each year.

7. GENERAL

7.1 If any member (other than the Mayor or General Manager) is absent from three (3) consecutive meetings of the Committee without having obtained leave from the Committee, his/her seat shall become vacant.

7.2 Any recommendations of the Committee or any portion thereof may be amended by the Council or may be referred back to the Committee for further consideration.

7.3 The recommendations of the Committee shall, so far as adopted by Council, be resolutions of Council, provided that recommendations or reports of the Committee shall not have effect unless or until adopted by the Council.

7.4 All Communications of the Committee as a Whole shall be made through the Committee.

7.5 Subject to Section 10 of the Local Government Act 1993, (as amended) a meeting of the Committee shall be open to the press and the public.

7.6 The Committee may resolve that the press and the public be excluded from the whole or part of any meeting of the Committee for reasons as set out in Section 10 of the Local Government Act 1993, (as amended).

7.7 A member of the Committee shall not, at meetings of the Committee, vote in or take part in discussions of cases in which he/she or any relative of his/hers, has by him/herself or by his/her partner, any pecuniary interest.

7.8 The Council may provide certain technical or specialist staff to assist the Committee at its ordinary meetings, or otherwise as may be agreed to by the General Manager.

7.9 The Committee may co-opt citizens, with specialist knowledge and/or experience, to attend and discuss matters at the Committee Meetings. Such co-opted members shall have no voting rights.

APPENDIX 2
Weeds Control Plan

WELLINGTON CAVES MANAGEMENT PLAN FOR WEEDS:

COUNCIL AREAS: WELLINGTON COUNCIL

CONTACTS: BRYSON REES **PHONE:** (02) 68452099
ANDREW COSIER
CRAIG BENNETT

SIGNATURE:

_____ _____
GENERAL MANAGER DATE

PLANTS COVERED BY THIS PLAN:

Common Name:	**Botanical Name:**	**Category Classes under the Noxious Weeds ACT 1993:**
Golden Dodder	*Cuscata spp*	C3
Tree of Heaven	*Ailanthus altissima*	C4
African Boxthorn	*Lycium ferocissimum*	C4
St Johns Wort	*Hypericum perforatum*	C4
Blackberry	*Rubus fruticosus aggregate species*	C4
Noogoora Burr/Bathurst Burr	*Xanthium spp*	C4
Galvanised Burr	*Bassia birchii*	Not Declared
African Olive	*Olea europaea spp cuspidata*	Not Declared
Century Plant	*Agave americana*	Not Declared
Pepper-leaf Senna	*Cassia barclayana*	Not Declared
Onion Weed	*Asphodelus fistulosus L.*	Not Declared

PLAN PERIOD:

Start Date: 1 Feb 2007 Completion Date: 1 Feb 2012

AREA OF OPERATION:	Wellington Caves Complex and Reserve
AIM:	To reduce the impact of weeds on natural, cultural and recreational values.
OBJECTIVES:	1. Co-ordinate management at a regional, state and local level by December 2012. 2. Control all new weed infestations within 4 months of detection or before flowering. 3. Reduce the core area of St Johns Wort under active management by 30 % by the end of the plan with integrated pest management. St Johns Wort Local Management Plan. 4. Maintain, and increase where possible, extension activities highlighting control options and opportunities for community involvement over the life time of the plan.
STAKEHOLDERS:	Wellington Council Friends of the Caves Wellington Caves Trust Department of Lands Bell River Land Care Group Central West Catchment Management Authority
BACKGROUND:	Wellington Caves • Just 5 km south of Wellington along the Mitchell Highway there is a signpost which leads to the area's major attraction: the Wellington Caves Holiday Complex. The first European to see the caves was most probably someone associated with Lieutenant Simpson's settlement (1823-1831), but the first written account was provided by the explorer Hamilton Hume in 1828, who noted, 'The inside of the cave is beautifully formed, some parts of it are supported by pillars 50 feet high and beautifully carved by nature'. Two years later George Rankin, a local magistrate, found fossil bones of both a *Diprotodon* and a giant kangaroo in the caves. Later, Rankin returned with Sir Thomas Mitchell and collected a variety of bones from the caves which appeared to have acted as a natural trap for fauna. The caves provided a steady source of information about ancient geology and fauna, even today. However during the phosphate mining period of 1913 to 1971 many priceless palaeontological evidence was turned into fertiliser for farmers. The caves were vandalised during the nineteenth century and it wasn't until 1884 that they became a reserve. Today up to 50,000 people visit the caves annually.
Considerations and Opportunities	Opportunities are to keep this reserve as a natural state encouraging community visitation.

There is a need to protect sensitive areas and avoid the use of herbicides that may damage or disrupt these areas.

Actions

Golden Dodder	• To conduct regular inspections of the Bell River riparian zone. • To reduce Golden Dodder infestations in the life of the plan. • Destroy all Golden Dodder plants as they appear.
Tree Of Heaven	• Conduct regular inspections. • Destroy all Tree of Heaven plants over a two year period. • Monitor site for new and emerging infestations.
African Boxthorn	• Conduct regular inspections. • Destroy all new and establishing African Boxthorn plants by the end of the plan.
Noogoora Burr/Bathurst Burr	• To conduct regular inspections of the Bell river and reserve. • Carry out control work as needed in accordance with council's Class 4 Management Plans.
St Johns Wort	• Conduct regular inspections. • Carry out control work in accordance with Wellington Council's Management Plan for St Johns Wort. • Implement integrated pest management in the form of Herbicide, grazing and Biological Control (Chrysolina Beatle).
Galvanised Burr	• Conduct regular inspections. • Carry out control work in the form of pasture management and Herbicide treatment and replace with designable native grasses.
African Olive	• Conduct regular inspections. • Treat as plants appear with the cut and past method.
Century Plant	• Conduct regular inspections. • Dig plants out as they appear.

Pepper-leaf Senna	• Conduct regular inspections. • Remove manually when required.

BENEFITS: Benefits to the community following implementation of the Weeds Management Plan include:
• improved aesthetic and recreational values;
• improved tourism opportunity and appeal;
• reduced bush fire hazard;
• improved community involvement and ownership as objectives are met.

LEGISLATIVE SITUATION:	This Plan has been developed in accordance with the NSW Noxious Weeds Act 1993.
Links To Other Plans:	Wellington Caves Management Plan Regional St Johns Wort Management Plan Local St Johns Wort Management Plan Regional Golden Dodder Management Plan Wellington Council's Class 4 Management Plans
MONITOR AND REVIEW:	This plan will be monitored and reviewed by Wellington Council Staff.

Adopted by council on 2004

APPENDIX 3
Fire Management Plan

ATTACHED

APPENDIX 4
Pest Control Plan

1. The following pests occur on the Reserve:
   - foxes
   - cats
   - rats
   - mice
   - rabbits
   - dogs
   - locusts

2. Control in response to sightings:
   a. Foxes - 1080 baiting on the Reserve to be carried out by the Rural Lands Protection Board Pest Control Officer in conjunction with Wellington Council.
   b. Cats - set traps as supplied by the Wellington Council Ranger; trapped animals to be removed by the Ranger.
   c. Rodents - set traps in infected areas to be examined daily by caves staff.
   d. Rabbits - baiting to be carried out by the Rural Lands Protection Board Pest Control Officer in conjunction with Wellington Council.
   e. Dogs - feral dogs have not been a problem on the Reserve, but on occasion dogs belonging to neighbours or visitors roam the area. To date the problem has been resolved by contacting the owners an requesting the dogs be kept at home or on a lead. However if removal is required, this should be done by the Wellington Council Ranger.
   f. Locusts are a problem only as part of a much wider locust plague. When this occurs, control of the plague is in the hands of Wellington Council and the presence of locusts on the Reserve must be reported to the council.

3. Ongoing control to minimize rodent infestation
   Guides need to enforce standing rules prohibiting visitors to take food into the caves. These rules need to be emphasized when events are held in Cathedral Cave.
   A water trap for rats should be maintained in the mine.
   Garbage receptacles throughout the Reserve should be emptied regularly.
   Rodent baits are to be maintained in Caravan Park units.
   Inspection for signs of rodents should be part of the routine cleaning of tourist facilities.
   Standards required by the Wellington Council Environmental Health Department are to be maintained in food preparation areas.

4. Regulations relating to pets.
   While it is recognised that the Caravan Park is advertised as "pet friendly", pet owners should be informed that they are required to keep their pets confined or on leads and remove their faeces. These requirements should be enforced when and where necessary.

APPENDIX 5
Works Program

Objectives	Strategies
Upgrade Cathedral Cave	install 12 v system, first level complete lighting refurbishment refurbish steps refurbish handrails provide seats
Open Water Cave	build perimeter fence build steps install lighting
Upgrade Gaden Cave lighting	-
Protect uncovered cave entrances	fence or alternative
Provide emergency communication to Gaden Caves	extend phone line from Cathedral Cave put phone line underground
Conservation of natural environment	rehabilitate sewage ponds weed eradication revegetation soil erosion control repair fences
Provide additional educational facilities	construct biodiversity trail produce education pack/DVD construct educational centre
Improve interpretation	add shelters and signage to Field of Fossils provide interpretive panels in the Mine provide interpretive panels in Cathedral Cave
Drought-proof	connect to town water
Emphasize fossils	create an outdoor Megafaunal "park"