92F/4 PEASTWOOD
LONG BEACH (I)

Department of
Indian Affairs and
Northern Development

CANADA

Ministère des
Affaires indiennes et
du Nord canadien

November 16, 1970

National Park
Department of Indian Affairs
and Northern Development
Box 518, Ucluelet, B.C.

our file notre dossier
your file votre dossier 77/1-I4

Department of Mines and Petroleum Resources
Parliament Buildings
Victoria, B.C.

ATTENTION: Please forward to appropriate personnel

3379

Sirs:

I am preparing an information pamphlet on the Long Beach area and wish to check out the veracity of one section of the pamphlet concerning the geological history of the Long Beach peninsula.

Would it be possible if one of the staff of this department could prepare a very brief summary of the important events that have occurred in creating the present landscape of this area. I am enclosing the material I have prepared so far; perhaps if it is basically accurate, any pertinant comments on it would be appreciated.

If this material has reached the wrong department, could you please forward it to the appropriate people. Thank you for any assistance that you are able to provide.

George Trachuk

G. Trachuk
Superintendent

DEPT. OF MINES
AND PETROLEUM RESOURCES
Rec'd NOV 18 1970

SH		
GEPE	✓	
JTF	✓	BOOA

92F/4

200 12/0 400 20/80

200 12/ 400 0

2400

PROPERTY FILE
92F/4 Gen
Long Beach.

(I)

NATURAL FEATURES

The land and the sea, as typified by the Long Beach area, have historically and at present, formed a complex interrelationship of dependancy without which, all living organisms, including man, could not survive. The climate, rainfall, and geological makeup of this region are directly attributed to this interdependance, and the plants and animals found here are a reflection of these influences.

THE LAND

The physical characteristics are deeply rooted in the geological history of the area. The Park is a narrow coastal plain lying between 50 and 150 feet above sea level which abuts against the Vancouver Island Range, reaching elevations of greater than 7000 feet.

At one time this region was part of a chain of active volcanic islands along the coast of North America. The volcanoes became inactive after discharging vast amounts of volcanic material over the area that is now Vancouver Island. The land surrounding the volcanic islands alternately rose above, or sank into the sea. During the last series of submergences (Triassic, Jurassic and Pleistocene periods) layers of sand were deposited in the sea by ancient rivers. Later they became compressed by pressure into sandstone. More recently, gravels were added to the landscape as huge glaciers pushed their debris towards the sea. These sandstones and gravel deposits covered the volcanic rocks. Upon rising from the sea again, erosion has repeatedly worn away parts of the sandstone and gravel blanket, leaving knobs of old volcanic rock exposed, such as Vargas Cone and "Radar Hill" found in this Park. Along the shore, the erosion of these deposits by the relentless pounding of the ocean has formed extensive beaches of sand and gravel exposing the old volcanic rocks that are now the "headlands."

November 25, 1970

Mr. George Trachuk,
National Park,
Dept. of Indian Affairs and
Northern Development,
Box 518,
Ucluelet, B. C.

Dear Sir:

Your letter of the 16th was passed on to me because I geologically mapped the Kennedy Lake area for our Bulletin 55. I have prepared the attached outline of the geological history as it can be deduced or reasonably inferred. There is little reference to living organisms because so far very few fossils have been found in the area. I have not described the rocks because I gather that is not your purpose; if you do need the description you could take them from Bulletin 55. I do not know the extent of the park, so I have focussed on Long Beach and the country to the northeast.

Yours truly,

G.E.P. Eastwood, Ph.D., P.Eng.,
Geologist

G.E.P./as

Encl: Geological History of the Long Beach Area - filed 800A

Sent. Bull 55

Geological History of the Long Beach Area

The story begins some 200 million years ago in Triassic time, when the area lay beneath the Pacific Ocean. Fissures opened in the ocean floor and vast piles of lava poured out from the depths of the earth. The ocean floor was built up nearly to sea level. In late Triassic time this volcanic activity ceased abruptly, molluscs thrived, and limestone was precipitated from the ocean waters. In early Jurassic time many volcanoes exploded into action, piling thousands of feet of volcanic fragments on top of the limestone. This episode was closed by movements of the earth's crust, which compressed the rock, into broad folds. The surface was then above sea level and displayed a series of parallel ridges and valleys.

In middle Jurassic time, 165 million years ago, large masses of molten rock again forced their way up from deep in the earth's crust and solidified before reaching the surface to form coarse-grained granitic rocks. At the same time the surface rose still higher, creating a mountainous land. Moist westerly winds were cooled in passing over the mountains, and the moisture condensed as heavy rain. The torrential streams eroded the mountains in late Jurassic time and exposed the granitic rocks. They deposited the debris as sands and gravels just offshore, which was close to the present shoreline.

Sometime in the Cretaceous Period these sands and gravels were hardened into rock and folded by further compression of the area. A huge rift developed approximately under the present Long Beach - Tofino road. The rocks on the southwest side were moved northwest and the rocks on the northeast side were uplifted. The sandstones exposed in headlands and other places along the present shoreline are the products of the late Jurassic erosion, whereas older rocks are exposed northeast of the road. These uplifted rocks were carved into rugged mountains in Tertiary time, and the debris of erosion was again deposited offshore, as sands and gravels which have remained sea-covered. They have been found in recent offshore drilling.

In Pleistocene time, between one million and ten thousand years ago, a thick sheet of ice covered all but the highest mountains, and the weight of it actually depressed Vancouver Island so that sea level rose. Since the melting away of the ice the Island has risen again and sea level has dropped but not to its old level, and the lower parts of river valleys have become fiord-like arms of the sea. The two arms of Kennedy Lake are fiords that have become landlocked. The ice sheet disappeared first from the mountain ridges, leaving masses of stagnant ice in the valleys. One particularly large block of ice occupied the basin of Kennedy Lake. The meltwater from other parts of the ice sheet swept sand and silt down from the mountains and over the surface of the Kennedy Lake ice block to form the sand plain between the lake and Long Beach. Hills of volcanic and granitic rocks were partly buried by this flood of sand.

Long Beach itself has been formed in geologically Recent time by the relentless attack of waves from the open sea on the unconsolidated Pleistocene sands and gravels. Breaking waves dislodge the sand grains and pebbles, and the undertow carries them down the gently-sloping beach and sea-bed. The headlands

and islands of late Jurassic sandstone protect the beach to some extent by breaking the force of the largest waves. Strong southwest winds have blown sand onshore to form the sand dunes just behind the beach.

B.C. Dept. of Mines & Petroleum Resources

November 25, 1970

G.E.P.E./as

Date November [illegible] 1970

Send to Mr. G. Trachuk,
Superintendent,
National Park,
Department of Indian Affairs
and Northern Development,
Box 518,
UCLUELET, B. C.

1 copy Bulletin #55

(gratis)

bg

Signed

Mailed

Expressed

Delivered

Date

Initial

10M (100)-153-9507 (4)