Province of British Columbia
Ministry of Environment
WATER MANAGEMENT BRANCH

MEMORANDUM

To: A.P. Kohut
Senior Geological Engineer
Groundwater Section
Water Management Branch

Date: November 14, 1985

Our File: 92 F/10

Re: New Well Site for Kye Bay Improvement District

Introduction

As requested by Mr. Ove Hals, Head, Water Supply - Health Engineering, Nanaimo Regional office, a review of the proposed well sites for Kye Bay Improvement District has been completed. The review is based on telephone conversations with Mr. Grant (District member) and local drillers, and examination of available well records and air photos. The maximum water requirement is 32 gpm. This memorandum presents a brief review of the groundwater conditions of the area and discussion of the proposed sites and makes recommendations on the well construction.

Groundwater Conditions

Figure 1 shows the location of the three sites (1, 2, and 3) and Figure 2 is an interpretation of the hydrogeology across the area. Most wells in the District area are located along the shore between Sites 1 and 3 and are shallow dug wells completed in beach gravel which likely receives groundwater discharging from the upland to the southwest. These wells supply one to two dwellings; actual capacities are unknown. A 30-foot well near Site 3, drilled by Anderson Well Drilling in the summer of 1985, has a reported capacity of 30 gpm. The quality of water was tested in some wells and coliform bacteria was detected (Grant, 1985, pers. comm.). No problems with salty water were reported; this may be because groundwater use is quite low here.

Most wells behind the steep bank are located along Knight Road but two (Gee well X12E #22 and Knutsen X13E #9) are located at the crest of the bank similar to Site 2. The deeper wells are completed in a sand and gravel aquifer (Quadra Sand, the major aquifer in the Comox area) underlying hardpan. The aquifer thickness is reported only from the log of Ellis' well (X12E #23) and is 55 feet. Capacity of the wells behind the steep bank range between 5 gpm to 50 gpm. This aquifer may extend northeastward and underlie the shore at depth near Sites 1 and 3.

Discussion of the Sites

Site 1 is located along the shore on Federal Government property. The beach gravel along the shore may not provide sufficient water because of its apparent limited thickness. The target here would be the Quadra Sand aquifer if existent. Geologic information at depth is lacking but based on

regional geology, this aquifer may be encountered at a depth of roughly 40 feet (Figure 2). An 80-foot well may be necessary at this site . The static water level is likely near ground level. Well interference is not expected to be a problem because of the scarcity of wells near the site but the possibility of seawater intrusion exists.

Site 2 is located near the crest of the steep bank on Provincial Crown Land (road right-of-way). This site is likely situated in the same geologic environment as the area to the southwest. The Quadra Sand aquifer is expected to be at a depth of roughly 90 feet (Figure 2). A 130-foot well may be necessary here . The static water level is likely about 45 feet below ground. No wells exist nearby and well interference is not expected. Site 2 is also the site farthest inland. The storage tank would also be located at Site 2.

Site 3 is located along the shore on private property. Geologically, this site would be similar to Site 1. However, the proximity of the Wagoner well (100'± away) and the 30-foot well drilled by Anderson make well interference a potential problem along with seawater intrusion.

Property considerations and possibility of well interference render Site 3 undesirable. As for Sites 1 and 2, Site 2 is located further inland and adjacent to the proposed storage tank. If the geology is uniform and the Quadra Sand aquifer extends to Site 1, there would likely be less drilling costs (roughly $1,000) there, however, geological information at depth at Site 1 is lacking and possibility for saltwater intrusion would be greater here than at Site 2. In conclusion, based on the above, the drilling sites in order of decreasing preference would be:

Site 2
Site 1
Site 3

Well Construction

A larger diameter surface casing of minimum 15-foot length should be installed for construction of a surface sanitary seal to prevent pollution from septic fields and other surface contamination sources. The well capacity should be assessed by pump testing for a period of 24-hour duration. Well construction and testing should be done under the supervision of a groundwater engineer.

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References

Fyles, J.G. 1960. Surficial Geology, Courtenay, Comox, Nanaimo and Newcastle Districts, Vancouver Island, British Columbia. Map 32-1960, Geological Survey of Canada, Ottawa, Ontario.

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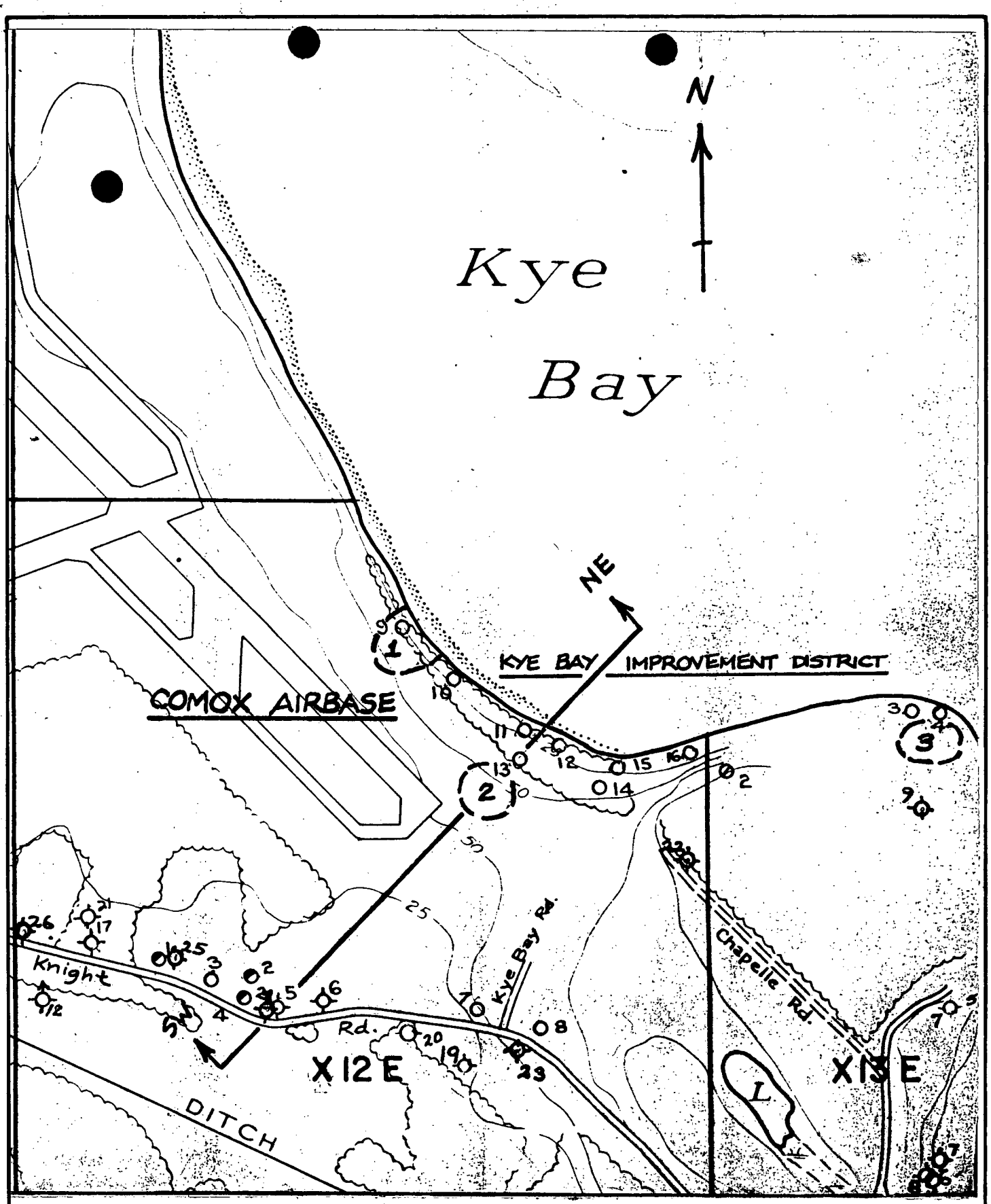
MW/dma



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TO ACCOMPANY REPORT ON
NEW WELL SITE FOR
KYE BAY IMPROVEMENT DISTRICT

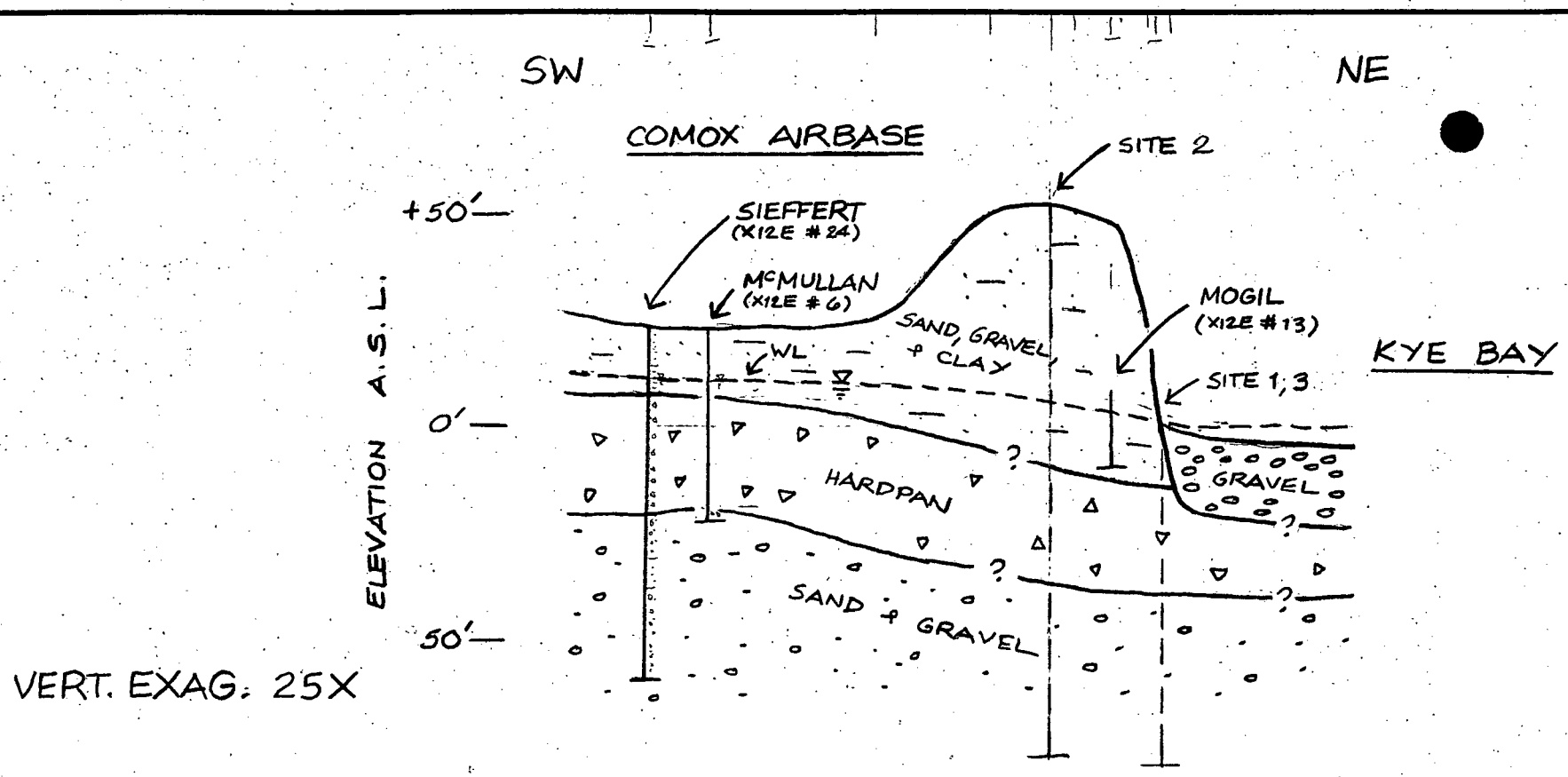
SCALE: VERT. N/A
HOR. 1:12,000

DATE 12/11/85

M. WEI ENGINEER

FILE No. 92F/10 DWG. No. FIGURE 1

BCIL 7673-M.E.



INTERPRETATION OF HYDROGEOLOGY, KYE BAY

NOTE: BASED ON WELL LOG FILES, AIR PHOTOS, AND FYLES (1960)

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SCALE: VERT. 1:480
HOR. 1:12,000

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M. WEI ENGINEER

FILE No. 92F/10 DWG. No. FIGURE 2

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