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File 230.61 Fallout

HOLMES & NARVER, INC.
ENGINEERS • CONSTRUCTORS
LOS ANGELES

June 29, 1959

Mr. Joe B. Sanders
Director, Pacific Operations
U. S. Atomic Energy Commission
Post Office Box 5400
Albuquerque, New Mexico

Subject: ESTIMATED WEIGHTS OF CONSTRUCTION MATERIALS,
OPERATIONS CASTLE, REDWING, AND HARDTACK I

Dear Mr. Sanders:

In accordance with your telephone request of June 11, 1959, and your TWX
JBS-5309 of June 12, 1959, we are enclosing a tabulation of the materials
included in the composition of the listed zero stations:

ESTIMATED WEIGHT OF MATERIALS, POUNDS (Sand & Coral in Cu. Yds.)

	<u>CASTLE</u> Bravo Sta. 20 Steel Bldg.	<u>Zuni</u> Sta. 22 Steel Bldg.	<u>REDWING</u> Seminole Sta. 23 Steel Tank	<u>LaCrosse</u> Sta. 24 Steel Bldg.	<u>HARDTACK I</u> Koa Sta. 21 Steel Tank
Steel & Iron	122,000	111,000	123,000	1,448,000	70,800
Aluminum		2,600	10	470	67
Copper		1,800	100	200	Trace
Lead			200,000		Trace
Paraffin			5,400		
Manganese					300
Wood	37,000	8,500	1,600	2,200	11,800
Crater					
Coral Sand	2,236,300 cy	460,070 cy	71,940 cy	6,400 cy	
Coral Rock	78,528,400 cy	2,555,870 cy	192,720 cy	105,800 cy	
Dimens.	6200' dia. x 201' deep	1800' dia. x 86' deep	630' dia. x 31' deep	400' dia. x 46.5' deep	

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The summary does not include user-furnished materials, except Station 24, REDWING, which includes user-furnished 7-inch tubing and aluminum thrust ring, but does not include vacuum pumps and gas ballast equipment. Station 24 tabulation for iron and steel also includes steel to within 400 feet of GZ.

The information for composition of the CASTLE Station was contained in a letter from Mr. J. M. Lloyd to Mr. P. W. Spain, dated 18 May 1954, and includes Stations 1202, 1351, 1560.01, and 1812.01.

The information for composition of the REDWING Stations was taken from a tabulation submitted in a confidential letter from H&N to Mr. P. W. Spain, dated April 9, 1956. (H&N Number 343).

The HARDTACK I tabulation appears on confidential Drawing J/S 90-005-54, dated August 7, 1958, which was transmitted to Mr. Rea Blossom by H&N IA-9500, dated October 20, 1958.

Crater information is from survey data at the H&N Resident Engineer's office, EPG. Quantities of reinforcing steel or concrete for foundations have not been included. Chemical composition of cratered material has not been determined, but the following information has been taken from Geological Survey Professional Paper, 260-A "Geology of Bikini and Nearby Atolls," dated 1954, pages 84-86:

Calcium Carbonate, 87.7% to 98.6% with the minimum reading at
15.5' depth and the maximum at 340' depth.

Magnesium Carbonate, 8.3% to 0.7% with maximum at 15.5' depth
and the minimum at 340' depth.

From other samples at Bikini, spectrographic analyses indicated the following

Mn - .0004 to .003%
Na - .07 to 1.0%

However, the spectrographic analyses of carbonates are stated in the paper as "not considered to be as accurate as those of some other types of rock," and "two samples---from 330 feet and---from 635 feet, contain more silicon, aluminum, iron, manganese and sodium than other samples, but these elements are possibly due to contamination by drilling mud."

We shall be glad to have samples taken and analyzed to present more conclusive information if desired.

Very truly yours,

HOLMES & NARVER, INC

/s/ S. P. Howell, Manager
Engineering & Construction

1/ It is not possible to incorporate the information provided into predictions of induced activity without this data.

H. Knapp

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