

Lewis Flight Propulsion Laboratory

Cleveland, Ohio

EVALUATION OF
PLUM BROOK ORDNANCE WORKS

SUMMARY AND GUIDE TO
NACA
REFERENCE MATERIAL

July, 1958

Cleveland, Ohio
July 1958

SUMMARY OF NACA EVALUATION OF PLUM BROOK ORDNANCE WORKS

1. Following this summary there is a guide to the NACA evaluation. The guide explains the use of the two units comprising the display.

2. To arrive at a value to the NACA of the old Plum Brook Ordnance Works, a number of competent and qualified laboratory personnel were selected. They made personal inspections of the Ordnance Works using the following factors as bases for their conclusions:

- a. Is the item desirable or applicable for present or future NACA use? If it has no present or foreseeable use, it has no value to the NACA.
- b. Is it a desirable item as it stands? If the item must be moved, reworked, repaired or reinstalled, it has less value.
- c. What was its original acquisition cost (if known) or what was its estimated acquisition cost?
- d. What is the present condition and estimated future life of the item?
- e. What is the estimated present value of the item if sold as surplus by the government?

3. Values were then placed by them on those items desired by the NACA. The various reference memoranda explain the methods used for specific items. Throughout the NACA values, the following two terms are used and their definitions follow:

- a. "Net value to NACA": is the value to the NACA of the land, buildings, improvements, equipment, property and materials which can be used by the NACA at present or in the foreseeable future.
- b. "No value": The buildings, improvements, equipment, property and materials so designated cannot be used by the NACA at present or in the foreseeable future. It is contemplated that such "no value" (to the NACA) items will be disposed of through excess or other channels.

July 1958

4. There are three Army Ordnance Corps credit vouchers. Grand totals of Army book value and NACA values are as follows:

| | <u>Voucher No.</u> | <u>Army Book Value</u> | <u>NACA Value</u> |
|-------------------------|--------------------|----------------------------|-------------------|
| Real Property | T-2402-58 | \$ 16,717,825 | \$ 1,482,017 |
| Machinery and Equipment | T-2403-58 | 8,275,874 | 358,502 |
| Stores Inventory | T-2404-58 | <u>264,047</u> | <u>20,197</u> |
| | TOTALS | \$ 25,257,746 | \$ 1,860,716 |



Charles A. Herrmann
Chief, Technical Services Divisions

Enclosures

July 1958

GUIDE TO THE NACA EVALUATION OF PLUM BROOK ORDNANCE WORKS

The following display has been prepared in the process of evaluation of the Plum Brook Ordnance Works. This evaluation has been referenced around the Army Ordnance Vouchers and related material and is best examined in the order of the Roman numerals which number the two major units.

Unit

Summary

- I Copies of the original Ordnance vouchers and inventory with NACA valuations imposed in the margins. The values are the net present values established by the NACA of real and personal property to which the NACA desires permanent title. Our purpose in imposition of these values has been to match the Army presentation, thus enabling a direct comparison of values in each category. Footnotes refer the reader to NACA reference material.

Unit I consists of the following:

1. Voucher T-2402-58, pages 1-4, transferring accountability of real property, total cost \$16,717,825.08; plus addenda sheets, pages 5-13, giving a breakdown of land, railroads, roads and grounds, building and structure costs.
2. Voucher T-2403-58, pages 14-15, transferring accountability of personal property, total cost \$8,275,874.48; plus addenda sheets, pages 16-21, giving breakdown of the eleven accounts included in personal property.
3. Voucher T-2404-58, pages 22-24, transferring accountability of excess maintenance and service inventory, total cost \$264,047.56.
4. Inventory of Real Property, pages 25-37, as the title implies, this is a detailed listing of real property, noting floor areas of buildings and lineal measure of utility services.
5. Schedule of Real Property and Capital Equipment, Ravenna Arsenal figures of the various real and personal property account numbers. (It should be noted that these figures are approximately the same, but do not exactly match the Ordnance accounts.)

July 1958

Unit

Summary

- II NACA Reference Memoranda and Maps. There are eleven memoranda and thirteen maps dealing in detail with various parts of the Plum Brook Ordnance Works. These memoranda are the references for the footnotes in Unit II.

Memoranda

Map Exhibits

| | |
|----------------------------|--|
| A Land | I Land, Roads and Grounds Improvements, |
| B Railroads | Buildings and Improvements, |
| C Roads and Grounds | Miscellaneous Structures and Railroad |
| D Utility Systems | Tracks |
| E Electrical Facilities | II Utilities; Domestic Water |
| G Buildings | III Utilities; Fire Water |
| H Miscellaneous Structures | IV Utilities; Process Water |
| J Mechanical Equipment | V Utilities; Clarified Water |
| K Mobile Equipment | VI Utilities; Natural Gas |
| L Miscellaneous Equipment | VII Utilities; Steam |
| M Supplies | VIII Utilities; Air |
| | IX Utilities; Sewage and Waste Disposal |
| | X Utilities; Toluene |
| | XI Electrical; Transmission and Power |
| | XII Electrical; Plant Lighting |
| | XIII Electrical; Fence and Road Lighting |

It is recommended that in the process of familiarizing himself with this display, the reader at first examine the units in the order of the Roman numerals. When it is understood how the material has been presented, it will then be possible to move from unit to unit without confusion.

As an example, to find the NACA valuation for the Land:

Unit I - NACA value has been imposed next to Ordnance value in the Real Property Voucher. The footnote on page 5 refers us to NACA reference memorandum "A".

Unit II - Memorandum "A" explains the methods used in determining the NACA valuation.

Any applicable maps may also be used as reference material for location and identification of areas and materials.

Other valuations are referenced in similar manner.

Capey

July 11, 1958

From Lewis [REDACTED]
To NACA Headquarters

Att: Mr. E. H. Chamberlin

Subject: Recommendation for the transfer of Plum Brook Ordnance Works to NACA.

1. Construction of the Plum Brook Ordnance Works was started April 15, 1941, and substantially completed in 1942. Manufacturing processes were started January 11, 1942 and suspended in 1945.
2. The nature of the operations dictated expendable construction procedure and for a life expectancy of five years. Many departures were made from standard design and construction practices due to material shortages at the time. Some substitutions were made that were adequate for the expected five years use, but much of the material today has deteriorated to the extent that it is of no value. There are three TNT areas, a Pentolite area and three acid areas all at this location. The acid manufacturing resulted in very corrosive atmospheric conditions, affecting equipment, buildings, piping etc., in large areas. A minimum maintenance of this plant over the last 13 years, in addition to abnormal deterioration has resulted in a decided effect on the value of this installation.
3. The Ordnance Corps has declared the plant in excess to its needs and agreed to transfer 3180 acres to the NACA by a five year permit dated January 22, 1958. The Ordnance Corps has issued to the NACA a permit to use 500 acres for a period of 10 years at this same location (dated 7-5-56). There are also easements to the extent of 45 acres to be considered with this overall transaction consisting of approximately 3725 acres.
4. Under normal conditions a transfer of property of this nature would require a detailed inventory and estimate of value of all property at the site. This inventory by GSA has been estimated to cost the Government \$100,000. The decontamination of certain areas, including burning of the buildings and cleaning the area, would cost the Government another \$448,600 (estimate). To dispose of the remaining buildings and clear the site for other use it is estimated that the cost to the Government would be more than could be realized by the salvage value of the buildings. By careful planning the NACA can use the site as it exists, resulting in an immediate savings to the Government of approximately \$548,600.00.
5. Any existing equipment required by NACA, or disposed of later, would result in a further savings to the Government.

6. This plant has performed the services intended by the Ordnance Corps and has been declared excess to the needs of the Ordnance Corps.

7. The transfer of the property to the NACA would result in no cost to the Government. The established value of the property to the NACA will remain as capital assets of the Government.

8. It is therefore recommended that the Department of the Army or the Ordnance Corps transfer title of the Plum Brook Ordnance Works, including all real and personal property, to the NACA without reimbursement of funds, and that accountability therefore be terminated. The NACA will inventory and evaluate the real and personal property retained and survey and dispose of all excess property.

Charles A. Herrmann
Chief, Technical Services Divisions

CAH:wvr

Gen. Del.

July 18, 1958

1151

From Lewis
To NACA Headquarters

Subject: Evaluation of certain property at Plum Brook
Ordnance Works

- References:
- (1) Memo for record, 6-10-58, EHC
 - (2) Voucher transmittal let. 5/22/58
(copy attached)
 - (3) Recommendation for Transfer, 7/11/58
(copy attached)
 - (4) Evaluation display, attached

1. An inspection and evaluation of the Real and Personal property at Plum Brook Ordnance Works was made during the period of March 17 through July 14, 1958. A detailed inventory of all property was not made. Those items selected were evaluated on the basis of factors outlined in the evaluation summary.

2. It is requested that the Headquarters Office discuss with Army Ordnance the procedures for concluding this transaction, including transfer of property and the disposal by demolition or otherwise of the equipment and structures of no value to the NACA.

Charles A. Herrmann
Chief, Technical Services Divisions

CAH:wvr

- Encls:
- (1) Recommendation for transfer, CAH
 - (2) Copy of letter from Major Catherman
 - (3) Summary & Guide to Reference Material (2 copies)
 - (4) Unit I, NACA values imposed on Vouchers (2 copies)
 - (5) Unit II, NACA reference material (2 copies)
 - (6) Map exhibits I-XIII (13 units)

Take to [unclear] E.C. [unclear] 7/20/58

LEWIS

August 8, 1953

From: NACA Headquarters
To: Lewis

Subject: Review of Lewis' Evaluation of Plum Brook Drainage Works

References: a) Transmittal let. July 11, 1953, LHM:avr
b) Reference material composed of Units I, II and other data

1. A review has been made by the Headquarters Fiscal Internal Audit Staff of subject evaluation by Lewis. The review has been made of the financial and accounting aspects and has been restricted to the facts contained in the referenced material.

2. The objectives of the review were 1) to appraise the soundness of the values placed by Lewis on the real and personal property to be acquired in an accounting and economic sense, and 2) test footings, extensions and methods of arriving at values. These objectives are in line with our desire to show fair and realistic values in the records for the property to be acquired.

3. The following comments are therefore submitted in the form of observations and questions. While it is realized that logical reasons probably exist in most instances for the actions taken, it will be appreciated if you will review these observations and furnish amplification where necessary. There is also included a listing of errors in computations which were noted by the auditors during the review. Corrections have been made on Headquarters copies and should be made on your copies of the reference material.

4. The following comments are keyed to Units I and II of the reference material using the same section and item unit numbers:

(1) ref. Lewis letter 7/11/53; Memorandum A

In paragraph 1 concerning inventorying, demolition and decontamination, the writer states, "By careful planning the NACA can use the site as it exists, resulting in an immediate savings to the Government of approximately \$545,600." While this probably indicates prudent planning in not making a proposed expenditure, we question whether it can be considered a saving. See next comment No. (2).

DIRECTOR
ASSOC. DIR
Budget
PERSONNEL
SEC. 1
SEC. 2
SEC. 3
SEC. 4
SEC. 5
SEC. 6
SEC. 7
SEC. 8
SEC. 9
SEC. 10
SEC. 11
SEC. 12
SEC. 13
SEC. 14
SEC. 15
SEC. 16
SEC. 17
SEC. 18
SEC. 19
SEC. 20
SEC. 21
SEC. 22
SEC. 23
SEC. 24
SEC. 25
SEC. 26
SEC. 27
SEC. 28
SEC. 29
SEC. 30
SEC. 31
SEC. 32
SEC. 33
SEC. 34
SEC. 35
SEC. 36
SEC. 37
SEC. 38
SEC. 39
SEC. 40
SEC. 41
SEC. 42
SEC. 43
SEC. 44
SEC. 45
SEC. 46
SEC. 47
SEC. 48
SEC. 49
SEC. 50
SEC. 51
SEC. 52
SEC. 53
SEC. 54
SEC. 55
SEC. 56
SEC. 57
SEC. 58
SEC. 59
SEC. 60
SEC. 61
SEC. 62
SEC. 63
SEC. 64
SEC. 65
SEC. 66
SEC. 67
SEC. 68
SEC. 69
SEC. 70
SEC. 71
SEC. 72
SEC. 73
SEC. 74
SEC. 75
SEC. 76
SEC. 77
SEC. 78
SEC. 79
SEC. 80
SEC. 81
SEC. 82
SEC. 83
SEC. 84
SEC. 85
SEC. 86
SEC. 87
SEC. 88
SEC. 89
SEC. 90
SEC. 91
SEC. 92
SEC. 93
SEC. 94
SEC. 95
SEC. 96
SEC. 97
SEC. 98
SEC. 99
SEC. 100

(2) Ordnance Voucher No. T-2402-58-Item 1 Land; Memorandum A

The acquisition costs of subject 3225 acres were \$743,573. The estimated value to NACA of \$294,973 was obtained as follows:

| | |
|----------------------------------|------------------|
| Acquisition Cost-3225 Acres | \$743,573 |
| Less decontamination costs, etc. | <u>448,600</u> |
| Net value to NACA | <u>\$294,973</u> |

While we do not feel values should be unduly appreciated, realism is necessary for the agency to have a defensible position in the values recorded. Other standards which we feel may be appropriate in arriving at fair values for the land include:

- (a) What is the current fair or market value of similar land in this area if the agency had the need to acquire more?
- (b) Acquisition costs were about \$230 per acre over 17 years ago. The proposed value is about \$90 per acre. This would not seem to recognize economic changes and the inflationary spiral of land values of double or more, hence \$460 per acre might be a more realistic figure.
- (c) In governmental accounting, acquisition costs are justifiable bases for valuation of capital assets.

If, after consideration of all factors, an evaluation is arrived at which is considered equitable and will bear scrutiny of others interested, no objection can be seen in using the estimated cost of demolition, decontamination, etc. as one of the factors in determining the final value to be recorded. Normally, costs incurred in restoring or putting land in useable condition are capitalized.

(3) Ordnance Voucher No. T-2402-58-Item 2 Railroads; Memorandum B

The same method in arriving at net value to NACA of railroads was used as in the case of real property,

| | |
|--|------------------|
| Acquisition Costs 28.4 mi. (track only) | \$129,280 |
| Less est. repair costs | <u>47,500</u> |
| Net value to NACA | <u>\$ 81,780</u> |

This treatment appears appropriate in arriving at net value to NACA. This is assuming that these are normal maintenance repairs. However, if these repairs are more material and restore the railroad tracks to their original condition, it would not be inappropriate to capitalize such costs. (By adding to the recorded value of \$81,780).

(1) Expense Voucher No. E-247-55-Item B Roads and Grounds Improvements; Memorandum C

A departure from methods used in arriving at values for Item 1, Land and Item 2, Railroads, is evident here. That is, acquisition costs for roads of \$13,179 have not been used. Since acquisition costs were a factor in arriving at the value of the land and of the railroads, we wonder why they were not also considered in determining the value of the roads. The net value to NACA of \$15,125 is composed only of improvement cost estimates. A question as to the soundness of these estimates found in memorandum C is raised as follows:

(a) Error in computation, Memorandum C paragraph 4(a):

| | <u>Square Yards</u> | <u>Estimated Cost of Construction</u> |
|-----------------|---------------------|---------------------------------------|
| Per survey team | 179, | \$44,375 |
| Per auditor | <u>168,</u> | <u>33,779</u> |
| Difference | <u>11,</u> | <u>\$11,097</u> |

This error reduces the total estimated cost of road improvements from \$15,125 to \$14,028.

- (b) The tabulation in Memorandum C, paragraph 4(a) shows a value of \$2.50 per sq. yd. placed on 143,000 feet by which the reconstructed road was widened. We assume that reconstructed roads are at least as wide as the constructed roads, i.e., 14 feet, and, accordingly the original roadway of 10 feet is unaccounted for in terms of a valuation to be assumed by us. If the costs for these 10 feet are included, it appears an underestimate of \$81,442 has been made thus:

$$\frac{20402}{7} \times 10 = \frac{291428}{7} = 41632 \text{ sq. yd.} \times \$2.50 = \$104,082$$

on this basis, revision of cost estimates follows:

| | |
|---|------------------|
| Reconstructed | \$ 44,375 |
| Constructed | 14,250 |
| 10 additional feet of reconstructed road not included above | 84,442 |
| | <u>243,567</u> |
| Less error (a) above | <u>11,097</u> |
| Auditor's revised est. of improvements | <u>\$232,470</u> |

The foregoing is based on the assumption that both constructed and reconstructed roads are 14 feet wide and that no factor has been included in the estimated

value of the roads for the other 10 feet of the reconstructed road. This assumption may be in error and your comments will be appreciated.

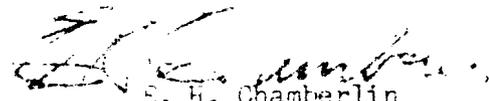
- (c) The valuation of \$25,000 for drainage ditches, Memorandum C, paragraph 5, is not shown on the Ordnance Voucher. Therefore, this value is not included in the total on page 3 voucher No. T-2402-58 of \$1,482,017. This appears to be an oversight.
- (d) It seems possible that drainage ditches alongside of even the unused roads may have some value which should have been included. Would we have to put these ditches in if they had not been there in order to drain the used section of road? If so they may be an improvement which should be capitalized.
- (e) Of the 42.5 miles of roadway in the NACA portion, apparently only 11.3 will be used and no value has been placed on the remaining 31.2 miles. We note that a value of \$500 has been placed on Bridge #640 over an unused section of Fox Road. If the road has no value, it would appear that the bridge also has no value.

(5) Ordnance Vouchers Nos. T-2403-58; T-2404-58 and Memoranda

The review of these vouchers indicates that considerable effort has been made to select realistic and equitable standards in the evaluation of machinery and equipment. A few discrepancies were noted in calculations; e.g., compressors were to be valued at \$5000 but one was listed at \$2500, which do not seem significant because of the nature and magnitude of the number and original value of items as well as the uncertainty as to the future possible uses of much of the equipment. See list attached.

- (a) We do wish to suggest, although it is no doubt the intent of officials concerned, that strict physical, accounting or other controls deemed necessary be placed over the personal property acquired at Plum Brook, particularly that which has been adjudged to be surplus or "no value."
- (b) The inventory of expendable supplies is covered in Memorandum M. The material of value to NACA is listed at acquisition costs of \$20,196.98. In paragraph 3 of memo M, it is recommended that physical location remain at Plum Brook. We assume that it is proposed to

expend the value of supplies as soon as title is acquired and concurrently with recording of these values in the records. We believe that consideration should be given to providing accounting controls through the stores account for the items of value to NSA.


E. H. Chamberlin
Executive Officer

WJT/TEY:qcb

FINALIZATION OF PLUM BROOK ORDNANCE WORKSVolume 17 - WCA Reference MaterialSchedule of ErrorsMemorandum E - Electrical Facilities

Item No. 1j - Transformers

| | <u>Line number</u> | <u>Amount shown</u> | <u>Should be</u> | <u>*Difference</u> |
|---------|------------------------|-------------------------|----------------------|--------------------|
| Page 14 | 6 | \$ 354.00 | \$ 364.00 | - 10.00 |
| | 7 | 275.00 | 274.00 | 1.00 |
| | 10 | 572.00 | 573.00 | - 1.00 |
| | 12 | 1,250.00 | 1,253.00 | 3.00 |
| | 14 | 3,004.00 | 2,004.00 | 1,000.00 |
| Page 16 | 4 | 333.00 | 320.00 | 3.00 |
| | 8 | 1,900.00 | 1,898.00 | 2.00 |

*Understatements shown as minus.

Item No. 1j - Transformers - page 16, line 2.

Quantity listed is 7. Accounted for as retained are 6 transformers. One apparently unaccounted for.

Item Nos. 2(a) and (b), page 17.

Total mileage for 33 KV pole line equals 4 3/4 miles. Mileage shown on page 20 for estimated present value is 4 1/4 miles, an understatement of \$125.00.

Item 2 (d) through 2 (m), pages 17 - 18 - 19.

Total footage of 6900 volt lines is shown as 42,500 ft. The listings of separate lines total only 38,000 ft. The difference may be due to omission of linear feet in item number 2 (i).