

E2.731

67/14
C

→ R. Spurr

✓
FINAL REPORT
OPERATIONS DIVISION

Site Selection. With the establishment of the War Relocation Authority by Executive Order in early 1942, one of the first tasks to be performed was the selection of suitable sites on which relocation centers could be constructed to house some 110,000 evacuees. Not only must the sites be satisfactory to house this group of displaced persons but employment opportunities must be found to allow the employables to work at constructive jobs.

The criteria developed and used by the Authority in site selection are expressed in a statement released by M. S. Eisenhower, Director of the Authority, on April 13, 1942, as follows:

"The War Relocation Authority in cooperation with the Wartime Civil Control Administration is concentrating all its energies right now on selection of sites for reception centers to which the Japanese evacuated from military zones in California, Oregon and Washington can be transferred from temporary assembly centers.

"Scores of sites are being studied by officials intimately familiar with resources and other conditions in the west. Each potential site must meet such military, physical and economic requirements, as:

"1. All reception centers must be located on public land so that improvements at public expense become public, not private, assets. Any land required for this purpose must remain in public ownership.

"2. Because of manpower needs in the armed forces and because the minimum guard unit can guard 5,000 persons as easily as a smaller group, first attention will be given to sites adequate for large projects.

"3. Each center must provide work opportunities throughout the year for the available workers to be located there. Work within each area will be of three types -- public works, such as land subjugation, food production and the production of war goods.

"4. All centers must be located at a safe distance from strategic works.

"5. Transportation and power facilities, water supply, soil, climate and similar factors must be satisfactory.

"Unless sites for reception centers approach these requirements, we cannot give them consideration. The site for each reception center will be announced as soon as finally approved.

"Two reception centers are now under construction. These are the Manzanar Center in Owens Valley, California and designed to house 10,000 evacuees, and for the present under WCCA management, and the Parker center on the Colorado River Indian Reservation, Arizona where housing is now being built for 20,000 which will be managed by the War Relocation Authority from its inception.

"Agricultural development will start at each reception center looking, if possible toward making the centers' population self sufficient in food stuffs, and also, if practical for the production of a surplus of crops needed for the Food for Freedom Program. At the Parker Center, water and raw land are available to develop 90,000 acres of new production.

"The Authority is exploring the possibilities to manufacture at the centers articles requiring a great deal of hand labor which are needed by the Army or Navy or which otherwise contribute to war needs. The possibilities range from cartridge belts to camouflage nets. Several manufacturers, some of whom have long employed Japanese, and others whose plants are now closed down have indicated great interest in relocating their plants adjacent to reception centers.

"Each reception center will be a military area under military police protection."

The Director of the Authority called on other federal agencies and state agencies to recommend various sites which would qualify under the announced policy. Various agencies in the Department of Interior and in the Department of Agriculture responded promptly and wholeheartedly by suggesting sites and provided pertinent information concerning their proposals. They also loaned personnel to assist in the investigations and gave freely their judgments and aid in the task. The War Department made available its staff, particularly

that of the Corps of Engineers to assist the Authority. The Wartime Civil Control Administration which had the responsibility for the evacuees in the assembly centers in the coastal areas also shared in the work and reviewed the various proposals in the light of their effect on the military situation as it then existed within the Western Defense Command. The Corps of Engineers, who were to have the responsibility for constructing the centers when the sites had been selected, made investigation concerning transportation facilities, sources of domestic water, problems of health and sanitation, and suitability of sites for construction.

The first site selected was the Colorado River Center located on the Colorado River Indian Reservation. In fact, negotiations were initiated by the Secretary of War on March 13, 1942 requesting that the Secretary of the Interior make this area available for use as an emergency shelter for housing the evacuees from the west coast.

With the issuance of Executive Order No. 9102 on March 18, 1942, the responsibility for the program was given to the Director of the War Relocation Authority and the responsibilities for the selection and administration of the relocation centers was transferred to the War Relocation Authority. The Director of the Authority entered into a Memorandum of Understanding with the Secretary of the Interior on April 15, 1942 which authorized the Authority to use approximately 90,000 acres of land on the Colorado River Reservation for the establishment of a relocation center to house approximately

20,000 people and to develop and utilize such agricultural lands as were needed within this area. It was also agreed that the Indian Service would operate the Colorado River Center under policies laid down by the War Relocation Authority and with funds furnished by the Authority.

The portion of the Colorado River Indian Reservation made available to the Authority was entirely undeveloped, desert land. It was necessary to build access roads to the center which was located approximately 18 miles south of Parker, Arizona. In order to furnish irrigation water for the lands within the camps and also for agricultural purposes, it was necessary to construct a main canal and the necessary laterals. The lands which were to be used for agricultural purposes had to be cleared and leveled. Three camps were constructed within this area; Unit I with a capacity of 10,000 people, Unit II located three miles farther to the south with a capacity of 5,000, and Unit III located approximately five miles south of Unit I with a capacity of 5,000 people.

Under the original Memorandum of Understanding between the Department of the Interior and the Authority, it was agreed that the permanent improvements placed on the Reservation by the Authority would be adequate compensation to the Colorado River Indian Tribes for the use of their lands so long as they were needed by the Authority for the housing of the evacuees. It was also contemplated that the Department of the Interior, through the Indian Service, would secure a lease for the Authority from the Colorado River Indian

Tribes indicating their agreement to such an arrangement. The lease, however, was never secured and both the Authority and the Department of the Interior have been forced to operate under the Memorandum of Understanding between the Secretary and the Director of the Authority.

The second site selected by the Authority for a relocation center was located on the Pima Indian Reservation near Sacaton, Arizona. The site is about 45 miles south of Phoenix.

On the portion of the Reservation selected, approximately 7,000 acres of land had been developed and planted to alfalfa and was being currently used by white stockmen as grazing lands. There were, in addition, some 8,000 acres of undeveloped land which was classed as irrigable together with several thousand acres of non-irrigable land that was selected for building sites. Two units were proposed for construction, one housing approximately 15,000 evacuees, known as Canal Camp and the second unit, housing approximately 10,000 was to be known as Butte Camp. The two units were approximately three miles apart. The two nearest railheads, Casa Grande to the south and Chandler to the north, were each approximately 18 miles from the center sites.

The only access roads to the immediate areas were low grade gravel roads and it was necessary to construct a first class highway from the centers to the state highway in order to provide reasonably

adequate all weather route. Permission was secured from the Secretary of the Interior on April 16, 1942 for the use of the area and a Memorandum of Understanding was entered into at a somewhat later date. It was contemplated that the Authority would use the already developed agricultural lands for vegetable production and grazing and would temporarily lease any surplus lands for grazing purposes to outside users. It was also contemplated that labor and equipment not required for center operations and agricultural production would be utilized in the subjugation of the undeveloped lands and in the construction of additional irrigation facilities.

A rental of \$20.00 per acre per year on the developed lands was to be paid to the Pima Indians for the use of the lands and \$3.60 per acre for the delivery of four feet of irrigation water annually. The Authority was to have the use of any undeveloped lands which it might develop for a period of five years and the rental rate thereafter would be agreed upon between the Authority and the Pima Indian Tribe.

Both this area and the area on the Colorado River Indian Reservation generally met the requirements that had been set up by the Director and the War Department as suitable sites for relocation centers. However, the Gila River Relocation Center on the Pima Reservation was to be administered directly by the War Relocation Authority rather than by the Indian Service as was the case on the Colorado River Reservation.

The third site selected was near Tulalake, California on Reclamation Withdrawal Lands which were a part of the Klamath Reclamation project. The site of this camp was located approximately 40 miles southeast of Klamath Falls, Oregon. Virtually all the lands were in public ownership. A portion of the lands, however, were being leased to private operators in the general area. Permission was given the Authority to use these lands by the Secretary of the Interior on April 23, 1942 and a Memorandum of Understanding covering the conditions of use were developed between the Department of the Interior and the Authority. The Authority, through the Real Estate Division of the War Department, purchased the lease rights involved in order to provide sufficient agricultural land for the center.

The annual rental charge on this area was \$6.00 per acre per year for the use of land and \$2.00 per year for irrigation water on all those lands used for agricultural purposes and \$4.50 per acre per year for the lands on which the camp was constructed. A total of approximately 5,000 acres was secured by lease from the Department of the Interior of which approximately 3,800 acres were suitable for cultivation. Provision was made so that additional lands might be secured at a later date if desired.

This center was located adjacent to the Southern Pacific Railroad and was on an improved highway. The capacity of the center was originally planned for 10,000 people and before construction was undertaken increased to 16,000 all located in one large camp.

Late in April, 1942 approval was given the Director by the Commissioner of the Bureau of Reclamation to utilize a portion of the Gooding Reclamation Project northeast of Twin Falls, Idaho as a relocation center. This area was all in public ownership and entirely undeveloped. The site was approximately five miles from the nearest railroad spur line and about 30 miles from the nearest main line railroad passenger station. Public bus facilities, however, were available within a short distance of the center.

A supply of irrigation water for this area was available in the American Falls Reservoir and the Miller-Gooding Canal brought this irrigation water to within seven miles of the camp. It was necessary to construct irrigation laterals from the Miller-Gooding Canal to the camp for center irrigation and for irrigating such agricultural lands as the Authority was able to develop. Main highways were located within approximately one mile of the center area, consequently the access roads to be built were comparatively inexpensive. Some 35,000 acres of land was made available to the Authority. A few sections of the lands were state school lands and the balance Reclamation Withdrawal lands. One camp with a capacity of 10,000 evacuees was to be constructed.

A Memorandum of Understanding was entered into between the Authority and the Bureau of Reclamation for the use of the lands. This Memorandum and the Lease provided that the Authority pay \$1.00 per acre per year for the camp site and \$.10 per acre per year for the undeveloped grazing lands in the balance of the area. It also

provided that any lands which the Authority would clear and level and for which it would provide irrigation laterals could be used by the Authority for a period of three years without rental charge.

The Manzanar Relocation Center located in the Owens Valley in southeastern California was originally constructed as an assembly center by the Wartime Civil Control Administration. Because of its desirable location and climate, it was decided to continue its use as a relocation center.

The lands on which this center was located belonged to the City of Los Angeles and were originally purchased by the City as water shed protection lands because of the location of an aqueduct which was constructed by the City to augment its water supply. While a portion of the approximately 6,000 acres of land in this area had originally been used for agricultural purposes no farming operations had been carried on for about 20 years.

The War Department took possession of this area under the second War Powers Act when the assembly center was built and issued a license on May 23, 1942 to the War Relocation Authority to occupy and use the lands for its purpose.

The water supply for both domestic use and irrigation comes partially from mountain streams and partially from wells. The nearest freight railhead is at Lone Pine, 10 miles from the center, and the nearest passenger station is at Mojave, 125 miles to the southwest. Bus service, however, was available on the main highway between Reno and Los Angeles which runs adjacent to the center. The camp was constructed with a capacity of 10,000 evacuees.

The Heart Mountain Relocation Center is located in Park County about 12 miles northeast of the town of Cody in north-western Wyoming.

The bulk of the lands in this center were also Reclamation Withdrawal lands and were part of the Heart Mountain Reclamation Project. The original area totaled approximately 43,000 acres of which approximately 40,000 acres were federal lands and about 3,000 state and private. The latter lands were purchased for the Authority by the Real Estate Division, U. S. Corps of Engineers.

The center is located on a branch of the CB&Q Railroad and was also immediately adjacent to a hard surfaced highway. None of the lands within the center area had been developed for agricultural use but water was available from the Shoshone Reservoir located southwest of Cody and transmitted to the center area through the Heart Mountain Canal which was constructed along the north side of the center area. Necessary laterals and structures had been installed for irrigating approximately one-half of the area. A considerable amount of work was proposed in connection with the lining of the Heart Mountain canal to reduce water losses. It was also anticipated that if labor and equipment were available, additional laterals and structures might be constructed to provide irrigation water for the balance of the center area.

One camp with a capacity of 12,000 evacuees was constructed adjacent to the highway and railroad in about the central part of the area.

Approval was given for the use of this area on May 22, 1942 and a Memorandum of Understanding was drawn up between the Department of the Interior and the Authority which provided for an annual rental charge of \$.10 per acre for grazing lands and \$1.00 per acre for the center camp site. Lands which were developed for agricultural use were to be used without charge by the Authority for a period of three years. While this area was the farthest north of any of the relocation centers and at an elevation of approximately 4,600 feet, it was considered to be well adapted to the production of the hardier types of vegetables and also for the production of feed crops in connection with the production of livestock for subsistence purposes.

The seventh site selected for a relocation center was in the Mississippi Delta area of Arkansas just outside the Mississippi River levee. This site known as the Rohwer Relocation Center was located in Desha County on lands under the control of the Farm Security Administration, U. S. Department of Agriculture. The lands had originally been purchased for the relocation and rehabilitation of distressed families in that part of the country.

A Memorandum of Understanding was entered into with the Farm Security Administration on May 23, 1942 for the use of approximately 9,500 acres of land. Approximately 700 acres of privately owned land was purchased lying between the public lands and the Missouri Pacific Railroad and a state highway. This purchased area was used as a camp site.

Almost the entire area in public ownership was covered with second growth hardwood timber and all of the area required considerable drainage work as well as clearing, in order to make it suitable for agricultural purposes. It was anticipated that sufficient labor would be available on the center to assist materially with the drainage work and to clear lands for the production of subsistence crops for the center. Since the lands were not presently in satisfactory condition for agricultural use, no rental charge was made to the Authority for the lands other than a payment equivalent to the taxes assessed against the lands by State and County governmental units. One camp of 10,000 capacity was constructed.

A second center known as the Jerome Relocation Center was located in Drew and Chicot Counties, also in the Delta area of Arkansas about 15 miles south of the Rohwer Center. This land was also under the control of the Farm Security Administration and similar arrangements were made as of June 6, 1942 for the use of these lands.

All of the area with the exception of about 700 acres was in second growth hardwood timber and the entire area required drainage. The center camp was located adjacent to the Missouri Pacific Railroad and a hard surfaced state highway. The nearest passenger rail station was approximately one mile from the center. The camp at Jerome also had a capacity of 10,000 evacuees. Rental arrangements were similar to those for Rohwer.

The Granada Relocation Center located in Prowers County, southeastern Colorado was made up of two large and several smaller holdings all in private ownership. This area of slightly over 10,000 acres was purchased for the Authority by the Real Estate Division, U. S. Corps of Engineers.

Some 6,000 acres of this area had been used for agricultural production for a period of years. Water was available for irrigation by diversions from the Arkansas River which formed the north boundary of the center. The main line of the Santa Fe Railroad and federal highway No. 50 are approximately one mile from the site as was also the small village of Granada.

It was anticipated that the Authority would require lands which could be used immediately for the production of foods, in order to provide as large a portion of the subsistence requirements as possible. The 6,000 acres of land on the Granada Center would fill such need while the undeveloped lands on some of the other centers were being cleared, drained, irrigated and otherwise prepared for agricultural use. The Granada Center was constructed to house approximately 8,000 evacuees.

The last center to be selected, June 20, 1942, was the one located in west central Utah approximately 15 miles northwest of Delta. This area was in mixed ownership. About 1,400 acres were public domain, about 9,000 acres tax delinquent lands owned by Millard County and the balance in private ownership. There were

only seven families living within the area of approximately 19,000 acres. Purchase was made for the Authority by the Real Estate Division, U. S. Corps of Engineers.

Irrigation water was available from the Sevier River Bridge reservoir and distributed within the area through three different irrigation companies; namely, Delta, Abraham and Deseret. Drainage had been a problem within this area and accounted for part of the abandonment of previously cultivated lands. With the organization of the drainage district and the construction of many miles of surface drains, considerable success had been attained in lowering the water table in the area.

The nearest freight and passenger rail facilities were at Delta, 15 miles away. Of the 19,000 acres purchased about 7,000 were either in old stands of alfalfa or had been cultivated within the past few years. It was also necessary to purchase water stock in the three irrigation companies in order to provide a satisfactory supply of water for irrigating the lands within the area. Approximately 20,000 shares of water stock in the three companies were purchased. The center was constructed with a capacity of 10,000 evacuees.

In the selection of these areas the criteria outlined by the Director were followed quite consistently. None of the areas were at all close to military or important war production installations. There was one-half acre or more of land available per person housed on the center for the production of food and feed crops. There was considerable opportunity for development work in all of the areas

and almost without exception such development work would be of permanent value to the area and to the Nation. They were all on land either already in public ownership or the lands were purchased before any improvements were made.

The smallest center was built for 8,000 people in order to make the most efficient use of the military personnel who were to control ingress and egress at the centers. Generally, power facilities, water supplies, soil and climate were satisfactory. On four of the centers transportation, both freight and passenger, were somewhat difficult, brought about largely by the effort on the part of the military to have the areas isolated from "strategic works".

Basic Construction. The construction of the relocation center camps on each of the selected areas was carried out by private contractors under the supervision of the U.S. Corps of Engineers and with funds made available for that purpose from the President's Emergency Fund.

The construction consisted of barrack housing together with mess halls, hospital facilities, recreation buildings, warehouses and a limited amount of office space and staff living quarters. All of these buildings were of the "theater of operation type" construction. In addition, all of the utilities were installed such as the water system, sewage disposal system, electrical system and telephone. Due to the extreme demand for all types of materials required in the construction of housing and utilities, it was difficult, and many

times impossible, to secure reasonably satisfactory material.

Lumber was green and many times the quality was inferior. Many of the water pipes installed were second hand and not well adapted to the climatic and soil conditions found in a particular area. Also, considering the speed with which construction was scheduled and the difficulty on the part of contractors in securing reasonably skilled labor much of the construction was substandard.

The barracks were either 20x100' or 20x120' in size. Three to five partitions were placed in each barrack and one such room was made available for the housing of each family. The partitions were generally made with 2x4" studding and covered on one side with sheet rock.

With the exception of the Granada Center and the two Arkansas Centers, the floors were of single thickness lumber. Due to the fact that much of this lumber was inadequately cured cracks very rapidly developed which permitted dust and wind to permeate the buildings. At the Granada center the buildings were set on foundations and ordinary building brick laid dry on sand were used as floors. At the two Arkansas centers double floors were laid using largely native lumber.

The walls of the barracks were constructed of sheathing covered with tar paper with the exception of Granada, Heart Mountain and Gila River Centers. At Granada approximately one-half of the barracks were sided with mineral surfaced Celotex, while at Gila River all of the barracks were sided with sheet rock.

Roofs were covered with composition roll roofing or composition shingles. At both the Colorado River Center and the Gila River Center double roofs were provided in order to partially eliminate the effect of the excessive temperatures in those two areas.

On only a few of the centers were buildings equipped with adequate chimneys. Particularly at Central Utah, Minidoka and Heart Mountain where terra cotta tile chimneys were used maintenance was excessive and frequent fires were caused through the checking and crumbling of the terra cotta flues.

The recreation halls in practically all centers were of the same construction and of the same type as were the barracks. At the Minidoka Relocation Center prefabricated buildings 20x100' were used for recreation halls.

Mess halls were also of the "theater of operation type" of construction. Floors were of concrete and each building equipped with three Army ranges and reach-in electric refrigerators.

Warehouses varied considerably on the different centers. At Colorado River, Manzanar, Gila River, and Tule Lake the construction of warehouses for the most part were similar to the barracks and 20x100' in size. On the balance of the centers the warehouses were 40x120' in size and construction was of the mobilization type. One or more reefers were included on each center.

With one exception housing for the appointed staff was confined to standard "theater of operation type" barracks partitioned into individual rooms.

The military police areas on most of the centers was of the modified mobilization type. In a few cases the buildings were of prefabricated construction.

The center hospitals varying from 150 bed to 250 bed in size were the best constructed and best equipped buildings of any on the centers. One office building, generally of "theater of operation type" construction was provided for each center.

Wells were provided as a source of water supply at all of the centers with the exception of the Heart Mountain Relocation Center. These wells were equipped with electric motors and one or more standby or auxiliary gasoline engines. Supply tanks of various sizes were provided on each of the centers depending on the size and the pumping capacity of the combined wells. At the Heart Mountain Center water was pumped direct from the Shoshone River during the winter months and secured from the irrigation canal during the summer months while the canal was in use. At the Heart Mountain Center also a complete water treatment plant was installed with ample capacity to handle the entire camp. In the other centers where well water was used, treatment was generally restricted to chlorination.

The water mains on many of the centers were constructed of used steel pipe and in some instances required replacement shortly after the end of the first year of operation of the camp. This was the situation at Central Utah where, due to certain soil conditions, the light steel pipe installed had to be completely replaced with cast iron pipe within 12 to 24 months.

The sewage disposal system varied from no treatment at all at Heart Mountain to complete treatment at the two Arkansas centers. In some cases the affluent beds were entirely too small for the volume of wastage on the center. Both the water system and sewage disposal system were designed for the use of 100 gallons of water per person per day which is standard Army design. WRA centers, particularly the Arizona Centers, used from two to three times this amount per day.

The electrical system on practically all of the centers was satisfactory so far as the quality of the installation was concerned. However, here again the capacity was based on regular military standards and not on family groups. Radios, extra lights, electric irons and to some extent hot plates caused an excessive overload on the electric system. The transformer capacity was inadequate to carry the overload and resulted in continuous maintenance.

The telephone systems installed were generally satisfactory. On two of the centers, Tule Lake and Heart Mountain, separate fire reporting telephones were installed terminating in a separate switchboard in the first station. On the other centers fire telephones were hooked in with the standard switchboard in the telephone office with the resulting delay in transmitting calls to the Fire Department.

Each center was provided with one or more fire stations and two center mount pumpers. The Gila River and Colorado River Centers which had multiple camps were provided with three and four center

mount pumpers respectively. Each center camp was enclosed with a five-strand barbed wire fence. Streets in the centers were constructed with a minimum cross section and surfaced with gravel or crushed rock.

The above described facilities were available on each of the centers at the time the WRA took them over for operation. In many cases the evacuees were moved into the centers before some of the facilities were completely installed. Very limited provisions had been made for housing the staff to supervise the centers. Office space was wholly inadequate to accommodate the number of people required to perform the daily operations required for a town of 8,000 to 20,000 people. No provisions were made for repair garages or for a motor pool.

On practically all of the centers it was necessary to construct either drainage systems or irrigation systems and to clear and level lands before farming operations could proceed. No facilities had been constructed to house livestock which would form an important part of the subsistence program on the center. No school facilities of any kind had been provided. Additional facilities were needed for the processing of foods. These additional facilities must of necessity be provided by the WRA in order to operate the centers reasonably effectively and efficiently.

The Organization of the Operations Division. It was necessary to organize a supervisory staff which could assume the responsibility for carrying out the functions and the operating program on each of

the centers. It was essential to provide supervision and organize the efforts of the evacuees in providing fire control, the operation and repair of motorized equipment, the maintenance of buildings, the operation and maintenance of the water system, the sewage disposal system and the electrical system, the firing of the boilers in the hospital, the maintenance and care of the grounds and roads, and many other items necessary to the day by day operation of the existing facilities.

In addition, supervision must be provided and the evacuees and equipment organized to construct office space, schools, staff housing, garages, livestock facilities and other buildings required to complete each of the relocation centers. It was also necessary to organize for the carrying out of land subjugation, the installation of drainage systems, the building of canals, laterals and other irrigation structures, the construction of roads and the development of minor industries to help supply the needs at each of the centers. In order to accomplish these functions the Operations Division was organized into five sections:

1. Construction and Maintenance
2. Motor Transport and Maintenance
3. Fire Control
4. Agriculture
5. Industry

The responsibility of the Construction and Maintenance Section consisted of the construction of all new buildings and facilities and the construction of drainage ditches, canals, laterals, roads and the subjugation of land. Also, the section was responsible for the operation and maintenance of the utilities, janitorial work, and the maintenance of buildings, grounds and roads.

The Motor Transport and Maintenance Section was responsible for the operation, maintenance and repair of all motorized equipment including passenger cars, trucks, tractors, draglines, motor patrols and the like.

The Agricultural Section was responsible for the preparation of lands and the planting, irrigation and harvesting of food and feed crops and the production and care of livestock.

The Fire Control Section was responsible for inspections to remove existing fire hazards, for the training of fire fighters and for the operation of fire fighting equipment in the suppression of fires. They were also responsible for educating the evacuees within the center concerning fire hazards and to make the entire population fire conscious. This was particularly important because of the temporary type of construction on the centers.

The Industry Section was responsible for the organization, development and operation of small industries which would supply certain of the requirements of the center population for such things as clothing, furniture, mattresses, and various types of food products such as tofu, bean sprouts, shoyu sauce and other types of Oriental foods. They were also responsible for the manufacture of any items required in the war effort which could be produced to advantage on the centers.

The National supervision of the program was originally divided between the Regional offices of the Authority and the Washington office. General supervision of the construction and maintenance

work, the motor transport work, fire control, and industry was out of the Regional offices and the supervision of the agriculture program was out of the Washington office. This situation continued until January 1, 1943 when the supervision of the other functions was transferred to the Washington office of the Authority. Until July 1, 1943, however, the general supervision of the motor transport and maintenance work was not a part of the Operations Division in the Washington office.

Construction and Maintenance Section. The organization of the Construction and Maintenance Section in the Washington office included:

- A chief engineer
- An assistant engineer
- A design and office engineer
- A refrigeration engineer
- Necessary stenographic and clerical help

During the first year of the program an irrigation and drainage engineer was also included in the staff.

The function of this staff was to provide general supervision to the construction and maintenance program, to review and make recommendations to the Head of the Division concerning the programs and specific construction recommended by the various relocation centers, to act in a consulting capacity to the centers and to review and present to the War Production Board for approval items of construction approved by the Director of the Authority. Periodic inspections were made of the construction and maintenance work on the various relocation centers.

The typical organization of this Section on each of the relocation centers consisted of:

- A chief engineer
- A design or office engineer
- An irrigation, drainage and roads engineer
- A construction and maintenance superintendent
- An assistant construction and maintenance superintendent
- A chief construction foreman
- A utility foreman
- A foreman electrician
- A foreman plumber
- A refrigerator foreman
- A foreman carpenter
- A foreman mechanic

In addition, depending upon the particular work load and the complexity of the problems at the various centers, other appointed personnel were employed temporarily. In certain cases qualified evacuees were used in the design or office engineer position, and in the refrigerator foreman position. On a number of the centers certain skilled operators such as dragline operators or trenching machine operators were also included in the list of appointed personnel. The responsibility of this appointed staff was to provide the technical skills required in connection with their respective positions and to supervise the work of evacuees who performed the various functions required in the different activities. The number of evacuees employed varied with the size of the construction job on each of the centers and with the particular problems that arose incident to the operation and maintenance of the existing facilities. It was only occasionally that appointed staff members were used for actual construction work.

As indicated above a considerable volume of construction work remained to be done after the Authority took over the relocation centers. No provision had been made for schools and it was necessary to either construct school buildings or to convert existing barracks that might be spared from housing to school purposes. On four of the centers school plants adequate to take care of the requirements of the center were newly constructed. At the Colorado River Center adobe school buildings were constructed for both high school and elementary school use at all three of the camps. At Granada, Heart Mountain and Tule Lake high schools only were constructed. On the balance of the centers barracks were converted for school use for both elementary and high school pupils, and at Granada, Heart Mountain and Tule Lake barracks were converted for elementary school purposes. Where high schools were constructed an auditorium was built as a part of the high school plant. An auditorium was constructed on each of the other centers in order to provide a general meeting place for larger evacuee groups.

Automotive repair garages were constructed on each of the centers. These buildings were generally 37x168' in size and provided the minimum space required for the repair and servicing of the automotive equipment on each of the centers. At Minidoka and Manzanar existing warehouses were remodeled and used as repair garages. At Gila River camouflage net buildings which had been constructed by

the Corps of Engineers and used temporarily for the weaving of camouflage nets were later remodeled and used as automotive repair garages and service buildings. At Colorado River a separate machine shop was constructed which was used extensively in the repair and rebuilding of the large amount of heavy construction equipment which was operated at that center. A motor pool was constructed at each of the centers which included a paved or graveled parking lot enclosed by a substantial fence and equipped with filling station and dispatcher's office. The motor pool area was essential to proper protection of the equipment and control of its use.

Additional office space beyond that constructed by the Engineers was required on each of the relocation centers. In a few places additional construction was undertaken but for the most part barrack buildings or "prefab" buildings were converted for office use through necessary remodeling.

Staff housing was constructed on all of the centers. As indicated above only a very limited amount of dormitory space was provided as part of the basic construction by the Corps of Engineers. Buildings of temporary construction were built according to plans furnished by the Farm Security Administration of the Department of Agriculture. Each building was usually divided into four apartments consisting of a living room, kitchen, bath and one or two bedrooms. In a few cases it was also necessary to construct one or more additional dormitory buildings to house school teachers and other single members of the staff.

On several of the centers, particularly Tule Lake and Gila River, it was necessary to construct additional refrigeration warehouses in order to take care of the large volume of perishable products that were either produced on the center or purchased in carload lots on the open market.

On a few of the centers, particularly at Tule Lake and Heart Mountain additional buildings were constructed for the purpose of housing industries which it was planned to establish on those particular centers. Later when the industrial program was no longer required the buildings were converted into either office or warehouse space. The same was true of the camouflage net plants which the Corps of Engineers constructed at Manzanar, Gila River and Colorado River.

In order to provide storage space for root crops such as potatoes, onions, carrots, beets and the like so as to spread the period of use for these vegetables over the winter months, it was necessary to construct root cellars at several of the centers where climatic conditions made this possible. At Heart Mountain two large root cellars were constructed which provided ample space to store sufficient potatoes to supply the center during the entire winter and also for storing seed potatoes for the following year. In addition, onions, beets, carrots, cabbage and similar crops were stored for a portion of the winter period. These two root cellars were constructed about one-half underground and the balance above ground using pole construction for the supports on the side and center and pole construction

covered with straw and earth for the roof sections. Ventilators were installed in the roofs and at the ends of the buildings in order to provide temperature and moisture control. Bins were constructed for storage and a center driveway provided from end to end of the building. At the Granada Relocation Center one such building was constructed with similar materials and design. At the Central Utah Center a similar root cellar was constructed except for the fact that about two-thirds of the capacity of the cellar was underground. Two large root cellars were constructed at the Minidoka Relocation Center, one designed particularly for the storage of potatoes and the other for the storage of onions. The onion storage cellar was equipped with exhaust fans in the roof ventilators which permitted a more rapid change of the air in order to reduce the humidity within the cellar. These two cellars at the Minidoka Relocation Center had a capacity of approximately 1,000,000 pounds of vegetables each.

At the Tule Lake Center a 50x300' building was constructed entirely above ground for vegetable storage. This building was insulated with rock wool and provided with a concrete floor and is of a permanent type of construction. This building will be of considerable value to the Tulalake community over a period of years. A small root cellar was also constructed at the Manzanar Relocation Center.

In order to make it possible to produce poultry, hogs and other livestock on the various centers, minimum housing had to be constructed to give reasonable protection to these various classes

of livestock. Poultry houses were constructed on all of the centers with the exception of Jerome. At Heart Mountain surplus CCC buildings were moved to the center and reassembled and remodeled for brooder houses and laying houses. On the other centers new construction was provided using either new or salvage lumber in the construction of the laying houses and brooder houses. At the Granada and Rohwer Centers the construction was limited to only a few houses. The buildings at Tule Lake, Colorado River and Gila River had a capacity of approximately 35,000 birds each.

Pork was produced at each of the ten relocation centers. The construction generally was of a very temporary type and included shelters, lots, feeding platforms and troughs. On a few of the centers farrowing pens were constructed and used but for the most part feeder hogs were purchased and these facilities were not required. No particular facilities were constructed for the beef cattle herds at Central Utah, Gila River and Granada other than corrals and feeding facilities used in handling and finishing the cattle.

At the Gila River Center a dairy barn and milk house were constructed of sufficient capacity to house 100 milk cows. Slaughterhouses were built at Tule Lake and Colorado River and an existing building remodeled for this purpose at the Granada Center. On these three centers no commercial facilities were available for slaughtering within a reasonable distance. On some of the other centers temporary slaughtering facilities were set up for a short period but generally the slaughtering was done in a commercial slaughterhouse under government contract.

In connection with the agricultural program on several of the centers it was necessary to construct a farm mess hall where the farm workers could be provided their noon meal. This was necessary because of the excessive amount of time required and the cost of transporting all of the workers back to their respective dining halls during the middle of the day.

When the Tule Lake Center was designated as a segregation center in the fall of 1943, it was necessary to enlarge the facilities from its original capacity of 16,000 to a capacity of approximately 20,000. Negotiations were completed with the War Department to build the additional housing and provide the expanded utilities to take care of the increase in population.

Ten additional blocks were constructed together with the necessary mess halls, latrines, laundries and recreation buildings. An additional sewage disposal plant was constructed and the water supply augmented by additional wells and a storage tank. The old Military Police area was turned over to the Authority to be converted into additional staff housing and the new Military Police area was constructed to accommodate approximately 800 men. A new motor pool and two garage buildings were constructed. A manproof fence was constructed around the entire evacuee area together with additional guard towers and other security installations. Perimeter roads were constructed around the center and also around the agricultural area to provide for consistent patrol of the segregates while at work. This construction was completed by the Corps of Engineers by commercial contract.

At the Jerome and Rohwer Centers in the Mississippi Delta of Arkansas it was necessary to install drainage systems in order to give adequate protection to the center areas and to make it possible to use the cleared lands for agricultural production. Approximately one-half million dollars worth of drainage construction was completed on these two centers. The excavation was done by contract and the clearing of the rights-of-way with project equipment and labor.

Wood cutting was also an important activity on the two Arkansas Centers since wood was available and also the most economical type of fuel that could be used in this area. All wood that was used in heating the barracks, mess halls and offices was cut by the evacuees on the project lands.

Some lumber was also produced in a project operated sawmill using project logs at the Jerome Center. This lumber was used in connection with the construction of various buildings on the center as well as for bridges and culverts in the area.

At the Colorado River Relocation Center it was necessary to construct about 12 miles of main canal with a capacity of 2,000 second feet and some 23 miles of laterals to serve the agricultural lands which were cleared and leveled. Approximately 1,159,000 cubic yards of earth was moved in connection with the construction of the canal and the laterals. A drain approximately 18 miles in length was also constructed to take care of waste water and flood waters within the area. Approximately 2,400 acres of desert land covered with Mesquite were cleared and leveled for agricultural purposes. The

cost of clearing this land was approximately \$60.00 per acre and the leveling cost ran from \$80.00 to \$100 per acre. Most of this was done with project labor and equipment but a portion of it was also done under contract.

At the Manzanar Relocation Center where the water supply was secured from mountain streams and from wells, it was necessary to provide masonry lined irrigation laterals to distribute the irrigation water to the various fields. Since this area had not been in cultivation for approximately 20 years, it was also necessary to do considerable clearing and leveling work in order to prepare the lands for agricultural use.

At the Tule Lake Relocation Center additional drainage ditches were constructed on the agricultural land in order to make it usable for the production of vegetables. This additional drainage was carried out on approximately 2,500 acres of land known as the League of Nations Tract. In cooperation with the Bureau of Reclamation the Authority concrete lined the "M" canal which traverses the center area.

At the Central Utah Center considerable work was done in connection with the improvement of the drainage system on the project area. Many of the drains were partially filled or were of insufficient depth to carry off excess water and lower the water table on the agricultural lands. These ditches were reconditioned and some of the irrigation laterals were reworked and established on proper grades. Considerable work was done in releveled old irrigated areas and in improving the general drainage and irrigation systems on the farm.

At the Minidoka Relocation Center as indicated above irrigation water was available about seven miles from the relocation center in the Miller-Gooding canal. A lateral from miles 21.3 on the canal was constructed to the relocation center proper in order to supply irrigation water for the intervening agricultural area and for the center itself. This lateral together with the necessary drops and turnouts was completed according to the specifications set up by the Bureau of Reclamation for the permanent development of this area. Some 1,200 acres of land was cleared of sage brush and leveled for agricultural use. Sublaterals and farm ditches were installed in order to complete the development work for this area.

At the Heart Mountain Relocation Center necessary maintenance work was carried out on the existing laterals which had been constructed to furnish water for the area but had never been used. Approximately 1,790 acres of land was cleared from sage brush, leveled and farm ditches installed. A number of culverts and bridges were also installed to provide maintenance roads for the laterals and access roads to the various agricultural areas.

At the Granada Relocation Center the drainage and irrigation ditches were rehabilitated and some work was done on the diversions on the Arkansas River in order to improve the irrigation system for this area. Considerable releveling work was accomplished and the fences on the grazing lands were rebuilt and put in good condition.

At the Gila River Relocation Center approximately 40 acres of desert land was cleared and leveled and seeded to pasture crops to provide a small pasture adjacent to the dairy buildings.

At two of the centers, Colorado River and Gila River, the construction of access roads was the major undertaking. At Colorado River approximately 23 miles of high grade hard surfaced road was constructed running from the warehouse area in Parker to Unit III. This road compares very favorably with the best federal and state highways in Arizona. The cost of this road was approximately \$469,705. In addition farm access roads were constructed to service the subjugated lands and bridges were constructed over the main canal and laterals for both the main highway and the farm roads.

At the Gila River Center approximately 13 miles of high grade hard surfaced highway was constructed of a standard approximately equal to that constructed at Poston. This access road connects the two centers with state route No. 87 leading to the Serape Siding, Chandler and Phoenix. Most of the roads on the portion of the reservation leased to the Authority were reconditioned and part of them recross-sectioned. One hundred and twenty thousand dollars was also made available to the Indian Service at the request of the Secretary of the Interior to complete a similar high grade hard surfaced road from the center to the south connecting with state route No. 187.

Practically all of the fences on the 7,000 acres of land used for agricultural and grazing purposes had to be rebuilt and improved. This work involved a very substantial amount of labor and a considerable cost in materials.

Improvements were also made on roads at the Central Utah Center, Granada Center and the Heert Mountain Center. These roads were largely farm access roads and maintenance roads used in connection with the maintenance of the irrigation laterals and structures.

At the Minidoka Center it was necessary to construct a road approximately paralleling the lateral from the Miller-Gooding canal to the relocation center in order to provide access to the lateral for maintenance purposes and also to provide an access road to the agricultural lands.

A limited amount of access road to agricultural areas was also constructed at the Manzanar Relocation Center and a considerable mileage of road was constructed and graveled at the Jerome Center in order to provide access to the cleared lands and to the timber lands from which the fire wood supply was secured. A limited mileage of access roads was constructed at the Rohwer Center to facilitate the drainage work and to make it possible to transport fire wood from the timbered areas to the center proper.

The general maintenance work on all of the centers consisted primarily of the maintenance of buildings, utilities, roads and grounds.

Due to the fact that the building construction was of "theater of operation type" it was necessary to replace building paper and the light type of roofs that were used on many of the buildings. As was indicated above it was necessary to replace all of the water mains in the Central Utah Center. A very considerable amount of maintenance

work was also required at the Heart Mountain Center where water mains had been installed without providing expansion joints. Particularly during the first winter a great many breaks occurred and expansion joints were installed as these breaks were repaired. At the Gila River Center welded steel pipe was used and no protective covering was placed over the welded joints. By the end of the second year many of these joints began to rust through and it was necessary to reweld the connections and protective covering was installed at the same time. At the Minidoka Center where wooden stave pipes were largely installed as water mains considerable maintenance and replacement were required by the end of the third year. Because of the difficulty in securing standard plumbing fixtures the "victory" type of plumbing fixture was used in many instances. The use of this type of fixture necessitated replacement periodically. This was particularly true of valves in latrines, laundries and mess halls.

The janitorial staff required to police the latrines, mess halls, recreation buildings and offices on the centers was quite large. Due to the fact that either wood or coal was used in all but three of the relocation centers the job of firing boilers to provide hot water and the firing of space heaters required a considerable amount of personnel. Considerable maintenance work was also required in connection with hot water boilers on a number of the centers, particularly Heart Mountain, Tule Lake, Granada and Central Utah. It was necessary to install a water treatment system on several of these installations in order to reduce excessive deposits on the inside of the pipes and flues.

The operation of the boilers in the hospital, pumps at the wells which furnished the domestic water supply and the operation of the sewage disposal plants also required a considerable staff.

As mentioned above the electrical system on practically all of the centers was seriously overloaded. This required frequent maintenance work on transformers and the replacement of fuses at the various buildings as the overload became excessive.

All of the mess halls were equipped with 40x60 cubic feet reach-in electric refrigerators. The staff housing was equipped with the ordinary domestic type of electric refrigerators. Both of these required considerable maintenance, particularly those in the mess halls where the care given the boxes was frequently rather unsatisfactory. Due to the difficulty of securing Freon it was necessary to convert many of the boxes on the projects to the use of substitute refrigerants. The refrigeration warehouses or reefers required constant attention because of the insulation used and the type of construction installed on most of the centers.

The work in the Construction and Maintenance Section on all of the centers was constantly plagued by a lack of labor efficiency. Most of the labor received \$16.00 per month with highly skilled and supervisory people receiving \$19.00 per month. This, of course, was in addition to housing, food, complete medical care, small allowance for clothing and education all furnished by the government. The cash in hand, however, so far as each worker was concerned was the \$16.00 or \$19.00 which he received. This amount of cash over and

above major items furnished by the government was little incentive for the worker to give eight hours of serious effort to the job at hand. The evacuees on the center who did not work received all of the other benefits with the exception of the clothing allowance.

It has been variously estimated that the efficiency of the evacuee labor, depending on the individuals and on type of work being performed, varied anywhere from 25 to 100 percent as compared to outside labor paid prevailing wages. When all types of outside labor during the war is taken into consideration it would appear generally that the efficiency of the evacuee labor even at \$16.00 per month would vary between 40 and 50 percent. Considering the difference in the pay scales including the additional items furnished by the government, the cost of construction, maintenance and other work was undoubtedly considerably less than it would have been had the various jobs been accomplished by other labor paid prevailing wages. This same question of labor efficiency was a factor in all types of activities carried out by the Authority.

Motor Transport and Maintenance Section. The work of the Motor Transport and Maintenance Section was definitely a service activity. It was pointed out above in this report that many of the centers were located at considerable distance from railheads and passenger facilities. Likewise the type of organization used on the centers with central feeding, the need for distribution of food products and other types of supplies throughout the area, the carrying on of

construction work and of a rather substantial agricultural program all called for large amounts of transportation equipment for the transportation of workers and supplies. The unloading of coal at the railheads and the transporting of this coal to the individual blocks within the center alone required the use for a good portion of the year of 10 or a dozen dump trucks. Since a typical center covered approximately one square mile of area, the amount of motorized equipment required to perform the many functions inherent in a town of 10,000 people was very considerable.

A total of 1943 vehicles, both passenger car and trucks, were used for transportation purposes together with 465 pieces of heavy motorized equipment such as tractors, draglines, motor patrols and the like. The major part of the transportation equipment secured by the Authority for this purpose came from the War Department and was generally made up of old CCC equipment, WPA equipment and a certain amount of obsolete Army equipment. Relatively few vehicles were newer than 1939 model. A great deal of the CCC equipment were 1935 and 1936 models. However, since better equipment could not be secured the Authority was faced with the problem of servicing and repairing old and partly worn equipment for which it was many times extremely difficult to secure repair parts.

In addition no facilities had been provided as a part of the basic construction on the centers for the servicing and repair of motorized equipment. Consequently, it was necessary to construct motor repair garages, motor pools and machine shops before reasonably adequate repair and servicing work could be accomplished.

It was not until the early part of 1943 that the Section of Motor Transport and Maintenance was set up in the Washington office and not until July 1, 1943 was it placed in the Division of Operations. Two men were employed at that time to spend almost their entire time on the centers assisting them in organizing the work of the Section, in streamlining their procedures and developing a reasonably efficient layout for the operation, servicing and repair of the approximately 2,400 pieces of motorized equipment.

The supervisory organization developed on each of the centers consisted generally of:

- A Motor Transport and Maintenance Superintendent
- An Assistant Motor Transport and Maintenance Superintendent
- A Motor Pool Supervisor
- 3 to 5 Foremen Mechanics

On most of the centers it was also necessary to employ one or more heavy equipment operators to operate some of the more complex pieces of equipment. Parts rooms were established in connection with the repair garages and placed under the supervision of the warehousing division.

The securing of repair parts was generally time consuming and difficult to accomplish. Many of the parts had to be made in the machine shops, particularly in connection with the heavy equipment in order to keep the equipment operating reasonably consistently.

It was found necessary on most of the centers to survey off some of the oldest equipment and to use parts secured through salvage

to repair and make replacements on equipment still in operation. Most of the centers found it desirable to use some of these motors as replacements after rebuilding the motor in the machine shop. This plan worked out quite satisfactorily and made it possible to keep equipment in operation a much greater percentage of the time.

A limited number of vehicles were necessarily assigned to certain functions on a 24-hour basis. For illustration, the fire control officer required a car at his disposal continuously as did the internal security officers and the doctors on the center. The electrician and the plumber were subject to call all hours of the night in case of an emergency and as a result had to have a car assigned to them on a continuing basis. Farm irrigators were required to work during the night and needed transportation equipment to go to and from their work. Every effort was made to hold the amount of motorized equipment assigned on a continuing basis to the lowest possible figure.

A system of daily trip tickets was instituted which gave the most effective control that the Authority was able to devise in the use of the transportation equipment. Each activity on the center requiring the use of motorized equipment made their request in the form of a daily trip ticket signed by the responsible official in charge of that function and transmitted to the Motor Pool Supervisor who in turn made the equipment available only on the written request of the activity supervisor and for the period indicated.

The appointment of a Mileage Coordinator on each of the centers also helped substantially in combining trips and in eliminating a duplication of equipment usage. Thousands of gallons of gasoline were conserved each month through the use of these devices.

Monthly inspection was initiated on all of the vehicles and provided reasonably efficient preventive maintenance.

General training of drivers and all maintenance and repair workers contributed substantially to a reasonably efficient Motor Transport and Maintenance Section. On the whole, considering the obsolescence of the vehicles secured by the Authority and the difficulty of securing repair parts, the inexperience of both evacuee operators and evacuee mechanics, a reasonably satisfactory job was accomplished in this field by all of the centers.

Fire Control Section. The type of construction on the relocation centers constituted a definite fire hazard. In addition the climatic conditions existing on most of the centers characterized by extremely low humidity during much of the year added immeasurably to the hazards. At the Colorado River Relocation Center the humidity during the summer occasionally reached a low of 18 to 20 percent. This coupled with the extreme heat during the summer months resulted in extreme inflammability of the wooden construction. The most of the evacuees having lived on the west coast were unfamiliar with the use of coal or wood as a fuel and this unfamiliarity was an additional factor which contributed to the fire hazards.

A Fire Protection Adviser was appointed in the summer of 1942 and stationed in the San Francisco Regional Office. In January, 1943 he was transferred to the Washington office of the Authority to head the Fire Protection Section. In this position he prepared a series of instructions and procedures for the guidance of the relocation centers in fire prevention and fire suppression. He spent almost his entire time in the field on inspections and in consultation with the staff on the ten relocation centers.

On each of the relocation centers a Fire Protection Officer and Assistant Fire Protection Officer was appointed. At the Gila River Center where two camps had been constructed a second assistant was employed and at Colorado River where three camps were constructed two additional assistants were considered necessary. Evacuees were used exclusively as fire fighters on all of the centers. On a 10,000 population center 58 evacuees were employed in the Fire Protection Section. This gave sufficient personnel to man both of the center mount pumpers which were provided for each of the centers allowing the men to work on a rotating shift of 24 hours on duty and 48 hours off duty. It also provided for inspectors whose job it was to inspect all the buildings and facilities on the center, to locate any fire hazards which might exist and to have such hazards removed as promptly as possible.

An intensive training program was instituted on each center and daily fire drills were held when the weather conditions would permit. As a result, even though practically none of the evacuees had previous experience in fire control work, they became quite proficient in the performance of their duties.

Another function of the Fire Control Section was the education of the center population with regard to fire hazards and emergency fire suppression. All of the barracks, mess halls, warehouses and other buildings were equipped with fire extinguishers and many small fires were extinguished by the use of the portable fire extinguishers located conveniently in each of the buildings.

I doubt that any other group of people has ever become more fire conscious than were the evacuees on the ten War Relocation Authority centers. The efficiency of the Fire Control Section on the centers is indicated by the total fire losses during the period of their existence. The total fire loss of government buildings amounts to \$115,819.67. Total loss of government equipment and materials and supplies amounted to \$168,572.57 for approximately four years of operation. In addition there was a total private loss suffered by evacuees or appointed staff members of \$73,847.15. The total per capita loss government and private for the four years of operation amounted to 1.074. Considering the temporary construction, the climatic conditions and the inexperience of the fire fighters and the unfamiliarity of the evacuees with the types of fuel generally used, this extremely low loss compares very favorably with the best records of cities throughout the United States.

Agricultural Section. When the War Relocation Authority was established by Executive Order the Authority was charged with providing as far as feasible and desirable useful employment for the evacuees. Since nearly one-half of the evacuees had been employed in some phase of agricultural production or distribution before evacuation, it was decided that a rather extensive agricultural production program should provide one of the major types of useful employment. This concept was expressed in the criteria set up by the Director in site selection as indicated in the early part of this report.

It was generally thought desirable to have available for agricultural use approximately one acre of land for each evacuee to be located on the center. In addition to subsistence production of vegetables, meats and other livestock products, it was anticipated that large quantities of food could be produced for the armed forces and for Lend Lease. The so called "Food for Freedom" program was being emphasized wholeheartedly in early 1942 and there appeared to be no obstacles to the disposal of any additional foods over and above subsistence which might be produced on the centers.

Much of the land which was expected to be used for agricultural production was wholly undeveloped at the time the centers were constructed. At Rohwer, Colorado River, Manzanar, Minidoka and Heart Mountain all of the land to be used for food production was either in sage brush or trees. In some cases it was necessary to provide irrigation works or drainage, in addition to the subjugation of the

lands. At Gila River, Central Utah, Granada, Jerome and Tule Lake a limited amount of land was available for immediate crop production and it was anticipated that additional lands would be developed and used for this purpose.

The first requirement to be met at all of the centers was the production of food for subsistence and with this in mind a program was worked out promptly between the agricultural staff and the staff responsible for mess operations for the production of as great a variety of vegetables as could be produced under the soil and climatic conditions existing on each of the centers.

In order to carry forward the program of food production two positions were set up in the Washington Office. These men were to function in an over-all supervisory capacity and to be responsible for scheduling food shipments between the various relocation centers and later in securing outlets for such food as was produced over and above subsistence requirements.

A small appointed staff was selected for each relocation center, generally made up of:

- A Chief of Agriculture
- A Farm Superintendent
- 2 Assistant Farm Superintendents
- 1 or more Agricultural Foremen

These men were responsible for the determination of the kinds and amounts of agricultural produce to be grown and for the supervision of the entire farming operations including the production and handling of the livestock and livestock products.

In the production of vegetables every effort was made to grow as large a variety as possible and to spread the production over as long a season as was practical. In order to increase the period of use of project grown vegetables root cellars were constructed where climatic conditions permitted in order to store root crops for use during the winter period. Plans were also developed in the Arizona Centers for the growing of winter vegetables to be shipped to the more northerly projects during the winter months. Likewise, potatoes, onions, carrots and other crops which could be more successfully grown in the northern areas were supplied to the Arizona Centers. In this way the centers would become practically self-sufficing so far as vegetable production was concerned.

In order to operate the amount of land required for both vegetable production and feed crop production, it was necessary to secure considerable quantities of farm equipment. Farm tractors, plows, cultivators, seeding and harvesting equipment was secured for each of the centers. Considerable difficulty was experienced in some cases in securing sufficient equipment in time to carry out all of the production program.

Since the relocation centers would produce large quantities of garbage it was considered advantageous to purchase feeder hogs and utilize this garbage in the production of pork for subsistence on each of the centers. As a result facilities were constructed and hogs purchased shortly after each of the centers were opened and the major pork requirements for all of the centers was produced.

Many of the evacuees were believed to have had experience in poultry production on the west coast and a program was undertaken to purchase baby chicks and to raise both a laying flock and meat birds on each of the centers. Because of the pressure of other construction required on the centers, it was not possible to erect poultry houses on many of the centers during the first year. Ultimately, however, buildings were constructed and poultry meat and eggs were produced on all of the centers with the exception of Jerome. This program was reasonably successful at all of the centers with the exception of Rohwer and Granada. On these two centers this program ~~was rather unsuccessful~~ *did not prove to be efficient* and as a result was discontinued by the end of 1943. At Gila River, Colorado River, Central Utah and Minidoka the production of eggs and meat birds approximated the project requirements.

Because of the availability of pasture and range lands it was decided to establish a beef cattle herd at Gila River, Granada and Central Utah. The beef cattle production program at these three centers was probably the most successful livestock venture in which the Authority engaged. Gila River produced enough beef for its own requirements and in addition over a considerable period of time furnished beef to the Colorado River Center. Granada furnished a small amount of beef for the Heart Mountain Center and the Central Utah Center furnished a number of car loads for the Minidoka Center.

Due to the availability of a limited amount of Grazing at Manzanar, a small beef herd was established which provided a portion of the beef requirements for that center.

Because of the extreme difficulty of securing milk at the Gila River Center a 100-cow dairy was established in order to provide a supplemental supply of milk for the Gila River Center. It was not considered advisable generally to engage in dairy production due to the high initial cost of establishing the dairy herd and the necessary facilities for handling the milk.

As soon as the subsistence program on the various centers was well under way investigations were made concerning market outlets for the additional agricultural products which might be produced on the various centers. It soon became apparent that there was considerable opposition on the part of commercial farmers to the production of vegetables and other products for sale at relocation centers. Delegations visited the offices of the Authority and pressures were exerted through letters and otherwise opposing the use of the evacuee labor in competition with commercial agricultural producers. The demand for labor on farms throughout the country was extremely critical and commercial producers requested that the evacuees be permitted to leave the centers and to assist them in the production of agricultural products rather than for the Authority to attempt to produce as a government business.

It had become apparent before this time that there would not be very much labor available on the relocation centers for the carrying forward of a large public works program such as the large scale development of agricultural lands and the building of canals and laterals incident to the use of these lands for agricultural production. Such labor as was available beyond the requirements for operating the center could best be used in the production of food where land and facilities were already available. As a result only sufficient land was cleared and developed to meet the subsistence requirements for each of the centers and the balance of the anticipated development program was abandoned. The speed with which the evacuees relocated outside of the centers confirms the wisdom of this decision.

Had the Authority known at the beginning of the program that it would have restricted its agricultural production to subsistence crops, a much smaller acreage of agricultural land or potential agricultural land could have been secured. The acreage of developed agricultural lands, however, was not allowed to lie idle but were used for the production of livestock or was leased out to private operators and used for agricultural production. Because of the difficulty of securing labor and equipment no other agency would have been in position to subjugate the undeveloped lands which the Authority had under agreement from other federal agencies.

When the War Department announced the lifting of the exclusion order on the west coast effective January 2, 1945 and the closing of

all the relocation centers, with the exception of Tule Lake, became imminent, plans for agricultural production on the balance of the centers was discontinued for 1945. At the Gila River and Colorado River centers which were winter producing areas, the production program was continued on a limited scale until July 1, 1945. At Tule Lake the full year's production program was undertaken and completed.

Agricultural had the same problems in connection with labor efficiency as was mentioned under Construction and Maintenance. It is generally conceded that the efficiency of labor in agricultural production, however, was somewhat better than it was in connection with the construction and maintenance work. Many individuals among the farmer group took sufficient interest in the agricultural production program to put in more than the required eight hours per day. It was this interest on the part of some of the leaders that was responsible for the better efficiency. The program as a whole was successful.

In addition to the direct benefits resulting from the availability of fresh produce in the mess halls on the relocation centers, there was a definite National benefit resulting from the subjugation and development of new farmlands and the irrigation and drainage facilities accompanying that development. A second benefit was the fact that the relocation centers were not in competition with the general public for the rather limited supply of many types of food.

A third benefit and one which aided the relocation program substantially was the experience and training in farm operations which the farm workers secured on the various relocation centers. A great many of them had no previous experience outside of the coastal areas. This experience in various parts of the country convinced them that they would be able to make a success of farming in other parts of the country and contributed materially to their interest in relocation.

Industry Section. The possibilities of industrial development on the various relocation centers was also considered because of the employment opportunities which it might provide for the evacuees.

Consideration was originally given to two types of industrial work. First, the types of industry which would provide products required on the relocation centers, and second, to provide materials which were needed in the war effort. It was generally thought that in addition to the agricultural production and the public works development programs other means of employment would be essential in order to give useful work to the employable evacuees.

At the beginning of the program a small staff was set up in the Regional office in San Francisco to investigate the various industrial possibilities which could be operated on the relocation centers. It was known that certain types of Oriental foods would be in demand as a part of the diet on the relocation centers and with the removal of the Japanese-American from the west coast former sources of supply would no longer exist. As a result plans were

made and small plants set up on most of the centers to produce tofu, shoyu sauce, bean sprouts, noodles and various types of pickled products. These small plants operated almost throughout the life of the centers.

It was also expected that it would be to the advantage of the government to establish a bakery on each center so that the evacuees might bake their own bread for use in the mess halls. Because of the difficulty of securing bakery equipment and the fact that there seemed to be no shortage of bread in any of the areas, bakeries were not actually established except at the Tule Lake Center. Second hand equipment was purchased and installed in a remodeled warehouse and approximately 3,000 pounds of bread was produced in that bakery daily.

The possibility of dehydrating foods during the harvest season for use during winter periods was also considered and tried on a small scale. This venture was generally unsuccessful. Small plants were established at Gila River and Manzanar and a limited amount of produce was dehydrated. However, because of the inter-shipments between the centers and the use of root cellars, there was no particular season when the dehydrated products were especially in demand. In addition, the evacuees did not like the product and the small pilot plants were closed.

Sawmills were established at Heart Mountain and Jerome and produced a substantial amount of lumber which was used on the centers in connection with the construction and maintenance work.

Office furniture was also produced on practically all of the centers. Filing cabinets, desks, tables, chairs and various types of special equipment required on the center were constructed. Quite a number of the evacuees were excellent cabinetmakers and the quality of the equipment considering the restricted lumber supply was quite good. Furniture was also made for school rooms as well as a limited amount of furniture for staff housing. Tule Lake, Manzanar and Heart Mountain had probably the most successful cabinet shops of any of the centers.

At Manzanar a mattress factory was established and the evacuees produced sufficient mattresses to supply the requirements for that center. The cost of these mattresses was approximately equivalent to the retail price of an inferior mattress on the open market.

Three centers; namely, Manzanar, Heart Mountain and Minidoka established small clothing factories. At Heart Mountain and Minidoka production was confined to types of clothing which were required for government issue on the centers such as cooks' aprons and caps, doctors' smocks, nurses' aprons, work gloves and the like. At Manzanar very satisfactory equipment for a clothing factory was secured from NYA surplus. About 70 people were generally employed in the factory and they manufactured, in addition to issue clothing, all types of garments such as dresses, coats, trousers and pajamas. These garments were sold at cost to the evacuee cooperative and distributed to the evacuees through their own stores. Sales were made not only at Manzanar but also at several of the other centers through their cooperative stores.

One of the early industrial efforts which was carried on in cooperation with the U. S. Corps of Engineers was the production of camouflage nets at three of the centers; namely, Manzanar, Gila River and Colorado River. Buildings for the garnishing of nets was constructed by the Army Engineers and the evacuees were employed either by the Engineers as was the case at Manzanar or by private contractor as was the case at Gila River and Colorado River. At the Manzanar factory the evacuees were paid the customary center wages of \$16.00 and \$19.00 and a standard days work was established per worker of 1,000 square feet of net per day. Workers soon became quite proficient and before long were completing their 1,000 square feet before noon. This situation caused considerable dissatisfaction among the evacuees and the plant was closed in December, 1942. At Colorado River and Gila River where a private contractor operated the plants a somewhat different arrangement was worked out. The contractor paid prevailing rates on a piecework basis for the entire production per man. The worker received the customary \$16.00 or \$19.00 per month for the first 1,000 square feet of garnished net per day. The difference between the \$16.00 per month and the standard piece work rate was placed in a trust fund for distribution among all evacuee workers on the center. For the amount of net garnished over and above the 1,000 square feet the individual worker received the full standard piecework payment. Workers became so proficient at net garnishing that certain individuals were able to complete as much as 3,800 square feet per day receiving

wages amounting to as much as \$17.00 or \$18.00 per day per worker. This also caused considerable dissatisfaction among the workers who were not able to secure employment on the camouflage work and in the late spring of 1943 these two plants were closed.

Other types of industrial manufacture were considered such as a lens grinding plant at Heart Mountain, a tent factory at Tule Lake, a ceramics plant at Heart Mountain and various others. However, only two other plants were at all successful where the products were for off project use.

All small silk screen plant was set up at Heart Mountain and a somewhat larger one at Granada. Both of these plants were secured from WPA surpluses. The Heart Mountain plant produced a considerable number of posters and other visual material for use on the center and in addition produced some 4,000 posters for the Training Aids Section of the Bureau of Naval Personnel.

The silk screen plant at Granada had a somewhat larger capacity and in addition to posters and other materials for center use produced some 250,000 posters for the Training Aid Section of the Bureau of Naval Personnel. At retail prices these posters would have been worth approximately \$100,000. The cost of producing them was slightly over \$27,000. This plant particularly was successful as a training project and out of 150 different workers who were employed at one time or another in the silk screen shop nearly 90 are now or have been employed in silk screen work in various communities over the country.

In the early spring of 1943 a small plant was established at Gila River to produce ship models to be used for training and identification purposes. These models were also manufactured for the Training Aid Section of the Bureau of Naval Personnel. Some 800 models were produced consisting of cruisers, destroyers, battleships, carriers and the like. Ships were built on various scales ranging from 1" to 60" to 1" to 1". Approximately 50 people were employed in this plant at the peak of its production and the quality of workmanship was unusually high considering the very limited tools and equipment that were available to the workers.

As relocation progressed on the centers these plants along with other of the less essential center activities were closed. The industrial program as originally conceived was not needed on the centers in order to provide employment except for limited periods. A definite need on the centers was filled, however, by the production of center consumed goods as mentioned above. In addition many of the evacuees acquired skills which were of considerable value to them in securing employment on the outside when they relocated. Again, the wage scale was one of the deterring factors for production for off center use.

Operations Program in Retrospect. The experience of the War Relocation Authority in the operation of its ten centers reveals certain mistakes or errors in judgment which should be pointed out as a part of the closing report.

It was probably impossible to secure any particular modification of the basic construction provided on each of the relocation centers. Of necessity the construction for such a program must be temporary and as cheaply built as was consistent with reasonable safety and healthful living conditions. Certainly no one could accuse the government of building either convenient or luxuriant quarters. The furnishing of one bare room approximately 20' square with no partitions and no furniture other than cots, mattresses and blankets for each family was far from luxurious. Equipment covered only the bare essentials. The same might be said of mess halls, recreation buildings and the other construction having to do with the living of the evacuee group.

The equipment supplied throughout the centers was probably as good as could have been secured at the time the buildings were constructed. It would have been of great value to the Authority in carrying forward its program had several additional facilities been constructed:

1. An auditorium where the administration and the evacuees could gather to discuss major problems of policy where a limited amount of group entertainment could have been provided.
2. Repair garages and motor pool facilities should have been a part of the basic construction on each of the centers in order to permit reasonable operation and repair of the motorized equipment on the center.
3. The construction of a limited amount of staff housing as a part of the basic construction would have aided immeasurably in increasing the efficiency of the staff during the early months of project operation.

Other items of construction might well have been included but their absence during the initial period was not serious. Had some of these items been included in the basic construction for each of the centers, it would have permitted the Authority to have completed the additional required construction such as schools, livestock facilities and its development work much earlier. This earlier construction would have permitted a longer period of use for much of the construction finally completed.

The maintenance program on the centers was unduly increased in many cases because of the extreme rush and lack of careful inspection during the initial construction, particularly of the utilities.

Water systems, sewage disposal systems and electrical systems should have been installed with sufficient capacity to handle family groups rather than according to army standards for single soldiers.

In connection with motor transport and maintenance the operation of obsolete and worn out equipment was extremely expensive to the government. While it was probably impossible to secure better equipment at the time the centers were established, every possibility should have been explored to provide the best possible equipment available for an operation of this type.

Not only should repair garages have been provided but they should have been equipped with reasonable up to date shop equipment for repair work.

One of the first jobs that should have been done in connection with the Motor Transport and Maintenance Section was the securing of well qualified supervisors and the establishment of a rigid system of control in the use of the motorized equipment. Only through such rigid control can equipment be kept in serviceable condition and unnecessary travel eliminated. The general system of equipment repair, servicing, inspection and use control that was finally developed on the centers saved the government many thousands of dollars.

Even though the record of the Authority so far as fire losses are concerned is exceptionally good, too much emphasis cannot be placed on good equipment, consistent adequate training of personnel and on the establishment of fire consciousness among all residents of the center.

While the agricultural program came far from meeting the early plans which have been developed, it did provide quite adequately for subsistence on the centers. The vegetables and other products produced were a big factor in the enviable health record on the centers during the four years of operation. While the amount of equipment and labor used in the production of these agricultural products was somewhat high as compared with the outside in terms of hours of use they were low in terms of cost per unit of production.

Likewise the processing of foods on a center had real value and the production of clothing, mattresses and furniture resulted in a substantial saving to the government. Had the number of employables on the center been as great as was originally anticipated some of the other industrial programs would no doubt have made a credible showing.