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BWIP Repository Project

Working Draft

Interim Housing Conditions Profile—Benton and Franklin Counties, Washington

P. A. Bolton

November 1987

Prepared by
Battelle Human Affairs Research Centers
for the Pacific Northwest Laboratory
under Contract DE-AC06-76RLO 1930
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1.0 BACKGROUND AND OVERVIEW

1.1 Overview of the BWIP Program

By the end of this century, the Federal Government plans to begin operating the first geologic repository for permanent disposal of commercial spent nuclear fuel and high-level radioactive waste. The Office of Civilian Radioactive Waste Management (OCRWM) of the U.S. Department of Energy (DOE) is responsible for implementing the Nuclear Waste Policy Act of 1982 (NWPA). In the NWPA, Congress approved geologic disposal by declaring that one of the key purposes of the NWPA is to "establish a schedule for the siting, construction, and operation of repositories that will provide a reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and such spent nuclear fuel as may be disposed of in a repository" (42 U.S.C. §111(b)(1) (1982)).

The NWPA specifies the process for selecting a repository site and involving the public in the siting decision. The DOE's final siting guidelines (10 CFR Part 960) further detail the steps leading to the siting decision. Following this process, in February, 1983, the DOE identified nine potentially acceptable sites for the first repository. These sites were evaluated in accordance with the DOE's siting guidelines. The results of these evaluations were reported in Draft Environmental Assessments (EAs), which were issued for public review and comment in December, 1984. The final EAs were issued in May, 1986. Chapter 4 of each EA included a description of site characterization activities and an analysis of the potential for environmental and socioeconomic impacts resulting from these activities. At that time, the Secretary of Energy identified five sites as suitable for site characterization and recommended three sites for characterization as candidate sites for the first repository. On May 28, 1986, the President approved characterization at three sites: Deaf Smith, Texas; Yucca Mountain, Nevada; and Hanford, Washington. This formally began the site characterization phase of the repository siting process. Site characterization is expected to last approximately seven years.

Issue resolution strategies have guided, and will continue to guide, the design of the site characterization activities at the Hanford Site. As part of this effort, the DOE will prepare a Site Characterization Plan (SCP) that describes in some detail the site, the proposed site characterization activities, and plans for decommissioning the exploratory shaft facility (ESF) and mitigating any significant environmental impacts caused by site characterization should the site be decommissioned. A significant part of the site characterization effort (which will be described in the SCP) will be research performed from the ESF. At each of the three proposed sites, one or more shafts will be sunk to the level where the potential repository would be built. Underground drifts connecting these shafts and underground rooms will be excavated so that tests and

measurements can be made. In addition to the ESF, extensive surface-based field studies will be implemented during site characterization. These studies, which represent a significant level of effort, include surveys of soil conditions, monitoring of seismic activity, geologic and hydrologic investigations at the ground surface and in boreholes not hydrologically connected with the ESF, and selected environmental reviews. Technical descriptions of the environmental and socioeconomic studies to be undertaken during site characterization will be provided in the Environmental and Socioeconomic Monitoring and Mitigation Plans (MMPs) and Comprehensive Environmental and Socioeconomic Plans (CEP and CSP).

The Mined Geologic Disposal System Program administers the overall site characterization effort for the Repository Program, and is responsible for site selection and repository construction. At BWIP, this program is organized into eight components: (1) Systems Engineering; (2) Waste Package Engineering; (3) Site Characterization; (4) Repository Design; (5) Regulatory and Institutional Activities; (6) Exploratory Shaft; (7) Test Facilities; and (8) Program Management. To implement the site characterization phase of the repository program, a work force of management, technical, and support services workers will be employed and a variety of materials and services will be procured. The program will pay taxes and make Payments Equal to Taxes (PETT) to state, county, and local government units. The program also involves extensive regulatory and institutional activities that include communication and liaison with other federal agencies, and with state, tribal, and local governments.

1.2 Purpose of the BWIP Socioeconomic Profile Reports

The BWIP Socioeconomic Profile Reports are designed to provide information about the characteristics of the communities in which socioeconomic impacts from the BWIP may occur. The Profile Reports present a compilation of historical information about socioeconomic conditions in the affected communities. These reports are designed to provide a transition between the BWIP EA, published in 1986; the Monitoring Reports; and other technical reports associated with the BWIP SMMP and CSP. The principal objectives of the Profile Reports are to update the DOE BWIP socioeconomic database by compiling available secondary and primary data and to make this information available to both the DOE program and other interested parties. The initial Profile Reports will help identify the need for additional data. The database developed for the profiles will assemble socioeconomic data in a uniform, readily accessible format.

A series of BWIP Socioeconomic Profile Reports are being prepared. This report is one of the first set of five separate BWIP Profile Reports, which cover the following topics:

- Economic/Demographic Conditions;
- Fiscal Conditions;

- Housing Conditions;
- Public Facilities and Services; and
- Socioeconomic Conditions in Cultural Communities.

The Profile Reports will be supported by an Interim Monitoring Report on BWIP Project Characteristics, which will provide information until SMMP implementation about the work force, purchases, and tax payments of the BWIP Program. The Interim Monitoring Report on BWIP Project Characteristics will include data from a survey of the BWIP work force that was conducted in August, 1987.

1.3 Overview of the Study Area Described in the Profile Report

The BWIP Reference Repository Location (RRL) is located within the DOE-controlled Hanford Site in south-central Washington. The 570 square-mile Hanford Site is institutionally controlled. Since 1943 it has been restricted to projects directly associated with nuclear activities. As shown in Figure 1, the Hanford Site extends into Benton, Franklin, and Grant counties and is near the communities of Richland, Kennewick, Pasco, West Richland, and Benton City. During the decade of the 1970s, the Benton-Franklin MSA[1] was one of the most rapidly growing metropolitan areas in the nation. However, the January, 1982, termination of the Washington Public Power Supply System Nuclear Project WNP-4 and the mothballing of WNP-1 abruptly reversed this growth and initiated a period of employment and population decline that continued through the mid-1980s.

Since 1970 the economy of the Benton-Franklin MSA has been dominated by three primary influences: (1) nuclear weapons-grade fuel manufacturing by the DOE and its contractors, (2) construction of nuclear power plants by the Washington Public Power Supply System (the "Supply System") at the Hanford Site between 1973 and 1983, and (3) agriculture. These three activities have directly employed about 40 percent of the employed labor force in the MSA, and have supported additional workers through local purchases of goods and services. The high salaries and wages paid by the DOE, the Supply System, and their contractors enhanced the income of many families in the MSA. Between 1981 and 1983, however, the Supply System completed one nuclear power plant (WNP-2) and halted construction on two additional units (WNP-1 and WNP-4) being built on the Hanford Site. The resulting loss of about 10,000 jobs, along with a downturn in the agricultural economy, was largely responsible for a local recession that lasted from 1982 through 1984. Average annual employment of Benton-Franklin MSA

[1] MSAs, metropolitan statistical areas, are urbanized areas that constitute integrated economic areas. MSAs are used by the U.S. Department of Commerce, Bureau of the Census, as geographic reporting units for a variety of social and economic data. The Benton-Franklin Metropolitan Statistical Area is composed of Benton and Franklin counties.

residents fell from 75,900 people in 1981 to 59,400 in 1984 before gradually rising to 62,100 in 1986. Had it not been for increasing employment by the DOE and its contractors on other projects, the local recession probably would have been sharper and more prolonged.

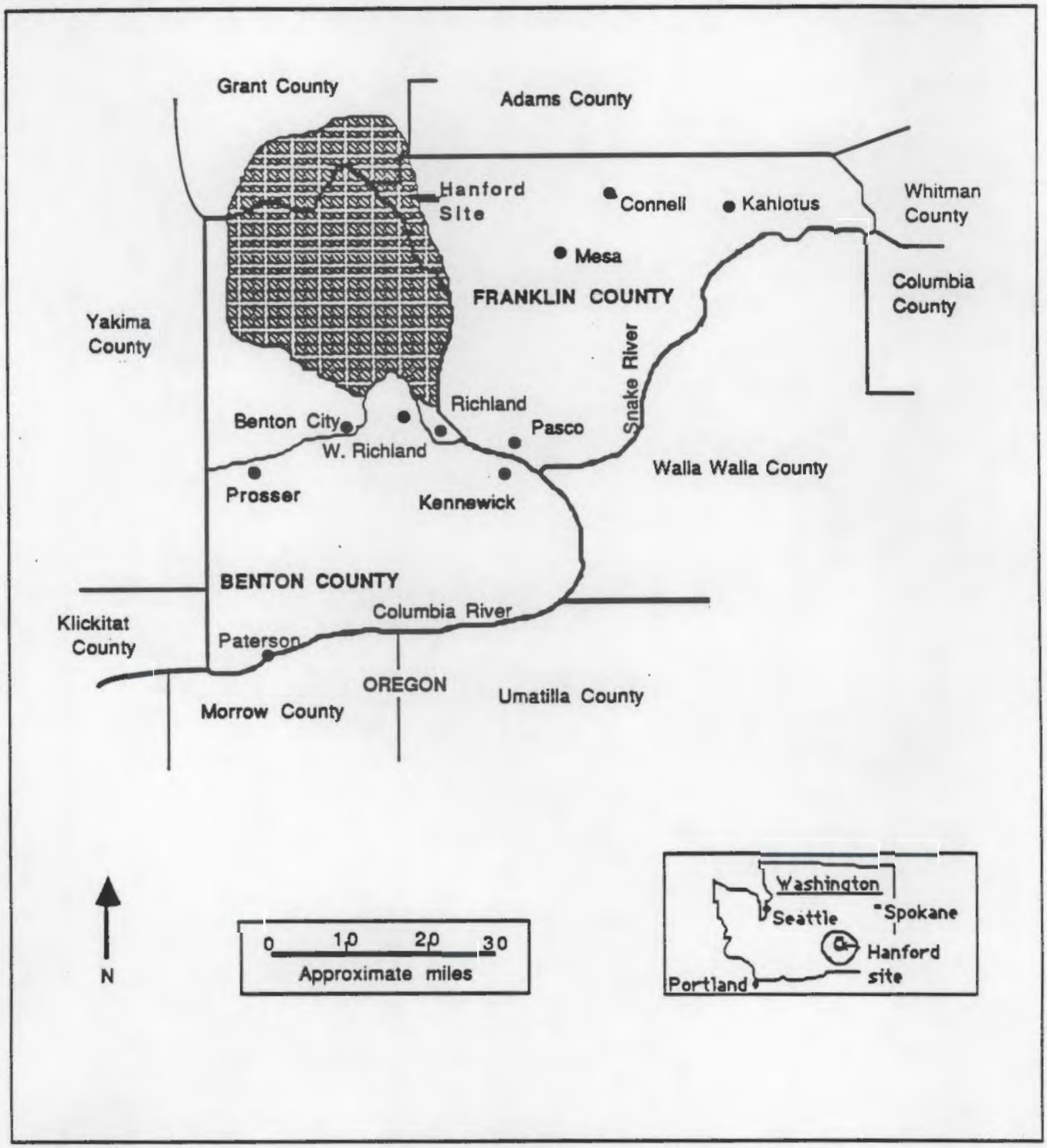
Population in the Benton-Franklin MSA has exhibited similar fluctuation. The MSA's total population grew from 93,356 people in 1970 to 147,900 in 1982, fueled largely by increasing employment opportunities. The decrease in employment opportunities between 1981 and 1984 led to out-migration. By 1986 the total population had fallen to 139,300. Although the MSA's population increased slightly in 1987 to 139,600 due to natural increase (births minus deaths), out-migration continued in 1987, despite growth in employment.

For this report, the study area is defined as Benton and Franklin counties, including the cities of Kennewick, Richland, Benton City, Prosser, West Richland, Pasco, and Connell. Depending upon the results of the work force survey conducted in August, 1987 and information about BWIP procurements (Clark, 1987), the study area may be expanded to include other jurisdictions both within and outside Benton and Franklin counties. Expansion of the geographic and jurisdictional scope of the fiscal profile is discussed in Section 4.

1.4 Organization of this Profile Report

This report is divided into five sections. Section 2 summarizes the methods used to compile and analyze the data presented in the report. It includes a discussion of the Quality Assurance context within which the data were collected, analyzed, and stored; a definition of the variables and time period included in the profile; a description of the secondary and primary data collection, compilation, and analysis procedures used in preparing the report; and a summary of the database management system that will be used to store and provide access to the data presented in the report. Section 3 contains the profile information, organized by topic. A combination of tables, figures, and text are used to describe housing conditions in the study area. Section 4 summarizes outstanding technical issues and data requirements, and Section 5 provides a bibliography of the documents and personal communications from which the data in this report were obtained.

FIGURE 1. Map of Benton and Franklin Counties, Washington



2.0 METHODS

2.1 Quality Assurance Context

The Quality Assurance Program of Battelle's Pacific Northwest Laboratories ensures that researchers conduct activities in a planned and controlled manner and verify the quality of their results. Quality assurance for the data reported here is guided by PNL-MA-60, Quality Assurance Manual for License-Related Programs (Battelle 1985). PNL-MA-60 is designed to satisty the requirements of NQA-1-1983, 10 CFR 50 Appendix B, and DOE-RL Order 5700.1A, Quality Assurance.

QA Plan ED-29 specifies which elements of PNL-MA-60 must be implemented for the Basalt Waste Isolation Environmental and Socioeconomic Program. Technical procedures for data collection for the Basalt Waste Isolation Environmental and Socioeconomic Program are prepared in accordance with PNL Administrative Procedure (PAP) 501, Preparation, Review and Approval of Procedures (PNL-MA-60, Procedures for License-Related Programs, Vol. I).

The data presented in this report were collected in accordance with Technical Procedures SMP-101 and SMP-102, which guide the collection of primary and secondary data, respectively (Battelle 1987a, 1987b). SMP-101, Documentation of Primary Data Collection, is designed to ensure that sound social science practices are used in the collection of data from individual respondents, through direct observations, or from primary historical records, and that methods for data collection have been documented. SMP-102, Documentation of Secondary (Documentary) Data Collection, is designed to ensure that complete and accurate attribution is made for all secondary data cited in any project report.

Data traceability is provided through the application of procedures spelled out in SMP-101 and SMP-102. Reference to the source and origin of all data, whether collected from primary or secondary sources, will be provided by the BWIP database management system. This system will support the cataloging, cross referencing, and retrieval of full citations for all data elements.

2.2 Variables and Time Period Included in the Profile

Jurisdictions Included in the Profile

This report describes the housing stock and its availability in Benton and Franklin counties. Depending on the specific measures, data are presented for the entire MSA, for Benton and Franklin counties separately, for incorporated and unincorporated areas within the

counties, and for specific incorporated areas. The most detailed data are available for the two counties and for the major cities of Kennewick and Richland in Benton County and Pasco in Franklin County.

In 1986, 64 percent of the population of Benton County and 66 percent of the housing units were in Kennewick and Richland. Seventy-three percent of the population and 75 percent of the housing were in the incorporated areas of Benton County. In Franklin County, Pasco accounted for 52 percent of the county's 1986 population and 57 percent of its housing. Fifty-nine percent of the population and 63 percent of the housing were in the incorporated areas of Franklin County (Washington Office of Financial Management 1986: Tables 1 and 2).

As discussed in Section 4, more detailed data are needed to fully describe the housing conditions in the jurisdictions described here.

Time Period Covered in the Profile

This report focuses on the period from 1975 to 1986. Some data from the 1970 census are included to provide information about conditions prior to the growth period of the 1970s.

The main housing construction boom in the Benton-Franklin MSA coincided with the Supply System construction period, which began in 1973 (Cluett et al. 1984, Section 5: 17-39). The large influx of population related to construction activities spurred housing construction. By 1979 the supply of housing began to catch up with demand, and housing construction slowed. Construction activity declined somewhat earlier in Richland than in Kennewick and Pasco. Data from 1975 forward provide an initial description of housing conditions during the high growth period and the current distribution and availability of housing by location and type. Additional data for 1986 and 1987 will be available soon.

Variables Included in the Profile

The variables included in this profile were selected to describe aspects of housing supply and demand. To describe the supply of housing, data on housing stock, the distribution of housing by location and type, and housing construction are presented. Data on vacancy rates, patterns of real estate activity, and market value serve as indicators of the demand for housing as it relates to the existing supply.

2.3 Secondary Data Collection, Compilation, and Analysis

This report relies almost exclusively on secondary data. Data on housing stock were obtained primarily from publications of the U.S. Department of Commerce and the Washington

Office of Financial Management. Data on housing vacancies were abstracted from the U.S. Postal Service survey data published by the Federal Home Loan Bank. Real estate activity data were obtained from year-end summaries prepared by the multiple listing service for the Tri-City Board of Realtors. Local building department and assessor's office records have not yet been examined, but more complete information on annual housing construction and housing value can be obtained from these sources.

For the most part, data are presented as they appear in the source documents. In some cases, percentages or rates of change have been calculated to facilitate comparisons across jurisdictions.

2.4 Primary Data Collection, Compilation, and Analysis

In addition to the secondary data, interviews were conducted with several persons involved with city planning or private real estate in the Tri-Cities area. The major objectives of these interviews were to obtain additional information about recent housing conditions in the Tri-Cities, to identify known weakness or biases in the secondary data being used, and to identify additional data.

2.5 Data Storage and Access

To support the profiling effort, a database system is needed that supports multiple users and networks and provides access, security, integrity, and synchronization. Both research specialists and casual users need the data to be available on an ad hoc as well as a production basis, and they need to be able to access any combination of data elements. To meet quality assurance requirements, the data in the system must be modifiable only by authorized personnel who follow specified procedures. In addition, the system must be constructed and operated in a manner that assures the data are accurate, without inconsistencies or anomalies in design or values.

In order to meet these requirements, the BWIP Socioeconomic Program is establishing a relational database in which the data presented in this paper will be stored. A relational database is best suited to the storage and retrieval of the quantity and type of information included in the profile reports. It represents the data in tables and provides commands that allow manipulation of the data to create new tables that contain the data elements of particular interest. In this database system, Standard Query Language (SQL) will be used because it provides the necessary power, ease of use, flexibility, and accessibility. SQL is emerging as a standard for database languages. The database management system (DBMS) will use INGRES, a well-known commercial software program that provides access level authorization, journaling, and built-in referential integrity for related data elements. An expanded data dictionary structure will be provided in the database

system to facilitate system access and use. The dictionary, coupled with a basic knowledge of SQL, will enable the user to access needed information quickly and easily while protecting data integrity and security. To further ensure data integrity, software control procedures are being implemented for database creation and maintenance.[2] For ease of use, the system will support multiple users and networks.

[2]The database design for the relational database model will be based on Entity-Relationship diagramming, using Yourdon-DeMarco data flow diagrams for analysis. The relationships have been put into Third Normal Form, with referential keys identified.

3.0 HOUSING CONDITIONS PROFILE FOR BENTON AND FRANKLIN COUNTIES

3.1 General Background and Overview

The recent economic and demographic history of the Benton-Franklin MSA has been dominated by three primary influences: (1) nuclear energy and weapons-grade fuel production by the U.S. Department of Energy (DOE) and its contractors, (2) construction of nuclear power plants by the Supply System, and (3) the agricultural sector. Although other activities are also important to the local economy, the overall economic health of the MSA has been most affected by the employment and income generated by these three sectors. Current housing patterns in the MSA have been influenced by the area's experience with rapid growth in the mid-1970s. Trends in the housing market have been influenced by national economic factors, such as interest rates, and by local economic conditions, especially current and anticipated employment opportunities.

Employment in the Benton-Franklin MSA rose from 40,080 workers in 1970 to a peak of 75,900 in 1981 before declining to 59,400 in 1984, primarily due to the loss of about 10,000 Supply System jobs after 1981 (U.S. Department of Commerce 1986a; Cluett et al. 1984). The MSA's population followed a similar trend, with a slight lag. In 1970, total population in the Benton-Franklin MSA was 93,356 people (U.S. Department of Commerce 1973). The MSA's population grew rapidly after 1973, reaching a peak of 147,900 persons in 1982; it then declined to 139,300 in 1986 (Washington Office of Financial Management 1986). In 1987, the estimated population of the Benton-Franklin MSA was 139,600 persons. A summary of population change in the study area jurisdictions is shown in Table 1.

As seen in Table 1, population change followed somewhat different patterns in Benton and Franklin counties. Benton County grew faster than Franklin County in the 1970s. Benton County reached its peak population in 1982. Nevertheless, between 1980 and 1986 Benton County experienced a net population loss of over 5,000 people (Washington Office of Financial Management 1986: Table 9). Franklin County's population grew more gradually during the 1970s, peaked in 1982 and then began to decline. However, the population of Franklin County did not fall below the 1980 level (Washington Office of Financial Management 1986: Table 9).

Housing supply generally followed the population growth patterns. Construction activity was higher in Benton County, and much multiple-unit housing was built there in the late 1970s to accommodate the influx of construction workers and associated population growth. Much of the construction activity took place in the then-unincorporated areas between Richland and Kennewick. After 1980 the population of Richland declined and housing activity slowed considerably. Kennewick continued to increase its influence as a regional economic center. Growth has continued there during the 1980s with both annexation and in-migration being

important factors. In Pasco, the population peaked in the early 1980s and then dropped again to the 1980 level. Recent changes in the transportation network, particularly the new I-182 bridge across the Columbia River, may change the settlement pattern of workers at the Hanford Site. In the past, Supply System workers typically chose to live in the unincorporated areas of Benton County or one of the Benton County communities.

TABLE 1. Study Area Population, 1970, 1980, 1982, 1985, 1986, and 1987

Jurisdiction	Population					
	1970	1980	1982	1985	1986	1987
Total Benton-Franklin MSA	93,356	144,469	147,900	140,900	139,300	139,600
Benton County	67,540	109,444	111,700	105,200	104,000	104,100
Kennewick	15,212	34,397	35,350	36,990	36,600	37,320
Richland	26,290	33,578	33,550	30,508	30,240	30,280
Prosser	2,954	4,049	4,170	3,980	4,010	4,000
West Richland	1,143	2,938	3,934	3,730	3,720	3,700
Benton City	1,070	2,087	1,970	1,930	1,820	1,815
Unincorporated Benton County	20,871	32,395	32,726	28,062	27,610	26,985
Franklin County	25,816	35,025	36,200	35,700	35,300	35,500
Pasco	13,920	18,428	19,050	18,700	18,420	18,520
Connell	1,161	1,981	1,960	2,075	2,046	2,060
Kahlotus	308	203	215	225	225	223
Mesa	274	278	275	245	260	260
Unincorporated Franklin County	10,153	14,135	14,700	14,455	14,349	14,437

Adapted from Washington Office of Financial Management 1985, 1986 and 1987.

3.2 Supply of Housing

Total Housing Stock in 1970 and 1980

TABLE 2. Characteristics of the Housing Stock in Benton and Franklin Counties, 1970 and 1980

	Benton County		Franklin County	
	1970	1980	1970	1980
Total Housing Units	na	42,651	na	13,310
Total Year-Round Housing Units	21,623	42,610	8,348	13,122
Percent of Housing Units Occupied	94.9%	91.5%	94.4%	91.3%
Percent Owner-Occupied	71.0%	67.5%	63.6%	63.1%
Median Value of Owner-Occupied Units	$16,240	$62,700	$16,811	$54,800
Monthly Median Gross Rent	$107	$316	$94	$252

na means not available.

Adapted from U.S. Department of Commerce 1972 and 1983.

Table 2 provides a brief description of the housing stock in Benton and Franklin counties in 1970 and 1980. In Benton County, the number of year-round housing units increased by 97.0 percent between 1970 and 1980 through the addition of 20,987 year-round units. Over this period the number of year-round housing units in Franklin County increased more slowly than in Benton County, rising by 57.2 percent with an addition of 4,774 units.

In both Benton and Franklin counties, about 91 percent of year-round housing units were occupied in 1980, somewhat lower than the 94 or 95 percent levels of 1970.[3] This level of occupancy indicates that housing stock generally met the demand for housing in both 1970 and 1980. Data presented later indicate that this was not true for all years between 1970 and 1980.

[3] This occupancy level does not correspond with the vacancy rates provided by the U.S. Postal Service to the Federal Home Loan bank for 1980, reported later in this report. The value of presenting the 1970 and 1980 occupancy levels here is that they are based on the total population census. A comparison can be made of conditions in 1970 and 1980, and between Benton and Franklin counties, with data collected in comparable surveys.

The lower level of occupancy reported by the U.S. Census in 1980, compared to 1970, may be a reflection of the surge in building that took place in the late 1970s. Other data indicate that housing demand was being met in the Tri-Cities by 1980, and that an excess of multi-family units had been built (Federal Home Loan Bank 1985).

In Benton County, the percentage of year-round housing units that were owner-occupied was somewhat lower in 1980 than in 1970. This reduction may have resulted from the rapid growth occurring at this time, and the increased supply of apartment rental units that were built to meet the demand created by in-migrating workers. The level of owner-occupancy in Franklin County did not change noticeably between 1970 and 1980, but it was consistently lower than in Benton County. Additional data are needed to determine whether the lower level of owner-occupancy in Franklin County is due to the higher proportion of the population in lower-paid agricultural jobs that make home ownership less feasible.

Since the data on housing values and rental rates in Table 2 are not adjusted for inflation, they do not give a clear indication of changing value over time. However, the unadjusted figures do provide a basis for comparing change in Benton and Franklin counties. Average housing values were roughly comparable in the two counties in 1970. By 1980 average housing value and median rent was higher in Benton County than in Franklin County.

Change in Housing Stock 1980-1986

TABLE 3. Change in Housing Stock in Benton and Franklin Counties, 1980-1986

Jurisdiction	1980[a]	1986[a]	Net Change Number of Units	Percent Change	Number of Annexed Units 1980-1986[b]
BENTON COUNTY					
Total County	42,651	45,157	2,506	5.9	na
Unincorporated	11,176	11,111	-65	-0.1	-1,690
Incorporated	31,475	34,046	2,571	8.2	1,690
Benton City	805	691	-114	-14.2	18
Kennewick	14,456	16,448	1,992	13.8	1,407
Prosser	1,559	1,692	133	8.5	6
Richland	13,387	13,664	277	2.1	1
West Richland	1,268	1,551	283	22.3	258
FRANKLIN COUNTY					
Total County	13,316	14,170	854	6.4	na
Unincorporated	4,704	5,202	498	10.6	-52
Incorporated	8,611	8,968	357	4.1	52
Connell	687	690	3	0.4	1
Pasco	7,702	8078	376	4.9	51

[a] Table 2.
[b] Table 12.

Adapted from Washington Office of Financial Management 1986: Tables 2 and 12.

Information on the total housing stock in 1980 and 1986 is provided in Table 3. This table shows housing change during the period of slow growth from 1981 to 1986 in terms of net change in the total number of units. It also shows the number of housing units gained through annexation. The number of housing units in a sub-county jurisdiction is affected by construction (or demolition) of housing, addition (or loss) of mobile homes, and by annexation. In both counties and each of the Tri-Cities the housing stock grew between 1980 and 1986. In Benton County, although the population exhibited approximately a 5.0 percent decline between 1980 and 1986 (see Table 1 above), housing stock showed a net increase of 5.9 percent.

Table 3 shows that the incorporated areas of Benton County experienced the bulk of housing stock change in the county, and that the net change was dominated by additions to housing stock in the incorporated areas, both from construction and annexation. The unincorporated area of Benton County had a net decrease in number of housing units between 1980 and 1986. During this period, a total of 1,690 housing units were annexed by incorporated areas in the county. The balance of 881 units can be attributed to new construction and mobile

homes. The net decrease in housing stock (65 units) in the unincorporated area was smaller than the number of housing units annexed during that period, indicating substantial construction of new units or addition of mobile homes in the unincorporated area between 1980 and 1986. Annexation played an important role in the increase in housing stock in Kennewick and West Richland in this period. Kennewick added 1,407 units through annexation and West Richland added 258.

In Franklin County, population stayed stable, growing by only 0.8 percent, but housing grew by 6.4 percent (Washington Office of Financial Management 1986: Tables 2 and 9). In Franklin County, the unincorporated area lost only 51 housing units through annexation by incorporated areas, and at the same time had a 10.6 percent net increase in the size of the housing stock.

Change in Housing Stock by Type of Unit 1980-1986

TABLE 4. Housing Stock, Benton and Franklin County by Type, 1980-1986

Jurisdiction	Total Housing Units	1 Unit Number	1 Unit %	2 or More Units Number	2 or More Units %	Mobile Homes Number	Mobile Homes %
1980 BENTON COUNTY							
Total County	42,651	27,421	64.3	10,934	25.6	4,296	10.1
Unincorporated	11,176	7,871	11.2	1,248	70.4	2,057	18.4
Incorporated	31,475	19,550	62.1	9,686	30.8	2,239	7.1
Benton City	805	444	55.2	69	8.6	292	36.3
Kennewick	14,456	7,819	54.1	5,374	37.2	1,263	8.7
Prosser	1,559	1,147	73.6	367	23.5	45	2.9
Richland	13,387	9,297	69.4	3,687	27.5	403	3.0
West Richland	1,268	843	66.5	189	14.9	236	18.6
1986 BENTON COUNTY							
Total County	45,157	27,701	61.3	12,000	26.6	5,456	12.1
Unincorporated	11,111	7,361	66.2	778	7.0	2,972	26.7
Incorporated	34,046	20,340	59.7	11,222	33.0	2,484	7.3
Benton City	691	505	73.1	89	12.9	97	14.0
Kennewick	16,448	9,049	55.0	6,003	36.5	1,396	8.5
Prosser	1,692	1,218	72.0	373	22.0	101	6.0
Richland	13,664	8,633	63.2	4,551	33.3	480	3.5
West Richland	1,551	935	60.3	206	13.3	410	26.4
1980 FRANKLIN COUNTY							
Total County	13,316	7,825	58.8	3,419	25.7	2,072	15.6
Unincorporated	4,705	3,420	72.7	279	5.9	1,006	21.4
Incorporated	8,611	4,405	51.2	3,140	36.5	1,066	12.4
Connell	687	419	61.0	162	23.6	106	15.4
Pasco	7,702	3,864	50.2	2,948	38.3	890	11.6
1986 FRANKLIN COUNTY							
Total County	14,170	8,100	57.2	3,516	24.8	2,554	18.0
Unincorporated	5,202	3,614	69.4	282	5.4	1,306	25.1
Incorporated	8,968	4,486	50.0	3,234	36.1	1,248	13.9
Connell	690	394	57.1	152	22.0	144	20.9
Pasco	8,078	3,981	49.3	3,069	38.0	1,028	12.7

Adapted from Washington Office of Financial Management 1986: Table 2.

Table 4 provides information about change in housing stock characteristics in Benton and Franklin counties. As was shown in Table 3, Benton County added 2,506 housing units between 1980 and 1986, a net increase of 5.9 percent. Over this period Franklin County added 845 units, a net increase of 6.4 percent. In 1980, Benton County had a higher percentage of its housing stock in one-unit structures (64.3 percent) and a lower percentage in mobile homes (10.1 percent) than Franklin County did (58.8 and 15.6 percent).

In 1986, the most notable difference between Benton and Franklin counties was that Franklin County had a larger proportion of mobile homes (18.0 percent in Franklin County and 12.1 percent in Benton County). Both counties showed a net increase in the number of mobile homes between 1980 and 1986. With the exception of West Richland, most of the increase in mobile homes took place in the unincorporated areas. In 1986 the unincorporated areas of Benton and Franklin counties had similar percentages of mobile homes, 26.7 percent and 25.1 percent respectively, although in 1980 the percentage of mobile homes in the unincorporated area of Franklin County had been higher (21.4 percent) than in the unincorporated area of Benton County (18.4 percent).

The net increase in mobile homes between 1980 and 1986 is somewhat unexpected, given the large drop in construction workers over this period. The overall net increase in the number of mobile homes in the two counties, and their importance in the housing stock, may reflect a national trend toward acceptance of mobile homes as an affordable and reasonable housing alternative.

Table 4 also shows that the study area communities vary with respect to the proportion of housing units that are part of multi-unit structures. As might be expected, the larger communities of Kennewick, Richland and Pasco have higher percentages of multi-unit housing. Most construction of multi-unit housing took place prior to 1980. With the exception of Richland, there was little change in the number or importance of multi-unit structures between 1980 and 1986.

New Housing Construction

TABLE 5. Residential Units Authorized by Building Permits and Public Contracts in Benton-Franklin MSA by Type of Structure, 1975-1985

Year	Total Units Authorized	1 Unit	2 Units	3-4 Units	5 or More Units
				(Percent of Total)	
1975	2,801	42.6	2.9	10.0	44.5
1976	3,301	46.4	2.8	3.6	47.1
1977	3,464	59.7	3.8	3.6	32.9
1978	3,259	66.0	5.0	6.2	5.3
1979[a]	2,562	40.9	6.2	9.7	42.1
1980[a]	900	59.7	8.2	13.6	11.2
1981	676	84.5	3.3	12.3	0.0
1982	221	76.9	4.5	0.0	18.6
1983	205	92.2	2.9	4.9	0.0
1984	145	97.2	0.0	2.8	0.0
1985	126	100.0	0.0	0.0	0.0

[a] 1979 and 1980 totals include 1.2 percent and 7.3 percent, respectively, of the units authorized by public contracts.

Adapted from U.S. Department of Commerce 1975-1985.

Table 5 provides information on the number of residential units authorized in the Tri-Cities area between 1975 and 1985. In most cases construction is actually undertaken when a permit or contract is obtained. Therefore, these numbers are valid indicators of housing construction activity.

During the early part of this period, population was growing in Benton and Franklin counties, mainly in conjunction with the construction activity on the Hanford Site. However, by 1981 most of the construction had been completed or halted and population began to decline (see Table 1).

In parallel with the economic and demographic conditions in the area, there was active construction of housing prior to 1980 followed by a general decline in construction of both single and multiple-unit structures from 1980 through 1985. As indicated in Table 5, the building boom of the 1970s peaked in 1977, declined gradually for a year, and then dropped off precipitously in 1979 and 1980. The decline in activity probably resulted from the combined effect of new construction catching up with the demand, declining demand due to population loss after 1982, and other economic conditions, particularly high interest rates.

While all categories of housing have been affected by the decline, construction of multiple-unit housing has nearly ceased. Since 1983, over 90 percent of authorized housing units were single-unit structures.

TABLE 6. Residential Units Authorized by Permits and Public Contracts Issued in Jurisdictions of Benton and Franklin Counties, 1975-1985

	Benton County					Franklin County	
	Kennewick	Richland	West Richland	Benton City	Prosser	Pasco	Connell
1975	644	1169	43	15	46	217	13
1976	1122	782	122	5	32	252	14
1977	1288	490	136	50	113	173	20
1978	1480	344	174	39	45	98	16
1979	882	428	73	37	44	532	6
1980	307	114	28	25	22	145	0
1981	175	156	44	na	30	58	1
1982	24	61	4	7	24	27	0
1983	31	21	11	18	10	23	0
1984	27	16	3	3	10	9	0
1985	17	36	8	1	5	4	0
Total[a]	5,997	3,617	646	200	381	1,538	70

[a] Public contracts contributed an additional 30 units in Pasco in 1979 and 66 units in Kennewick in 1980.

na means not available.

Adapted from U.S. Department of Commerce 1975-1985.

Table 6 indicates the level of construction activity as reflected by building permits issued by individual municipalities in Benton and Franklin counties. These data indicate that both the larger cities (Kennewick, Richland, and Pasco) and the smaller communities in the area experienced a substantial increase in housing construction during the Supply System construction phase. Peak construction occurred between 1975 (Richland) and 1979 (Pasco). By 1982, the number of building permits issued by each of the jurisdictions shown in Table 6 had declined well below the 1975 level. Between 1975 and 1985, Kennewick and Richland had authorized construction of 9,614 housing units, and Pasco had authorized construction of 1,538. Collectively, the seven municipalities shown in Table 6 had issued building permits for 12,449 housing units, 70 percent of the total units authorized between 1975 and 1985 in the two counties.

3.3 Demand for Housing

Vacancy Rates in the Benton-Franklin MSA and Tri-Cities

TABLE 7. Vacancy Rates in Benton-Franklin MSA and Tri-Cities, 1975-1985

Year	Total MSA	Kennewick	Richland	Pasco
1975	0.6	0.7	0.7	0.3
1976	0.8	0.9	0.7	0.8
1977	1.7	2.1	0.8	2.1
1978	1.3	1.4	1.1	1.5
1979	2.0	2.3	1.7	1.9
1980	2.8	2.5	3.7	1.9
1981	4.3	5.3	3.5	3.4
1982[a]	5.1	5.7	4.9	4.4
1983	8.6	8.7	9.1	7.7
1984	na	na	na	na
1985	8.2	8.3	9.0	8.4

[a] Beginning in 1982, vacancy rate calculations contain new units.

na means not available.

Adapted from Federal Home Loan Bank 1985.

Vacancy rates generally indicate the amount of housing available for occupancy.[4] The vacancy rates in the study area in recent years provide a picture of the way in which demand for housing changed as economic conditions and the size of the local population changed. The vacancy rates presented in Table 7 refer to the proportion of the housing that is unoccupied either because it is under construction, it has been completed but not yet occupied, or has been previously occupied but at the time of the observation was not occupied.

The vacancy surveys that provided the data for Table 7 are formal observations by U.S. mail carriers. For the Tri-Cities area, carrier routes do not necessarily correspond to official city boundaries. However, the data provide a picture of the trends in vacancies since 1975. Table 7 provides the vacancy rates for all of Benton and Franklin counties, and for Kennewick, Richland, and Pasco (and vicinity).

Vacant housing was virtually nonexistent during the mid-1970s, when Benton and Franklin counties were experiencing major growth. For example, the vacancy rate in 1975 for the

[4] It is probable that some of the vacant units also were not inhabitable. The available data did not provide this information.

MSA was 0.6 percent. This low rate of vacancy suggests there was considerable competition for available housing. As Table 7 indicates, vacancy rates have grown gradually in the Tri-Cities area since 1975. In 1985, the vacancy rate for the MSA had grown to 8.2 percent of the total stock. This is probably due at least in part to the high level of housing construction between 1975 and 1980. The vacancy rate of around 2.0 percent in 1979 suggests that the housing stock was adequate to meet housing demand at that time. Beginning in 1983, as population declined, vacancy increased considerably. In 1983 and 1985 Richland had the highest vacancy rates (9.1 and 9.0 percent) of the Tri-Cities.

Vacancy Rates by Housing Type

TABLE 8. Vacancy Rates by Housing Type

Year	Kennewick			Richland			Pasco		
	Detached Single-Family	Multi-Family	Mobile Homes	Detached Single-Family	Multi-Family	Mobile Homes	Detached Single-Family	Multi-Family	Mobile Homes
1975	0.4	2.7	0.7	0.7	1.2	0.4	0.3	0.3	0.8
1976	1.0	0.9	0.1	0.4	3.2	0.0	0.5	2.1	1.1
1977	1.2	5.3	0.8	0.3	2.2	0.0	1.1	5.3	1.6
1978	0.9	3.2	0.6	1.1	1.4	0.2	0.9	4.4	0.9
1979	1.2	5.2	0.8	1.1	3.1	1.0	1.0	5.2	0.8
1980	1.2	5.5	2.2	1.4	9.7	1.5	1.1	5.5	1.0
1981	1.5	14.4	2.1	1.5	8.4	3.3	1.7	9.2	1.4
1982[a]	2.7	13.8	2.6	2.5	10.9	2.0	1.9	10.1	4.9
1983[b]	3.7	19.9	7.3	4.2	19.7	5.7	2.5	16.4	13.0
1985	4.6	15.4	11.9	4.6	25.7	13.5	4.4	14.3	8.2

[a] Beginning in 1982 vacancy rate calculations contain new units.
[b] 1984 data were not included in the source document.

Adapted from Federal Home Loan Bank 1985.

Table 8 presents detailed information on vacancy rates by type of housing for each of the Tri-Cities. Vacancy rates for all types of housing increased through 1985, but the highest rates were among multi-family units. This can be partially explained by the more limited flexibility of home owners, compared to apartment dwellers, to find alternative housing or move away. Also the multi-unit developments built in the late 1970s were targeted for the influx of construction workers. When construction activity ceased, many tenants of the apartment complexes either moved to other communities, or in some cases, moved into houses that had become available at depressed prices.

Vacancy rates from the Federal Home Loan Bank documents were not yet available for 1986 and 1987. Interviews conducted with representatives of real estate and property management organizations indicated that their impression was that vacancy rates were fairly low in the area in September, 1987 (McVicker, personal communication, 1 September 1987; Moore, personal communication, 2 September 1987). The pattern of vacancies they described was similar to that shown in Table 8 for 1985. Vacancy rates were reported to be lower for single-family units than for multi-family units, especially small apartments (one or two bedrooms), which were reported to have the highest vacancy rates. It was their impression that few single-family homes were available for rent. Also, larger apartments (3 bedrooms or more) were believed to be somewhat scarce.

Real Estate Activity

TABLE 9. Trends in Single-Family Housing Listings, Days on Market, and Sale Price for the Benton-Franklin MSA, 1981-1986

Year	No. of Single-Family Housing Units[a]	No. of New Listings	% of Total Stock (Estimated)[b]	Average Number of Days on Market	Average Sale Price
1981	na	2,966	na	61	$73,000
1982	na	3,334	na	82	66,800
1983	36,442	3,436	9.4	105	64,900
1984	36,576	3,157	8.6	99	62,600
1985	35,768	2,309	6.5	85	61,300
1986	35,801	3,314	9.3	91	60,900

[a] Figures for total single-unit dwellings from Washington Office of Financial Management 1983, 1984, 1985, and 1986.
[b] This estimate is likely to be low since the listings figures include only those houses listed with the multiple listing service.

Adapted from Tri-City Board of Realtors, Year-to-Date Statistics, Computerized Multiple Listing Service, for last week of each year between 1981 and 1986.

The market for real estate is affected by both national and local economic conditions. Table 9 presents recent trends (1981-1986) in the study area for three measures: the number of new listings each year, the average number of days that a home stays on the market before being sold, and the average price of sold homes. The data were compiled from the records of the Tri-City Board of Realtors, and thus reflect only those homes marketed through the multiple listing service in the area. It is estimated that about 85 percent of all residential sales in Benton and Franklin County are reflected in these statistics (McVicker, personal communication, 1 September 1987).

As can be seen in Table 9, since 1981 about 3,000 housing units have been placed on the market each year. The substantially lower number in 1985 (2,309 listings) may be attributable to uncertainty in local economic conditions and fluctuating interest rates. Using the number of new listings as an indicator of the number of single-family dwellings on the market in a particular year, it was estimated that the listings represented about 6.5 percent of the total housing stock of single-family units for sale in 1985. In other years since 1981, over 9 percent of single-family units were on the market. The level of activity in the real estate market is not necessarily an indicator of excess housing as much as it is an indicator of economic conditions.

After 1981 it appears to have been difficult to sell a home in the study area. It took almost 20 more days to sell a home in 1982 than in 1981, and in 1983 the average time required to sell a

home peaked at 105 days.[5] This indicates a fairly slow market for homes. The average sale price of single-family units also dropped considerably between 1981 and 1982, from $73,000 to $66,000. Housing prices in the study area have continued to decline. The average sales price in 1986 was $60,900.

[5]Average days on market is probably a low estimate of the actual time required to complete a sale. The original contract may expire before the house is sold, and the house may then be placed on the market by another real estate agent, with the calculation of days on the market starting again with the new contract. Also, an owner may withdraw the house from the market for several months, to wait for more favorable conditions.

4.0 OUTSTANDING TECHNICAL ISSUES AND DATA REQUIREMENTS

The characteristics of housing supply and demand in the study area are being examined to describe the current housing stock and identify the processes by which the communities have adjusted housing stock to accommodate the dramatic population change experienced over the past decade. The central focus is on the capacity of the housing stock to meet the needs of the current population and of possible future population growth. Of particular interest is the match between the available housing stock and new population entering the area in conjunction with the BWIP program. In simple terms, the questions that need to be answered are: Does the housing stock available at the time of the new in-migration match the demand characteristics of the new population with respect to amount of housing and type of housing and price? If it does not, what will be the most likely solutions for providing housing to meet the new demand?

Again in simple terms, the two approaches to answering these questions are to examine past solutions for matching housing supply with housing demand, and to monitor, on an ongoing basis, the various factors that affected housing supply and demand. These factors include the number and demographic characteristics of the BWIP workers and in-migrating population, economic factors such as interest rates, local employment and income trends, building capacity, lending policies, and local planning policies that direct land use. In addition, direct measures of the availability, distribution, and condition of the housing stock are needed. Although this profile report provides some of the necessary information, outstanding technical issues and data requirements indicate the need for further examination of housing conditions in the study area.

4.1 Understand Past Trends and Solutions

There seem to be two important aspects of past trends. The first is that each of the municipalities in the Benton-Franklin MSA have experienced a different degree and kind of housing demand during the past decade. Efforts to supply housing also varied, with the result that current housing conditions in the various communities are somewhat different. The second is that past decisions about zoning and transportation routes have set the stage for future long-term settlement patterns. There has been enough growth in the area in the past, and there is enough optimism about the future, that the planning departments and developers have fairly well-developed "intentions," and in many cases, policies and plans for attracting and managing future growth.

Also with respect to the past, hard lessons were provided in the early 1980s. Bankers currently are showing more caution. It is likely that developers are as well. The Tri-Cities private and public decision makers have long operated in a context of uncertainty due to the nature of the economic base in the area. It appears that at least in the short run, the level of uncertainty has

increased due to questions about the future of activities on the Hanford site. More information needs to be gathered on how these aspects affect decisions about building, buying, and selling housing. The data presented in this document do not include all that are available. In particular, local data sources such as assessors' office records and special surveys done by various jurisdictions and organizations have not been tapped. More primary data are also needed, both to enhance the interpretation of secondary data and to provide data not available from secondary sources. Further discussions with local leaders will be helpful. Also direct observations of housing conditions and occupancy can aid an understanding of secondary data.

4.2 Obtain More Information about the Characteristics of the Population Needing Housing

Again historical information on housing patterns, and the observations of local experts, suggest that there were surprises in the early 1980s about how the downturn in project employment would affect the local communities. Past lore about the demise of "boom towns" turned out not to be accurate. For example, more families stayed than was anticipated, given the number of jobs lost. Factors both internal and external to the area played a role. Because of the nature of the jobs that had attracted people to the area, and their anticipated duration, many of the in-migrants had become homeowners. Homeowners have less flexibility in decisions about leaving than do renters. The area also offered appreciated amenities and employment potential that may have limited out-migration. At the same time, lack of employment opportunities elsewhere may have eliminated moving as a solution for unemployed workers and their families.

The residential patterns of those who stayed, in relation to the housing supplied during the period of high growth, have affected the type of housing currently available. This in turn affects the need for additional housing and the types of solutions that local planners, developers, and financiers are likely to implement. Further information on past trends in housing needs and on the likely characteristics of new population are needed to analyze future housing needs.

4.3 Obtain More Detailed Information about the Condition and Availability of Current Housing Stock

Little information has been compiled to describe the condition of the existing housing stock in the Benton-Franklin MSA. Because of the area's history, most of the housing in the study area is relatively new, less than 5 percent of the housing stock was built prior to 1940 (U.S. Department of Commerce 1980). However, there is a certain amount of "government housing" from the early days of the Hanford Site that may not have the life span or desirability of regular housing. Also, much of the recent housing construction took place during a period of very high interest rates and short-term, high demand. This may have contributed to some trade-offs between quality, costs, and timeliness. Maintenance of existing units may also have suffered

when assessed values dropped, vacancies increased, and loan obligations placed severe economic pressures on owners.

Several sources of information on vacancy rates were found. These include the decennial census, special sample censuses done by local government, state calculations of vacancy as part of population estimating for revenue distribution, and the postal carrier surveys conducted under contract. Less formal information also exists on vacancy levels from persons who work with property management on a daily basis. While all sources indicate similar patterns, there is considerable variation in the actual numbers they present. Vacancy rates are important indicators of the balance between supply and demand and influence decisions about housing construction, rental rates, and property management. Consequently, more detailed information on the neighborhood locations and conditions of vacant units would be valuable.

4.4 Examine the Need to Expand the Study Area

There may be a need to expand the geographic scope of the area included in the housing profile. More detailed information can be sought for the smaller jurisdictions within Benton and Franklin counties. Currently available data indicates that these smaller jurisdictions and other outlying areas have been influenced by the population changes related to activities at Hanford. Also, data on BWIP project characteristics will be examined to determine whether the study area should be extended to include other counties, such as Yakima County.

5.0 REFERENCES

5.1 Documents

Battelle Human Affairs Research Centers 1987a. Documentation of Primary Data Collection. SMP-101. Seattle, WA: Battelle Human Affairs Research Centers.

Battelle Human Affairs Research Centers 1987b. Documentation of Secondary (Documentary) Data Collection. SMP-102. Seattle, WA: Battelle Human Affairs Research Centers.

Battelle Pacific Northwest Laboratories 1985. Quality Assurance Manual for License-Related Programs. PNL-MA-60. Richland, WA: Battelle Pacific Northwest Laboratories.

Clark, David 1987. Interim Economic and Demographic Profile Report: Benton and Franklin Counties, Washington. Report prepared for the U.S. Department of Energy under Contract De-AC06-76 RLO 1830. Seattle, WA: Battelle Human Affairs Research Centers.

Cluett, Christopher et al. 1984. Nuclear Repository in Basalt: Preliminary Socioeconomic Assessment. RHO-BW-CR-142 P. Report prepared for the U.S. Department of Energy under Contract DE-AC06-76 RLO 1830. Seattle, WA: Battelle Human Affairs Research Centers.

Federal Home Loan Bank of Seattle 1985. Tri-Cities, Washington, Housing Vacancy Survey, October 1985. Seattle, WA: Federal Home Loan Bank of Seattle.

Nuclear Waste Policy Act of 1982. 42 U.S.C. §111(b)(1) 1982.

Tri-City Board of Realtors 1981-1987. Computerized Multiple Listing Service. "Year-to-Date Summary of Listing Activity" (1981-1984). "Year-to-Date Statistics" (1985-1987). Kennewick, WA: Tri-City Board of Realtors.

U.S. Department of Commerce 1972. County and City Data Book, 1972. Bureau of the Census. Washington, DC: U.S. Department of Commerce.

U.S. Department of Commerce 1980. Detailed Housing Characteristics: Washington. (HC80-1-B49 Wash.) Bureau of the Census. Washington, DC: U.S. Department of Commerce.

U.S. Department of Commerce 1983. County and City Data Book, 1983. Bureau of the Census. Washington, DC: U.S. Department of Commerce.

U.S. Department of Commerce 1975-1985. Housing Units Authorized by Building Permits and Public Contracts. Annual Volumes. Bureau of the Census. Washington, DC: U.S. Department of Commerce.

Washington Office of Financial Management 1983-1986. Population Trends for Washington State. Population Estimation and Forecasting Unit. Olympia, WA: Washington Office of Financial Management.

5.2 Personal Communications

McVicker, Roger. 1 September 1987. President, Tri-City Board of Realtors. In person.

Moore, Harry. 2 September 1987. President, Apartment Owners Association. In person.

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