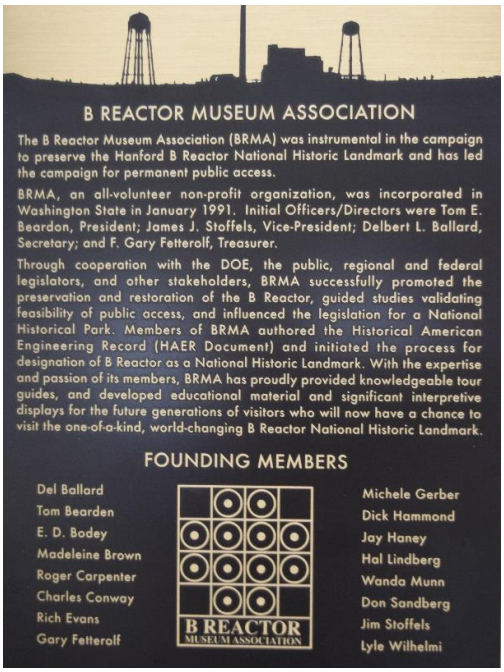
Saving B Reactor

Original Draft by Del Ballard 2005-2018 Revised/Edited by Dave Marsh & Gene Weisskopf 2023/24

SAVING B REACTOR

History of the B Reactor Museum Association (BRMA) and the Struggle for Preservation and Public Access to B Reactor



Dedication: This document is dedicated to the founding members of the B Reactor Museum Association who had the foresight and vision to secure a place in history for the B Reactor and prevent the isolation and destruction of the World's first full scale nuclear reactor. Those individuals sought to save the reactor from demolition and establish at a minimum, a Museum that could be visited in the future for many generations to come. Del Ballard began recording the history of BRMA along with the efforts of other founding members and future members and they are to be commended and thanked for their efforts to accomplish this task and to meet their initial goal of preserving the reactor and converting it to a museum for visitors. The BRMA continued to work and support the efforts which ultimately resulted in the formation of the Manhattan Project National Historical Park. Little did they know at the time that this along with two other sites (Oak Ridge TN, and Los Alamos NM) would become a National Park (The Manhattan Project National Historical Park). Thanks to all for their efforts.

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Forward

This document has been a vision of Del Ballard, one of the founding members of the B Reactor Museum Association (BRMA), for a number of years. He began this project approximately 20 years ago to identify who the BRMA is, what their goals were/are, and to document the efforts the organization accomplished to get to a point where the BRMA goal of establishing a B Reactor Museum or National Park was accomplished. The original goal of the BRMA was to preserve the B Reactor from the fate of Decontamination and Decomissioning in the form of "Cocooning" the reactor building as was the fate of the other eight Hanford reactors as part of the site cleanup process. Once the reactor was saved from "Cocooning" the next step was to turn B Reactor into a museum. Little did BRMA know when they initiated this process, or even imagine, that B Reactor and other sites at Hanford, as well as at Oak Ridge, TN and Los Alamos, NM, would become the Manhattan Project National Historical Park (MAPR). Del's knowledge and involvement in the process led him to begin the work of telling the BRMA story beginning with the establishment of BRMA (1990) as a non-profit organization. The draft that Del created sat for a number of years due to too many things on his plate as the BRMA President, Vice President, and Treasurer for 14 years.

In 2014, Dave Marsh arrived on the scene as a Docent for B Reactor Tours, and Pre-Manhattan Historical Tours. Dave, having worked on the Hanford Site in many different capacities over a span of 40 years became one of the Lead Docents responsible for the Pre-Manhattan Historical Tour leadership in conjunction with Anne Vargus of Indian Eyes and fellow Docent Marty Zizzi. After two years of serving as a Docent and learning more about who these old timers with the blue BRMA hats serving as Docents were, he determined that there was more to the tour program than just conducting tours of B Reactor and the Pre-Manhattan sites. Therefore, in 2018, Dave joined BRMA and, with a lot of help from Del who was the Treasurer at that time, accepted the BRMA Board position of Treasurer in 2019 and has been serving in that capacity until January of 2024. In 2023, the BRMA President (Robert Franklin) stepped down from his role as President and Dave was elected to the President position in the fall of 2023.

While working with Del, Dave would frequently hear Del say that he would really like to return to the BRMA history document and get it completed and published as a historical document. Dave and Del talked several times about what that meant and what kind of an effort it would take to complete the remaining work and get the document published. The Covid 19 pandemic came along in 2019 and affected all of the B Reactor tour programs and the activities in which BRMA was involved. In early 2020, Dave talked with Del and told him he was interested in picking up where he had left off to complete editing and proceed to publishing this document. That was over three years ago and BRMA is now at a point where the story is documented and can now be edited by our Board of Directors and soon published. Dave did not realize the amount of time it would take to update the document and fill in the blanks where the story was missing parts, but at this point in time he is very grateful for the opportunity to take on this task and work toward publication. The amount of information that Dave learned over that period of time is amazing and has increased his knowledge of the BRMA and truly impressed him with the efforts from BRMA members as well as many other organizations that worked together to accomplish the task of preserving B Reactor and other Manhattan Project sites as well as Pre-Manhattan sites at Hanford. Dave states that he is eternally grateful for the opportunity to work closely with Del and current and past BRMA members. Dave is also grateful for the input from past BRMA Board members in filling in the blanks of past events to accomplish this goal for BRMA.

Throughout the process, the support of the Department of Energy staff at Hanford has been instrumental in setting B Reactor and other important Manhattan Project sites aside and protecting them from demolition.

The following are words of encouragement from the Department of Energy (DOE) who funds and manages the Manhattan Project facilities and the Hanford Tour Programs including the B Reactor Tour and the Pre-Manhattan Historical Tour. Since the mid-to-late 1990's the Department of Energy has worked with local and national legislators and many supporting organizations to evaluate the possibility of protecting the B Reactor and setting it aside as a potential museum for the future. DOE has supported BRMA efforts to preserve B Reactor, and during that time DOE spent many years interacting with BRMA and then in 2003 that office began direct interaction with BRMA. DOE appreciates the role BRMA played, and it was ONLY because BRMA maneuvered and partnered with DOE and the American Heritage Foundation (AHF) to shine enough of a light on B Reactor that it stayed off the "cocooning" schedule for a number of critical years. Although unable to officially document the role of BRMA, specific DOE representatives acknowledge that without the persistent efforts and influence of the BRMA the B Reactor would not have been preserved nor be available for the recognition it now receives. By 2008, the conditions were right to capitalize on public and political interest and turn the National Historic Landmark designation into a reason to change B Reactor's future! The relationship between the DOE, the National Park Service and BRMA continues to develop each year and steps to build a stronger relationship continue to the present day.

Respectfully submitted, Dave Marsh

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1.0 Introduction

"The Atomic Age began at exactly 05:30 Mountain War Time on the morning of July 16, 1945, on a stretch of semi-desert land about 50 airline miles from Alamogordo, New Mexico. And just at that instance there rose from the bowels of the earth a light not of this world, the light of many suns in one." Source: Journalist William L. Laurence, New York Times, September 26, 1945

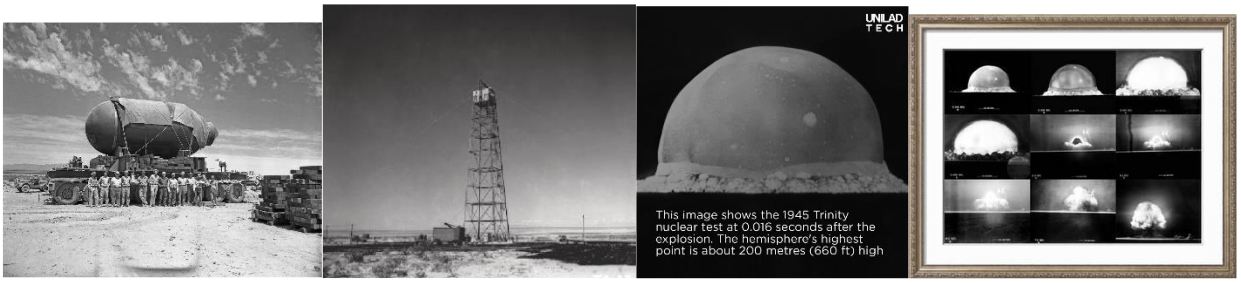


Figure 1. 1 Photos of the plutonium weapon, the Trinity test tower, and images of the mushroom cloud from the test

Disclaimer

This document is provided as a history of the progress, activities and ultimate role of the B Reactor Museum Association (BRMA) in the establishment and continued preservation of the Manhattan Project National Historic Park that was created in November 2015, and the Park's continued support into the future.

2.0 What Is B Reactor

The B Reactor is the world's first production-scale nuclear reactor. It was rushed into construction during the height of WW II as part of the Manhattan Project, the urgent effort by the United States to create an atomic bomb before one could be built, it was feared, by the Nazi Regime in Germany. The design for the reactor leaped from an extremely slender volume of research, most of which was barely a year old. In spite of the unproven technology and wartime constraints, the reactor was constructed and taken to criticality with complete success, all within a single year. In the first nine months of operation, it produced fissionable material (plutonium) for the world's first atomic bomb, the Trinity test in July 1945, and for the atomic bomb that was dropped on Nagasaki, Japan, in August 1945, which hastened the end of World War II.

2.1 Brief Historical Highlights by Year (Manhattan Project/B Reactor Timeline)

1942 Selection of Hanford for Construction of World's First Full Scale Nuclear Reactor and associated plutonium separation plants.
1943 October, Construction Began on B Reactor at Hanford
1944 September, B Reactor Start-up 11 months after groundbreaking for the Reactor Building
1944 December 26, First "Official" batch of Irradiated Fuel Processed at T-Plant
1945 February, First Official Pu transferred to Los Alamos
1945 July 16, First ever nuclear explosion, the Trinity test, in New Mexico, using Hanford plutonium

1945 August 9, Fat Man Plutonium Weapon Dropped on Nagasaki, Japan
1945 August 14, Japanese Formally Surrender ending World War II
1946 March, B Reactor Shut Down, absence of pressure to produce Pu
1948 June, B Reactor Returned to Service
1956 September to December B Reactor Water Upgrade to Accommodate Increased Power Level of 2000 MW (Reached in early 1961)
1968 February 12, B Reactor Deactivated
1976 B Reactor Listed as a Landmark for American Society of Mechanical Engineers
1990 November 19, 1990, the formal establishment of BRMA with 16 founding members (See Appendix A for list of original founding members and list of BRMA members and roles from 1976 to present)
1991 B Reactor Museum Association (BRMA) Incorporated as a 501.c.3 Non-profit organization. Initial planning began within BRMA to consider and develop a B Reactor/Manhattan Project interpretive center at the rest stop on Highway 240 near the Vernita Bridge.
1992 Listing of B Reactor on National Register of Historical Places by National Park Service
U.S. Department of Energy (DOE) issued a "Record of Decision" that stated its preferred disposition of the eight reactors was to place them in a safe storage condition for a period of up to 75 years.
The initial newsletter for BRMA, called the "Moderator", was issued. Identified as Issue 1, Aug./Sept 1992
1993 American Nuclear Society presented The Nuclear Historic Landmark Award to B Reactor.
BRMA continues to support the filming of the Oral History Project for former White Bluffs, Hanford, and Richland residents and former Hanford workers.
1993 A Record of Decision was issued that called for the dismantlement of all of Hanford's surplus reactors, including the B reactor.
BRMA participated in the gathering of signatures and distribution of a petition to preserve B Reactor.
1994 B Reactor Listed as a National Civil Engineering Landmark by the American Society of Civil Engineers.
1995 BRMA scheduled a workshop in conjunction with the 50th Anniversary of the bombing of Japan, to discuss The Hanford Legacy Project, a "Sister City" relationship between Richland and Nagasaki and a Richland Peace Park.
BRMA issued letters to the Benton County Planning Commission, the City of Richland planners, and DOE-RL planners asking that land be set aside in the Hanford Comprehensive Land Use Plan for a future Museum at B Reactor.
In mid-1995 a 42-ton granite stone was rescued by BRMA from the DOE and transferred to Jim Acord by the Lampson Crane and Rigging Co. Also, two smaller granite stones were moved by the ICF Kaiser Hanford Co.
October 9, 1995, a letter from Gerry Woodcock, President of BRMA, was issued to government planners regarding a land use study. The letter pushed for preservation of B and the creation of a state park along the Columbia River.
1996 BRMA created and established a website and a "Virtual Presence" to display the BRMA story and to highlight the activities associated with preservation of B Reactor.
A new non-profit group, The Environmental Science and Technology Foundation, dedicated to raising funds for a new museum was established. Jerry Woodcock is the BRMA representative to that group.

BRMA developed a proposal for a dinner train to/from B Reactor.

1997 BRMA issued letters to the Manager of DOE-RL (John Wagoner), the Washington State Department of Ecology, the Regional Administrator for the Environmental Protection Agency.
BRMA members participated in a walkthrough of the C Reactor for the purpose of identifying articles for a future museum at B Reactor.
BRMA prepared an "Agreement in Principle" which was provided to members of the Tri-Party Agreement (DOE-RL, the EPA, and Washington State Department of Ecology).
BRMA produced a slideshow (dated April 25, 1997) showing the broad outlines of WWII and the role of B Reactor and laying out a proposed "path forward" for the goal of making the reactor a museum and tourist destination.
Phase II Feasibility and Engineering Study was published and contained favorable support for the future of the B Reactor.

1998 BRMA established a Memorandum of Understanding with DOE-RL for cooperative development of BRMA's objectives.
BRMA continues to promote the possibility of a "Dinner Train" to B Reactor and the possibility of a boat dock at the 181-B Pump House.
BRMA was provided office space in the Bechtel office building.
BRMA also solicited input from the public through the "Moderator" to provide historical information about their work background and B Reactor.
A special thanks to Aaron Burks for hosting the Sunday February 8, 1998, BRMA Membership Meeting at the Atomic Ale Brew Pub.
Bechtel published the B Reactor hazards survey in June as document BHI-01282.

1999 BRMA continues work on the preparation of the long awaited Historical American Engineering Record (HAER) document on B Reactor.
BRMA took possession of several pallets of reactor-grade graphite blocks, which are being considered for making a demonstration core matrix.
BRMA is in the final stages of completing the B Reactor HAER.
The Final Hanford Environmental Impact Statement (HRA-EIS) containing the ultimate status of the B Reactor HRA-EIS published in April.

2000 A formal gathering on June 22, was conducted by Bechtel to show Appreciation for BRMA's efforts in the attempts to preserve B Reactor by Bechtel and DOE-RL.
BRMA members continue their effort to claim unused graphite from the Department of Energy
BRMA members participated in an evaluation of the White Bluffs bank in order to determine methods and feasibility of restoring the bank.
BRMA signed a contract with Bechtel to provide tour guides for tours at B Reactor. This includes a small honorarium for those who serve as tour guides from BRMA.
The Advisory Council on Historic Preservation (ACHP) recently sent its final report to DOE Secretary Spencer Abraham.

2001 May, The HAER of B Reactor (105-B building) was issued as HAER No. WA-164/DOE/RL-2001-16 Revision 0. This document was prepared by BRMA members with Gene Weisskopf as the project coordinator.
BRMA president Gene Weisskopf participated in a conference telephone call regarding the flagpole going up at B Reactor, including Tom Marceau (Bechtel), Dee Lloyd (DOE), and Greg Griffith (State Historic Preservation Office).
BRMA provided tour guides at B Reactor for Congressman Doc Hastings.

BRMA provided a Tour at B Reactor for Umar Salikhbaev, the Deputy Director of the Uzbekistan Academy of Sciences, Institute of Nuclear Physics, in Tashkent, Uzbekistan.

On September 11, 2001, terrorists attacked New York City and Washington D.C. which became known as the 9-1-1 Terrorist Attacks.

In late October, Gene and Del Ballard attended a meeting to discuss and provide input for the Hanford Reach National Monument's advisory panel.

BRMA members participated in a jet boat ride up the Columbia River from Richland, to B Reactor.

Bechtel's B Czar, Dru Butler, announced that the budget for cleanup efforts at B Reactor and the FY-01 DOE budget for B Reactor cleanup work was $550,000.

2002 A panel of distinguished historic preservation experts convened by the Advisory Council on Historic Preservation at the request of DOE, recommended that the "ultimate goal" for the remaining major Manhattan Project properties, designated as Signature Facilities by DOE, "should be the formal establishment of these historic properties as a collective unit administered for preservation, commemoration, and public interpretation in cooperation with the National Park Service."

Due to the 911 attacks, public tours remain suspended due to sitewide DOE security restrictions.

All regulatory requirements to make B Reactor a museum have been met at this point.

2003 September 30, Statement on Introduced Bills and Joint Resolutions by US Congress Senate Bill: 1687, which directs the Secretary of the Interior to conduct a study on the preservation and interpretation of the historic sites of the Manhattan Project System.

2004 In September, B Reactor 60th (1944-2004) Anniversary Celebration was held.

Manhattan Project National Historical Park Study Act (Public Law 108-340), Passed

National Historic Landmark Nomination by BRMA with Follow-up by National Park Service, and the University of Washington

2005 BRMA learned that the House Resource Committee had passed H.R.3207, the Manhattan Project Park Study Act and the Senate passed S-1687 the duplicate of the House bill.

BRMA established a formal Speakers Bureau to provide BRMA members as speakers to local and regional organizations.

August 17, Energy Deputy Secretary Clay Sell toured B Reactor as part of his Hanford Site visit. He called B Reactor "easily the highlight" of his trip to Hanford and declared that "I think it [B Reactor] should be saved."

2006 BRMA members Sally and Bob Potter represented the association at the first-ever DOE sponsored Museum Conference held in Las Vegas, NV in June.

In March of this year, the NPS kicked off the Manhattan Project National Historic Park Special Resource Study authorized by Public Law 108-340 signed by President Bush in October.

2007 Funding was received from the Murdock Charitable Trust fund for development of two exhibits for the B Reactor, a 100-B Area model and model of graphite used in the B Reactor Core.

August 23 and 24, BRMA members Sally Ann and Bob Potter represented BRMA and the B Reactor Preservation Coalition as part of a Hanford Communities delegation at the Historic Preservation Peer Exchange Conference hosted by the Energy Communities Alliance (ECA) in Washington, D.C.

The B Reactor scale model is placed at B Reactor

2008 August, following approval by the Secretary of the Interior, National Historic Landmark status was given to the B Reactor in a ceremony held at the B Reactor

2009 Formal establishment of the current B Reactor Tour Program by DOE-HQ Deputy Secretary Jeffery

Kupfer
Formal contract established with Indian Eyes to manage the Hanford Tour Program.
BRMA in conjunction with DOE-RL supported the application for the NPS grant which is part of the Save America's Treasures program for the preservation of significantly historic items.

2010 Letter from the DOE dated May 13, 2010, signed by Dr. Ines R. Triay, Assistant Secretary for Environmental Management at the Department of Energy refutes NPS determination of infeasibility of establishing a multi-location National Park
DOE-RL established a comment period to address surplus rail cars on the Hanford Site
BRMA works with AHF and DOE-RL to develop videos for visitors to B Reactor.
September, The Special Resource Study/Environmental Assessment was issued, as "DOE/EA-1868."

2011 July, the Secretary of the Interior, with DOE concurrence, in a letter to Congress recommended the establishment of a three-site Manhattan Project National Historical Park. The Secretary recommended that the park be managed as a partnership between NPS and DOE.
Excess graphite finally transferred to BRMA for use in development of a core model.

2012 Congress held a hearing in both houses on the proposed Manhattan Project National Historical Park, but passage of a bill to implement the park failed.
June 28, H.R. 5987, A bill was submitted to establish the Manhattan Project National Historical Park in Oak Ridge, Tennessee; Los Alamos, New Mexico; and Hanford, Washington; and for other purposes, but failed passage.
Secure funding was obtained to develop the 100-B Area Model and the Graphite Model for display at the Reactor.

2013 Congress held a hearing in both houses on the proposed Manhattan Project National Historical Park, but passage of a bill to implement the park failed.
After many years of attempts to allow youth to visit B Reactor, approval was granted.

2014 September, Celebration of B Reactor 70th (1944-2014) Anniversary
December 4, 2014, the House passed the 2015 National Defense Authorization Act, which authorized the Manhattan Project National Historical Park. The Senate passed the bill on December 12.
President Obama signed the National Defense Authorization Act into law on December 19, authorizing the Manhattan Project National Historical Park.
December, B Reactor is officially included in the Manhattan Project National Historical Park, consisting of historic facilities at Hanford, Los Alamos and Oak Ridge.

2015 November, A Memorandum of Agreement between the National Park Service and the Department of Energy was signed, formally establishing a process for managing the Manhattan Project National Historical Park.

3.0 Why BRMA

In 1989, the Tri-Party Agreement (TPA) was created among the Department of Energy (DOE-RL), the Washington State Department of Ecology (WDOE) and the Environmental Protection Agency (EPA). It was soon realized that the fate of B Reactor was in jeopardy of being demolished, along with the other eight nuclear reactors at Hanford.

Individuals who had worked at B Reactor or other facilities at Hanford were the initial supporters of preservation, especially for B Reactor, given that it was the first of its kind, a full-scale production nuclear reactor.

It is well recognized that the formation of BRMA was the starting point for an organized and formalized effort to preserve B Reactor. However, for several years prior to BRMA, there were many suggestions and sporadic efforts to conserve the history represented by B reactor.

As the 1980s ended, the cold war was over and all plutonium production ceased at Hanford. N Reactor was officially shut down in late 1986. Plans were being made for cleanup of the Hanford site, which included the disposal of all nine production reactors (the initial 3 [B, D, and F] and the additional 6 reactors [C, DR, H, KE, KW and N]). It certainly was not clear from either the Environmental Impact Statement (EIS) or the TPA that any of those unique, historic facilities would be preserved.

The fact that the DOE-RL was making plans to tear down and clean up the entire site, with little interest in any preservation efforts, was a real concern for members of the local Tri-City Technical Council. This was an umbrella organization of representatives from the 20-some scientific and engineering societies that were active in the Tri-Cities. A committee was formed to consider what could be done to change the decision to dismantle all the reactors and certainly the initial reactor, B Reactor, and also to consider options for converting that reactor into a museum.

The committee members were well aware that B Reactor held a very special place in history—it had been a major contributor to world history, science, technology, and engineering, and that it should be preserved.

Over the next 10 to 12 years, efforts and proposals were made to set aside the B Reactor for future consideration as a Museum, National Landmark, or even a National Park in order to preserve its history.

3.1 What is BRMA

BRMA is an all-volunteer association of individuals and groups originally formed to preserve the historic B Reactor on the Hanford site in southeastern Washington State as a public museum. That goal was achieved with formation of the Manhattan Project National Historical Park, which includes B Reactor and other historic facilities at Hanford; as well as at Los Alamos, New Mexico; and Oak Ridge, Tennessee.

BRMA is proud to partner with the National Park Service and the Department of Energy, the two agencies responsible for the operation of the Hanford branch of the Manhattan Project National Historical Park.

4.0 Formation of BRMA

4.1 Manhattan Project Historical Overview

The Italian born physicist, Enrico Fermi, had successfully demonstrated that it was possible to release and control the enormous internal energy of the atom. In December 1942, Fermi and his staff at the University of Chicago had assembled a large stack of graphite blocks interlaced with hunks of natural uranium, in a configuration that would hopefully constitute what is now called a “critical mass” and thereby create a "nuclear chain reaction”. In other words, he demonstrated the controlled release of atomic energy - the splitting of uranium atoms (fission) in a so-called “pile”. That demonstration was a major step that led to the program to build plutonium-production reactors at Hanford.

A second significant and essential discovery happened earlier when, in 1941, Glenn Seaborg had isolated the newly discovered element plutonium at his lab at the University of California, Berkeley. Plutonium is created as a by-product of splitting the uranium atom, and this was what Fermi’s pile was intended to prove. Seaborg also proved that plutonium was twice as likely as uranium-235 to fission, making the element a possible material for use in nuclear weapons. Both uranium-235 and plutonium-239 were now candidates for making nuclear weapons.

In 1942, Leslie Groves, of the U.S. Army Corp of Engineers, was selected to lead a secret program to develop an atomic bomb (to be called the Manhattan Project). He decided to proceed with two alternate approaches in producing the required fissionable materials. He elected to construct multiple facilities at Oak Ridge, Tennessee, for the purpose of concentrating (enriching) the element uranium-235; and secondly to construct facilities elsewhere to produce plutonium. He didn’t know which approach would be the most successful, therefore he proceeded with both.

4.2 B Reactor’s Historical Significance

In December 1942, the then General Groves assigned Colonel Franklin D. Matthias to select a site for the new plutonium-production facilities. Matthias and two engineers from E.I. du Pont de Nemours & Co, Inc. (DuPont) traveled west in their nationwide search, and soon settled on the area in arid and slimly populated southcentral Washington state as the preferred site. The 670 square mile area around the small agricultural town sites of Hanford and White Bluffs were soon to become the Hanford Engineer Works (HEW). The area along the Columbia River was then selected to be the site for constructing the facilities that would produce plutonium for the war effort. In an astonishingly short period of time, the Hanford site was transformed from an area of open sagebrush and sparsely located agricultural uses to a huge industrial complex. Initial construction on the Hanford site included three production reactors identified as the B, D, and F Reactors. Groundbreaking for the B Reactor was conducted in October of 1943 and the Reactor was completed with start-up of B Reactor in September of 1944, just 11 months after construction began. The B Reactor was the first of three Reactors constructed and placed into operation in late 1944 and early 1945.

As a part of the Hanford facilities, three chemical-processing plants were built, the B, U and T plants (in the 200 Area at Hanford), for chemically separating plutonium from the irradiated fuel slugs. Facilities were also built for fabricating uranium slugs for reactor fuel (the 300 Area). And, of course, all the support facilities, area wide infrastructure, and the village of Richland to house the operating staff. This whole

complex was constructed in an unbelievable time of some 15 months. The first shipment of plutonium was delivered to Los Alamos, New Mexico for use in developing the bomb, in December 1944.

Hanford continued to operate and produce plutonium for nuclear research and development, all the way through the Cold War and through the 1980s, when the last of Hanford's nine reactors was shut down.

4.3. Situation when BRMA was formed 1989-1990

Early in the 1990's, it was evident that some entity was necessary to promote and sponsor the decision to set aside and preserve B Reactor for future generations. The reactor building (105-B) was slated to be placed into "Interim Safe Storage", the supporting facilities dismantled, and the site decontaminated and decommissioned. The time was right for the formation of an organization to preserve the B Reactor and its significant history.

4.4 Founding of BRMA 1990-91

On July 17, 1990, the initial meeting of a committee (later to be designated as the B Reactor Museum Association or BRMA) was held in a government office building in Hanford's 300 Area.

Attendees included Tom Bearden, Jay Haney, Kevin Clark, Jim Stoffels, Del Ballard, and Gary Fetterolf. The primary purpose was to consider what type of organization would be most appropriate in their efforts to preserve B Reactor. The title picked for the new organization was to be the B Reactor Museum Association (BRMA). It was strongly recommended that the association seek tax-exempt status as a 501 (c)(3) nonprofit organization, a set of by-laws, and the election of officers for the new organization's board. The group also discussed the needs for plans be established to recognize the 50th anniversary of the B Reactor construction and operation in 1994.

Subsequent meetings were held in September and October to further the plans for formalizing the BRMA. The purpose and goals of the organization were established. Gary Fetterolf was asked to draft a set of bylaws. Official contact was to be made with Department of Energy officials to establish a relationship and offer support. Del Ballard volunteered to contact Sid Morrison, our district's Representative in the U.S. Congress, for his support.

Tom Bearden and Jim Stoffels held the first official meeting with the DOE Richland Operations Office (DOE-RL) on September 5, 1990, where they introduced BRMA and its objectives, and expressed their interest in obtaining the DOE's input and cooperation. Attendees included Tom Bauman, DOE-RL Director of Communications, Kevin Clarke, in charge of cultural resources at Hanford, and Kenneth Jackson, Hanford Site Security. Discussion included what entities and their contacts may be involved in efforts to consider a "community museum".

The meeting of November 19, 1990, can be considered as the formal establishment of BRMA. With 16 "founding members" in attendance, officers were elected: Tom Bearden as President, Jim Stoffels as Vice President, Del Ballard as Secretary, and Gary Fetterolf as Treasurer. It was recommended that eight standing committees be established, although these positions were not filled at that time.

On November 20, 1990, Del Ballard, Tom Bearden, and Don Sandberg met with U.S. Congressman Sid Morrison to discuss current activities for the preservation of Hanford's B Reactor as a historical museum. Recommendations were developed on how BRMA should exert a disciplined approach to review and comment on the final environmental impact statement for the Hanford reactors that was about to be issued. Congressman Morrison indicated solid support for preservation of B Reactor and the Hanford legacy. He was given several relevant documents, including a letter from the American Society of Mechanical Engineers (ASME) to the then Secretary of Energy, Admiral Watkins, asking DOE to reconsider the demolition of B Reactor.

With the help of Attorney Bob Heye, who acted pro bono for BRMA, the group submitted their Articles of Incorporation to the state of Washington in mid-January 1991. The Certificate of Incorporation was signed by Secretary of State Ralph Munro on January 22, 1991. Thomas Beardon signed for BRMA, as the initial Registered Agent for the organization.

4.5 BRMA Non-Profit Corporation Status

The initial request for 501(c)(3) tax-exempt status was submitted to the Internal Revenue Service (IRS) in July 1991. Temporary approval was granted via a letter dated August 21, 1991. After a five-year Advance Ruling Period, BRMA received confirmation from the IRS on June 04, 1996, stating that tax exempt status approval had been granted to the B Reactor Museum Association.

4.6 BRMA Goals

4.6.1 Initial BRMA Goals

The following six goals were those originally identified by BRMA with the distinct purpose of setting B Reactor aside as a museum.

1. Initiate and support efforts to set aside B Reactor as a Museum, National Landmark, or National Park.
2. Restore the reactor building and contents to reflect its appearance during operation.
3. Add exhibits that reflect the history of the Hanford site.
4. Provide public access to B Reactor, including road access from Highway 24 or 240.
5. Educate the public as to the historical and technological significance of B Reactor.
6. Promote other attractions in the Tri-City area to increase visitors to B Reactor.

4.6.2 BRMA Revised Goals 2015

Following the establishment of the Manhattan Project National Historical Park, in November 2015, the original goals for BRMA were revised to reflect a change in mission and vision for the organization.

1. Provide recommendations for priorities for park development and interpretation directly and through the Tri-Cities Park Committee to DOE, NPS, other Park sites, EPA, and elected officials
2. Organize Committees per existing Bylaws to Implement Identified Goals
3. Provide updates, corrections and whole new sections for Atomic Heritage Foundation's (AHF) Green Guide

4. Assist in developing and installing DuPont exhibit in 105-B Bldg.
5. Assist NPS in installation and operation of the 105-B Wi-Fi system
6. Add display about T Plant at 105-B or Logston
7. Expand BRMA souvenir & document items and sales, including patches and new AHF Green Guide
8. Publish a BRMA history and accomplishments document
9. Provide support for the formation of a Friends of the Park Organization

4.7 BRMA's Role in the Preservation of B Reactor

The following sections describe the many roles played by BRMA in the preservation of the B Reactor, from the initial steps to get the facility set aside as a National Historic Landmark to designation of multiple national engineering organizations to the ultimate designation as a leg of the Manhattan Project National Historical Park in 2015.

4.7.1 BRMA's First 10 Years

The first decade of activities by BRMA was along three fronts.

1. Conducting activities to educate the public and to develop local and regional support for the preservation of the historic B Reactor.
2. Working to influence the DOE and the Hanford site prime contractors to get the reactor cleaned up and removed from the contract's scope of work to be cocooned.
3. Getting state and federal legislators informed and in support of the historic significance of B Reactor and to support its preservation.

In February of 1994, future BRMA President Jerry Woodcock (President from January 1995 to December 1997) described his thoughts and status of planning for the writing and casting of a play titled "B REACTOR STARTUP" to be performed in September 1994. Jerry indicated that he planned to write the script and ask for volunteers to help with planning and casting for the play.

5.0 Studies, Reports, & Legislation

5.1 Local/Hanford Activities

5.1.1 Phase 1 Feasibility Study Summary 1995

A Record of Decision issued in 1993 called for the dismantlement of all Hanford reactors, including the B Reactor. Work was progressing towards this, including the decontamination of the reactors. In 1992, the B reactor had been placed on the National Register of Historic Places, and there was strong and growing support throughout the nuclear community to preserve the reactor as a museum. Preliminary steps had been taken towards preservation of B Reactor. Examples were the installation of visitor displays, and conducting limited, controlled tours, many of which were led by BRMA guides. Portions of the facility that had residual radioactive contamination were not included in these tours.

Through persuasion via internal and external interests, and specifically from BRMA, the DOE authorized a study (called the Phase I Feasibility Study) to define what was necessary to continue using the B Reactor as a museum. The scope of that study was to evaluate the technical feasibility of those activities; to examine the cost effectiveness of those actions versus dismantlement; and to evaluate options that would improve the B Reactor as a museum attraction. In addition, an examination of the cultural value of the reactor was done, noting specifically its relationship to the Hanford site and place in national/international nuclear history. This Phase I report was authored by Battelle Pacific Northwest Laboratories/Parsons Environmental Services, Inc.

BRMA participated in establishing the content and detail of the report through periodic reviews and comments on drafts of the report.

Six alternatives were evaluated in this Feasibility Study. The first five alternatives each addressed the use of B Reactor as a museum. The first alternative provided only the most basic repairs and improvements to the facility to permit continuation of ongoing tours. The next three alternatives considered making improvements and enhancements to the reactor, adding additional displays and improved access. All of these alternatives concluded that the use of the facility as a museum was technically feasible and the necessary actions could be implemented separately in a time-phased manner. Preliminary cost estimates were provided, as well.

The sixth alternative called for the dismantlement of the reactor in compliance with the standing Record of Decision (ROD) obtained through the National Environmental Policy act process. Such dismantlement would not meet the intent of the listing on the National Historic Register or allow appropriate preservation of the historic landmark. The cost estimate associated with dismantlement far exceeded the cost of the activities described in the first five alternatives. The details of this Feasibility Study can be found in Appendix C-8 of this document.

Reference: BHI-00076 Rev. 01 “105-B Reactor Facility Museum Phase 1 Feasibility Study Report Approved September 18, 1995.”
For full text of this document, see: https://pdw.hanford.gov/download/288b864c-76ab-4c9b-993e-13479863fab9

5.1.2 Phase II Feasibility Study Summary 2000

BHI-01384 Rev. 0 105-B Reactor Museum Feasibility Assessment (Phase II) Project June 2000

The B Reactor is located within the Hanford Site in the 100-B Area, on the south bank of the Columbia River. It is approximately 35 miles upstream and 32 road miles from the city of Richland, in the southeastern portion of Washington State, and is one of nine plutonium-production reactors constructed during the 1940s and the Cold War. Construction of the B Reactor began June 7, 1943, and operation began on September 26, 1944. The B Reactor was the world's first full-scale production reactor and produced plutonium for the first man-made nuclear explosion, the Trinity Test in New Mexico on July 16, 1945, and for the bomb dropped on Nagasaki, Japan, on August 9, 1945. The reactor permanently ceased its plutonium-production operation in February 1968. Because of its historical significance, the reactor was listed in the National Register of Historic Places on April 3, 1992. A portion of the B Reactor is currently functioning as a controlled-access tour area; however, minor hazards and deficiencies exist within the tour area that require corrective action before the public is allowed unescorted access.

This Phase II report is expected to meet the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Milestone M-93-05 commitment for the third quarter of fiscal year 2000. The purpose of this report is to provide the basis and supporting documentation necessary to prepare the B Reactor as a facility open for partial, unescorted public tours.

To this end, potential hazards and deficiencies had to be identified by performing a walk-through with professionals representing the architectural, electrical, mechanical, and structural engineering disciplines; industrial and radiological health and safety; and fire and life safety. On the basis of a review of past evaluations and information gained from this walk-through, the hazards and deficiencies in the B Reactor and proposed corrective actions are provided in the report.

The BRMA, as the primary stakeholder, was provided a review and comment period for the 60% and 90% reporting phases of this project. On the basis of the proposed corrective actions described in the 60% draft report, BRMA (in conjunction with the U.S. Department of Energy, Richland Operations Office) participated in preparation and review of the 105-B Reactor Museum Feasibility Assessment (Phase II) Project in June 2000.

The Department of Energy reached consensus on the final mitigative measures necessary to ensure the health and safety of potential tour members visiting the B Reactor and to protect the environment.

Engineering design drawings and associated costs to implement the measures were subsequently presented in the 90% draft report. Review comments received from BRMA on this report have been incorporated into this final report. The selected measures reduce or eliminate risk to persons touring the facility, provide for appropriate accessibility under the Americans with Disabilities Act, and retain the character of the building to the maximum extent possible as a registered National Historic Landmark.

The major selected mitigative activities include:

1. Providing ventilation to reduce the naturally occurring radon that accumulates in the tour area.
2. Providing new electrical service and de-energizing the existing service

3. Removing sources of radiological contamination
4. Providing necessary egress in the event of an emergency
5. Providing adequate barriers to prevent access by tour members to unauthorized areas of the facility.
6. To provide for accessibility requirements, a restroom facility with showers is recommended to be built in the vicinity of the reactor.
7. Additionally, exits and tour areas will be upgraded where needed to meet code requirements.

Because of the B Reactor's historic significance and to maintain its historical integrity, all mitigative measures have been designed to be as visually unobtrusive as possible. An example of these measures is that the existing lighting will be refurbished and used on the primary tour route. In addition, custom-made replicas of existing doors are recommended for installation where appropriate to meet current building codes.

During the review/assessment of the primary tour route, it was determined that an additional egress route was required from the "work area." This egress route will be along the southern end of the valve pit and lunchroom. In creating this egress, an additional area of the B Reactor will be opened for touring.

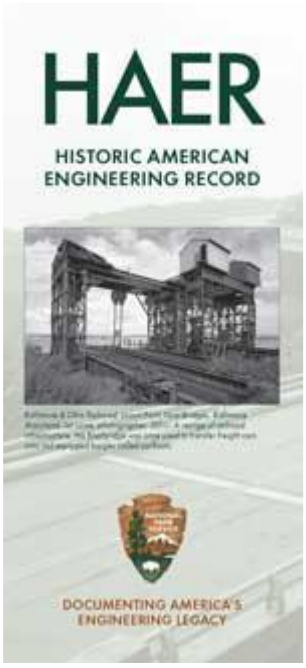
A comprehensive fire hazard analysis was also performed to evaluate the entire B Reactor as it relates to the tour route. Recommendations resulting from this analysis are included in the selected mitigative measures.

Finally, detailed engineering drawings and associated costs are provided in this report for completing recommended hazards mitigation activities. After the recommended actions of this report are implemented, the tour route portions of the facility will meet the safety requirements necessary to allow unescorted access by the public.

However, appropriate surveillance and maintenance activities must remain a key requirement to maintain the structure for public access. A corrective action for the aging roof and exterior ventilation ducting was beyond the scope of this work but will be necessary in the near future.

Reference: 105-B Reactor Museum Feasibility Assessment (Phase II) Project. BHI-01384, Rev.0

5.1.3 B Reactor HAER Document, Prepared by BRMA, 2001



Historic American Engineering Record (HAER)

The Historic American Engineering Record (HAER) was established in 1969 by the National Park Service, the American Society of Civil Engineers and the Library of Congress to document historic sites and structures related to engineering and industry. This agreement was later ratified by four other engineering societies: the American Society of Mechanical Engineers, the Institute of Electrical and Electronic Engineers, the American Institute of Chemical Engineers, and the American Institute of Mining, Metallurgical and Petroleum Engineers. Appropriate subjects for documentation are individual sites or objects, such as a bridge, ship, or steel works, or larger systems, like railroads, canals, electronic generation and transmission networks, parkways and roads.

HAER developed out of a close working alliance between the Historic American Buildings Survey (HABS) and the Smithsonian Institution's (SI) Museum of History and Technology (now the Museum of American History). From its inception, HAER focused less on the building fabric and more on the machinery and processes within, although structures of distinctly industrial character continue to be recorded. As the most ubiquitous historic engineering structure in the landscape, bridges have been a mainstay of HAER recording; HABS also documented more than 100 covered bridges prior to 1969. In recent years, maritime documentation has become an important program focus.

In 2001, BRMA member Gene Weisskopf completed and published the Historic American Engineering Record for the B Reactor facility. The following is a brief description of that document.

B Reactor Area 100-B, Hanford Site, Richland Vicinity, Benton County, Washington
Official Document Number/Reference HAER No. WA. 164 DOE/RL-2001-16
Published May 2001

The B Reactor is the world's first industrial-scale nuclear reactor. Its sole mission was to transmute uranium into plutonium, which could then be fashioned into an atomic bomb. B Reactor's role in history is unmistakable, as significant and world-changing as the discovery of fire, the first gasp of a steam-driven piston, or the first flight by the Wright brothers. Such events are recognized immediately for their import, and forever stand as milestones in the human timeline.

Being the first secures a spot in history, but many other factors play into B Reactor's historical role. This stark concrete structure focuses a broad set of historical vectors and then send them on their way in completely new directions.

The "pile," as reactors were then called, was born of necessity in the urgent quest by the United States during World War II to build an atomic bomb before it might be done by Germany.

1. This effort was encapsulated in the Manhattan Project, under the auspices of the Army Corps of Engineers, which may well be the largest scientific, engineering, and industrial project ever

undertaken. Although the war was draining the country of materials and workers, the goal of building an atomic bomb was reached in less than three years.

2. The fundamental research and experimentation with nuclear chain reactions preceded the reactor's construction not by decades or even years, but by a matter of months.
3. The industrial-scale B Reactor sprang from Enrico Fermi's historic laboratory in Chicago, where he oversaw the construction of the world's first chain-reacting pile in December 1942, just a few months before construction of B Reactor began.
4. The million-fold leap from laboratory to industrial-scale power levels is remarkable. Whereas Fermi's pile in Chicago (CP1) produced power that never exceeded 200 watts (a measurement of heat, not electricity), the B Reactor operated at a power level of 250 million watts (megawatts, MW). In its later years, the reactor exceeded 2,000 MW.
5. B Reactor was the first of three built and operated by DuPont at the sprawling Hanford Engineer Works in southeastern Washington State. The B Reactor was built in little under a year, and the entire Hanford complex in two. The reactors and other plutonium-production facilities that made up Hanford are recognized as modern marvels of engineering and heavy construction.
6. The quantity of new technology that went into B Reactor is staggering. No one had ever dealt with even a fraction of the radiation that was generated in the Hanford piles. Reactor materials, cooling system, shielding, and instrumentation all had to be designed and built to withstand this entirely new environment, as were the work procedures needed to operate it.
7. B Reactor was built for the short-term, but after helping to end the war it continued to produce plutonium for more than 20 years. The quality of its design and construction far exceeded the immediate wartime needs.
8. Its role of making plutonium was the world's first application of nuclear energy from a self-sustained nuclear chain reaction. The experience that was gained and the groundbreaking advances in technology that were made over its 24-year life span influenced the design and operation of the nuclear reactors that were to come.
9. B Reactor supplied plutonium for the world's first atomic bomb, the Trinity test on July 16, 1945, and for the atomic bomb that was dropped on Nagasaki, Japan, on August 9, 1945.
10. The reactor created tritium for the world's first thermonuclear explosion, the hydrogen bomb test in November 1952, and established the processes and procedures for full-scale tritium production.
11. Its role as a plutonium-production reactor, the world's first, makes B Reactor a central player in the 45 years of atomic stalemate between the United States and the Soviet Union, the Cold War.

"Foreword by the B Reactor Museum Association"

This history of Hanford's B Reactor is not just a work of historical investigation. It is also the out-growth of the collected interests and lives of the members of BRMA. BRMA was organized in Richland, Washington, in 1991 to promote the preservation of B Reactor and its eventual conversion into a public museum. To achieve those goals, BRMA lobbied and worked with the U.S. Department of Energy (DOE), other governmental bodies, contractors working to clean up the Hanford Site, and the public. Although the reactor was not yet open to the public, the goal of a B Reactor Museum was soon officially shared by the Department of Energy.

Many members of BRMA worked at Hanford and the B Reactor. Some arrived at Hanford during the top-secret war years and worked on construction of the plant. A few were there at B Reactor when it first

started in September 1944. All members of BRMA, including even those who never worked at Hanford, have an appreciation for the intense historical focus that can be found at B Reactor.

A contract to write this Historic American Engineering Record was issued to BRMA by Bechtel Hanford Inc, the DOE contractor whose responsibilities include overseeing historic and cultural resources at Hanford. Bechtel requested BRMA's authorship based on the group's long involvement with B Reactor. Tom Marceau, the technical representative and liaison at Bechtel, did much to facilitate the entire process, and his efforts are greatly appreciated.

At the DOE's Richland Operations Office, Dee Lloyd, the manager of Hanford's Cultural Resources Program, was a ready and helpful resource on many issues that arose. The work on this document was organized and managed by project coordinator Gene Weisskopf, one of the few BRMA members who never worked at Hanford or in the nuclear industry. Gene was responsible for all aspects of the project and acted as the point of contact between BRMA, Bechtel, and the DOE. He did the bulk of the research, writing, formatting, and associated tasks for this project. Many others assisted in many different ways.

Del Ballard and Lyle Wilhelmi helped to spearhead this project in the beginning, talking with Bechtel and BRMA members about how the job might be handled. Del spent many hours researching DOE plans and drawings and provided much assistance and advice to the project coordinator as the work progressed. Lyle Wilhelmi did extensive searches for appropriate photographs, finding plenty from which the best were culled. Both reviewed much of this document and offered valuable comments.

Roger Rohrbacher wrote the first draft for the "Instrumentation" section, clearly explaining how the instruments both controlled the reactor and provided multiple and redundant safety systems. He answered countless technical questions throughout this project, always in clear, understandable language.

Miles Patrick wrote the draft that served as the basis for the material in the "Cooling System" section and answered many questions about the all-important treatment of cooling water for B Reactor.

Jim Stoffels wrote the bulk of the "Tritium Production at B Reactor" section and was frequently called upon for advice and counsel. He reviewed the final draft of this document and offered valuable fixes and suggestions. Jim also secured the rights to include the three Yamahata photos of post-atomic bomb Nagasaki. The sobering images vividly illustrate the awesome power released by the plutonium that was produced at Hanford. We thank Shogo Yamahata, the photographer's son, for granting us permission to include the images in this document.

Ron Kathren reviewed the entire document in great detail, and thereupon revised and wrote more material for the section titled "Worker Health and Safety." His longstanding expertise in the field of health physics added much to this document.

Kelly Woods provided the background, solid technical advice, and personal remembrances that were needed to bring to life a classic reactor problem laid out in the section named "Graphite Swelling and the Closure of B Reactor." Kelly's generous e-mail and telephone communications proved to be a boon to the success of this history.

Other reviewers donated substantial amounts of time to ensure the technical and grammatical accuracy of this document, including Tom Clement, Jim Frymier, Bill McCue, Richard Nelson, Pam Novak, and Jim Williams.

Many of the interviews excerpted in this document were done by Greg Greger, working with videographer Tom Putnam. Their efforts laid the groundwork for the continuing oral history of Hanford and B Reactor. We extend our thanks and appreciation to those who offered us their time and memories.

Many other BRMA members offered advice, suggestions, and encouragement, and their efforts are also reflected in this work, including Richard Dierks, Eugene Eschbach, Greg Greger, Joe Hedges, Annette Heriford, Roger Hultgren, Dee McCullough, Bill Michael, John Rector, Carol Roberts, Jerry Saucier, Bob Smith, and Harry Zweifel.

Others outside of BRMA also deserve recognition and our thanks. At the DOE Reading Room in Richland, librarian Teri Traub and Janice Parthree were immensely helpful during the research phase, and their kind demeanor is much appreciated. In Bechtel's records-management group, our thanks go to Linda Montgomery and Ed Zugar who directed our searches for photos. We also thank Marjorie McNinch at DuPont's Hagley Library in Wilmington, Delaware, for her courteous replies to our queries.

We are indebted to all the men and women who ushered in the Atomic Age at Hanford, a part of whose story we tell here. Under the pressures of a world at war, they worked in secret in a totally new, untried industry that might have failed catastrophically. Most of them had no knowledge of B Reactor's and Hanford's purpose, but they did have unlimited faith in their country and their cause. As for the other side of B Reactor's world-changing story, we also recognize those who died in Nagasaki from the bombing on August 9, 1945; their place in history will forever be remembered.

The ultimate "thank you" goes to the members and supporters of the B Reactor Museum Association, without whose efforts the story of B Reactor and all it represents might never have been told.

5.1.4 Engineering Evaluation/Cost Analysis Study and report.

Included here is the Executive Summary of DOE/RL-2004-55 Draft A

This document presents the results of an evaluation of three removal action alternatives for the final configuration of the 105-B Reactor Building pending eventual disposition of the reactor core by 2068. Portions of the 105-B Reactor Building and the 116-B Reactor Exhaust Stack are contaminated with chemical and radiological hazardous substances and pose a potential risk to human health and the environment, warranting a final removal action. An interim removal action decision for a time frame of up to 10 years was documented in an action memorandum in 2001, which included hazard mitigation and potential public access of the 105-B Reactor Building (DOE-RL 2001 c). To date, approximately 85% of the hazard mitigation removal actions stipulated in the 2001 action memorandum have been completed. Achievement of the remainder of the hazard mitigation removal actions will continue through 2011 or until a final disposition pathway is determined.

In accordance with previous commitments, the U.S. Department of Energy (DOE) is continuing to seek a sponsor with interest in preserving all or part of the 105-B Reactor Building for historical purposes. To date, such a sponsor and funding have not been identified, although efforts continue. The alternatives summarized in this evaluation enable the DOE to begin the planning and budgeting process for a final configuration of the 105-B Reactor Building with the assumption that a long-term sponsor cannot be found and there will be no long-term public use or structural preservation of the facility. This engineering evaluation/cost analysis is also being prepared to comply with Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Milestone C-l 6-06E, "Final Configuration for B Reactor." Actions evaluated in this document would be implemented, pending public approval, as a removal action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). This document briefly describes the 105-B Reactor Building, its historical significance, and interim action alternatives already selected for historic preservation. The document also describes site conditions and the sources and extent of contamination to provide a framework for the discussion of removal action objectives and alternatives. Finally, each alternative is compared against the criteria of effectiveness, implementability, and cost.

Removal actions evaluated for the 105-B Reactor Building include no action, interim safe storage, and long-term surveillance and maintenance. The no action alternative assumes all short-term and long-term maintenance of the facility is terminated and the facilities are locked to prevent entry. Interim safe storage, which has been performed or is in progress at other Hanford Site reactor facilities, includes decontamination and demolition of the reactor facility up to the shield walls that surround the reactor block, the construction of a safe storage enclosure, and a reduced schedule of surveillance and maintenance. The long-term surveillance and maintenance alternative includes an extended period of facility monitoring with major and minor repairs as necessary followed by eventual decontamination and demolition of the reactor facility. This evaluation approach has been implemented at the Hanford Site 105-C, 105-D, 105-DR, 105-F, 105-N, 105-KE and 105-H Reactor facilities with Interim Safe Storage (ISS) the preferred alternative selected.

Engineering Evaluation/Cost Analysis for present-worth cost estimates for the three alternatives are shown in Table ES-1. Consistent with guidance established by the U.S. Environmental Protection Agency and the U.S. Office of Management and Budget, present-worth analysis is used as the basis for comparing costs of cleanup alternatives under the CERCLA program (EPA 1993).

Table 5. 1 Cost Comparison for Final Configuration Alternatives for the 105-B Reactor.

Alternative	Present-Worth Cost
Alternative 1 - No Action	No cost
Alternative 2 - Interim Safe Storage	$19,623,000
Alternative 3 - Long-Term Surveillance and Maintenance	$25,870,000

The recommended removal action alternative at the 105-B Reactor Building is interim safe storage to begin at the conclusion of the 10-year interim mitigation program or when deemed appropriate by DOE and the regulatory agencies. This alternative is recommended based on its overall ability to protect human health and the environment and its effectiveness in maintaining protection for both the short term and the long term. The alternative would also reduce the potential for a release by reducing the inventory of

contaminants. This alternative provides the best balance of protecting human health and the environment, protecting workers, meeting the removal action objectives, achieving cost effectiveness, and providing an end state that is consistent with future cleanup actions and commitments to the Tri-Party Agreement (Ecology et al. 1998).

5.1.5 Surplus Reactor Auditable Safety Analysis BHI-01172 August 2004

EXECUTIVE SUMMARY

This auditable safety analysis (ASA) documents the authorization basis for the surveillance and maintenance (S&M), until final disposition, of the following inactive reactor buildings and ancillary facilities: to include:

105-B Reactor Building
116-B Reactor Exhaust Stack
119-B Building
1608-B Gas Line Pressure/Vacuum Seal House
105-C Reactor Building
No ancillary facilities
105-DR Reactor Building
190-DR Pumphouse
105-F Reactor Building
No ancillary facility
105-KE/KW Reactor Buildings
182-K Emergency Water Reservoir Pumphouse
183-K Pipe Tunnels
1720-K Administrative Office Building
11 0-KE and 11 0-KW Gas Storage Facilities
115-KE and 115-KW Gas Recirculation Buildings
116-KE and 11 6-KW Reactor Exhaust Stacks
11 7-KE and 11 7-KW Exhaust Air Filter Buildings
118-KE-2 and 118-KW-2 Horizontal Control Rod Storage Caves
150-KE and 150-KW Heat Recovery Stations
166-KE and 166-KW Oil Storage Facilities
119-KW Exhaust Air Sample Building
165-KW Power Control Building
181 -KW River Pumphouse
183-KW (Process Water) Filter Plant
190-KW Process Water Pumphouse.

The 105-D, 105-H, and 105-F Reactor Buildings, which are scheduled to be modified for interim safe storage under the Facilities Decommissioning Project, are outside the scope of this ASA and have their own authorization basis documents.

Except for the 105-B Reactor, the final disposition of the inactive reactor buildings, as recorded in DOE/EIS-0I 19D, Draft Environmental Impact Statement; Decommissioning of Eight Surplus Production Reactors at the Hanford Site (DOE 1989), and the Record of Decision (58 Federal Register 48509), is safe storage followed by deferred one-piece removal of the reactor blocks. The approach used is in accordance with CCN 038398, Nuclear Safety (DOE-RL 1996), as implemented in BHI-DE-01, Design Engineering Procedures Manual, EDPI-4.28-01, and 0000X-EG-N0004, Rev. 1, Engineering Guide for Performing Hazard Analysis and Final Hazard Classification (BHI 1998d).

Deterioration of the reactor buildings and ancillary facilities, which have exceeded their design life, presents potential industrial safety and radiological/chemical/biological hazards to workers during S&M activities. In addition, the reactor blocks and fuel storage basins within the reactor buildings contain significant quantities of radionuclides that present potential radiological hazards onsite and to adjacent areas of the Columbia River. Corrective maintenance performed on these facilities under the risk management program has significantly reduced the risk associated with these hazards.

A detailed analysis of the potential hazards associated with the S&M activities at the inactive reactor buildings and ancillary facilities indicated that no activity/process authorized by this ASA could credibly result in undue risk to a worker, a member of the public, or the environment. Environmental Restoration Contractor programs and procedures, including the work control program, and passive barriers (e.g., asphalt emulsion covering fuel storage basin walls and floor, the thermal and biological shields encasing the reactor block graphite stack) adequately control the hazards associated with these facilities. The appropriate programmatic, project-specific, and special controls that protect the worker, the public, and the environment have been identified and are detailed in Section 5.0.

The final hazard classification for the inactive reactor buildings and ancillary facilities was determined to be radiological, based on an analysis of the hazards associated with the Surveillance & Maintenance of the facilities. The special controls necessary to ensure that the bounding analysis assumptions remain valid are detailed in Section 5.0. This document can be found in its entirety on the DOE/RL website.

5.2 Local Actions to Support MAPR Creation

5.2.1 Initial Proposals to Set B Reactor Aside

At a scoping meeting held by the DOE on December 4, 1990, asking for public input, BRMA presented comments requesting the preservation of B Reactor. Del Ballard read a prepared statement describing the desire of many to recognize, preserve, and make available to the public B Reactor and the facts and hardware that form a significant part of our nation's nuclear history. Specifically, that "It is the desire and recommendation of the B Reactor Museum Association that the Hanford B Reactor be preserved and converted to a historical museum facility." It was further requested that the DOE expand the scope of their Programmatic Environmental Impact Statement to include the consideration of the historical significance of selected major facilities or features of the nuclear complex. Specifically, BRMA asked "that the B Reactor be preserved and restored, as necessary, for use as a national museum and in a manner that permits full public access and viewing."

5.2.2 Hanford Land Use Plan

DOE/EIS-0222-F Final Hanford Comprehensive Land-Use Plan Environmental Impact Statements September 1999

Specifically, Executive Order 12512, Federal Real Property Management, requires executive agencies to ensure the effective use of real property in support of mission-related activities. Also, to stimulate the identification and reporting of excess real property and to achieve maximum utilization, the Federal Property and Administrative Services Act of 1949, as amended, requires all executive agencies to periodically review their real property holdings. These reviews identify property which is "not needed," "underutilized," or "not being put to optimum use." Property determined to be excess should be promptly reported to the Federal General Services Administration (DOE 1997b).

1.0 Introduction

Coordinated land-use planning is one of the many trustee responsibilities the U.S. Department of Energy (DOE) has, as a federal agency holding Federal assets. This Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS) considers several land uses for the Hanford Site planned for at least the next 50 years. As Hanford cleanup progresses through the next 40 years, cleanup Records of Decision (RODs) issued under the Comprehensive Environmental Response, Compensation, and Liability Act of 1989 (CERCLA) and decisions made through the Resource Conservation and Recovery Act of 197610 (RCRA) permitting process will impact some areas within the proposed land uses. Likewise, other DOE missions, such as research and development (R&D), might be collocated at Hanford because of DOE's continued Federal presence as the long-term caretaker of CERCLA/RCRA or low-level waste (LLW) disposal sites. Other DOE missions, such as economic development or even other Federal mandates such as natural resource protection, could also impact Hanford land uses.

As with all Federal activities, where, when, and how quickly Hanford waste sites are remediated and proposed land uses are achieved depends on Congressional funding. It is DOE's responsibility to include in its annual budget request sufficient funds for applicable environmental requirements. The Tri-Party Agreement, which defines the schedule for clean-up activities at the Hanford Site is one source of such requirements and is itself dependent on Congressional funding. These cleanup activities are an important factor in determining when, or even if, proposed land uses might be fulfilled.

The DOE has prepared this HCP EIS to evaluate the potential environmental impacts associated with implementing a comprehensive land-use plan (CLUP) for the Hanford Site for at least the next 50 years. The DOE is expected to use this land-use plan in its decision-making process to establish what is the "highest and best use" of the land (41 Code of Federal Regulations [CFR] 101-47, "Federal Property Management Regulations"). The final selection of a land-use map, land-use policies, and implementing procedures would create the working CLUP when they are adopted through the ROD for this EIS.

In this EIS, DOE is working with Tribal governments and Federal, state, and local agencies to develop several land-use alternatives – specifically, the potential environmental consequences associated with each alternative – for at least the next 50-year time frame. These individual land-use plans, together with a common set of policy statements, represent the distinct alternatives developed by the cooperating agencies

and consulting Tribal governments on this document. The cooperating agencies are the U.S. Department of the Interior (DOI), which includes the Bureau of Land Management (BLM), Bureau of Reclamation (BoR), and U.S. Fish and Wildlife Service (USFWS); Benton, Franklin, and Grant counties; and the City of Richland. The consulting Tribal governments are the Nez Perce Tribe Department of Environmental Restoration and Waste Management (Nez Perce Tribe) and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

With the exception of the required No-Action Alternative, each alternative presented represents a Tribal, Federal, state, or local agency's Preferred Alternative. Each alternative is presented independently. Effort was taken to present each alternative with equal measure to encourage public comment.

The HCP EIS provides environmental review for the following DOE actions:

Designation of existing and future land uses, and land-use policies and implementing procedures, through the adoption of a CLUP for the Hanford Site.

Incorporation of site-specific CERCLA RODs into a regional land-use planning process.

For full text of this document see:
https://www.hanford.gov/files.cfm/Final_Hanford_Comprehensive_Land-Use_Plan_EIS_September_1999_.pdf

5.3 Special Study NPS Legislation

5.3.1 BRMA Board Members Issue Letter to Federal Legislators Promoting Preservation of B Reactor

In a letter to members of Congress (re H.R. 3207 and S. 1687, dated March 2004) Board President Del Ballard stated: BRMA requests support for passage of these two important Congressional actions to preserve a very important part of United States history in B Reactor. The full letter can be found in Appendix C-9 of this document.

5.3.2 Draft Special Resource Study/Environmental Assessment published November 2009

The purpose of this study is to comply with the Manhattan Project National Historical Park Study Act (Public Law 108-340), passed in 2004, which directed the Secretary of the Interior to "conduct a study on the preservation and interpretation of historic sites of the Manhattan Project for potential inclusion in the National Park System." A Summary of the assessment is provided below to understand the process conducted to determine the future of B Reactor and Los Alamos and Oak Ridge facilities.

EVALUATION OF FEASIBILITY

It was initially determined that size, boundary configurations, distance between sites, safety concerns, and landownership patterns would make the establishment of an NPS unit incorporating all four sites infeasible. However, many of the issues that first led the National Park Service to make a determination of infeasibility were addressed in a letter from the Department of Energy dated May 13, 2010. In that letter, Dr. Ines R. Triay, Assistant Secretary for Environmental Management at the Department of Energy, clearly

stated the Department of Energy's endorsement of a strong and permanent partnership between the National Park Service and the Department of Energy in which roles and responsibilities would be clearly delineated. The Department of Energy reaffirmed its commitment to ultimate responsibility, in perpetuity, for cleanup and disposition of all radiological resources at all "three original DOE properties" and that these properties should be included in any future designated Manhattan Project National Historical Park. The Department of Energy also reaffirmed its commitment to site preservation and to allowing visitor access at several historic facilities, including the Hanford B Reactor National Historic Landmark at Hanford, Washington, and the X-10 Reactor National Historic Landmark and the historic Y-12 Beta Racetracks at Oak Ridge, Tennessee. The Department of Energy's May 13, 2010, letter further stated that the Department of Energy "concurs with the NPS study assumption that any facilities included in an NPS unit will remain in DOE ownership and that the Department of Energy will maintain them, preserve important historic resources at these sites, ensure visitor and employee safety, and request necessary funding from Congress to do so in the future." These expressed commitments from the Department of Energy addressed key constraints related to the feasibility of establishing a Manhattan Project National Historical Park at the three DOE facilities and their related communities in Oak Ridge, Los Alamos, and Hanford. This led to a revision of the assessment of feasibility, and to the finding that NPS management of a potential new unit is feasible.

Accordingly, revisions have been made to Alternative E. The revised alternative is contained in the document in its entirety. The revised alternative does not include Dayton as one of the sites included in the national historical park. Although the Dayton sites are potentially suitable and may possess national significance, the individual sites do not meet the same level of integrity as those in the other three locations. Nor do they meet the feasibility factors considered necessary for effective and efficient management to the extent the other sites do. In particular, there are no entities, forthcoming at this time, who are committed to preserving the historic Manhattan Project facilities in Dayton. Should interest in Dayton develop in the future, once the sites are preserved, these sites may be considered as an affiliated site along with other Manhattan Project associated resources at other locations throughout the nation.

ALTERNATIVES CONSIDERED

Alternative A: No-action Alternative
Alternative B: Nationwide Nonprofit Consortium
Alternative C: National Heritage Area
Alternative D: Area Affiliated with the National Park System
Revised Alternative E: Manhattan Project National Historical Park (with units at Los Alamos, Oak Ridge, and Hanford)

ALTERNATIVES CONSIDERED BUT DISMISSED

The following alternatives were considered but dismissed in the environmental assessment. They are presented here as background to the process that brought the study team to revise alternative E.

1. Designation as a National Historical Park Encompassing Los Alamos, Oak Ridge, Hanford, and Dayton.
2. Designation as a National Monument under Department of Energy Administration

THE SELECTED ALTERNATIVE

Alternative E was revised to include Oak Ridge, Tennessee, and Hanford, Washington, as locations to be included in the national historical park along with Los Alamos, New Mexico. The revision was carried out in response to overwhelming public input and substantive comment, as well as the Department of Energy's commitment to maintain complete responsibility for safety and security.

5.4 Legislation Authorizing the MAPR

5.4.1 The Atomic Heritage Foundation

The Atomic Heritage Foundation (AHF) was founded in 2002 in Washington D.C. Its goal is Preserving and Interpreting the Manhattan Project. And later, after MAPR was created, dedicated to supporting the Manhattan Project National Historical Park and capturing the memories of the people who harnessed the energy of the atom.

Late in 2014 rumors began to flow among the communities of Richland, Oak Ridge and Los Alamos that the World War II Manhattan Project at these sites were viable candidates for National Park status. This was the result of the promotional efforts at the three major Manhattan Project sites. Within a relatively short period of time, Cindy Kelly, President of the AHF confirmed to the sites that she had just learned that the rumors were true.

Cindy had a long-standing background in preserving areas, facilities, and items of historical significance. She had a special desire to preserve the history of the Manhattan Project as the beginning of the Atomic Age. Maynard Plahuta had worked with Cindy when she worked for DOE Headquarters prior to leaving to establish and manage the AHF. Cindy was key to developing efforts to establish a national historic park. She contacted Maynard, president of BRMA along with members from Oak Ridge and Los Alamos. This was the beginning of the collective efforts to create legislative authorization to establish a national park. At Hanford, Cindy had already been working with BRMA members Del Ballard and Maynard Plahuta on a variety of items. She also had been working with people from Los Alamos and to a much lesser extent people from Oak Ridge. Thus, the development of proposed congressional language began.

Cindy started the collective effort by setting up and chairing telephonic meetings among the three sites. These started as weekly meetings but soon extended to three to four meetings each week. However, not very long after those meetings started, Oak Ridge seemed to lose interest in working diligently with the other two sites. Maynard has said that BRMA was not sure why, but it appeared there were some Oak Ridge leaders who were more interested in developing various economic development endeavors on specific DOE land that didn't coincide with National Park development.

All the telephonic meetings focused on preparing proposed language for a congressional bill to create a Manhattan Project National Historical Park [MAPR]. BRMA members recall that there were 18 separate drafts before reaching a final product. Most of the drafts involved minor changes that came about from the frequent telephonic meetings. A lot of the changes or additions resulted from specific items relevant to each or collectively all of the three sites. BRMA thought that all the Hanford interests were covered in the

draft. However, one Hanford item BRMA didn't realize was missing was an access road to and from highway 240 to B Reactor and the four pre-Hanford buildings included in the park.

At the time, David Reeploeg of TRIDEC was working with the other two sites on a variety of authorized updates needed for legislative action.

Congressman Doc Hastings must be given thanks for his leading actions in Congress to create the MAPR. Doc spearheaded action in the House along with support from Senators Murray and Cantwell in the Senate. Doc and his staff consulted and worked with other congressional members to gather support to create the Park. His consultations resulted in getting their support for the park by adding historical sites and buildings in their respective legislative districts in his proposed legislation to establish the MAPR.

It is interesting to note that DOE Headquarters Office of Environmental Management [EM] did not originally support the establishment of the park. This was contrary to the support from the Richland Office of DOE which reports to EM. However, Assistant Secretary Inez Triay who held authority over EM fully supported the establishment of the park. Of course, this negated the EM position. Also, the DOE headquarters Director of Administration and the Office of History fully supported the park.

The support of the Tri-Cities Development Center [TRIDEC] in the establishment of the park, particularly Gary Petersen, is important to recognize. Gary began participating in the previously noted regularly scheduled phone calls among the three DOE sites chaired by Cindy Kelly. In the later stages of the calls, Gary arranged to have the TRIDEC lobbyists in Washington D.C. participate in the calls. Information from the lobbyist on the status of Doc's proposed authorization bill to establish the park was the most current and accurate actions on the hill. This was helpful to BRMA in determining next steps. Gary [TRIDEC] helped the three Manhattan Project communities working with Representative Hastings and his staff and congressional representatives of Los Alamos and Oak Ridge to gather and coordinate our collective efforts needed for the next steps.

Maynard states that he knew that one of Doc Hastings' major goals while in Congress was to establish a national park. He also knew that one of the real reasons Doc invited Secretary of the Interior Salazar to visit B Reactor on one of his trips to the Northwest was to have Secretary Salazar obtain firsthand knowledge for establishment of a national park including B Reactor. Maynard recalls that the visit to B Reactor was on a Sunday afternoon where BRMA members met Secretary Salazar and Doc Hastings. During discussions with Secretary Salazar, he mentioned that groups like BRMA are often the catalyst that gets a national park established. He indicated BRMA should try to get the "works in motion" to get the selection through the system. He said from what he saw that day BRMA would get his support to establish B Reactor as a national park. That was a very encouraging comment that fostered BRMA's continued effort to have B Reactor become a national park.

Following National Park Service [NPS] regulations, and as authorized by Congress in 2004, NPS initiated its feasibility study to determine whether the Manhattan Project met all NPS requirements to be designated a national park. That study was quite exhaustive. It included evaluating all key DOE sites and activities pertinent to the Manhattan Project. The result was narrowed down to Hanford, Oak Ridge, and Los Alamos. NPS then held meetings at all three sites to gather public comment. Of course, all three sites fully supported their respective location to be included in the park.

When the first NPS feasibility draft to establish a park was issued, only Los Alamos had been chosen to be included in the park. That was very puzzling to the other two sites since those sites were key to telling the full story. For example, how could an atomic bomb be created without plutonium from Hanford. Or how could a uranium weapon be created without uranium from Oak Ridge? After some lengthy discussion with NPS, it was revealed NPS did not want to take on any responsibility to maintain the B reactor. NPS clearly stated it did not have the necessary staff, knowledge, or resources to maintain the reactor. NPS had similar concerns regarding the Oak Ridge facilities.

With knowledge of the NPS position, Inez Triay, [DOE HDQ. Assistant Secretary for EM] stated DOE would retain full control and responsibility for B Reactor and any other facilities at Hanford that may be or become part of the park. That is how DOE retains control and responsibility for the pre-Hanford facilities such as the Hanford high school and the White Bluffs bank. Inez's position was accepted by NPS and that provided the means for Hanford and Oak Ridge to join Los Alamos as an integral part of the MAPR. That agreement was included in the subsequent memorandum of understanding between NPS and DOE, and further formalized in the legislation establishing the park.

BRMA's goal began its ultimate journey to fruition when the U.S. House of Representatives passed legislation on December 4, 2014, to create the MAPR. That was followed by the U.S. Senate passage to do the same on December 12, 2014. The actual date of enactment of the law was December 19, 2014, when it was officially signed by the President. That was followed by organization meetings between NPS and DOE over several months. A cooperative agreement defining the respective roles and responsibilities of DOE as landlord of the facilities and NPS as operator of the park was then signed in Washington D.C. by Energy Secretary Ernest Moniz and Interior Secretary Sally Jewell.

The flag of the NPS flew over Hanford's historic B Reactor for the first time on November 12, 2015, at a special event commemorating its inclusion in the MAPR. More than 250 invited guests, including school children for the first time, gathered at the reactor for its dedication as part of the new park.

In closing, BRMA and the Tri-Cities community have many people and organizations to thank for getting the Manhattan Project National Historic Park established. To list them all would unintentionally miss some. Thus, it is most appropriate to make a general all-encompassing BIG THANK YOU TO ALL!

Excerpted from the Manhattan Project Sites Draft Special Resource Study/Environmental Assessment November 2009

5.4.2 DOE Acceptance of Preservation ("with other party to operate")

Under the Law and Policies document of the Manhattan Project National Historical Park, the roles and responsibilities are clearly defined for both DOI/NPS and DOE in the management of the Manhattan Project National Historical Park. The Department of Energy is primarily responsible for the maintenance and upkeep of the designated facilities described in the actual legislation. (See Appendix C-7 for specific details).

6.0 B Reactor Models, Displays, & Exhibits

6.1 Reactor 1:10 Scale Model

The physical scale model of B Reactor's internal block was the first of several projects built under the technical direction of BRMA members. The scale model was created for the benefit of tour visitors, to enhance their understanding of the physical arrangement of the reactor and its support facilities.

This model was built to a 1:10 scale, with one corner cut away to show the internals of the reactor—graphite blocks, the thermal and biological shielding, the process tubes, the horizontal control rods, the vertical safety rods, the cooling-water system, and other details.

This model was included in a plan formulated by the Atomic Heritage Foundation (AHF) and BRMA in 2006, for the purpose of producing audio and video programs to tell the B Reactor story. The AHF obtained a grant from the Murdock Charitable Trust to fund this program. Funding specifically for the reactor model was supported by an additional grant from BRMA in the amount of $10,000.

A design-build fixed-price contract for the reactor model was awarded to Lockheed Martin (LM) by AHF in July 2007, in the amount of $21,504. It must be noted that the contract to LM included additional funding for the production of several exhibit panels to go with the model; the total contract award was some $44K.

The reactor model and exhibit panels were successfully completed and delivered to the 105-B building in early October 2007.

Figure 6. 1 Photo of B Reactor Core 1/10 Scale Model with Nameplate & Atomic Heritage Foundation and BRMA Actions 2006

Atomic Heritage Foundation (AHF) proposal team that included BRMA members. The proposal team developed the following consensus priority list for new B Reactor exhibits:

- Audio/Visual (AV) Production of Historical Overview, Atomic Science Timeline, and Computer-generated Briefing of B Reactor Construction and Reactor Operations (a Virtual Model).
- A Physical Model (4ftx4ftx4ft) of the B Reactor Block
- Audio/Visual/computer-generated Briefing of Refueling (Charge/Discharge) operations and Fuel Storage Basin Operations
- Cooling Water Valve Pit/Systems Operation Display Panel
- Accumulator Room/Safety Systems Display Panel
- Ventilation System/Exhaust Fan Room Display Panel
- Control Room Audio/Visual Production for a "virtual theater experience"

In November, Cindy Kelly, AHF president, filmed and recorded interviews at B Reactor that can be used, along with previously recorded interviews and oral histories, for the production of the new exhibits.

In January, representatives from BRMA met with Cindy in Richland to discuss the details of the overall scope for the new B Reactor exhibits.

Negotiations are underway between AHF and Pacific Studio of Seattle for the design, fabrication, and installation of the Murdock Trust exhibits at B Reactor.

Also, during Cindy's January trip to Richland, we met with Meier Enterprises, Inc. of Kennewick, to finalize the scope for the production of a four-module computer-generated model of B Reactor to be integrated into the new Murdock exhibits. The modules include: 1) reactor construction, 2) reactor operations and control, 3) fuel manufacturing, fuel loading and discharge from the reactor, and fuel storage basin operations, and 4) the moving of fuel to T Plant and the chemical separation process, waste generation and storage.

A contract has been signed by AHF with Meier to begin the production of the first modules for completion by the end of March.

BRMA also held a meeting at the new Lockheed-Martin Information Services (LMIS) model shop in north Richland to discuss the details of the physical model of the B Reactor block. Contracts for the physical model with LMIS and with Pacific Studio for overall design, fabrication and installation of the new Murdock Trust B Reactor exhibits are expected to be signed in mid-March during Cindy Kelly's next trip to Richland. We expect the installation of the new Murdock Trust exhibits to be completed by the end of 2007 or early 2008.

6-2 100-B Area Model

The 100-B Area model is an eight-foot square, interactive model that represents the entire industrial area surrounding B Reactor. It was built to a scale of 1:450. The model covers all significant structures and features in the 100-B Area, from the river pump house on the north to the Primary Substation on the south, and from the storage basin on the west to the retention basin on the east. The function of each of the

principal features is described on a front panel. A large video screen was provided so that visitors can watch video vignettes describing building and system functions, with emphases on the purpose and flow of the reactor cooling water, all the way from the Columbia River to storage, chemical treatment, pump house, through the reactor, and back to the river. The audio for the vignettes can be heard on either headphones or a speaker.

Scoping meetings for defining the concept and configuration for this model were held in late 2011 and early 2012, among AHF, BRMA, and Lockheed Martin. Detailed drawings showing plot plans and architectural features of all structures were identified by BRMA and provided to Lockheed Martin. AHF issued a contract to LM for the detailed design and fabrication of the model. The model was completed and delivered to B Reactor in the summer of 2013.

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Although this model was built under a contract issued by the AHF, it came into being largely through the efforts of BRMA. Hank Kosmata and Del Ballard were the principals leading the work with LM. Hank and Del were instrumental in getting funding, including $25,000 from the City of Richland's hotel/motel tax fund; and Cindy Kelly for a substantial Murdock Foundation grant for the models and related items, and a $25,000 matching/challenge donation from member Clay Perkins. These funds, along with $10,000 contributed by BRMA, paid for the two models and various related items such as the vignettes used with the models and other items for B Reactor displays and tours.

Figure 6. 2 100 B Area Diorama showing B Area as it looked in 1945

6.3 Graphite Model

For years, BRMA had envisioned the production of a model (a mockup) of a 1:1 scale section of the reactor core, using a number of reactor-sized graphite blocks and aluminum cooling tubes and fuel slugs, to provide a detailed illustration of the insides of the reactor. No one was more profound in pursuing this work than longtime BRMA member John Rector. However, John did not live to see this project completed. Finally, in 2012, when funding became available from the Murdock Trust through the AHF, we were able to proceed with just such a model. The following is the story of this model as presented by Gene Woodruff, written in 2016. Gene was the BRMA member who led and directed the design and fabrication, which was performed by Lockheed Martin Services.

Characteristics normally associated with the term model, miniaturization or substitution of material, are hard to find here. Rather, a small section of B Reactor's core is mocked up using full-size nuclear graphite blocks produced for the first Hanford reactors in the early 1940s. Those blocks were never used and were declared surplus at the end of construction, around 1945. In a similar manner, segments of surplus aluminum process tubes, used to contain uranium fuel elements and cooling water, are inserted in appropriate positions within the model. Obviously, an exception was made for the uranium fuel element exposed in the cut-away section of the fuel channel in the top layer. The aluminum containment can is there, but no actual uranium is inside.

Surplus graphite bars were also remnants of subsequent reactor construction, the K Reactors in the 1950s and, finally, N Reactor in the early 1960s. These scattered block repositories were eventually consolidated in the field just south of B Reactor. This jumbled mixture of varied block designs was confusing to many but to some in BRMA and DOE, it represented an invaluable asset that could be used for educational displays, mementos, plaques, and awards. By 2000, negotiations with DOE were underway for offsite release of some of the material to BRMA, for memento fabrication and distribution activities.

Figure 6. 3 Graphite Recovered by BRMA and Stored at a local storage location.

The blocks originally intended for the B, D, and F reactors were recovered from the jumbled assemblage of graphite on February 9, 2012. Those blocks were collected on four pallets: 31 for use in a model; #2 blocks from K and N reactors representing core block design evaluation; #3 B, D, and F tube blocks; and #4 B, D, and F filler-layer blocks. The pallets were moved inside 105-B and eventually to Central Stores Warehouse on Stevens Drive in Richland for drying-out and radiation surveying. Once the material was officially released for excess, it was transferred to a local storage facility.

The design of the graphite model was performed by Lockheed Martin. It consists of a three-layer, 4x4 assembly of the recovered blocks. The lower layer contains five bored tube blocks separated by six solid filler blocks. The middle layer contains ten solid filler blocks arranged side-by-side, with their long axis perpendicular to those in the tube layers below and above.

One position is left vacant to provide an open channel for a horizontal control rod. The blocks adjacent to the open channel are structurally stabilized with graphite keys penetrating the tube blocks below. The third and top layer has two tube blocks with an intervening filler bar. The filler bar is cut to create another open channel, this time for a vertical safety rod, with liner blocks keyed in place. A portion of one of the tube blocks is cut away to reveal the process tube with simulated fuel element inserted. After delivery of the blocks, fabrication of the model began at Lockheed Martin's Snake River Model Facility in January 2013. Provision was made to collect the graphite dust from the machining work, in anticipation of packaging it for the souvenir market. In fact, that dust became a popular item purchased by visitors on the reactor tour. (See Figure 6-4 of actual model).

The model now resides in B Reactor in the front-face work area. The model gives visitors not only an accurate representation of the intricate reactor core, but also a close-up view of the graphite that was produced for Hanford in the early 1940s. That production took place in Clarksburg, WV, St. Mary's, PA, and Niagara Falls, NY. The graphite producers were then known respectively as National Carbon Company, Speer Carbon, and Great Lakes Carbon. National is now a division of Union Carbide, Great Lakes remains the same but Speer's identity is lost in an evolutionary complexity.

Of note, the highest purity graphite was used in the central reactor core, and was known as Grade AGOT, which stood for Acheson Graphite Ordinary Temperature. In 1895, Dr. E.G. Acheson invented the electric furnace used originally to graphitize electrodes for steel production, and eventually for the production of high-quality nuclear graphite, now in the B Reactor core and in the graphite model.

Figure 6. 4 Photo of the Graphite Model on display at B Reactor

6.4 Artifact Collection

The first attempt to collect artifacts associated with the B Reactor was conducted in 1998 by future members of BRMA who visited the C Reactor during preparation for Cocooning of that reactor. The purpose of the visit was to identify artifacts from C Reactor that might be used when and if B Reactor became a museum. Several artifacts were identified and tagged for future display.

Ultimately many of the retired reactors would be visited to identify and collect artifacts for display purposes. A huge thank you to the Washington State History Project, The CREHST museum and the Hanford Science Center for allowing artifacts in their possession to be used at B Reactor as the tours began in the mid 90's. Many of those artifacts are on display at the B Reactor today and include historical objects protected as a part of the Hanford History Project. Examples of tools fabricated for use at B Reactor, photos, technical manuals, drawings, and collectable items make up many of the exhibits at the reactor today.

Figure 6. 5 Hand Painted Safety Signs

Figure 6. 6 Artifact Collection at B Reactor Radiological Instruments

6.5 Hanford Relics - Rail Cars, Railroad Engines, Hydraulic Robot

For several years BRMA members have desired to establish a “Dinner Train” tour to the B Reactor as a portion of the B Reactor Museum efforts. As early as 1998, a suggestion was made to examine the possibility of re-opening rail lines from Richland to the B Reactor and refurbishing a retired dining car for use in establishing a “Dinner Train Tour” to the Reactor once it is designated as a Museum (National

Park). The idea was proposed through BRMA, and a preliminary evaluation determined that the existing rail lines could not be certified for re-use and the cost of upgrades and installation of required new track was prohibitive. Never the less, it still remained as a dream of several BRMA members.

Figure 6. 7 Railroad Engines at Rear of B Reactor

Figure 6. 8 Photo of Hanford Railroad Engines and Cask Cars on Display

6.6 Hanford's First Robot/MOBOT

Sourced from an article in the General Electric News: MOBOT 1957

A MOBOT was designed and built in 1957 by the 100-area mechanical development section. The MOBOT was designed by Gary Howden as a member of the Hanford laboratories. It was designed to perform tasks in areas where the radiation levels were too high for human occupancy. A prototype was built and tested and it performed well. Its primary task was to locate irradiated fuel elements that became lodged in the rear face piping. If the location of the irradiated fuel elements were known, they could be jarred loose by water from a fire hose and would drop into the pickup shoots to the pool. This required a radiation detection device that was directionally sensitive and able to operate in very high radiation fields. Mr. Marvin Smith had the responsibility for obtaining a design and a prototype from the instrument development section at Hanford laboratories for an alternative to human intervention leading to excessive radiation exposure. He received a patent on the design shield used for the robot.

The MOBOT was used for this purpose on several occasions in the reactors, when fuel would become lodged in the discharge area piping. It was stored on the experimental level at DR Reactor after it was used to locate fuel lodged in the rear face piping of all eight of the production reactors.

In 1962 a critical mass accident occurred in the scrap recovery facility in the 234-5Z building in 200 W area at Hanford. One of the 20-inch quartz vessels used in plutonium recovery had overfilled, gone critical, and operated as a bare reactor for about 36 hours. The crew needed to know which cell contained the vessel with the critical mass in it. The critical vessel had to be drained to the floor of the cell by opening a valve in the control panel, however the radiation levels were too high to allow human entry into the scrap recovery facility. It turned out that the 100 Area MOBOT was the only remote-control device available at Hanford that could enter high radiation levels and verify which tank had gone critical. The mechanical development engineers and Marvin Smith of the radiological engineering group were ordered to take the MOBOT to the 234-5Z building and try to pinpoint the critical vessel. Due to the high radiation levels, they had to work from more than 100 feet away down a corridor and around a corner in a room at the building's side entrance. After 60 hours of effort, they were able to pinpoint the critical vessel and drain it to the floor of the cell, using the MOBOT. The crew worked under the supervision of Mr. Les Bruns, the facility supervisor, and the Hanford Emergency Management team headed by H.M. Parker. The MOBOT did everything, from moving scaffolding out of the way, to crushing a 10-foot step ladder against the concrete wall for the same reason. The MOBOT deserved a top rating for its performance, making it possible to bring this bare reactor under control. [Submitted by Marvin L Smith CHP May 28th, 2001.] The MOBOT is now stored at B Reactor as one of the early artifacts and pictured below.

Figure 6. 9 Photo of Hydraulic Robot/MOBOT on Display at B Reactor (blue and yellow instrument)

7.0 B Reactor Operational Anniversary Events

7.1 B Reactor 25th Anniversary Celebration June 7th, 1968

The following narrative was provided by BRMA member Maynard Plahuta detailing the 25th Anniversary celebration.

A celebration was held at the Rivershore Inn on George Washington way in Richland on June 7th, 1968, to commemorate the 25th anniversary of operation of the B reactor. A press conference held at the Hotel with General Leslie Groves and Dr. Glenn Seaborg resulted in questions from the public and the news media. Dr. Seaborg stated that the Atomic Energy Commission today was consistent with any predictions made 25 years previously. He further defined the Atomic Energy Commission's role in nuclear science as one of developing new areas of research to a point where they could be taken over by industry. In his closing remarks he addressed the future of nuclear energy in terms of medicine, electrical power, propulsion and many other commercial uses associated with the successes of the Manhattan Project efforts.

General Groves was questioned about America's decision to build the bomb. General Groves, who headed the Manhattan Project replied "Taking up with Dr. Ernest Lawrence, Dr. Enrico Fermi, and Arthur Compton, who were part of the original committee, they came up with the answer that they saw nothing else to do. And of course, I would say they were the leaders, in every sense of the word, at that time. They were the best men in the project…" Dr. Seaborg commented on the question as well saying "I felt that this was the only thing to do at that time, we were in a race with the Nazis, and a nuclear station had been discovered in Germany. We thought that we were therefore in a race for survival. Whoever got the atomic bomb first would certainly have the upper hand. I might add General Groves, during this time while we were working on the atomic bomb, there were very few scientists that would have had qualms about it. They all felt that this was something we had to do. "General Groves stated that we would stop and think once in a while that this is a terrible thing, but after all there were a lot of American lives involved."

The panel discussion held at the B Reactor was chaired by Dr Charles D. Harrington, President of Douglas United Nuclear. He introduced the four panel speakers for the session. The panel was composed of Retired Colonel Franklin Matthias, currently Vice President of Kaiser Engineering, and was responsible for leading the construction efforts at Hanford, as well as all of the heavy construction and hydroelectric plants in the United States and Canada. Additionally on the panel was Professor John Wheeler. He is the Joseph Henry professor of physics at Princeton University. He has done much research and published many scientific papers in his field of atomic and theoretical physics. Additionally present was Dr. Dale Babcock, the director of reactor engineering of the Atomic Energy division of the DuPont company. The panel also consisted of Professor Norman Hilberry who was professor of nuclear engineering at the University of Arizona since his retirement from the directorship of the Argonne National Laboratories.

The unprecedented task of building a secret plutonium-production facility was staggering to the imagination. Colonel Mathias remembers the first steps and his first introduction to the project was on the 14th of December 1942 when General Groves sent him to Wilmington to a meeting with the plant people (DuPont). "Well now, the next thing is to find a place for the project. So, he suggested that I get busy the next day and find out where there was going to be power enough, because one of the requirements was at

least 100,000 kilowatts of power. Another requirement was a lot of cool fresh water. “The requirements of the construction manual for a good site in a buildable area, was fundamental to them. The desirability of finding an area in which there were as few as possible number of people was also a factor to minimize the relocation problem. There was initially a hope that this site would not be closer to the coast than 250 miles. This one we missed a little bit. We got an allocation of power from the War Production Board. We got a flight limitation over the area. We worked out an agreement to get both the Army and the Navy out of the area, where they were using it for gunnery practice. By early January, General Groves came out and looked at the site and away we went. We knew there was going to be a tremendous impact on the community. We had an obligation to keep everything secret. We knew that the normal services would be tremendously interrupted by the impact of this construction. We didn't realize how much, but as the job went along, we realized more and more how a project like this gets into just about every phase of human activity. And our problems were multiplied by this site. On the 10th of June, we had 4500 people working on the project, and on the 11th of June I called General Groves and reported that we needed 1,500 more common laborers. We ended up with a peak employment of 45,000 people.”

Dr. Wheeler described his role in early research concerning fission and interactions with Niels Bohr, Eugene Wigner, Enrico Fermi and Leo Szilard and other colleagues about what would be the future of fission. He remembers that in early discussions concerning studies associated with fission that an early estimate of a budget for the study would be in the neighborhood of $5000 for the first year. That was followed by laughter from the audience. The audience having 100% hindsight regarding the actual activities surrounding the efforts associated with understanding the fission process. Dr. Wheeler stated that he could remember Bohr saying that it would be impossible to think of making a weapon, that it would take the efforts of an entire country to do it. And little did he realize that it would be the efforts of three countries involved, England, Canada, and the United States. He stated that for him as a very junior member of the enterprise, the most striking thing in the whole project was this contact with colleagues in the world of engineering to get on with a job, and then the concern about safety. There were six from the American group and six from the British group sitting across the table. In a discussion of the question about safety of reactors, he stated that “only one chance in a million that control system # 1 would fail. And if that failed only once chance in a million that control system #2 would fail. And if that failed, only one chance in a million that control system #3 would fail, and an unbelievably small chance that everything would break down.” He stated, “Then it follows from this, that what we have to worry about is not the failure of the control system, but the failure of human systems. We have to worry about the chance that this will happen. Somebody who is so trusted that he slips through security system, and so clever that he can turn off the engineering safety system.” He commented during this discussion, “sitting across from him was Klaus Fuchs, the greatest spy of all time. One month later, he was in jail for espionage.” Dr Wheeler summarized then that here (in Richland) alchemy, the old dream of manufacturing elements was first realized. He further stated that “Here he saw something that to him means very much. The empty hospitals overseas, prepared for the invasion of Japan that were never used, tell only part of this story. The half million or more casualties that were expected on the American side – of course, only a fraction of those that would have occurred altogether.” He stated, pointing to the front face of the B Reactor, “that this reactor means a great deal to me.”

Dr Dale Babcock, who worked with Dr. Wheeler on the development of a heavy water reactor, recalled some of the more humorous incidents at Hanford, including an itinerant heating method. The wonderful design engineers that Dr. Wheeler has been talking about had designed in our room all kinds of valves and

traps and whatnot to convey the steam around, and we were getting the excess that didn't go into the pipes. Another interesting item is the construction of a robot. As you were told, the reactor puts out highly radioactive material. It could not be approached by people unless they were separated from the radioactive material with a large amount of shielding. The question was asked, what would we do? We didn't have a mechanism of getting a piece of mechanical equipment in there. Men, of course, couldn't come in. So, the engineers designed a robot, which as I remember, weighed about 30 tons, and of course was largely made of lead. Gilbert Millen climbed into this robot and as things would happen, they couldn't get him out. Here with Dr. Fermi, one day, he asked us when we were crossing a certain five-mile area out here to note the number of coyotes that we saw crossing the road. Well, after Fermi had enough data on this, he told us that there was about one coyote to the square mile on the project out here. One final piece of calculation was, one day someone came in and said, "I hit a coyote today. How do I count it? Does it cross the road?" Laughter erupted in the audience of over 100 guests. Well, it turned out that this was a very interesting item to Dr. Fermi. He says, "This becomes a collision probability." He did a little bit of arithmetic and he says, "Why that says that the cross section of coyote is only one square centimeter." Much to the amusement of the audience.

The narrator stated that the final speaker was Dr. Norman Hilberry whose association with nuclear energy dates back to early 1941. Dr Hilberry stated that these days were all exciting. The second safety thing was a lesson he learned in this room (B Reactor front face). George Weil and I both learned much about safety from the DuPont procedures. They used to kid them about how you could always tell a DuPont safety man because he was the guy that went around with a pocket full of subcontractor's badges. He kept his job if he could get a DuPont badge off and a subcontractor's badge on before the guy bounced a second time. (Again, followed by raucous laughter) . They started off on January 3, 1942, to design the first gas-cooled reactor, the group in the room were all physicists. As far as I can remember that day we covered basically every kind of reactor design, except about three, that's been suggested since. We came up with a gas-cooled reactor design and discussed many other reactor types. The reason we were doing it, the reason for plutonium, was that the isotope separation might indeed prove to be impossible. It's a horrible business, really. Anybody who has ever built a vacuum system, all you had to do was be told what K-25 was like, basically a nightmare. You knew it was impossible. The fact that they did it doesn't change the fact that it was still impossible.

The tour then progressed to the T-Plant building which had been converted from its original purpose of separating plutonium to a unique decontamination facility. T-Plant was built by the DuPont company as part of the original Manhattan Project activities at Hanford. The plant began operations on December 26, 1944. The building is approximately 900 feet in length, 72 feet high and 68 feet wide. The building is comprised of 42 process cells, each approximately 18 feet long, 13 feet wide and 22 feet high. The cells are covered with 6-foot-thick shielding blocks when in actual operation. The walls are designed to reduce the radiation levels, so that individuals could work in the building without direct exposure to the radiation levels within the cells. The walls range in thickness from 5 to 11 feet. The interesting fact about this particular celebration was that the entire panel of experts, and all visitors (somewhere over 100) were allowed into the T-Plant canyon without any protective clothing.

During the presentations at T-Plant, Dr. Seaborg stated that the job DuPont Company did in scaling up the Bismuth Phosphate separations process from the tracer scale experiments and the ultra-micro chemical experiments, to its successful implementation on the industrial scale at T-Plant, is one of the most

marvelous engineering feats in the history of industrial chemistry.

Following the site visits and presentations was a reception and banquet held at the Rivershore Motor Inn in Richland. General Groves who was in charge of the wartime Manhattan Project, recalled in his address the reasons for selecting the Hanford site. He stated that he was familiar with the state of Washington and told Colonel Matthias that he knew exactly where the plant would be located and that was in the Horse Heaven Hills, which did not turn out to be the actual selected location. He stated that the land which now makes up the Hanford site was not productive agricultural land and did not become so until they started to condemn the land. General Groves further stated that there were many reasons for the selection of the Hanford site location, but he believed that the primary reason was a success that he termed the "American Way of Life" He stated that one of the most important features was the role played by American management.

The anniversary celebration was very well received by the attendees and a video was made of many of the presentations made during the conference. The video is titled: Hanford 25th Anniversary Celebration and is available on YouTube.

7.2 50th Anniversary Events - October 1994

Figure 7. 1 Hanford Nuclear Reservation Manhattan Project 50th Anniversary Pin

A big event to celebrate the 50th Anniversary of B Reactor was put on by cooperative efforts of the American Nuclear Society and BRMA. During that celebration, the large black granite stone, now resting out front of the main entrance to the B Reactor, was engraved and displayed. A big Thank you to Wanda Munn for her leadership in putting on that celebration.

BRMA speaker's bureau provided speakers for the celebration. public groups, technical societies, media events and at other venues. In addition to those informative talks to the public, BRMA prepared resolutions recommending and requesting preservation of B Reactor. Signatures were obtained from all of the local cities, county, ports, The Tri-City Industrial Development and Economic Council (TRIDEC), and the Tri-Cities Visitors and Convention Bureau, thereby strengthening the resolve of the community for preservation.

The celebration included a theatre show "The Gang's All Here" on February 17, 1994, which is a repeat of the first movie shown in the Richland Village Theatre. On April 30th BRMA provided assistance for a mess-hall style dinner party held at the Benton Franklin Fair Grounds which was a family style sit-down dinner. 50th Anniversary coloring books were distributed to all 3rd through 6th grade students in Tri-City schools and made available a free booklet describing the history of Richland housing in conjunction with the City of Richland.

7.3 60th Anniversary Events September 2004

After just one year of frantic construction work on the B Reactor, the world's first full-scale production reactor was completed, charged with uranium fuel, and was initially "started up" on September 26, 1944. With that date in mind, BRMA started planning early on to hold a grand celebration of the 60th anniversary, in 2004. BRMA leaders and members were well aware that such an event would be an excellent opportunity to further advance the support from the community and our federal legislators for the organization's goals of preserving the reactor and converting it into a public museum.

In November 2003, it appeared that some financial support could be available from the Atomic Heritage Foundation, and BRMA board members began discussions on the potential events for a 60th anniversary celebration. A planning committee was established. Del Ballard, President, appointed Tim Johnson to chair that committee; other members identified included Bob Bowersock, Gene Weisskopf, and Larry Denton. It was not long after that that many more of the active BRMA members were involved. Tim also very wisely garnered the help and support of his good wife Dawn, who later provided immense help in obtaining financial support and in other areas of event planning.

In December 2003, BRMA mailed a letter to Keith Klein, DOE-RL Manager, requesting access to B Reactor for a 60th anniversary commemoration in September 2004. Copies were given to the Washington congressional delegation, management of the NPS, and others.

Although obtaining the necessary approvals from the DOE was a frustrating experience, eventually partial and often only verbal acceptance was obtained, and BRMA proceeded to make plans. Del did receive a formal letter from Keith Klein in August, accepting our invitation to him to welcome attendees at the celebration dinner.

Numerous planning meetings were held during the spring and summer of 2004, and major events were gradually agreed upon. Bus tours were arranged to take the public from downtown Richland to the reactor for guided tours. Special historical exhibits were planned for display at the Richland community center, along with a book-signing by the author Richard Rhodes. Also planned were a jet-boat tour on the Columbia River, and a climactic celebration dinner to be held at the Richland Shilo Inn. Del contacted Richard Rhodes, Pulitzer Prize-winning author of "The Making of the Atomic Bomb," and arranged for his presence as the keynote speaker at the dinner. An additional event was the premier of the Atomic Heritage Foundation film "Hanford's Secret Wartime Mission (1943-1945)". The date selected for the big celebration was the weekend of October 8 and 9.

The premier showing of the AHF film took place at the Battelle auditorium on Friday evening, October 8,

with an estimated audience of about 250. This documentary film tells the story of the Manhattan Project at Hanford, from the selection of the site to the successful production of plutonium at B Reactor. The jet boat event was hosted by Battelle. Columbia River Journeys provided the jet boat carrying some 60 visitors to the Tri-Cities. Historical exhibits were set up and shown in the Richland Community Center in October. These included the US Army Corp of Engineers, the US DOE, CREHST, the REACH, and the U.S. Fish and Wildlife Service. A joint exhibit was shown by three agencies: The National Park Service, the Washington State Office of Archaeology and Historic Preservation, and the Washington Trust for Historic Preservation. At that same venue, a book signing was held featuring authors Richard Rhodes, Roy Gephart, and Michele Gerber.

The bus tours to B Reactor on Saturday, October 9, were the most exciting event for many of the visitors. Nine buses were filled, accommodating some 400 participants. Three buses used and made several roundtrips throughout the day, which not only handled the sizeable crowd, but also limited the number of visitors at the reactor at any one time. Todd Nelson and his team of co-workers at Bechtel made the entire set of bus tours go seamlessly. BRMA provided a dozen tour guides to lead the visitors through the reactor. The crown jewel of the weekend celebration was the very nice dinner on Saturday evening, at which the keynote speech was given by author Richard Rhodes to some 230 guests. Due to the fact that Congress was still in session, our Washington delegation, including Senators Cantwell and Murray, along with Representative Doc Hastings, were unable to attend. Representative Hastings provided a prepared video and each of the Senators had a delegate read prepared statements. All three legislators recognized the new law authorizing a study by the NPS and offered solid support for the preservation of and public access to B Reactor.

Welcoming comments were offered by BRMA President Del Ballard, which were followed by introductions by the master of ceremonies Michael McDonnal. Supporting comments were presented by Cindy Kelly, President of AHF; Lt. Colonel Randy Glaeser, Army Corps of Engineers; Dr. Stephanie Toothman, NPS, and Kris Watkins, Tri-cities Visitor and Convention Bureau. Keith Klein of the DOE also provided comments supporting historic preservation. Attendance at the dinner came from many states, including CA, DE, GA, MI, MN, MT, NJ, UT, WI, and others. A resounding and thought-provoking speech was delivered after dinner by Dr. Richard Rhodes.

All of these events were well attended and a huge success for BRMA and all the other agencies and organizations involved. While BRMA was the organizing sponsor, very significant financial contributions were made by the prime contractors on the Hanford site, including Bechtel, Washington Group, Eberline, and Fluor Hanford. The AHF also was a major contributor, and the DOE provided support through their personnel and equipment. A financial report for the overall celebration showed that BRMA recorded an income of $38,407 and total expenses of $32,298.

Richard Rhodes visited the Hanford Site in 2004, in preparation for his participation in the 60th anniversary celebration. He was taken on a tour of B Reactor by Richard Romanelli and Del Ballard. The photograph of Dr. Rhodes in the control room at B Reactor was taken by Del.

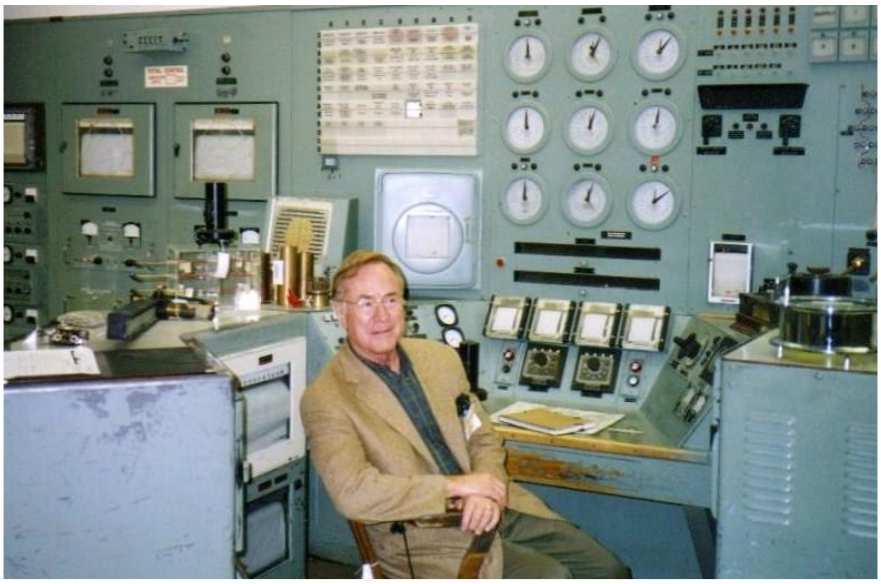

Figure 7. 2 Photo of Richard Rhodes at Control Panel in B Reactor Control Room

7.4 70th Anniversary Events 2014

The year 2014 meant the coming of the 70th anniversary of the initial startup and operation of B Reactor. Many individuals connected with the history of the Manhattan Project, and those involved with the very prominent activities underway in establishing a National Historical Park, felt it was essential to hold an event to recognize and celebrate this 7th decade anniversary. In contrast to the events held at the 60th anniversary, where BRMA was the prime mover, the lead in the planning for this celebration was performed by a joint committee led by chairperson Colleen French of the DOE. Others on that committee included representatives from the Tri-City Development Council, BRMA, Richland Public Library, and Visit Tri-Cities. Though not leading the planning work, BRMA did agree to take the lead in raising donations for the event from the various Hanford-related companies. Maynard Plahuta, BRMA President, did an excellent job in raising over $9,000 to support the celebration.

Although plans for the event were not developed as early as would seem appropriate, the main event on September 26th, at the site of the famous reactor, was a roaring success, attended by over 200 people. For the first time ever, alcohol was legally served on the Hanford site (not since the Hanford construction camp taverns served up to 12,000 gallons of beer a week to construction workers during WW II). A wide selection of food was served by the Atomic Ale Brewpub of Richland, as well as their locally brewed Plutonium Porter and Half-Life Hefeweizen brews. Entertainment was provided by the Mid-Columbia Mastersingers, who performed “Boogie Woogie Bugle Boy” and other hits from the1940s. In concert with the music, historic images were projected through the dark onto the walls of B reactor. Tours of the reactor were led by docents, many of whom were BRMA members.

BRMA was given significant recognition by DOE for its longtime work in insisting on and promoting the preservation and cleanup of the reactor. Del Ballard, a founding member of BRMA, gave a short presentation summarizing the work and influence exerted by BRMA in achieving our primary goal to have B Reactor become a public museum. Following a direct plea to Congressman Doc Hasting, Del was given a personal promise by Doc that the National Historical Park legislation would be approved by Congress.

Such legislation was, indeed, passed by Congress not too long after this 70th anniversary celebration.

At the event, keynote talks were given by David Klaus, Deputy Under Secretary, US DOE, and Congressman Doc Hastings. Other program speakers included Retired DOE Managers Mike Lawrence, Keith Klein, Dave Brockman, and Matt McCormick, as well as Doug Shoop, acting Manager, DOE Richland Operations.

7.5 Park Authorization and Local Celebration November 12, 2015

BRMA's ultimate goal of preserving B Reactor as a museum or even as part of the National Park Service was realized in November of 2015.

The flag of the NPS flew over Hanford's historic B Reactor for the first time on November 12, 2015, at a special event commemorating its inclusion in the Manhattan Project National Historical Park (MAPR). More than 250 invited guests, including school children for the first time in the reactor, gathered at the reactor for its dedication as part of the new park.

Figure 7. 3 Photo of Flag Raising at B Reactor Commemorating Establishment of MAPR

Hanford's B Reactor site dedicated as part of new national park! From an article from the Tri-Cities A Journal of Business (TCAJOB) Staff| January 2016

Without a doubt, the highlight of this year was the establishment of the Manhattan Project National Historical Park. This pinnacle of success for BRMA is particularly due to the foresight and unceasing and persistent efforts of BRMA's original founders to preserve the history of B Reactor, and to convince others

to join these efforts. This Park is a well-deserved salute to all past and present BRMA members!

In the months and years to come, BRMA must work cooperatively and diligently with the National Park Service (NPS), DOE, our community, and the other two Park sites (Oak Ridge and Los Alamos). It is a continuing goal of BRMA to ensure the Park progresses forward in the direction and at the pace needed to make it a proud legacy.

The November 12th celebration at B Reactor to recognize the establishment of the Park was certainly a highlight. BRMA has a lot to be proud of with B Reactor being the current key showplace for the Park. This is true at present for the entire Park, including all three locations--Oak Ridge, Los Alamos and Hanford. It was a great and memorable celebration. It was a pleasure to have Chip Jenkins, Acting Director, NPS Pacific West Region, and other NPS staff including rangers from Olympic and Rainier National Parks to be present and participate in the celebration. Chip's program presentation was interesting and forward thinking. We were also honored to have Senator Cantwell on the program with encouraging thoughts and words for future Park development.

Included in this section are numerous pictures taken on the day of the celebration. Another highlight of the celebration was the fact that this was the first-time children under twelve were permitted to tour B Reactor. This new unrestricted access will hold true for all future public tours. This unrestricted tour access relates to the NPS country-wide 100th year anniversary whereby all 10-year-old children (essentially 4th graders) throughout the country can get a full 2016 pass to all National Parks for themselves and family members via the NPS website. BRMA joined DOE in recognizing the NPS initiative by inviting a fourth-grade class from each of the Kennewick and Richland school districts. DOE made arrangements with the schools and BRMA provided each student with a unique commemorative tee shirt.

The establishment of the Park would likely not have occurred this past year without the legislation proposed by Rep. Doc Hastings and the support of Senators Murray and Cantwell. Doc's approach to putting the Park in the Defense Authorization bill was a key factor.

President Maynard Plahuta stated that he was looking forward to working with all BRMA members in 2016. As BRMA progresses to enhance the Park, the opportunity to work closely with NPS and DOE on many projects will present itself. BRMA will strive to develop more contacts with NPS as activity increases throughout 2016 and future years. BRMA sees this as a process lasting at least three and likely more years.

Figure 7. 4 Maria Cantwell, Bob Thompson, Maynard Plahuta and Aaron Burkes address Tri-City area leaders during 70th Anniversary celebration.

Figure 7. 5 Senator Maria Cantwell with Tri-City Master Singers at NPS celebration 70th Anniversary. Cantwell expressed her pleasure at having completed the goal of establishment of the National Park.

Figure 7. 6 Dignitaries Raise the NPS Flag at the entrance to B Reactor (Present are Representative Doc Hastings, Senator Maria Cantwell, Maynard Plahuta, Colleen French for DOE-RL, and Chip Jenkins of the NPS.

Figure 7. 7 U.S. Representative Doc Hastings and his wife and Del Ballard at the NPS Ceremony of the establishment of the Manhattan Project National Historical Park.

Figure 7. 8 Colleen French-DOE/RL and Chip Jenkins-NPS discuss agency plans for operation of the Park.

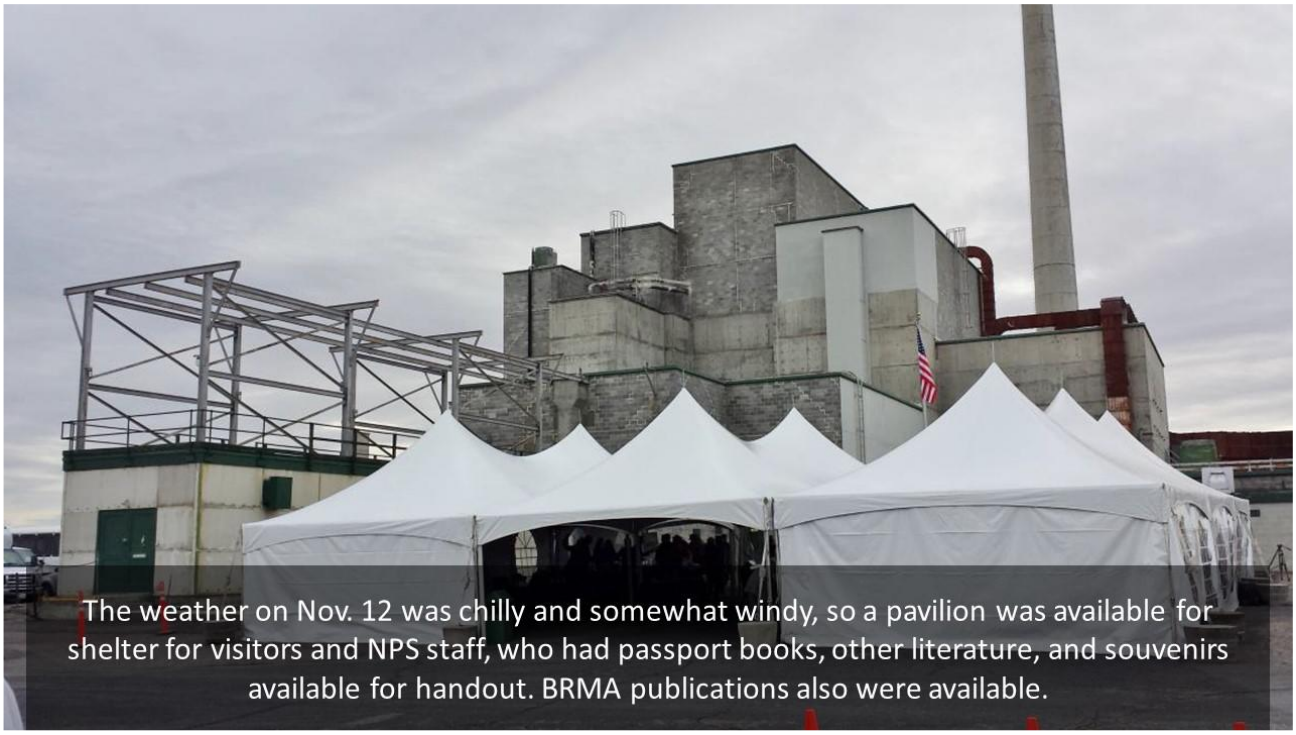

Figure 7. 9 Tents set up outside of the B Reactor for the celebration of the establishment of the National Park at B Reactor.

Figure 7. 10 Chip Jenkins of the National Park Service addresses the attendees at the November celebration of establishment of the National Park.

Figure 7. 11 Students and Del Ballard assist in the initial raising of the NPS Flag at B Reactor.

7.6 Advisory Committee (Now Advocacy Committee)

After three years of attempts by the US Congress, when legislation had been passed by the House of Representatives but not the Senate, in late December 2014, the Senate finally voted 88 to 11 for the authorization to create a new Manhattan Project National Historical Park. The bill was soon signed by President Obama and was now the law of the land, as well as the fruition of so many years of work by BRMA, and all those that made this a reality.

Early in 2015, through the work of the Tri-City Development Council (TRIDEC) and Visit Tri-Cities, a steering committee was formed to provide a common voice from the community in support of the new park. BRMA was provided a seat on that committee and was the only non-elected representative selected, meaning that other members of the committee were city mayors or county commissioners. The first official action by the committee, held in March of 2015, was to retitle their name from Advisory to Advocacy.

BRMA was pleased to see the development of the Tri-Cities National Park Advocacy Committee (TCNPAC) in the Tri-Cities community. TCNPAC is comprised of community elected officials as well as representatives from TRIDEC, Visit Tri-Cities, and BRMA. Their purpose is to be a consolidated consensus voice representing the community in relationships and discussions with NPS and DOE officials.

The National Park Service was not slow in initiating their presence in the Hanford branch of the multi-site park. Some 15 representatives from all over the country visited Richland and the Hanford site in mid-April 2015.

8.0 B Reactor Tour Programs

8.1 Sporadic BRMA-Led Tours (1990's)

During the 1990s, special tours into the reactor could be arranged by special request to the DOE. For most of those tours, BRMA members such as Bill McCue, Larry Denton, John Rector, and others, were asked to provide guide service. Such special tours were provided free to tour guests. In September 1997, one of the first drafts of a Hanford tour program script was developed and used for several years as the basis for Hanford Site Tours including a drive-by of the B Reactor (it was not yet open regularly for visitors).

Public tours began in the late 1990's by special request from the Department of Energy and managed by the current site contractors. Formal tours began in 1998 through Bechtel Corporation as the contractor responsible for the care of the B Reactor.

8.2 Contract/Official Public Tours

In 1998, DOE formalized the tour program and Bechtel issued a formal contract to BRMA to provide tour guide services upon request. A Bechtel subcontract, #0200-SC-G0046, was issued to BRMA in mid-1998, with an initial authorization of $59,815. The BHI Procurement specialist was Michael Hughes, and their Tech. Rep. was Tom Marceau. At that time, BRMA was using some eight prior Hanford and B Reactor employees as knowledgeable tour guides. BRMA names on that original list included John Rector, Bill McCue, Roger Rohrbacher, Larry Denton, Bob Smith, Miles Patrick, Lyle Wilhelmi, and late-comer Gene Weisskopf.

BRMA was awarded $125 for each tour guide they provided on a tour. BRMA provided the guides with a $25 honorarium, or $50 if they provided the transportation. This was the format for Tour operation and Tour Guides until the program was offered outside of Hanford for Tour direction and support. During the preparations for the 2009 tour season, a separate contract was awarded to Indian Eyes LLC for the performance of B Reactor tours.

The following information is sketchy relative to the number of tours and guests during the early years of the tours. Between 1998 and 2009, approximately 300 visitors were accommodated on B Reactor tours that were conducted mostly by BRMA members serving as tour guides.

In the spring of 2009, B Reactor tours were modified and a contract with Indian Eyes LLC was put in place to provide docents for B Reactor tours. Between the years 2009 and 2015, approximately 5000 visitors took B Reactor tours.

8.3 Indian Eyes Role and Tour Program

In early 2009, a Request for Proposal was issued by DOE and its contactors for conducting tours of B Reactor on a more formal and regular basis. In April 2009, the contract was awarded to Indian Eyes LLC to provide oversight and tour guides for B Reactor and Hanford Site Tours. The program formalized compensation for tour guides for two types of tours: Hanford Site Clean-up Tours and B Reactor Tours.

There were two types of tour guides, or docents as they were called: B Reactor Docents and Bus Docents. A narrative was prepared by Russ Fabre, the manager of the B Reactor facility, with help from several volunteers. Buses were provided by the Department of Energy as a free service to visitors. The tour program signup was established online and tours were conducted Monday through Saturday, from early April until mid-November.

In 2015, an additional tour was developed, the Pre-Manhattan Historical Tour. It focused on the communities of Richland, White Bluffs, and Hanford from 1800 to 1943, with an emphasis on the settlers who were present when the Manhattan Project was initiated in early 1943. A separate narrative and docent script were developed and implemented, with tours on Fridays and Saturdays, with two docents on a 15-passenger bus. The tour route was established with stops at five important locations focusing on early settlement of the Priest Rapids Valley.

Indian Eyes LLC contracted with between 15 and 25 individuals to provide Docent/Tour Guide services for the two types of tours. Many of the tour guides were current (or future) members of BRMA , which actively supported and continues to support the tour program.

Indian Eyes LLC maintained the program from 2009 until the spring of 2020, when tours were postponed due to the national outbreak of the COVID-19 virus epidemic. Tours were suspended for the remainder of 2020 and all of 2021 until the summer of 2022.

Figure 7. 12 B Reactor Museum Association Correspondence Header

9.0 Conclusion

After many years of dedicated hard work by current and past members of BRMA, along with our congressional representatives, the main goal of BRMA was achieved in the designation of Hanford sites to include B Reactor, T-Plant, the White Bluffs Bank, the Hanford High School, the Bruggeman Warehouse, the Allard Pumphouse, and sites at Los Alamos NM, and Oak Ridge TN as a National Park. As such, this history of BRMA will conclude with the accomplishment of that goal. The future may contain annual supplements to this document, but since the original objective of BRMA has been met, this story ends here! The following information is provided to include a brief discussion regarding continuing tours to B Reactor and the Pre-Manhattan Tours conducted for the Manhattan Project National Historical Park.

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Appendices to BRMA History and Saving The B Reactor

Appendix A BRMA Board of Directors President 1990 to 2023

Individuals responsible for the vast majority of the BRMA organization and the process of establishment of the Manhattan Project National Historical Park are identified below with the tenure of their participation in the organization. Many if not all served as BRMA Board of Director Members over the years and many are still involved in the everyday organizational activities.

Once the National Historical Park was established the roles of BRMA shifted to assisting the Department of Energy, and the National Park Service in development of tours, identification of artifacts that represent the B Reactor historical perspective as well as the development of exhibits at the reactor and the visitors center.

Founding Members of BRMA (Incorporated January 1991)

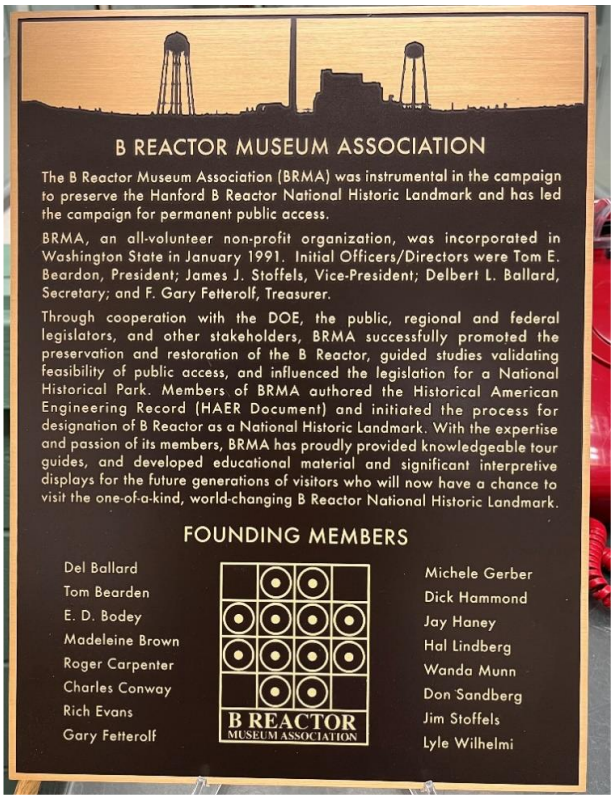


Figure A. 1 Photo of BRMA Founding Members Plaque

Del Ballard	Tom Bearden	E.D. Bodey	Madeleine Brown
Roger Carpenter	Charles Conway	Rich Evans	Gary Fetterolf
Michele Gerber	Dick Hammond	Jay Haney	Hal Lindberg
Wanda Munn	Don Sandberg	Jim Stoffels	Lyle Wilhelmi

1990 Initial BRMA Officers

President:	Tom Bearden
Vice President:	Jim Stoffels
Secretary:	Del Ballard
Treasurer:	Gary Fetterolf

1991 BRMA Leadership

President:	Don Sandberg
Vice President:	Jim Stoffels
Treasurer:	Gary Fetterolf
Secretary:	Del Ballard

Committee Chairs:

Public & Gov't Relations:	Madeleine Brown
History, artifacts & exhibits:	Lyle Wilhelmi
Membership & Fund raising:	Charles "Rip" Ripley
50th Anniversary Comm.:	Michele Gerber

1992 BRMA Leadership

President:	Don Sandberg
Vice President:	Jim Stoffels
Secretary:	Del Ballard
Treasurer:	Gary Fetterolf

Committee Chairs:

Government Relations:	Madeleine Brown
Public relations:	Pam Novak
History, Artifacts & Exhibits:	Lyle Wilhelmi
Membership & Fundraising:	Ann Fillion
Health/ Safety & Eng:	Miles G. Patrick

1993 BRMA Leadership

President:	Fran Berting
Vice President:	Jim Stoffels
Secretary:	Del Ballard
Treasurer:	Wally Howell

Committee Chairs:

Public Relations:	Pam Novak
History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Al Morrangiello
Fundraising:	Gary Fetterolf
Health/ Safety & Eng:	Miles G. Patrick

1994 BRMA Leadership

President:	Fran Berting
Vice President:	Jim Stoffels
Secretary:	Del Ballard
Treasurer:	Roger Rohrbacher

Committee Chairs:

Public Relations:	Wendy Keegan
History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Joseph Hedges
Fund Raising:	Pam Novak
Health/Safety/Engineering:	Miles Patrick

1995 BRMA Leadership

President:	Jerry Woodcock
Vice President:	Jim Stoffels
Secretary:	Pam Novak
Treasurer:	Roger Rohrbacher

Committee Chairs:

Fund Raising:	(Vacant)
Health/Safety/Engineering:	Del Ballard
History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Joe Hedges
Public Relations:	Jim Thornton

1996 BRMA Leadership

President:	Jerry Woodcock
Vice President:	Jim Stoffels
Secretary:	Pam Novak
Treasurer:	Roger Rohrbacher

Committee Chairs:

Fund Raising:	(Vacant)
Health/Safety/Engineering:	Del Ballard
History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Joe Hedges
Public Relations:	Jim Thornton

1997 BRMA Leadership

President	Jerry Woodcock
Vice President:	Jim Stoffels
Secretary:	Pam Novak
Treasurer:	Roger Carpenter

Committee Chairs:

Fund Raising:	(Vacant)
Health/Safety/Engineering:	Del Ballard
History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Joe Hedges
Public Relations:	Jim Thornton
Editor:	Gene Weisskopf

1998 BRMA Leadership

President:	Lyle Wilhelmi
Vice President:	Jim Stoffels
Secretary:	Pam Novak
Treasurer:	Roger Carpenter

Committee Chairs:

Fund Raising:	Pam Novak
Health/Safety/Engineering:	Del Ballard
History/Artifacts/Exhibits:	Madeleine Brown
Membership:	Joe Hedges
Public Relations:	Jim Thornton
Editor:	Gene Weisskopf

1999 BRMA Leadership

President:	Lyle Wilhelmi
Vice President:	Jim Stoffels
Secretary:	Gene Weisskopf
Treasurer:	Roger Carpenter

Committee Chairs:

Health/Safety/Engineering:	Del Ballard
History/Artifacts/Exhibits:	Madeleine Brown
Membership:	Joe Hedges
Public Relations:	Jim Thornton
Editor:	Gene Weisskopf

2000 BRMA Leadership

President:	Gene Weisskopf
Vice President:	Jim Stoffels
Secretary:	Madeleine Brown
Treasurer:	Joe Hedges

Committee Chairs:

Health/ Safety/Engineering:	Del Ballard
History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Joe Hedges
Public Relations:	Jim Thornton
Editor:	Gene Weisskopf

2001 BRMA Leadership

President:	Gene Weisskopf
Vice President:	Jim Stoffels
Secretary:	Madeleine Brown
Treasurer:	Warren Sevier

Committee Chairs:

Health/Safety/Engineering:	Del Ballard
History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Joe Hedges
Public Relations:	Jim Thornton
Editor:	Gene Weisskopf

2002 BRMA Leadership

President:	Gene Weisskopf (resigned June, 2002)
Vice President:	Jim Stoffels
Secretary:	Betty Gulley
Treasurer:	Warren Sevier

Committee Chairs:

Health/Safety/Engineering:	Del Ballard
History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Joe Hedges
Public Relations:	Jim Thornton
Editor:	Madeleine Brown

2003 BRMA Leadership

President:	Del Ballard (Madeline Brown was Pres. For 6 months after Weisskopf resigned)
Vice President:	Hank Kosmata
Secretary:	Madeleine Brown
Treasurer:	Warren Sevier

Committee Chairs:

History/Artifacts/Exhibits:	Lyle Wilhelmi
Membership:	Joe Hedges
Government Relations:	Madeleine Brown
Health/Safety/Engineering:	Del Ballard
Moderator Editor:	Tim Johnson

2004 BRMA Leadership

President:	Del Ballard
Vice President:	Hank Kosmata
Secretary:	Gene Weisskopf
Treasurer:	Warren Sevier

Committee Chairs

Membership:	Mel Finkbeiner
Property/Facilities:	Del Ballard
Hist/Artifacts/Exhibits:	Burt Pierard/Connie Estep
Tours:	Roger Rohrbacher
Public Relations:	Richard Romanelli
Government Relations:	Bob Bowersock
Editor:	Tim Johnson
HAER Project Coordinator:	Gene Weisskopf

2005 BRMA Leadership

President:	Michele Gerber
Vice President:	Hank Kosmata
Treasurer:	Del Ballard
Secretary:	Norm Miller

Committee Chairs:

His/Artifacts/Exhibits:	Burt Pierard & Connie Estep
Tours:	Roger Rohrbacher
Membership/Fund raising;	Mel Finkbeiner
Government relations:	Bob Bowersock
Property & facilities:	Del Ballard
Public relations:	Sally Ann Potter
Moderator Editor:	Tim Johnson

2006 BRMA Leadership

President:	Hank Kosmata (acting)
Vice President:	Hank Kosmata (acting)
Secretary:	Bob Smith
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Public Relations:	(Vacant)
Membership:	Mel Finkbeiner
Tour Coordinator:	Maynard Plahuta
Government Relations:	Bob Potter
Property & Facilities:	Del Ballard
Moderator Editor:	Richard Romanelli

2007 BRMA Leadership

President:	Hank Kosmata
Vice President:	Norm Miller
Secretary:	Steve Buckingham
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Mel Finkbeiner
Tour Coordinator:	Maynard Plahuta
Government Relations:	Bob Bowersock
Property & Facilities:	Del Ballard
Public Relations:	(Vacant)
Moderator Editor:	Richard Romanelli

2008 BRMA Leadership

President:	Hank Kosmata
Vice President:	C.J. Mitchell
Secretary:	Steve Buckingham
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Mel Finkbeiner
Tour Coordinator:	Maynard Plahuta
Government Relations:	Bob Bowersock
Property & Facilities:	Del Ballard
Public Relations:	Bob and Sally Ann Potter
Moderator Editor:	Richard Romanelli

2009 BRMA Leadership

President:	Maynard Plahuta
Vice President:	C.J. Mitchell
Secretary:	Steve Buckingham
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Burt Pierard
Tour Coordinator:	John Baldwin
Government Relations:	Bob Bowersock
Property & Facilities:	Del Ballard
Public Relations:	Bob and Sally Ann Potter
Moderator Editors:	Richard Romanelli & Missy Keeney Baker

2010 BRMA Leadership

President:	Maynard Plahuta
Vice President:	C.J. Mitchell
Secretary:	Terry Andre
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Burt Pierard
Tour Coordinator:	Bob Horgos
Government Relations:	Bob Bowersock
Property & Facilities:	Del Ballard
Public Relations:	Bob and Sally Ann Potter
Moderator Editors:	R. Romanelli & M. K.Baker

2011 BRMA Leadership

President:	Maynard Plahuta
Vice President:	C.J. Mitchell
Secretary:	Missy Keeney Baker
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Burt Pierard
Tour Coordinator:	Bob Horgos
Government Relations:	Bob Bowersock
Property & Facilities:	Del Ballard
Public Relations:	(Vacant)
Moderator Editors:	Richard Romanelli & Missy Keeney Baker

2012 BRMA Leadership

President:	Maynard Plahuta
Vice President:	C.J. Mitchell
Secretary:	Gene Weisskopf
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Burt Pierard
Tour Coordinator:	Bob Horgos
Government Relations:	Bob Bowersock
Property & Facilities:	Del Ballard
Communications:	Vacant
Formerly Public Relations:	Gary White
Moderator Editors:	Richard Romanelli & Missy Keeney Baker

2013 BRMA Leadership

President:	Maynard Plahuta
Vice President:	C.J. Mitchell
Secretary:	Gene Weisskopf
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Burt Pierard
Tour Coordinator:	Bob Horgos
Government Relations:	Bob Bowersock
Property & Facilities:	Del Ballard
Communications:	Gary White
Moderator Editors:	R. Romanelli & M.K. Baker

2014 BRMA Leadership

President:	Maynard Plahuta
Vice President:	C.J. Mitchell
Secretary:	Gene Weisskopf
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Burt Pierard
Tour Coordinator:	Bob Horgos
Government Relations	Bob Bowersock
Property & Facilities:	Del Ballard
Communications:	Gary White
Moderator Editors:	Richard Romanelli & Missy Keeney Baker

2015 BRMA Leadership

President:	Maynard Plahuta
Vice President:	Hank Kosmata
Secretary:	Gene Weisskopf
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Burt Pierard
Tour Coordinator:	Bob Horgos
Government Relations:	John Fox
Property & Facilities:	Del Ballard
Communications:	Gary White
Moderator Editors:	Richard Romanelli & Missy Keeney Baker

2016 BRMA Leadership

President:	Maynard Plahuta
Vice President:	Hank Kosmata
Secretary:	Gene Weisskopf
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard
Membership:	Burt Pierard
Tour Coordinator:	Gary Busselman
Government Relations:	John Fox
Property & facilities:	Del Ballard
Communications:	Gary Fetterolf
Moderator Editors:	Richard Romanelli & Missy Keeney Baker

2017 BRMA Leadership

President:	John Fox
Vice President:	Hank Kosmata
Secretary:	Gene Weisskopf
Treasurer:	Del Ballard

Committee Chairs:

History & Artifacts:	Burt Pierard & Robert Franklin
Tour Coordinator:	Gary Busselman
Park Committee:	Maynard Plahuta
Property & facilities:	Del Ballard
Communications:	Gary Fetterolf

2018 BRMA Leadership

President:	John Fox
Vice President:	Hank Kosmata
Secretary:	Gene Weisskopf
Treasurer	Del Ballard

Committee chairs:

Gov/Community Relations:	Maynard Plahuta
History/Archives:	Burt Pierard
Membership:	Gary Petersen
Products/Sales:	Rick Bond
Communications:	Robert Franklin
Interpretive Projects:	Gary Busselman

2019 BRMA Leadership

President:	Robert Franklin
Vice President:	Ben Johnson
Secretary:	Charles Davis
Treasurer	Del Ballard

Committee chairs:\

Gov./Community Relations:	Maynard Plahuta
History/Archives:	Burt Pierard
Membership:	Burt Pierard
Products/Sales:	Rick Bond
Communications:	Jillian Gardner-Andrews
Interpretive Projects:	Gary Busselman

2020 BRMA Leadership

President:	Robert Franklin
Vice President:	John Fox
Secretary:	Charles Davis
Treasurer:	Del Ballard/Dave Marsh (Assistant)

Committee chairs:

Gov/Community Relations:	Maynard Plahuta
Membership:	Bob Carosino
Products/Sales:	Rick Bond
Communications:	Jillian Gardner-Andres
Interpretive Projects:	Ben Johnson
History/Archives:	Burt Pierard

2021 BRMA Leadership

President:	Robert Franklin
Vice President:	John Fox
Secretary:	Charles Davis
Treasurer:	Dave Marsh

Committee Chairs:

Gov/Community Relations:	Maynard Plahuta
History/Archives:	Burt Pierard
Membership:	Bob Carosino
Products/Sales:	Rick Bond
Communications:	(Vacant)
Interpretive Projects:	Ben Johnson

2022 BRMA Leadership

President:	Robert Franklin
Vice President:	John Fox
Secretary:	Charles Davis
Treasurer:	Dave Marsh

Committee Chairs:

Gov/Community Relations:	Maynard Plahuta
History/Archives:	Burt Pierard
Membership:	Bob Carosino
Products/Sales:	Rick Bond
Communications:	(Vacant)
Interpretive Projects:	Ben Johnson

Gov/Community Relations:	Maynard Plahuta
History/Archives:	Burt Pierard
Membership:	Bob Carosino
Products/Sales:	Rick Bond

2023 BRMA Leadership

President:	Robert Franklin
Vice President:	John Fox
Secretary:	Charles Davis
Treasurer:	Dave Marsh

Committee Chairs:

Gov/Community Relations:	Maynard Plahuta
History/Archives:	Burt Pierard
Membership:	Bob Carosino
Products/Sales:	Rick Bond
Communications:	C. Mark Smith
Interpretive Projects:	Ben Johnson

2024 BRMA Leadership

President:	Dave Marsh
Vice President:	Robert Franklin
Secretary:	Charles Davis
Treasurer:	Liza Eschbach

Committee Chairs:

Gov/Community Relations:	Maynard Plahuta
History/Archives:	Burt Pierard
Membership:	Bob Carosino
Products/Sales:	Rick Bond
Communications:	C. Mark Smith
Interpretive Projects:	Ben Johnson

Appendix B Milestone/Major Accomplishments Summary With Additional Details as Necessary to support the BRMA story (1990-2016)

Editors Note: The following sections are gleaned from the BRMA Newsletter "The Moderator" and other appropriate sources to provide supplemental details of the significant events that occurred in the years 1976 to 2016 when the BRMA Primary Goal of establishing a B Reactor Museum and/or National Park was accomplished.

B-1 1976

The prominent and well-regarded American Society of Mechanical Engineers was the first technical society to give national recognition to the historic B Reactor. "National Historic Mechanical Engineering Landmark" status was awarded to Hanford's B Reactor in a ceremony held in Richland, WA, on May 10, 1976.

The nomination material for this award was authored by Elmer M. Johnston, PE, manager of an engineering design group for the Westinghouse-Hanford Co.

The National Landmark program is administered by a national committee of ASME, called the National History and Heritage Committee. B Reactor was only the fourteenth landmark to be designated by that program since it had begun in 1971. The committee stated: "the research work, engineering and planning required to make the reactor operate should be included in history as one of man's most brilliant scientific and advanced engineering achievements."

B-2 1992

BRMA established a "Job Jar" for BRMA members to identify skills and talents and offer those to support the BRMA Goals and Objectives.

BRMA proposed a temporary interpretive center at the Vernita Bridge rest area, with the intent to establish a location where visitors would meet in preparation for a tour of the B Reactor. The center would also include artifacts and an estimated cost would be approximately $150,000. Funding is currently being sought for this proposal.

Pacific Northwest National Laboratories (PNNL) was asked to prepare the nomination forms for B Reactor nomination to the National Register of Historic Places. The final forms, prepared by J.C. Chatters of PNNL, and dated November 13, 1989, were approved by Washington State in June 1991, and submitted to the National Park Service. Formal recognition and "listing" were accomplished on April 3, 1992.

The "Record of Decision" issued by DOE this year stated that the preferred disposition of the eight reactors was to place them in a safe storage condition for a period of up to 75 years. The BRMA worked

to assure that this method of "safe storage" was not applied to the B Reactor. BRMA believed that the entire structure and ambiance of the facility should be preserved to appear as it did during actual operation. Furthermore, current efforts should include maintenance work needed to assure long life and safe access to the facility.

B-3 1993

B-3-1 ANS B Reactor Designated as Landmark by The American Nuclear Society

Figure B. 1 Photo of BRMA members at dedication of the B Reactor Granite Display Block

In response to the issuance of the DOE/RL decision to dismantle all 9 of the Hanford reactor buildings, BRMA launched a petition drive to obtain over 1200 signatures supporting the setting aside of the B reactor and those petitions were sent to Assistant Energy Secretary Thomas Grumbly.

B-4 1994

B-4-1 ASCE B Reactor Designated as National Historic Civil Engineering Landmark by The American Society of Civil Engineers

B Reactor was designated a National Historic Civil Engineering Landmark by the American Society of Civil Engineers (ASCE) in 1994. The work to prepare the nomination forms and to justify the honor of recognizing B Reactor as a Civil Engineering Historic Landmark was accomplished by the Columbia Section of ASCE and led by the efforts of Del Ballard, Historian for the Section.

The forms submitted by the Columbia Section on April 16, 1993, were reviewed by the National Board of ASCE at their 1993 Spring meeting, at which time they requested additional justification. A subsequent letter, dated October 13, 1993, providing additional details describing the advancement of civil engineering technology was submitted. The ASCE board gave their approval at their 1993 Fall meeting, held in Arizona, with formal approval being announced in early 1994.

Following the ASCE awards ceremony in Richland, bus tours offering a detailed visit to B Reactor were given to some 150 visitors. Most of the tour guides on the buses and at the reactor were members of the BRMA, including Gary Fetterolf, Miles Patrick, Bill McCue Sr., John Rector, Ralph Wahlan, and Lyle Wilhelmi.

A formal ceremony to present the commemorative bronze plaque to the Department of Energy, owner of the facility, was held in John Dam Plaza in downtown Richland on March 26, 1994. Stafford Thornton, National President Elect of ASCE, from the West Virginia Institute of Technology, presented the award to John Wagoner, Manager of the DOE Richland Operations Office. That plaque, commemorating B Reactor's ASCE Landmark status, was added to the granite stone that Richland sculptor Jim Acord had created as part of Hanford's 50th anniversary, and which contained award plaques by the two other technical societies.

Figure B. 2 Photo of dedication of 1994 Association of American Society of Civil Engineer Plaque at John Dam Plaza [03-26-1994)

Those pictured above at the award ceremony were, (left to right), John Axford, President Columbia Section; Rich Hovey, Director district 12 ASCE; Del Ballard, Historian Columbia section, ASCE and Secretary of BRMA; Lane Bray, WA State Representative; Major Michael D. Baehre, Corps of Engineers, Walla Walla District; John Wagoner, Manager DOE-RL; and Stafford Thornton, President Elect ASCE.

B-5 1995

BRMA members participated in the gathering of information and artifacts to be sent to the Smithsonian Institute in Washington D.C. for creation of an exhibit to display the D Reactor Control Room Console.

B-6 1996

A proposal for a new museum to replace the current Hanford Museums of Science and History. The proposed title, the Columbia River Exhibition of History, Science and Technology (CREHST), aptly describes the museum's broad scope. Geologic history, American Indian history, early settler history, and Hanford Site history will be represented along with DOE exhibits. The Center will also be the staging area for B Reactor tours. Further details regarding the museum, the proposed location will be in the 12-acre Cultural Center at Columbia Point, in the area now occupied by the driving links and the Shamnapum club house. The City of Richland will handle site preparation. The former FFTF visitors center will be moved to the Cultural Center site as temporary quarters. It will not be grand but will support a transition from the Hanford Museums of Science and History to CREHST. BRMA has pledged its support for the effort.

Since several members of BRMA were train enthusiasts and there is existing rail lines from the city of Richland to many of the Manhattan project sites at Hanford, BRMA members Don Sandberg and Lyle Wilhelmi developed a proposal for the possibility of a "Dinner Train" that would carry visitors to the B Reactor as a part of the future B Reactor tours.

B-7 1997

BRMA developed a slide show that was uploaded to the BRMA website to provide an overview of the role of B Reactor during World War II and the Cold War era and future goals of the organization relative to preservation of B Reactor in order to make that information available to the public.

The Phase II Feasibility and Engineering study issued in 1997 by DOE defined the cost estimates and proposed schedule for preservation of the B Reactor. This document contained favorable support for the ultimate preservation of B Reactor and establishment of a potential museum. The document contained three specific milestones associated with preservation of B Reactor.

The three milestones associated with B Reactor are:

- M-93-04: Submit 105-B hazards assessment and characterization report to EPA – June 1999.
- M-93-05: Issue B Reactor Feasibility Study Engineering Design Report for public comment – June 2000.
- M-93-06-T01: Submit B Reactor Surveillance and Maintenance Plan for EPA approval in part.

B-8 1998

BRMA continued to work toward designation of a location for the use of Jet Boat tours to B Reactor. In the same light, BRMA met with the Tri-Cities Visitors and Convention Bureau's Director of Tourism Development to further discuss train and boat tours to B Reactor.

BRMA solicited input from its members regarding the collection of Hanford artifacts they would be willing to provide to a B Reactor Museum, and a request for manpower for anyone that may be interested in supporting BRMA in its goal to preserve B Reactor.

B-9 1999

B-9-1 B Reactor Special Visitor

B Reactor through BRMA had a very special visitor in November who came all the way from Wilmington and all the way from 1944 to revisit B Reactor. Bill Ryan was a DuPont employee when he was assigned to the Manhattan Project in Oak Ridge, TN. There he helped put together and conduct classes in what was the world's first school for reactor operators, devising the procedures and techniques for running a nuclear reactor. He was sent to Richland in early 1944, primarily as a liaison between the work going on in the 100 Areas and the main DuPont office back in Wilmington. He was here when the reactor was started up, and remembers quite well the episode with the xenon poisoning of the reactor.

His name (William McCoy Ryan) appears on a dozen Hanford reports of the day, a few describing some startup issues for D Reactor. But he left before D Reactor came online, leaving Richland at the end of 1944 to perform more important wartime work for DuPont. Before he left though, he and his wife had a baby boy at Kadlec hospital, December 1944. Their son, Michael, lived in Richland for all of a few weeks. So, it was with great interest when Michael called me in early November, saying that his father was coming west for Thanksgiving, and would it be possible for them to come visit B Reactor? With the help of Dru Butler, we arranged a tour of B Reactor for the three Ryans. It was a memorable occasion and a rich opportunity for the reactor to act like a museum.

In January, BRMA met with representatives from the Port of Benton, City of Richland, Regional Governmental Council, Columbia River Journeys, and others, to explore the interest in building a boat dock near B Reactor for use by the public and/or tour groups. Later in the spring BRMA was in pursuit of a grant from the Washington State Interagency Committee for money from the Outdoor Recreation Program. The river dock project fit well into the Boating Facilities category, and the chances of receiving funds appeared quite promising. However, since BRMA had not yet formally requested a hearing from the DOE, nor received any indication from DOE that BRMA could obtain a right-of-way, it was decided to defer such a grant request. Additionally, BRMA engaged Benton County in the planning and they happily included the dock project in their "Interim Action Plan." This document describes their proposed land use for the Hanford Site. All of the previously contacted agencies and individuals, including BRMA supporter, Dee Lloyd of DOE, continued to show their interest and support. In April, BRMA submitted a letter to the DOE requesting a land use easement for riverbank access and the installation of a small floating dock in the cove at the 181-B pump house. BRMA indicated that costs would be covered by sources other than DOE. BRMA later met with DOE and heard numerous "reasons" why such an easement could not be granted. We were told that a refusal letter would be sent to BRMA. BRMA again presented the project plan at a DOE Issues Exchange Workshop on May 25, 1999. At that time, it was indicated that the strongest objection was the cost of preparing an Environmental Assessment for the project. BRMA suggested that BRMA might be able to assist in the preparation of such a document. As of the end of the summer, 1999, no formal response has been received on BRMA's request for an easement, and the project is currently at a standstill.

B-9-2 New York Times Reporter Gets B Reactor Tour

BRMA participated in a tour for NY Times reporter who is documenting the Hanford Story. In February a reporter arrived in the person of Patricia (Patty) Leigh Brown. She spent three days here researching an article about Hanford's history, how that history is being preserved, and how it will be made available to the public. BRMA was called to accompany her on a tour of B Reactor on February 6. Gene and Lyle served as representatives of the BRMA organization, and Dee McCullough came along to add authenticity, credibility, and charm to the tour.

But the trip to B Reactor was only a part of her Hanford tour. Thank goodness she was a journalist with lots of experience, because "learning" about Hanford involves hours and hours and miles and miles, including interviews with Keith Klein, Michele Gerber, Dee Lloyd, and all of us on the reactor tour, some time at CREHST, a tour of the Hanford Site, breakfast with some HEW pioneers, and about a thousand pages of notes. The point is that the straightforward issue of preserving Hanford's history somehow also involves federal budgets, Tri-Party Agreements, the EPA, Bechtel's role in the 100 Areas, the local community's interests, and on and on and on. At least 97 stories all overlapping the one.

B-9-3 Hanford Advisory Board Advises Saving B Reactor

Another positive step along the EE/CA path is the advice being offered by the Hanford Advisory Board to the DOE and EPA. The HAB were interested in the process because it's a cleanup action at Hanford, and a unique one at that. With the help of our own HAB member Madeleine Brown, the board's advice was a resounding "do it!" to the DOE, in support of mitigating the hazards at B and making it accessible to the public. What sometimes can seem more like the Hanford Adversary Board gave their unanimous support for the EE/CA's preferred alternative. Given the diverse makeup of the board, this was a very important step.

B-9-4 Tour Conducted for Columbia Chapter of American Society of Civil Engineers

Officers of the Columbia Section of the American Society of Civil Engineers (ASCE) requested a special tour of the reactor for their members. Del Ballard being a member of the ASCE and their Historian obliged.

B-9-5 BRMA Conducts 2nd Annual BRMA Day At B Reactor

BRMA Day at B Reactor on Saturday, June 9. This was the "2nd Annual BRMA Day," which bodes well for similar events in the future. BRMA comfortably filled two buses with BRMA members and their friends and families, and an assortment of DOE, EPA, State of Washington, and Bechtel dignitaries, almost-dignitaries, and czars. Although the day might have looked like an effortless event, it actually took several thousand hours (it seemed) of planning, phone calls, e-mails, computer work, and general running around. Fortunately, BRMA had lots of help and everyone seemed to know the routine.

During the event, a very nice transaction transpired. Mike and Dru of Bechtel presented the BRMA with a $1000 check as a token (a rather large token) of their appreciation of BRMAs efforts.

B-9-6 BRMA Requested to Develop HAER Document for T-Plant

BRMA has been requested to develop another HAER document about another Manhattan Project legacy

facility. This second HAER Document would focus on the T-Plant Processing Facility. In the Spring of 1999, a contract was signed to prepare a HAER document for the 221-T Facility, T-Plant.

B-9-7 DOE Environmental Impact Statement

The revised DOE HRA-EIS includes responses to comments received in writing and at public hearings during the previous review cycles. The Final EIS is being transmitted to commenting agencies and individuals, made available to the public, and filed with the Environmental Protection Agency (EPA). A DOE decision on proposed actions will not be made earlier than 30 days after EPA issues a public notice of availability for the Final EIS. The DOE will issue a Record of Decision (ROD) published in the Federal Register.

B-10 2000

June 22, 2000 BRMA Appreciation Event at B Reactor By Gene Weisskopf President, BRMA

BRMA must thank Madeleine Brown for her role in shepherding the event through its formulation by Bechtel and the DOE. The whole event was just great—BRMA members and guests got to see the reactor.

While he never did say the magic words “I’m proud to be able to announce today…,” he left no doubt that things are percolating at DOE. Money will soon be available to perform much of the necessary safety and convenience work that will allow the building to be used by the general public. He also sounded encouraging about the signals coming from DOE headquarters.

Keith received a warm and rousing round of applause, and enjoyed being able to emphasize something that would remain at Hanford long after the cleanup work is done. After Klein’s pep talk, Mike Hughes, President of Bechtel-Hanford, took the podium. Bechtel is the contractor in charge of B Reactor, and so has much interaction with the BRMA.

Tour Coordinator Roger Rohrbacher and I did some homework a week before the event and came up with the fact that, since the beginning of 1999, 51 BRMA tour guides spent 178 hours and drove 1615 miles to host 19 tours for 426 guests. Those receiving plaques were: Del Ballard, Tom Clement, Larry Denton, Joe Hedges, Bill McCue, Dee McCullough, Miles Patrick, John Rector, Roger Rohrbacher, Jerry Saucier, Bob Smith, Paul Vinther, Gene Weisskopf, Lyle Wilhelmi, and Kelly Woods

Figure B. 3 BRMA Members Receive Recognition Award From DOE and Bechtel

Figure B. 4 Additional BRMA Members Receive Recognition Award

Figure B. 5 Additional Awards to BRMA Members.

Figure B. 6 June 22, 2000 BRMA Appreciation Event at B Reactor By Gene Weisskopf President, BRMA

B-10-1 Dinner Train To B Reactor

In early October, Lyle and Gene went on a “track inspection” tour with Dick Fox, Howard Kallio, and

John Haakenson of the Tri-City Railroad company. It's only a driving tour on the roads, but they see Hanford from a railroader's perspective, in regards to future train tours of the site out to B Reactor. They also get a peek at the classic "executive rail car" that's parked at Tri-City Railroad. It's been beautifully restored, with a kitchen, several bedrooms, a lovely dining room, and a comfortable and well-appointed sitting room at the rear. With, of course, the all-important platform at the back of the car for making speeches, etc.

B-10-2 B Reactor Artifacts

Also in October, Del, Lyle, and Gene attended a meeting at DOE in Richland to discuss current and pending issues regarding B Reactor, including what to do with artifacts that often get dropped off at B Reactor. There is still no central repository for Hanford artifacts, so oftentimes items are left at what seems like an appropriate place, which B really isn't.

The Phase I engineering study (BHI-00076) has been out since 1995. The Phase II study has been on the table and pending every year since. Bechtel is now in the process of issuing a Request for Quote to complete the engineering study

BRMA members continued efforts to obtain unused graphite for use in the production of a graphite model of the reactor core. Ron Kathren Lyle, and Gene attended a meeting to discuss methods for release and reassignment of the unused graphite to BRMA. Later in the year, the graphite was determined to be "Excess" property and relegated to B Reactor for future uses should the facility become a museum.

B-10-3 B Reactor Gains Momentum

The B Reactor Project is progressing well and gaining momentum on several fronts. The focus for Fiscal Year 01 (October 2000 – September 2001), is twofold—completion of required regulatory documentation (an Engineering Evaluation/Cost Analysis, or "EECA") as required by EPA, and increasing "ease of access" to B Reactor.

BRMA President Gene Weisskopf reflects on the future vision for B Reactor: *The shy bird (B Reactor) in the protected cage (Hanford Access Restrictions) will be released for all to see, displayed in a light that is no longer beamed solely by we interested and caring observers.*

B-10-4 ACHP Recommends Saving B Reactor

The Advisory Committee on Preservation of Historic Places (ACHP) included in its report, entitled "Recommendations and Preservation Options for Manhattan Project Signature Facilities at Oak Ridge and Hanford Reservations," recommendations for B Reactor and T Plant, and asks the DOE to immediately pursue the designation of these facilities as national historic landmarks. The ACHP suggests that these historic places be administered in cooperation with the National Park Service.

B-11 2001

During the summer, prospects looked very encouraging for B Reactor opening in the future, as a museum. On September 11 of this year, terrorists attacked New York City, and Washington D.C. which had detrimental effects on all Hanford tours including B Reactor tours, as security for all Government facilities became very restricted.

The tour for congressman Doc Hastings was supported by BRMA tour guides Roger Rohrbacher, Lyle Wilhelmi, and Gene Weisskopf. They first gave a tour for a small group of Office of River Protection people, and then Doc Hastings, Keith Klein, and Mike Hughes of Bechtel. The tour went well. Gene made a few small pitches for the place while Roger provided the commentary and stories. The Congressman really hadn't seen the reactor before. Gene gave him a couple of pages with a dozen B-related topics, just in case there's an opportunity for an impassioned speech on the floor of the House. Additionally, a tour was provided for several senior managers of Bechtel National which was also very well received.

B-11-1 BRMA Supports Development of REACH Museum

BRMA member Michele Gerber, served as the representative to the committee on management of the newly identified Hanford Reach National Monument. Michele provides the panel's point of contact for issues relating to historic resources within the monument lands. The advisory panel was established to provide public input to the Fish & Wildlife Service (F&W) for the development of a management plan for the Hanford Reach lands. The meeting was scheduled in October so that Dave Nicandri, the director of the Washington State Historical Society, could attend.

B-12 2002

B-12-1 Waste Management Symposium 2002

BRMA supported Dru Butler who had the opportunity to attend the 2002 Waste Management Symposium in Tucson Arizona and present a paper. The paper is co-authored with Gene Weisskopf.

More than 50 people attended the presentation. The audience was diverse, including DOE, contractors, and regulators. Dru spoke with the mayor of Carlsbad, NM, a college professor from Texas, nuclear scientists from Chile, Belgium and Canada. All of the handouts provided were quickly taken, and a list was formed for those requesting tour brochures or HAER reports.

BRMA also had chance to speak with John Wagoner (past DOE-RL manager) who provided a contact with a new non-profit group, the Atomic Heritage Foundation, regarding Manhattan Project history and preservation.

Also at the symposium were Washington Department of Ecology managers John Price and Max Power, who presented a paper, Washington State's Perspective on Long-term Stewardship. The paper includes a discussion on long term trust funding, and the "inter-generational transfer of information" via preservation of B Reactor and the Hanford Reach National Monument.

B-12-2 Hanford's Historic B Reactor: Preservation and Environmental Restoration

Abstract Presented by Drusilla Hobbs Butler and Robert F. Potter, Bechtel Hanford, Inc.

B Reactor faces an uncertain future. As the Hanford cleanup progresses, it is clear that a decision must be reached regarding the long-term fate of the historic, old building. Will it be treated differently than Hanford's other production reactors that are slated to go into an Interim Safe Storage configuration? There is strong stakeholder support to preserve the building as a museum of sorts, and the B Reactor Museum Association (BRMA), a non-profit group, is a strong advocate for preservation.

Along with cleanup regulations, the National Historic Preservation Act of 1966 (NHPA) may have a bearing on the fate of B Reactor. Although clearly not in the museum business, DOE has offered to partner with a suitable, non-profit or government group capable and interested in assuming operational responsibility for a museum at B Reactor.

B-12-3 The Paths of Fiction

(The following article was provided by Gene Weisskopf)

Almost a year and a half before the bombing of Hiroshima a magazine article announced the arrival of the Atomic Age. A mundane adventure story named "Deadline" appeared in the March 1944 edition of the magazine "Astounding Science Fiction." The story described how the fissionable isotope uranium-235 could be separated from uranium and fashioned into a bomb of stellar power. This so paralleled one of the two key paths of the Manhattan Project that it sparked a government investigation of the author, Cleve Cartmill, and his editor, John Campbell at Street and Smith Publications in New York. Although the few technical details in the story were evidently not very accurate, alarms were nonetheless raised by the very fact that it discussed a U-235 atomic bomb of city-crushing size, as these two excerpts show:

Have you heard of U-235? It's an isotope of uranium….I'm stating fact, not theory. U-235 has been separated in quantity easily sufficient for preliminary atomic-power research, and the like. They got it out of uranium ores by new atomic isotope separation methods; they now have quantities measured in pounds.…But they have not brought the whole amount together, or any major portion of it. Because they are not at all sure that, once started, it would stop before all of it had been consumed—in something like one micro-second of time.

"I see," he said…"Two cast-iron hemispheres, clamped over the orange segments of cadmium alloy. And the fuse… is in a tiny can of cadmium alloy containing a speck of radium in a beryllium holder and a small explosive powerful enough to shatter the cadmium walls. Then… the powdered uranium oxide runs together in the central cavity. The radium shoots neutrons into this mass—and the U-235 takes over from there."

Of course, just such a process was in the works at Oak Ridge, Tennessee. There, the isotope U-235 was being separated from uranium and shipped to Los Alamos, New Mexico, where a scant 140 pounds of the material was built into the atomic bomb that devastated the Japanese city of Hiroshima on August 6, 1945.

Another historically interesting aspect of the "Deadline" story is the extent of the investigation that followed it, as well as the extent of the investigation of that investigation by BRMA member William Ryan in Wilmington, Delaware. He and I discussed the story when he was visiting Richland in November 2000—Bill had actually heard of the story and investigation when he was working at Hanford for Dupont, helping to get B Reactor built and then started in the fall of 1944. In the past year, Bill spent countless hours pursuing the government documents of the "Deadline" investigation. As happens so often, he was quite impressed by the monolithic lack of enthusiasm on the part of those who could supply the documents. To make a long, long story much shorter, he succeeded in acquiring a number of documents that discussed the investigation and has put them and the details of his quest into a very enjoyable booklet. Bill has offered to make it available to those who are interested.

Two key points that Bill reveals are that the investigation in 1944 was much deeper than the details in the

story warranted, and that Cartmill and Campbell had no knowledge of atomic energy beyond what was available in the popular scientific publications of the day.

"Deadline" is yet another historical gem from the birth of the Atomic Age. Its value lies not so much in the details it contains, but in the clear lesson it teaches of the pioneering role that literary works of fiction can play—the quest for scientific truth can only be driven by the fuel of curiosity and imagination.

BRMA conducted a tour on March 14th of B Reactor for a reporter, photographer, and graphic artist from the Seattle Post-Intelligencer. BRMA members Dee McCullough, Paul Vinther, Everett Weakley, and Gene host the tour and spend a couple of hours showing off the reactor and answering questions. An article about Hanford cleanup (and hopefully B Reactor) is scheduled to appear in the newspaper around mid-April.

B-12-4 BRMA Gets A Seat At A New Table

BRMA member Dru Butler received an invitation from the Fish and Wildlife Hanford Reach Monument folks to participate in a 3.5-day workshop. They want a wide range of stakeholders to develop goals and management objectives for the Hanford Reach National Monument, which is historic B Reactor's newest neighbor. Dru wanted to know if it was her League of Women Voters that they wanted or my BRMA advocacy hat, and the answer was clearly BRMA advocacy!

B-12-5 DOE's Not-So Secret Museum Business by Madeleine Brown

The US Department of Energy has recently and frequently stated it's not in the museum business. USDOE needs to qualify that statement. USDOE is not in the museum business–except in Idaho Falls, Oak Ridge, Los Alamos, Albuquerque, and Alamogordo. Of course, it's not usually DOE employees who operate museums–as with nearly all functions at DOE sites, DOE pays contractors to do the work. One such museum is located near Arco, Idaho titled the EBR-1 museum. It receives more than 7000 visitors each summer. DOE still funds this museum to the tune in FY 02 of $368,801. This covers one contractor PR person, the three college students who work as guides there, plus electricians, painters, and RCTs (for monthly surveys plus a check of the garbage leaving the building).

B-12-6 Albuquerque is the site of DOE's National Atomic Museum.

This is the nation's only congressionally- chartered museum of nuclear science and history. Last, let's not forget the incredibly historic site of the world's first atomic explosion at the Trinity Test Site on July 16, 1945. The site of that test in Alamogordo, New Mexico, was declared a national historic landmark in 1975. It's on the northern end of the White Sands Missile Range and is open to the public twice a year. USDOE denying it's in the museum business is laughable–but it really isn't so funny when it keeps the public from visiting historic B Reactor and keeps the threat of cocooning lurking like a recurring nightmare.

B-12-7 A Grand Opportunity

'The Manhattan Project: A Living Legacy' will be held in Washington, DC, Saturday, April 27, 2002. The

symposium is sponsored by the Atomic Heritage Foundation, The National Trust for Historic Preservation and the Carnegie Institution of Washington. The Save America's Treasures group will announce two sizable grants. One is for Manhattan Project Properties at Los Alamos and the other is for EBR-1, the experimental breeder reactor, in Idaho. BRMA agreed to attend the subject meeting and while in Washington D.C. members will visit as many decision makers as possible. The message is simple: Congress must tell DOE to make B Reactor into a museum or tell another federal agency to work with DOE to make this happen. Madeleine Brown has agreed to make this trip.

B-12-8 September 11 Terrorist Attack

Due to limitations on access to the Hanford Site based on the events of September 11, badged and cleared individuals have been allowed to participate in B Reactor tours on a limited basis with BRMA providing tour guides.

B-12-9 Hazards Study Mitigation Plan for B Reactor

The Hazards study and mitigation plan for B Reactor are completed, as well as the Environmental Protection Agency-required EE/CA. Indeed, as each new administration takes charge in Washington, D.C. the museum concept is liable to new threats. DOE-RL activities to make B Reactor into a museum seem currently to be at a standstill, which may indicate that the present administration is cool to the idea and the museum idea should be left to languish for now.

B-13 2003

B-13-1 Senate Bill 1687

September 30, 2003, Senate Bill: 1687 was issued which directs the Secretary of the Interior to conduct a study on the preservation and interpretation of the historic sites of the Manhattan Project System. The Bill also directs the Committee on Energy and Natural Resources to evaluate the possibility for inclusion of Manhattan Project sites in the National Park System.

B-13-2 B/C Remedial Action Project

The B/C Remedial Action project has excavated and shipped 946,264 tons of contaminated soil, old pipes and debris to Hanford's Environmental Restoration Disposal Facility since the project began almost two years ago in the B/C Area. Major sections of the pipeline including the reinforced concrete effluent pipeline from B Reactor have been removed. The project and its heavy equipment continue to maintain a 25-foot buffer zone from the outside walls of B Reactor to ensure the protection of the structure.

Recent cleanup work has centered north and east of the B Reactor. The project is scheduled for completion in 2005, and at that time the B Reactor fencing that was removed to enable the project to proceed will be replaced.

B-13-3 Fall Tours Summary

About 100 people had the opportunity to visit the B Reactor in the first quarter of FY03. The groups included: Nez Perce Tribal Leaders, EPA Richland Office, Bechtel Corporate managers, Russian Treaty

Verifiers, the State Department, and US Military Interpreters. A BRMA guide was requested to host the Nez Perce tour.

B-13-4 BRMA History Artifacts and Exhibits By Lyle Wilhelmi

Burt Pierard and Antony (Tony) Grambihler, two computer enthusiasts, wanted to save video and audio tapes to CDs or DVDs for other projects. Burt, a history buff who recently joined BRMA, volunteered to affect the transfer of video oral histories to DVDs. Not only that, but he volunteered to upgrade them with appropriate titles, credits and pictures to make the oral history a little more understandable. Another breakthrough came when Del Ballard told a neighbor what we were planning. That neighbor, Tony Grambihler (not a BRMA member), volunteered to help with the project. Tony took on the transfer of audio oral history tapes to CD and it was done almost like magic. We are blessed because these two people not only have the sophisticated equipment to do the job but have the energy to do it. In support, Lyle Wilhelmi took on the task of producing colorful disc labels for each of the fifty or so CDs and DVDs He also extended an oral history database started by Gene Weisskopf, which can be used as a prototype for a database of oral histories kept in museums and pioneer organizations in the region.

B-13-5 BRMA to Get Some Airtime

Every 1st and 3rd Thursday, KONA's Mike MacDonagh interviews someone for a "Time Capsule" program. The idea is to relate history to life in our community. Thanks to Connie Estep, BRMA was invited to a December 10 planning meeting to lay out the historic tidbits for 2003. We'll have two interviews in 2003: first on August 7, to talk about how through B Reactor, this community impacted world history–and vice versa. On December 4, I (if no one else steps forward) will discuss the anniversary of the creation of the Manhattan District on December 5, 1942. And the rest, as they say, is history. Thank you, CONNIE ESTEP, for this opportunity!

B-13-6 What's been going on since September 2002

In December, BRMA member Del Ballard attended a presentation (story telling) given by Gerry Taylor, who serves as a Trustee, Board of Directors for the National Atomic Museum Foundation, in Albuquerque, NM.

B-13-7 What's new at the B Reactor? Update for January–March 2003 by Dru Butler

B-Reactor Project Manager

The B Reactor Project continues to make progress on completion of the hazard mitigation upgrades that are specified in the 2001 Engineering Evaluation and Cost Analysis. The fire protection improvements have been completed, including the addition of emergency lighting along the tour route and improved exit routes to the outside of the building. The lighting inside of the fuel storage basin has also been improved and provides a better view for visitors. The encapsulation of lead paint and asbestos tiles has been completed, the floors have been polished and the walls have been cleaned in the flow lab/machine maintenance room and the worker lunchroom. The rooms are now ready to become part of the tour route. The idea of using these rooms to provide meeting space or to stage exhibits has been discussed. The Control Room and the Accumulator Room have been painted and the floors have been cleaned and

polished. The B Reactor Crew has also cleaned and restored the small office outside of the control room. Pictured below are members of the B Reactor Crew including Lorene Chappell, Heavy Operator and Annette Howell, Radiation Control Technician. The B Reactor Crew take special care with the B Reactor, often finding creative ways to preserve the historic look of the building and its contents while meeting strict clean up requirements.

B-13-8 "Old" Glory Has Proud "New" Home

Mr. and Mrs. Everett Weakley, BRMA members, donated a vintage, 48-star American flag to BRMA for display at the B Reactor. This flag is the type that flew over B Reactor in its early days, including during the end of WW II, just after completion of the reactor. This flag was used to honor Mrs. Weakley's father, Mr. Joseph Kritzer, at his funeral in 1958. Mr. Kritzer was a WW I veteran and later worked at Hanford. The flag was flown at B Reactor on March 26, 2003, and, according to the wishes of the Weakley family, will be flown only on special occasions in order to preserve its integrity. 48-star American flag donated by the Weakley family was flown at B Reactor on March 26, 2003.

B-13-9 Atomic Heritage Meeting Summary by Del Ballard and Tim Johnson

The Atomic Heritage Foundation, spearheaded by its leader Cindy Kelly, organized a meeting and workshop in the Tri-Cities during April 30th and May 1st. Ms. Kelly is President of the D.C.- based Atomic Heritage Foundation, which is operating under a $250,000 grant from the DOE to develop a plan and submit a report to Congress on how best to preserve the most significant remaining buildings, artifacts, and documents that portray the history of the Manhattan Project. Plans are under way to preserve various sites that participated in the Manhattan Project including Oak Ridge, Los Alamos, and of course Hanford. The meetings and workshops started on the Wednesday afternoon, but on the Wednesday morning Cindy was escorted on a Bechtel-sponsored tour of B Reactor. Tom Marceau and Dru Butler hosted while Roger Rohrbacher and Bob Egge acted as guides. Others attending were Lyle Wilhelmi and Del Ballard of BRMA and Don Eckert and staff of BHI. Bechtel had the B-reactor building looking in top shape for the visit!

The recurring theme throughout the afternoon was documentation and preservation of key Hanford contributions to the Manhattan project, the B reactor in particular. Formal presentations included the telling of the Manhattan Project story at Hanford: Darby Stapp of PNNL covered pre-Hanford history; Tom Marceau of Bechtel described Manhattan Project Resources; Del Ballard summarized the B Reactor History and what BRMA sees as the path forward. Also participating were representatives from the National Park Service, the Fish and Wildlife Service, as well as other speakers from DOE, the Friends of the Reach, City of Richland, the Tri-cities Visitor and Convention Bureau, and the Richland Chamber of Commerce. Some 60 to 80 private citizens and Hanford employees attended the afternoon session.

A series of recommendations was made, and several parties agreed to their roles and responsibilities in these recommendations. Most notable among these was that DOE has stewardship responsibility under the National Historic Preservation Act (NHPA), and that DOE can work with other federal, state and local agencies as well as the public to preserve significant Manhattan Project resources. Other partners with roles to play include the Park Service (NPS), Fish & Wildlife, State Historic Preservation Office, CRESHT, and congressional representatives to authorize the funds for the NPS study. The following are the consensus recommendations of the workshop.

1. Get National Park Service study authorized with realistic time frames.

2. Responsible parties: Congressional representatives for Doc Hastings and Senators Murray and Cantwell; Heritage tourism partners and residents express support through letters to local Congressional offices; Atomic Heritage Foundation to work with Washington State Congressional delegation and other delegations.

3. Open B Reactor now for regular tours with B Reactor Museum Association (BRMA) and other partners.
4. Determine appropriate exposure limits for members of the public who visit B Reactor when the B Reactor is under jurisdiction of the Park Service or other long-term steward.
5. Include option for preservation of B Reactor in decision-making process under the Tri-Party Agreement.
6. Allow site access for road tours and reevaluate requirements for minors.
7. Preserve existing transportation alternatives and work with partners to implement public access via rail, road, and river. Detailed recommendations: Provide for boat tours from Richland to Vernita Bridge and provide a launch and take-out place at Vernita. Upgrade roads necessary to provide public access to B Reactor and other sites, as appropriate.
8. Identify critical near-term needs and take action including protection, stabilization, surveillance, maintenance and funding for structures, sites, artifacts and records.
9. Preserve T Plant for public viewing and interpretation and consider other Manhattan Project properties for possible reuse and preservation as necessary to interpret the history of the Manhattan Project at Hanford.
10. Examine river corridor contract to accelerate clean-up of White Bluffs and Hanford town sites. Facilitate access to White Bluffs ferry landing for a World War II memorial. Detailed recommendations: Consider an interpretive center to tell the story of the agricultural communities of White Bluffs and Hanford along the banks of the river. Consider rebuilding the railroad station building at White Bluffs or using the Bruggeman warehouse for interpretation. Also, recognize the sacrifices of the agricultural communities whose property was condemned by the government in 1943 and the loss of fishing, hunting and gathering rights by the Native American tribes.
11. Provide for restoration and long-term preservation of significant properties as part of the accelerated cleanup and plan.
12. Assist City of Richland in preserving and interpreting the “Alphabet homes” and commercial properties.
13. Collect, organize, and make available, with appropriate funding, existing information and documents prepared by DOE, BRMA, and other groups relating to preservation of the Manhattan Project at Hanford. Detailed recommendations: Construct a facility or adapt an existing facility such as the FMEF as a center for Manhattan Project and Cold War research and interpretation, similar to the Desert Research Institute’s new facility at the University of Nevada/Las Vegas campus. The facility would provide for the storage and curation of artifacts, archival film and documents, research library, and exhibits for the public.
14. Respond to the recommendations of the Advisory Council on Historic Preservation on the Manhattan Project and pursue implementation of the President’s Executive Order of March 3, 2003 to “Preserve America.”
15. Research and interpret Hanford’s technological spin-offs (e.g., health physics, environmental effects, transport fate and modeling, and various technologies).
16. Embrace “Living Legacy” concept to perpetuate rather than just preserve the history of Hanford and

provide access to physical and knowledge artifacts and provide for their continuing interpretation.
17. Continue public issues exchange, providing greater public participation.
18. Use DOD, NASA, and other efforts to interpret history of the Manhattan Project and fulfill DOE's stewardship responsibilities.
19. Identify working group to ensure goals and objectives from this workshop are followed through. (a) Make a record of this meeting, and (b) Review and comment on draft document

B-14 2004

B-14-1 MAPR Public Law Passed

Manhattan Project National Historical Park Study Act (Public Law 108-340), Passed. The effect of this legislation is to conduct a study to evaluate the potential for setting B Reactor (and potentially other Manhattan Project facilities) aside as a future museum or eventually a National Park.

B-14-2 DOE's Recommendation on the Final Fate of B Reactor Could Be Made as Early as September 2005 by Bob Potter B-Reactor Project Manager, Bechtel Hanford, Incorporated

The ultimate future of B Reactor will be determined through the federal Superfund regulatory process, and the commitments and milestones in the Tri-Party Agreement (TPA) that drive the timetable for the process. A recent change in the TPA now requires DOE to provide the Environmental Protection Agency (EPA) with a recommendation for B Reactor's final configuration by September 30, 2005. Should that recommendation include the "cocooning" of B Reactor, the preservation of the reactor as either an interpreted historical facility or a museum would be lost. However, recent events demonstrating continued support for the preservation of B Reactor could help save the reactor from being "cocooned".

B-14-3 An "Interim" Regulatory Decision Has So Far Saved B Reactor From Cocooning

Because of BRMA's preservation efforts, B Reactor has avoided the cocooning alternative for safe storage. In June 2001, a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process used an "interim" Engineering Evaluation/Cost Analysis (EE/CA) to evaluate alternative removal actions for radioactive, chemical and industrial hazards identified in B Reactor as potential threats to human health and safety and to the environment. In March 2002, an Action Memorandum resulted from the EE/CA that identified "interim actions" to mitigate hazards and allowed public access along a designated tour route for up to 10 years (through 2012), with surveillance and maintenance on the reactor also continuing during that period.

B-14-4 Additions to Tri-Party Agreement Will Accelerate Decision on B Reactor

In order to support DOE's plans to complete the interim safe storage of all Hanford reactors by 2012, the TPA was amended in April. A TPA milestone (M-093-25) was added for DOE to "submit an engineering evaluation of the final surplus reactor disposition to EPA and the Department of Ecology"

by September 30, '05. This will be an evaluation of alternative options to transporting the reactor cores in one-piece for disposal on the Hanford central plateau that was included in the original 1993 ROD. A related addition to the TPA was a commitment to "complete final configuration determination for B Reactor and submit recommendation to EPA by September 30, 2005." Although the 2002 Action Memorandum for B Reactor provides for hazard mitigation, surveillance and maintenance, and public access for escorted tours until 2012, this new commitment will accelerate the decision for the final disposition of B Reactor. DOE is currently planning to have BHI begin another "final" EE/CA-type engineering evaluation of various "final configuration options" for B Reactor in March 2004. It is expected that cocooning will be included as a final configuration option being evaluated.

In 2003 bills were introduced in the U.S. Senate and House of Representatives for the NPS study and the House and Senate conference committee included the NPS study in the Energy Bill that passed the House but failed in the Senate in the last session of Congress. Congressional leadership has announced they will be taking up the Energy Bill as priority legislation in the January 2004 session of Congress. With support from Senators and Representatives from the states of Washington, Tennessee and New Mexico, it is very likely that legislation authorizing the NPS study will be passed during the next session of Congress. Should an NPS study result in recommending a Manhattan Project National Park that includes B Reactor, it would identify the NPS as a possible operator for the facility.

B-14-5 Letter to Congress An Opportunity to Preserve and Present United States History by Gene Weisskopf Secretary & Past President, BRMA

Near the end of March, the BRMA sent a one-page letter to every member of Congress, explaining the importance of two upcoming bills (H.R. 3207 and S. 1687) that would direct (and hopefully fund) the National Park Service (NPS) to conduct a study on the preservation of historic sites of the Manhattan Project for potential inclusion in the National Park system. That letter is contained in Appendix D.6 of this document.

B-14-6 Nomination for National Historic Landmark Status

Around the middle of March, BRMA President Gene Weisskopf compiled a draft of the nomination for B Reactor as a National Historic Landmark. The application went to the National Park Service (NPS) in Seattle, where it received a preliminary review. The reactor is already on the National Register of Historic Places, having been entered in 1992 via a nomination by the BRMA. The Landmark status is quite similar to the National Register, except that a property must have national significance.

B-14-7 B Reactor Tour Route Continues to Improve by Lyle Wilhelmi, Exhibits Chairman, BRMA

B Reactor was toured June 23rd, 2004, by Todd Nelson (Bechtel Hanford Incorporated – BHI), John Crigler (BHI graphics designer), Roger Rohrbacher (B Reactor tour guide), Larry Denton (B Reactor tour guide), Lyle Wilhelmi (BRMA exhibits chairman), and Mike Caldwell, (BHI B Reactor facilities maintenance). The function of the group was to make recommendations for the 60th anniversary and subsequent B Reactor tours.

There was consensus that the building should be displayed as a period piece and look as much as possible like an operating reactor. Use of some areas evolved over time and had seen several uses. It was decided to pick a date in the operational history and label each part of the workspace according to its function as it was during that time period.

It was decided that additional signage was needed in the entry hallway, front-face work area, the accumulator room, the valve room and the control room. These are the areas that will be included in the 60th anniversary tours in October.

The stands for the historical exhibit in the entry hallway are to be redesigned so as to provide more space for tour groups. Exhibits addressing topics other than pre-Manhattan project history will be moved to other locations.

The front face requires no additional work but the front-face work area will be cleared of all but the topic of 105-B construction along the left wall and basic operational artifacts on the right wall. The display cabinets and their contents in the forward area of the workspace should be moved to another location to provide a clear view of the front face. The blank wall areas in the fan room or the rooms in the area of the old lunchroom were suggested as possibilities. The rear of the workspace will have no exhibits except the process tubes and associated tools.

B-14-8 60th Anniversary of B Reactor Going Critical: BRMA to Host October 9th Celebration Multiple Events Planned

As most BRMA members know, it was September 26th, 1944, when B Reactor went critical for the first time. As part of the 60th anniversary commemoration of that event, there will be several events taking place, and Bechtel Hanford has agreed to make a $10,000 contribution to be the presenting sponsor at the dinner. Other sponsorships are still pending. For details concerning the 60th Anniversary Celebration, see section 8.3 of this document.

During the 60th Anniversary Celebration, the World Premier of AHF Film: “Hanford’s Secret Wartime Mission: 1943-1945” was presented, by Cindy Kelly, President Atomic Heritage Foundation.

On Friday evening, October 8th, 2004, the Atomic Heritage Foundation was pleased to premier its documentary film, “Hanford’s Secret Wartime Mission: 1943-1945.” Thanks to the B Reactor Museum Association, Battelle for the use of the Battelle auditorium, and the many volunteers involved in making the event a success. An estimated crowd of 200 to 250 attended the world premiere of the film, and the response was very positive.

The documentary film tells the story of the Manhattan Project at Hanford, from the selection of the site to the successful production of plutonium in the B Reactor. First-hand accounts by Roger Rohrbacher, Steve Buckingham, Paul Vinther and other veterans as well as interviews with DuPont’s Crawford Greenewalt and Col. Frank Matthias help the history come alive. Interviews with members of the Yakama, Nez Perce and Wanapum tribes remind viewers of the dislocations caused by the Federal government’s taking over the land. Authors Michele Gerber, Roy Gephart and Robert Norris help explain the significance of the work at Hanford and its legacy. With documentary footage and photographs, the film recreates the incredible undertaking at Hanford to produce the plutonium used in

the “Fat Man” bomb dropped on Nagasaki. The film is available online at www.atomicheritage.org as well as at the CREHST Museum.

The keynote speaker was author Richard Rhodes (The Making of the Atomic Bomb) at a $230 plate dinner held at the Richland Shilo Inn. Representatives from the U.S. Army Corps of Engineers, US DOE, CHREST, and the REACH Museum were in attendance along with representatives from the NPS, Washington State Office of Archaeology and Historic Preservation and Washington Trust Historic Preservation and representatives of our local Congressional delegation.

During the visit, on-camera interviews were conducted with ten Manhattan Project and Cold War workers who had contributed to the construction and/or operation of the Reactor. Additionally, two Manhattan Project workers from T Plant and three from the 300 Area were interviewed. In rounding out the Hanford Site story, specifically the effects of construction on the local communities, interviews with former Hanford and White Bluff residents and Native American Elders were also filmed.

B-14-9 August 2004 BHI-01172 Surplus Reactor Auditable Safety Analysis Published

1.1 PURPOSE

1.1.1 This auditable safety analysis (ASA) provides the safety basis for maintaining the 105-B, 105-C

105-DR, 105-F, 105-KE, and 105-KW Reactor Buildings and ancillary facilities until interim or final disposition. The ASA provides a hazard baseline, identifies and evaluates the associated hazards, identifies the appropriate controls, documents the final hazard classification (FHC), and documents the resultant commitments for the surveillance and maintenance (S&M) of these inactive reactor buildings and associated ancillary facilities at the Hanford Site. In addition, this document provides a basis for evaluating proposed activities to determine if the activities are acceptable.

This document includes the following:

- A description of the S&M activities to be performed
- An assessment of the inventory of radioactive and other hazardous materials within the
- inactive reactors and ancillary facilities
- Identification of the hazards associated with the S&M activities for the inactive reactors and
- ancillary facilities
- Identification of internally and externally initiated accidents having the potential to result in
- significant consequences for workers, the environment, or the public
- An assessment of the bounding radiological and hazardous chemical consequences of the

- potentially significant accidents
- Determination of the FHC based on the bounding radiological and hazardous chemical
- consequences
- Identification of the controls (including commitments) necessary to control the identified
- hazards and to ensure that the FHC remains valid.

This ASA supersedes the preliminary hazard classifications (PHCs) performed for the 105-B, 105-KE, and 105-KW Reactors (BHI 1997e, 1997h, 1997i) and the safety analysis for interim stabilization to the 105-C, 105-DR, and 105-F Reactors (BHI 1996a, 1998f, 1998e).
The 105-D and 105-H Reactor Buildings, which are scheduled to be modified for interim safe storage (ISS) under the Facilities Decommissioning Project, are outside the scope of this ASA and have their own authorization basis. Upon completion of the modifications, these reactor buildings will reenter the S&M program.

B-14-10 B-Reactor to Commemorate 60th!

B-15 2005

September – the Bechtel Hanford operations contract contained Supplement #5 which provided funding for tour guide service for B Reactor tours. The $1500 supplement covers an additional 12 tours through March 31, 2005, which corresponds to the current BHI contract extension date which BRMA will support with tour guides for these proposed tours.

September - Doc Hastings' DC office contacted BRMA to report that the House Resource Committee had passed H.R.3207, the Manhattan Project Park Study bill, and it will now advance to floor of the House.

September - Great News: Learned via the Tri City Herald that the Senate passed bill S-1687, The National Park Service study bill. Both the House and the Senate bills are so close that a conference will probably not be required.

October - Del Ballard sent a message to Annabelle Rodriguez asking DOE to inform the NPS that they support the processing of the BRMA prepared nomination of B Reactor as a National Landmark.

October - Del Ballard spoke before the WA State Park Commission Board. Comments were given on highlights of the reactor's historical significance, current status, and the legislation for an NPS study. A resolution by the State Park Commission was requested asking for support and cooperation. Their director, Rex, indicated they would consider such a resolution at their December meeting. Reaction from their Board appeared positive. Marsh Taylor (budget officer) is very interested and will keep us apprised of their actions. Larry Fairleigh was the original contact for presentation.

October - Received the good news from Doc Hastings D.C. office that the President has signed the "Manhattan Project National Historical Park Study Act". This action directs federal agencies to formally

study the concept of B Reactor and other Manhattan Project sites becoming part of a National Park.

November - Received copy of letter from EPA to DOE (dated Nov. 10) giving their reaction to draft EE/CA on final configuration of 105-B. EPA believes the evaluation must include the museum option, and chides the DOE for not including that evaluation in the new EE/CA. BRMA has not, to date, been provided a copy of this draft of the EE/CA.

November - BRMA issued a letter to DOE, Keith Klein (DOE-RL Manager), to express the endorsement of BRMA of EPA's position in the above mentioned letter to: 1) include an alternative in the final EE/CA which preserves the B Reactor as a museum, and 2) delay the issuance of the EE/CA and the decision on the final configuration of B Reactor until after the National Park Service (NPS) museum feasibility study.

B-15-1 BRMA Speakers Bureau

October – BRMA organized a BRMA Speakers Bureau to provide programs about B Reactor for civic and service club meetings. The PowerPoint presentation that has been prepared to tell the B Reactor story will be the basis for these presentations. BRMA has 6 members who have volunteered to be speakers. This will help get our story out to the community.

We also received the good news that the Department of Energy (DOE- owner of B Reactor) wrote a letter stating that it had no objection to BRMA proceeding with the nomination of B Reactor to be a National Historic Landmark. This news was especially important, since the National Park Service (NPS) had told us that it couldn't really consider the National Historic Landmark nomination until the owner concurred. NPS also stated that the National Historic Landmark nomination was an important first step in the whole NPS process of studying B Reactor for preservation as part of the Manhattan Project Historic District Act which was enacted last autumn.

As soon as the Department of Energy sent its letter concurring with the National Historic landmark nomination, Congressman Doc Hastings inserted two parcels of funding for B Reactor into the House version of the fiscal year 2006 federal budget. One million dollars of funding will go to DOE for upkeep, maintenance and repairs to B Reactor (hopefully the $800,000 new roof that we have been pushing for, plus general maintenance). Another $250,000 will go to the Department of the Interior for the NPS feasibility study for preserving B Reactor. This amount of money will surely keep the study alive in 2006, while we work for more funding for 2007! As soon as the NPS received all of this good news, it forwarded BRMA's draft National Historic Landmark nomination for initial review at the Interior Department, and we now really have the ball rolling. Currently, we are awaiting the results of that review, to see if we have to make any modifications to our nomination.
We have three upcoming programs in August. On August 2nd Michele will give a luncheon presentation to the Richland Rotary Club; August 11th and 15th we've been asked to be the luncheon program for the Columbia Center Rotary at the Three Rivers Convention Center; and on August 15th we are the scheduled luncheon program for the River Side Rotary Club at Anthony's Homeport. In addition, on September 22nd, Michele is scheduled to give a B Reactor update to the TRIDEC Board of Directors.

A task team was recently formed composed of about a dozen BRMA members. The team is to come up with a list of suggestions / requests for proposed exhibits. The recommendation will be made as a proposal to the Richland Public Facilities District (PFD), which is responsible for the design, building & operation

of the Hanford Reach National Monument & Interpretive Center.

Photo caption: Deputy Secretary of Energy Clay Sell along with BRMA President Michele Gerber in the Control Room at "B".

Figure B. 7 Michelle Gerber and Clay Sell during visit to Hanford's B Reactor

On Wednesday, September 7, 2005, BRMA and the Richland Public Facilities District hosted a visit by Dr. John Van Zytveld, Program Director for the M. J. Murdock Charitable Trust, and Cindy Kelly, President of the Atomic Heritage Foundation. The visit to B Reactor, CREHST, and the site of the new Hanford Reach Heritage and Visitor Center (The REACH) on Columbia Point was part of the evaluation of an Atomic Heritage Foundation $350,000 grant proposal to the Murdock Trust. The grant would fund B Reactor exhibits; oral histories, vignettes and documentary films; and educational material that would be used at B Reactor and at The Reach, and at CREHST until The REACH is opened in 2008. The purpose of the visit was for Dr. Van Zytveld to evaluate first hand B Reactor as a viable museum/exhibit, the status of the design and construction of The REACH, and to determine the feasibility of B Reactor being operated by The REACH as an interpreted historical exhibit, as described in the Atomic Heritage Foundation proposal.

Figure B. 8 Visit Proposed Site for New REACH Museum

Photo caption: Visitors to B Reactor on September 7, 2005, were (from left) Cindy Kelly of the Atomic Heritage Foundation, BRMA President Michele Gerber, John Van Zytveld of the Murdock Trust, Bob Potter, Sally Ann Potter, Eric Gerber, Ron Hicks, Director, Reach Visitor Center and Gwen Leth, Director, CREHST

B-16 2006

B-16-1 Las Vegas Conference

Sally Ann and Bob Potter represented B Reactor Museum Association (BRMA) at the first-ever Department of Energy (DOE)-sponsored Museum Conference held in Las Vegas in June 2006. The conference was sponsored by DOE's Office of History and Heritage Resources (OHHR) and hosted by the Atomic Testing Museum and the Nevada Test Site Historical Foundation. Thirty-three representatives from 15 of 19 nation-wide DOE-related museums, science, and visitor centers attended the two-day conference.

The objectives of the conference were: 1) to provide input to a DOE headquarters (DOE-HQ) Museum and Visitor Center Study requested by Deputy Secretary of Energy Clay Sell; and 2) to organize a network of DOE-related museums, science, and visitor centers in order to establish access to DOE- HQ and influence how the Department meets its historic preservation responsibility.

In March, the National Park Service (NPS) kicked off the Manhattan Project National Historic Park Special Resources Study that was authorized by Public Law 108-340, approved by President Bush in October 2004. The funding to initiate the study was included in this years Department of Interior budget, with funding to complete the study included in the proposed 2007 budget.

B-17 2007

B-17-1 Nomination Of B Reactor As A National Historic Landmark Delayed Until Spring Of 2007

The Seattle Office of the National Park Service has delayed the submittal of B Reactor's nomination as a National Historic Landmark until the spring 2007. The application will be submitted to the nomination subcommittee of the National Park System Advisory Board for National Historic Landmark Designation in April and to the full Board later in the summer 2007.

Supplemental information for the application has been provided by Dr. John Findlay, a history professor at the University of Washington and Dr. Michele Gerber, Hanford historian, on the historical significance of the Manhattan Project and the specific contribution of B Reactor to the success of the Manhattan Project and the winning of the Cold War.

B-17-2 Work Continues of development of Models for B Reactor

Cindy Kelly of the Atomic Heritage Foundation continues to work with BRMA and others towards providing models and exhibits for B. Towards that goal she met with BRMA and others in Richland to firm up details with prospective contractors. As a result, she initiated a contract with Meier Enterprises for a graphic 3-D model of the reactor which will show the visitor how the reactor was constructed, what the key components are and how they function together to make it work. This computer model will be useful not only at the reactor but also at other venues and for various presentations regarding the project.

Cindy also is in the final stages of contract development with Lockheed for a physical scale model of the reactor which will feature a cut-away corner which will allow the visitor to look "inside" the reactor to get a better understanding of its construction and its key components. BRMA provided expertise and additional funding to supplement the grant. Thanks to Cindy Kelly of the American Heritage Foundation for her efforts to obtain the grant.

B-17-3 The National Park Service (NPS) Manhattan Project National Historic Park Study

The study that began in March 2006 to evaluate options for preserving and interpreting Manhattan Project facilities in Oak Ridge, Tennessee; Los Alamos, New Mexico; Dayton, Ohio; and Hanford, Washington is in progress. The study will evaluate the potential for selected facilities at those sites to be included into the National Park System, or to identify other preservation and management options. The total Study is being managed by the NPS Denver office, with the NPS Seattle office conducting the evaluation of the Hanford B Reactor and T Plant.

The NPS Seattle office has completed the preliminary evaluation of the Hanford facilities against the significance, suitability and feasibility criteria for New National Parklands. On February 6th and 7th, the NPS Seattle office conducted a two-day workshop in Richland with the Hanford Site Study Team. The purpose of the workshop was to review the results of their evaluation to date, and to develop a set of alternative management options for the preservation and public use of these Hanford facilities, and to properly commemorate how the Hanford site contributed to the Manhattan Project and the conclusion of World War II. Members of the Hanford Site Study team who participated in the workshop includes representatives from the Department of Energy (DOE) and their contractor, U.S. Fish & Wildlife Service, Senator Murray and Representative Hastings offices, BRMA, the Hanford Reach National Monument Heritage and Visitor Center Board of Directors, Hanford Communities, the Washington State Historical Society, and the Nez Perce Tribe.

B-17-4 Continued Meeting Attendance in Support of a Manhattan Project National Park

BRMA President Hank Kosmata, continues to promote Sally Ann and Bob Potter in attending meetings in Washington D.C. in August dealing with historic preservation and the National Park Service studies with respect to Manhattan Project sites. Their interesting report begins below.

On August 23 and 24, Sally Ann and Bob Potter represented BRMA and the B Reactor Preservation Coalition as part of a Hanford Communities delegation at the Historic Preservation Peer Exchange Conference hosted by the Energy Communities Alliance (ECA) in Washington, D.C. The conference included representatives from Hanford, Oak Ridge, Los Alamos, Rocky Flats, Butte County/Arco, Idaho,

the Atomic Heritage Foundation, and the U.S. Department of Energy Office of History & Heritage resources. Each organization presented an update on its historic preservation activities in promoting heritage tourism. A highlight of the meeting was a videoconference from Denver with Carla McConnell, Director of the U.S. National Park Service (NPS) "Manhattan Project Sites Special Resource Study" of facilities at four sites - Los Alamos, Hanford, Oak Ridge, and Dayton, Ohio.

B-17-5 B Reactor Model Development

On Monday, October 01, 2007, members of BRMA were able to see the final results of the physical model that has been constructed by Lockheed. The model will be transported out to the reactor this week and will be ready for the activities of October 10, and of course subsequent tours of the reactor. The details of the graphite stack, the shields, the movable control and safety rods, and the reactor piping systems are outstanding and will surely be a great help to future visitors who now will be able to see and understand what is behind that very impressive front face. The model makers were particularly painstaking in machining small blocks of model material to meet the exacting requirements of a portion of the Moderator block and really bring out how intricate and complicated this assembly actually is. The model includes a number of LED points that will light up to allow a guide or later a docent to demonstrate the critical components of the reactor.

BRMA has provided the technical direction for the construction of the model and has agreed to co-sponsor the cost of the model along with the Atomic Heritage Foundation. The second model, the virtual model by Meier Associates, is also in final form and portions of the graphics have been provided to Cindy Kelly and her sub-contractors to be included in their preparation of various exhibits that are being developed under her direction with funds from the Murdock trust as well as funds earmarked for B Reactor work by Doc Hastings.
BRMA has provided guidance on this model dating back to almost two years now from the initial concept. The output from Meier will be available in DVD format and can be used in PowerPoint presentations using BRMA computers and projector equipment.

The origin of the BRMA organization dates back to 1990 when members of the Tri-Cities Technical Council foresaw the benefits of long-term preservation of the world's first production reactor, the Hanford B Reactor. A committee was formed for the purpose of developing a path forward on how that may be made to happen. The outgrowth of that was our current non-profit corporation known as the B Reactor Museum Association. The dates of some of the necessary and important steps for definition of the organization include 1st draft of our By-Laws -November 12, 1990; Articles of Incorporation filed, and the Certificate of Incorporation by WA. State, January 22, 1991; the initial IRS Ruling as non-profit 501 (c)(3) organization August 21, 1991. Over the past two decades the organization, and the path to achievement of our original goal has experienced many successes and some disappointments. BRMA has been a focal point in garnishing the support of the community, our legislators, regional and national historical interests, and others in championing the goal to see that B Reactor is preserved. We have not yet made long-term preservation a certainty, but with the work now under way, and the accomplishments to date, how can we fail?

B-18 2008

B-18-1 B Reactor Receives National Historic Landmark Designation

On December 5, 2007, the Landmarks Committee of the National Park System Advisory Board voted unanimously to recommend designating B Reactor as a National Historic Landmark, the most significant designation for a historic property in the United States.
In August, following approval by the Secretary of the Interior, National Historic Landmark status was given to the B Reactor in a ceremony held at the B Reactor.

Congressman Doc Hastings had worked with the Interior Department for nearly a year to have the B Reactor application be considered by the Advisory Committee and secured the date for December 5th Committee meeting. At the hearing Congressman Hastings testified, "It has been local citizens who have worked tirelessly to highlight the national significance of B Reactor". He noted, "We are proud of the historic role that Hanford workers played during the middle part of the 20th Century and we are proud of the engineering marvel that Hanford workers built out in the desert." He concluded, "Recognizing B Reactor as a National Historic Landmark has my support as well as the support of the Tri-Cities community. They believe the B Reactor deserves the highest recognition from the federal government for historic preservation".

Senator Patty Murray also applauded the decision by the Landmarks Committee. She said, "Designating the B Reactor as a National Historic Landmark will help preserve the legacy of our region in American History. The B Reactor is both an important symbol of our nation's transition to the nuclear age and a reminder of the service and sacrifice that came with it. I look forward to the preservation of the site for future generations." Also testifying at the hearing was Dr. Michele Gerber, our local Hanford historian who played a key role in providing the national historical perspective of B Reactor in the application. Following the unanimous recommendation by the Advisory Committee, Michele stated "This is huge!", but she warned that this is only an important first step in designating B Reactor as a National Historic Landmark, and only one step toward preserving B Reactor and preventing DOE from proceeding with the cocooning of the facility.

B-18-2 Issuance of the NPS Special Resource Study on B Reactor

The current schedule for completing the Manhattan Project National Historic Park Special Resources Study recently reported by the NPS Seattle office: September 2008 Public distribution of the Draft Study Report on Management Options and Summary Newsletter issued.

B-18-3 A Landmark Day for B Reactor and BRMA

A "Landmark Day" For B Reactor by Bob and Sally Ann Potter Monday, August 25th was
truly a "landmark day" for Hanford's B Reactor! At a ceremony at B Reactor, attended by more than 100 federal, state and local government officials, community leaders, and B Reactor Museum Association (BRMA) members, U.S. Department of Interior Deputy Secretary Lynn Scarlett and Department of Energy Acting Deputy Secretary Jeffery Kupfer unveiled a plaque designating B Reactor as a National Historic Landmark. Following a long application and approval process that began in 2002 with a draft application prepared and submitted by BRMA , the official designation was signed by Secretary of the Interior Dirk Kempthorne in mid-August.

Figure B. 9 B Reactor Plaque Designating Reactor as a National Historical Landmark

Participants at the Aug. 25 ceremony at B Reactor included, from left, Jeffrey Kupfer, acting deputy secretary, DOE; Larry Denton, Dee McCullough, Bill McCullough, Norm Miller, and Paul Vinther, all BRMA; Stephanie Toothman, Cultural Program Chief, National Park Service Seattle Office; Michelle Gerber, Hanford Historian; Lynn Scarlett, deputy secretary, U.S. Dept of Interior; and David Brockman, Director, DOE Richland Operations Office.

Figure B. 10 Commemoration of Plaque Presentation

Burt Pierard & Steve Buckingham manning the BRMA display at the Tri-Cities Visitor & Convention Bureau Trade Show in November 2007. (Photo credit: Gary White)

Figure B. 11 BRMA Provides Presentation at Annual Visit Tri-Cities Convention

B-18-4 New B Reactor Visitor Access Program For 2009 Unveiled By DOE

As part of the National Historic Landmark ceremony at B Reactor on August 25th , Acting Deputy Secretary of Energy Jeffery Kupfer announced a new visitor program for B Reactor in 2009 and possibly into 2010. Kupfer announced that during March to October 2009, DOE is planning to open B Reactor to the public at least three days a week, including Saturday, with no advance registration required for "drive-up" visits. Visitors will be able to drive out to the State of Washington rest area at the Vernita Bridge and board a Department of Energy (DOE)-provided shuttle bus for the short drive along the Columbia River on a portion of the long unused Route 6 to the reactor.

DOE has committed to provide the additional funding needed to implement this new access plan, including: the cost of opening the reactor; the installation of a new entry gate onto the site from Route 24 at the Vernita Bridge and temporary restroom facilities; and minor road repairs on the road to the reactor.

B-19 2009

B-19-1 Two Tours with Visits to B Reactor

There will be two types of opportunities to visit B Reactor in 2009. The first is a Public Tour Program, which is a tour of the Hanford site. The second is a formal B Reactor tour. Each tour includes stops at the historic B Reactor, the Environmental Restoration Disposal Facility, the Waste Treatment Plant construction zone, and at an area where groundwater contaminated by chemicals previously used at Hanford is being remediated and treated. The time at B Reactor is limited on these tours to about an hour. There is no cost to participate in a Hanford tour, but space is limited. Buses will leave at 7:30 a.m., 9:30 a.m., and 11:30 a.m. from the Volpentest HAMMER Training and Education Center located at 2890 Horn Rapids Road in Richland, Washington. Each tour will take approximately five hours, so participants are encouraged to bring snacks and non-alcoholic drinks on the tour. A cafeteria is located at HAMMER with food and drinks available for purchase.

On a positive note, BRMA has been invited by Fluor Hanford and DOE to present BRMA's concept and suggestions for improving the content of the tours. BRMA members John Baldwin, Del Ballard, Pete Mellinger are preparing an outline with sufficient details of the tour content for presentation to DOE and Fluor Hanford for their consideration.

Since the last issue of The Moderator, BRMA has signed the TEAMING AGREEMENT with Indian Eyes, LLC. relative to assisting Indian Eyes, LLC, in filling the scheduled and special tours with tour guides. BRMA developed an excellent working relationship with Indian Eyes LLC, and BRMA is confident this will flourish both continue to provide great tour guides.

B-19-2 BRMA Supports National Park Service "SAVE AMERICA'S TREASURES" Grant Application

Every year the National Park Service (NPS) awards Save America's Treasures grants. These grants are historic preservation funds to preserve nationally significant historic properties and collections. Grants are awarded through a competitive process and require a dollar-for-dollar match of non-federal funds or in-kind services. This year the Tri-Cities Visitors and Convention Bureau (TCVCB), in collaboration with the Department of Energy Richland Operations Office (DOE-RL), has submitted an application to preserve Hanford's Manhattan Project Document and Photo Collection. The purpose of the grant is to improve preservation, storage and accessibility for historians, researchers and the general public for a significant part of the extensive DOE-RL-owned collection of Hanford Manhattan Project documents and photographs.

B-19-3 B Reactor Tour Program

BRMA Tour Coordinator John Baldwin, reported that at the beginning of this year, Fluor Hanford took over the contract to provide upkeep for B Reactor and assume the responsibility for converting it into a museum as well as providing an extended tour schedule. Flour decided to subcontract with Indian Eyes LLC to provide tour guides. Indian Eyes then advertised in the newspaper to hire tour guides. BRMA met with Fluor Hanford and DOE-RL and received assurances that BRMA members would continue giving tours as "BRMA had the experience and knowledge necessary to make B Reactor a successful museum." Subsequently BRMA entered into a subcontract with Indian Eyes LLC (IE-LLC) to provide at least half the tour guides for the 2009 tour season.

At the conclusion of the tour season, a number of BRMA members joined Indian Eyes LLC docents and staff at the B Reactor Celebration/Luncheon hosted by Indian Eyes at the B Reactor Logston facility. Del accepted for BRMA a certificate "In appreciation of a successful partnership in executing the B Reactor Tour Program - A Part of History.

B-20 2010

B-20-1 BHI-00076 B Reactor Facility Museum Phase 1 Feasibility Study Report

Complete Text of BHI-00076 Rev 01 "105 B-Reactor Facility Museum Phase 1 Feasibility Study Report Approved September 2010 is available on the DOE-RL Website. The Executive Summary is included

below.

EXECUTIVE SUMMARY

This report contains the results of the 105-B Reactor (B Reactor) Phase I Feasibility Study. The purpose of this feasibility study is to evaluate options for the dismantlement or reutilization of the B Reactor and determine the feasibility of each of these options.

This study was conducted to define the ·activities necessary to continue using the B Reactor as a museum; evaluate the technical feasibility of those activities; examine the cost effectiveness of these actions versus dismantlement; and evaluate options which would improve the B Reactor as a museum attraction. To accomplish these goals, an extensive assessment of the physical site conditions was performed. In addition, an examination of the cultural value of the reactor was done, noting especially its relationship to the Hanford Site and place in national/international nuclear history.

Six alternatives were evaluated in this Feasibility Study. The first five alternatives (Alternatives A through E) each address the use of B Reactor as a museum, while the sixth alternative (Alternative F) addresses issues associated with dismantling the reactor. Table ES-1 summarizes the key aspects of each Alternative, which are further described in the following paragraphs.

Table B. 1 Summary of Alternatives' Key Elements.

Alternatives	Description
Alternative A	Controlled Tour Access
Alternative B	Public Access With Current Displays
Alternative C	Public Access With Enhanced Displays
Alternative D	Public Access With Enhanced Displays and Additional Tours
Alternative E	Public Access With Enhanced Displays, Additional Tours, and River Access/Cultural Center
Alternative F	Dismantling

B-20-2 B Reactor Receives National Historic Landmark Designation

The original NHL plaque, shown here, was presented to the DOE, and the facility in 2008. The more formal NHL plaque (rectangular shaped) was awarded to the DOE by the National Park Service in 2015, and is currently on display in an interior office in the reactor building. That plaque is to be more prominently and permanently mounted on the structure when the requirements and details are all ironed out. The granite stone was prepared by sculptor Jim Acord, under the direction of the American Nuclear Society, in 1993/1994. The stone placed at the entrance to B Reactor is shown here with Del Ballard.

Figure B. 12 The Granite Stone is shown here with Del Ballard

B-20-3 DOE-RL Announces Public Comment Period on Surplus Rail Cars

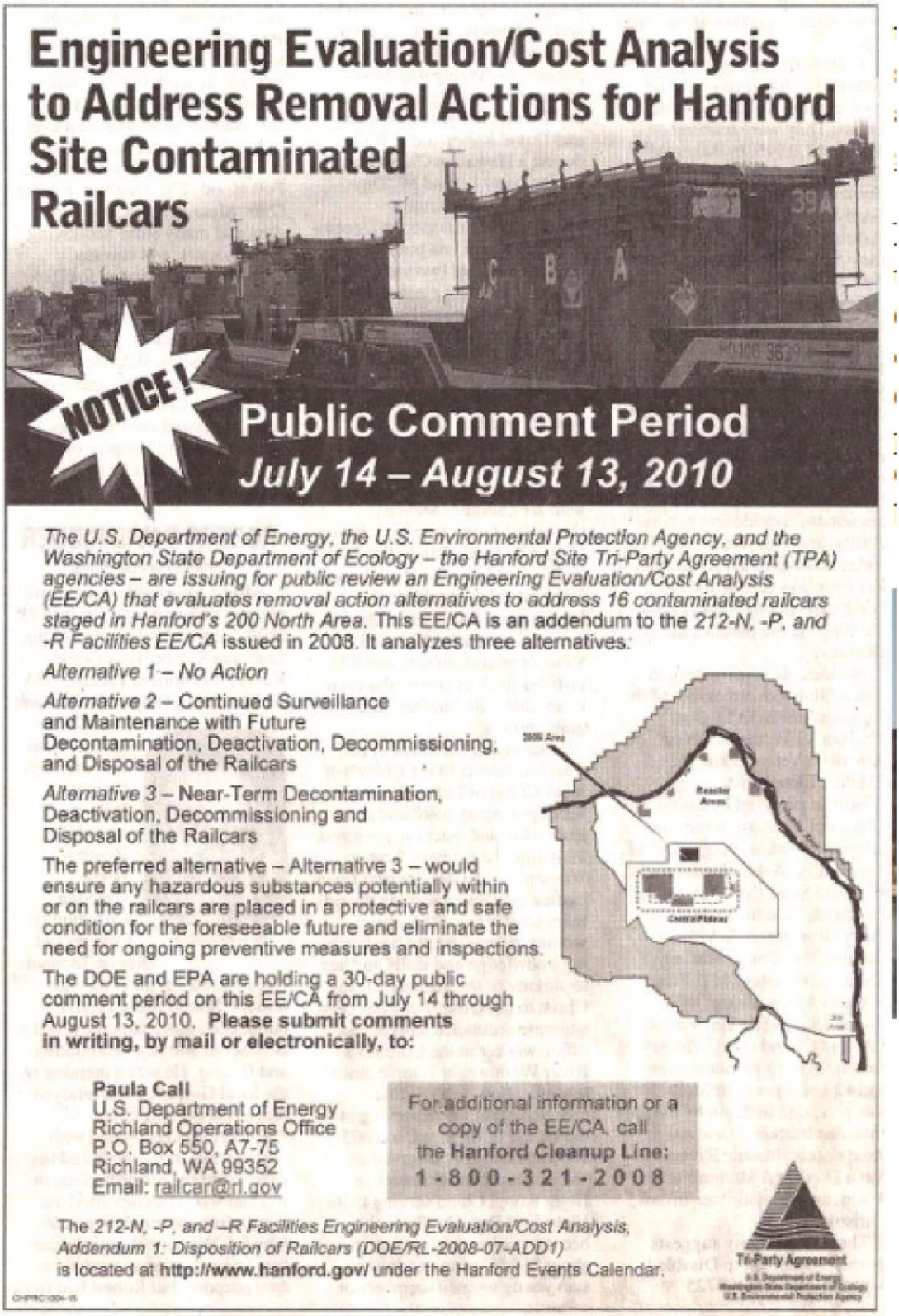


Figure B. 13 B Reactor Engineering Evaluation/Cost Analysis

B-20-4 Draft Special Resource Study/Environmental Assessment of Manhattan Project Sites

National Park Services' (NPS) has issued a draft of the Special Resource Study/Environmental Assessment with regard to Manhattan Project Sites. The following is the position the BRMA Board took in response to the draft document. The study report summary provides five alternative concepts for the resource protection/preservation, public access, federal agency management, and stakeholders roles in the telling of the Manhattan Project story through the historical resources of Hanford, Los Alamos, Oak Ridge, and Dayton. The local coalition met to discuss the alternatives and to present comments to NPS with more complete and updated information. The result of these meetings was unanimous agreement to recommend to NPS a modification to alternative E that would encompass Los Alamos, Hanford and Oak Ridge as a unit of the NPS.

This concept was suggested to the coalition by BRMA as a result of our Jan. 4th Board meeting. The essence of this approach was dropped from consideration in the NPS study as the most viable and long-reaching effective method of preserving this important piece of our nation's history and the significant impact these areas have had on the world at large. BRMA believes the reasons given in the study report for not considering the establishment and operation of such an NPS unit were weak and perhaps based on wrong or inaccurate assumptions and assertions.

Conclusion

The B Reactor Museum Association recommends a modification of the preferred Alternative E to include a One Park/Multiple Sites (Los Alamos, Hanford and Oak Ridge).NPS unit. We applaud the seriousness expressed by the DOE in their willingness to fully participate and the steps that have already been taken to mitigate several of the expressed NPS concerns. BRMA encouraged NPS to view this suggested modification as an exciting adventure in 21st Century Park management, crossing boundaries of time and space, as well as an innovative administration opportunity.

B-20-5 Historical Videos

The BRMA review and consultations with DOE of videos produced by the Atomic Heritage Foundation (AHF) which began last November (interrupted a bit because of the NPS meeting) are essentially complete. With a final DOE review followed by interaction between BRMA, DOE, and AHF we are hopeful for final DOE and AHF approval shortly. BRMA is appreciative of DOE funding this endeavor. Likewise, BRMA has completed its review of the Blue Book entitled "B Reactor: First In The World" for accuracy, clarification, and needed updates. Thanks to Del Ballard, Norm Miller, Bill McCullough, and Burt Pierard for their review expertise. Del did a tremendous job of getting all review comments incorporated into a copy for DOE and AHF review and acceptance.

B-20-6 BRMA Recommends Alternative E for establishment of a National Park

The B-Reactor Museum Association recommends Alternative E of the Special Resource Study be modified as follows:

1. Include the DOE owned facilities at all three Manhattan Project Sites (Hanford, Oak Ridge and Los Alamos) in the Manhattan Project National Historic Park. ONE PARK/MULTIPLE

SITES. DOE will continue to be responsible for maintenance, safety, and security at all DOE owned facilities and sites. (These responsibilities cannot be delegated to another party.) Include the B-Reactor at Hanford. Include the X-10 Graphite Reactor, and the Y-12 Beta-3 Racetracks at Oak Ridge.

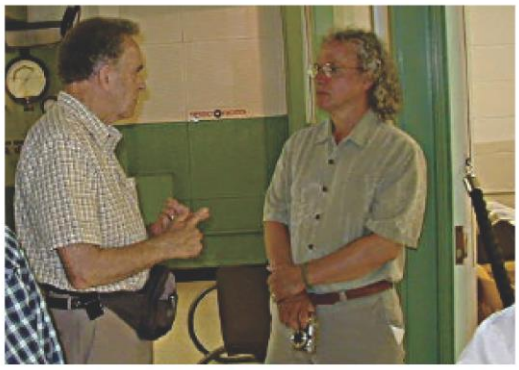
2. These three locations will become a full NPS service unit, with DOE and local communities as junior or supporting partners.
3. The NPS park superintendent would be in charge of overall interpretation, design and location of exhibits in facilities and location of exhibits and kiosks, educational materials, and assignment of NPS personnel. DOE and local communities will assist in these activities as needed and at NPS request. Local community museums will support the site with local guides or with materials as requested or needed.
4. DOE would continue to own all facilities and sites that have ongoing safety issues. Letter dated January 22, 2010, signed by Maynard Plahuta.

B-20-7 BRMA Holds Members Meeting At B Reactor Site

In late August, Colleen French, DOE Director of the Richland Office of Communications and External Affairs, contacted BRMA President Maynard Plahuta to invite us to hold our regular September 13th Membership Meeting at the B Reactor Site. "I thought this would be a wonderful opportunity for the BRMA members who haven't taken a Tour recently, if ever, to see what the Mission Support Alliance (MSA) Contractor has done, and is doing, to develop the Tours into a true museum experience for the public," she said. "I hope to establish this as an annual event at the end of the normal Tour Season."

BRMA President Maynard Plahuta (L), Colleen French, DOE (C), and BRMA Tours Coordinator Bob Horgos outside the reactor

Table B. 14 Maynard, Colleen, and Bob



Moderator Editor Richard Romanelli and BRMA Past President Gene Weisskopf in a serious discussion

Table B. 15 Romanelli and Weisskopf

Meeting in progress at front face work area

BRMA partnered with the Community Education office of the Kennewick School District and the CREHST Museum to provide a program on Dec. 7th, 2010. Titled Memories of B Reactor, the program will consist of BRMA members telling personal, unvarnished stories about Hanford's unique role in ending World War II and the Cold War. This will be a moderated discussion followed by a question-and-answer session. The meeting was conducted on December 7, 2010, at Kamiakin High School in Kennewick.

Table B. 16 Visitors to December 7th, 2010, Ceremony supported by BRMA

B-21 2011

B Reactor Docents Prepare For 2011 Tour Season

Left to right, Richard Romanelli, Bill McCullough, Paul Vinther, Bob Smith, C.J. Mitchell, Del Ballard, Ben Johnson, Pete Mellinger, and Bob Horgos

Table B. 17 Docents Prepare for 2011 Tour Season shown at the entrance to B Reactor

B-21-1 BRMA Takes Lead On HEW Guidebook Research By BRMA Researcher Burt Pierard

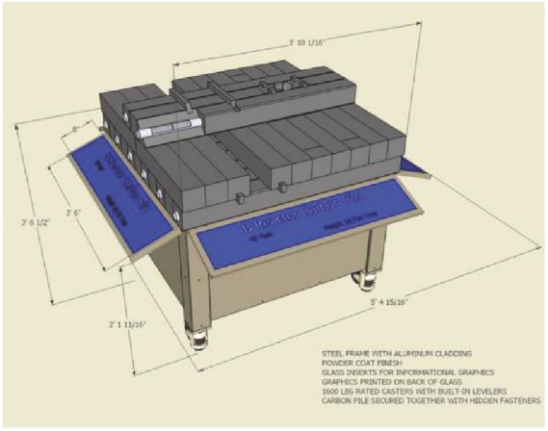
Cindy Kelly, American Heritage Foundation President, has asked BRMA to take the lead on research for the Hanford Engineering Works Guidebook for the Manhattan Project National Historical Park.

Cindy plans to have a separate Guidebook for each of the three principal locations (Los Alamos, Hanford and Oak Ridge) and has already drafted up the Los Alamos version. BRMA has suggested that the three books be exclusively site specific (no inclusion of pictures, etc. from the other sites) and then roll all three, as sections, into a Master Book. The Master Book would include sections for other facilities such as the Chicago Met Lab

Table B. 18 Panoramic Photo of the top of B-Reactor 2019

Photo is of Graphite Stockpile at B Reactor

Table B. 19 (Burt Pierard Pictured)



Artists Sketch of Proposed Graphite Model

Table B. 20 Graphite Model Sketch

B-21-2 BRMA Works to Transfer Graphite

Efforts to identify what controls may apply to BRMA's using graphite bars has uncovered extensive effort in this regard that occurred in 2001 under the direction of then-BRMA President Gene Weiskopf. Correspondence approving the transfer of 327 tons of graphite to BRMA (for use in models or sample sales) has been uncovered but the search continues for evidence that BRMA actually signed a letter accepting the conditions for transfer of the nuclear graphite (including return to DOE of any unused pieces), which is on the Nuclear Suppliers Group Trigger List.

Several ideas for using graphite bars in models or displays have been discussed with the Lockheed Group (constructor of the existing cut-away model), currently developing a table-scale model of the complete 100-B Reactor complex. As of July, of this year, our team of graphite block handlers still awaits a green light from DOE to proceed with recovery of B,D,F type blocks from the mixed pile of Hanford Reactor blocks near B Reactor (see photo in the Winter 2010-2011 The Moderator). Our mission to separate the B,D,F blocks will facilitate their utilization in models and other presentation roles. Until separation is achieved, the other programs are on hold.

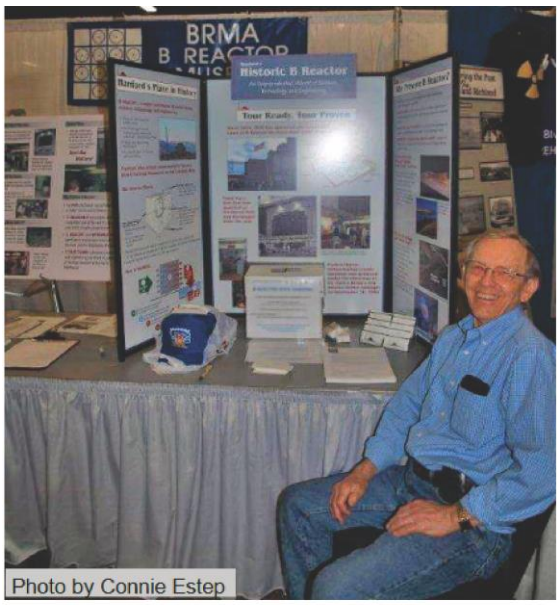
B-21-3 BRMA Hostos NPS and DOE Tours of B Reactor

During the last quarter BRMA and DOE were pleased to host members of the National Park Conservation Association (NPCA) for a tour of B. They are advocates of making B Reactor part of the proposed Manhattan Project National Historic Museum. We welcome their support---we have a copy of a letter by a number of their members sent to Rep. Doc Hastings encouraging his support of the proposed museum. The NPCA was formed in 1919. It represents more than 600,000 members and supporters through its Washington, DC, headquarters and 23 regional and field offices. It works tirelessly to ensure our national parks get vital care and support, and that these magnificent lands and landmarks are protected in perpetuity: Their efforts include

- educating decision makers and the public about the importance of preserving the parks.
- convincing members of Congress to uphold the laws that protect the parks and to support new legislation to address threats to the parks.
- fighting attempts to weaken these laws in the courts; and assessing the health of the parks and park management to better inform our advocacy work. This visit followed publication of an article on the Manhattan Project that appeared in the Spring 2010 issue of "National Parks", the magazine of the NPCA.

B-21-4 BRMA Members Staff 2011 Health and Safety Expo

BRMA developed and set up a display in mid-May at the 2011 Health and Safety Expo at TRAC in Pasco. BRMA President Maynard Plahuta was on duty when this photo was taken.



BRMA Promotes B Reactor At TRAC

Table B. 21 Maynard Plahuta Volunteers for BRMA at Tri-City Safety Convention

Table B. 22 Dignitaries at B Reactor (Including Doc Hastings, Christine Gregoir, and Maria Cantwell)

B-21-5 BRMA Attends Tri-Cities Visitor and Convention Bureau Meeting.

BRMA was invited to set up a display at the Tri-Cities Visitor and Convention Bureau annual meeting in November. This has been a very successful event in the past.

B-21-6 DOE Honored for Its Efforts to Preserve B Reactor

DOE's B Reactor Preservation Project Honored For Federal Leadership, Commitment to Historic Hanford Facility

SEATTLE – On August 11 the Advisory Council on Historic Preservation (ACHP) presented its Chairman's Award for Achievement in Historic Preservation to the Department of Energy (DOE), Richland Operations Office, for the B Reactor Preservation Project at DOE's Hanford Site in southeastern Washington state.

"The B Reactor Project spared an endangered National Historic Landmark from destruction and converted what had been a public problem into a publicly accessible national treasure," said Milford Wayne Donaldson, FAIA, ACHP chairman and California State Historic Preservation Officer. "The B Reactor is likely to become part of a new Manhattan Project National Historical Park that will teach millions about the amazing but true cliffhanger story of the race to develop the atomic bomb before America's enemies could do so during World War II."

Also recognized were a number of DOE's local community partners, who the B Reactor Preservation Project credit with having maintained an unwavering focus on the need to preserve the facility and providing significant input and assistance to DOE on its tour program. Special recognition went to:

Maynard Plahuta, President, B Reactor Museum Association
Pam Larsen, Director, Hanford Communities
Carl Adrian, CEO, Tri-City Development Council and
Kris Watkins, President and CEO, Tri-Cities Visitor and Convention Bureau

Celebrants at B Reactor on Aug. 29 included, from left, BRMA President Maynard Plahuta, Colleen French, DOE-RL, Congressman Doc Hastings, Rory Westberg, Deputy Director, Pacific Northwest Region, National Park Service, Kris Watkins, President and CEO, Tri-Cities Visitor and Convention Bureau, Carl Adrian, CEO, Tri-City Development Council, and Doug Shoop, Deputy Manager for DOE-RL

Table B. 23 August 29, 2011, B Reactor Celebration

B-21-7 Excess Graphite Finally Transferred

Another advancement that occurred late this year is the recent progress made to officially transfer the excess reactor graphite and one or two process tubes to BRMA. It appears we are finally at the point of having the necessary paperwork finalized. This transfer will help Gene Woodruff and his team to have a graphite pile model (approximately a four-foot cube) built. This model will represent the B Reactor pile, including process tubes and other features. The graphite also will be used to make souvenirs that will be available for sale to B Reactor tourists and others. Gary White appears to have found a possible location for the storage of the graphite at a minimum or no cost price for locating the graphite once in our possession.

B-22 2012

B-22-1 Initial Attempts to Pass Legislation for Identification of a Manhattan Project National Historic Park

June 28, H.R. 5987, A bill to establish the Manhattan Project National Historical Park in Oak Ridge, Tennessee, Los Alamos, New Mexico, and Hanford Washington, and for other purposes was submitted. Congress held hearings in both houses on the proposed Manhattan Project National Historical Park, but passage of a bill to implement the park failed.

B-22-2 Youth Granted Access to B Reactor

The big news this season is that our long-desired hope to have B Reactor tours available to youth under age eighteen has finally come to fruition. This is a major milestone BRMA has advocated for over a decade.

B-22-3 Funding Approved for 100-B Area Model

The funding for the production of the 100B-Area and the graphite models is another breakthrough this quarter. BRMA owes much appreciation and a “big thank you” for the significant contribution of member Clay Perkins toward this achievement. Clay offered a $25,000 challenge grant to complete the models. To meet that challenge, member Hank Kosmata initiated action to request a grant funded by the City of Richland’s hotel/motel tax fund program.

Hank Kosmata presented an application to the hotel/motel tax program committee which recommended approval to the Richland City Council. Subsequently, the Council approved the full $25,000. Thanks, Hank and Cindy, for your great and productive effort! With funds from Clay, the Richland grant, and the earlier Murdock grant provided to AHF, BRMA had sufficient funds to produce the two models as well as added vignettes, and kiosk(s) to be located at the Reactor.

B-22-4 Graphite Recovery

BRMA was permitted to recover B, D, F, graphite blocks from the mixed assemblage of remnant blocks machined for the nine Hanford reactors and finally collected in the field behind 105-B. Those involved in retrieval were Nathan Wood and Ruben Palomerez, both with Grant Construction. Kirk Christensen of MSA kept the job on schedule and with the help of Kevin Haggerty, B - Area Supervisor. BRMA's President Gene Woodruff, was welcomed aboard and introduced to the retriever crew. The retrieved bars were relocated onto four pallets: #1 for eventual use in the model, #2, K and N reactor blocks representing core design evolution, #3, B, D, F tube layer blocks and #4, B, D, F filler layer blocks. Additionally, graphite balls and boron impregnated balls were transferred as a potential source for souvenirs. Four aluminum process tubes were also set aside for souvenir or model applications.

B-22-5 NPS Announces Intent for Manhattan Project National Historic Park

In the spring of 2012, the issue of the National Parks Conservation Association Northwest Regional Office *Field Report*, included an article which announced Washington State's Next National Park. This announcement was a bit premature since the final approval for a park had not passed Congress. This was a lead in to the activities surrounding the designation of the Manhattan Project National Historical Park which would not be established for two more years. The Park service made the announcement based on legislation that had been put in place to finalize the process of designating the actual park at Hanford, Oak Ridge and Los Alamos.

B-22-6 Legislative Members and Representatives Testify to Congress in Support of National Park

On June 27 the Senate Subcommittee on National Parks of the Energy and Natural Resources Committee, chaired by Senator Jeff Bingaman of New Mexico, held hearings on Senate Bill 3300. This bill is co-sponsored by Senators Bingaman (NM), Alexander (TN), Cantwell (WA), Udall (NM), and Murray (WA). Mayor Thomas Beehan of Oak Ridge, TN, testified on behalf of the Energy Communities Alliance (ECA) in support of S.B. 3300. Mayor Beehan is the current chair of ECA, which is an organization of DOE communities throughout the nation. Beehan represented all three sites (Oak Ridge, Los Alamos, and Hanford) identified in the bill as units of the Park and was effective with his testimony. The Subcommittee on National Parks, Forests, and Public Lands of the House Natural Resources Committee, chaired by our Representative Doc Hastings, held hearings on H.R. 5987 on June 28. Rep. Hastings introduced the bill along with Reps Lujan (NM) and Fleischmann (TN). Gary Petersen of TRIDEC testified in support of the bill for all three communities identified above. Gary made an excellent presentation for establishing the MPNHP. Thanks, Gary, for representing Hanford and the other sites very well.

B-22-7 September Meetings with AHF President Cindy Kelly

BRMA was pleased to host Cindy Kelly (President-Atomic Heritage Foundation) on September 11 -13, during which a number of planned activities were accomplished. A major item was filming the vignettes for the 100-B Area and Graphite Models. Hank Kosmata, Gene Woodruff, and Del Ballard were the screen stars. They all did a tremendous job. Another activity completed by Cindy and her film crew were the oral interviews, mostly with 1940's "settlers" telling their experiences and living conditions while living through the "termination winds" and construction days of those times. Most, but not all, of the interviewees were either the wife or children of Hanford workers. They told very interesting stories that now are captured for posterity. There were a total of 10 interviewees, including exciting tales from a 98-year-old woman and a 97-year-old early male Hanford worker. We thank the WSU Tri-Cities for volunteering use of its PBS TV Studio to film the interviews. Also, thanks are due to Gene Weisskopf for transporting some interviewees to WSU Tri-Cities, and to Missy Keeney-Baker for designing beautiful "Thank You" cards sent to the interviewees.

B-22-8 Doc Hastings Makes Another Attempt

Rep. Doc Hastings' efforts to have the House pass legislation under the "suspension of rules" failed this year. It received 55% approval but under the "suspension of rules" a two-thirds majority is required. Under this process there is limited debate, which appears to be one of the reasons a two-thirds majority was not

achieved. The National Parks Conservation Association (NCPA) did an analysis of the vote and determined there were 63 votes from Congress persons who normally vote in favor of National Parks legislation. It appears, because of the very limited debate time, many of these Congress persons were not fully informed of facts, rationale, etc. Rep. Hastings still plans to bring the matter forward for House action this session of Congress.

B-22-9 Graphite Block Display Update

The "B,D,F" type graphite blocks we recovered from the pile of assorted blocks behind B Reactor (see the Spring 2012 BRMA Moderator) are now in our possession. They are in a warehouse in the 1100 Area where a block-by-block survey was conducted to assure that no radiological contamination was present. Planning for fabrication of the block display has also progressed through contractual arrangements with Lockheed Martin, thanks to Cindy Kelly of Atomic Heritage Foundation. The display (see picture) has three layers of the 70- year-old graphite. The lower tube layer has tube blocks containing tubes alternating with filler blocks. The middle filler layer contains an open channel for a simulated control rod. The top layer has two tube blocks with the intervening filler block containing an opening for a vertical safety rod. One of the tube blocks is cut away to illustrate a fuel element inside the tube. Side-rail panels will have text, graphics, and audio to explain the function and history of the graphite moderator. Buttons will connect to LED lights to highlight specific features on the blocks. Credit for the Display design and illustration goes to Lynn Ver Steeg of Lockheed Martin.

B-23 2013

B-23-1 Graphite Model Design Solidified

Early this year BRMA was able to firm up the design for the graphite and 100 B Area models. Hank Kosmata, Del Ballard and Gene Woodruff, along with Cindy Kelly, established the initial design of the models. Hank was also instrumental in getting funding, including $25,000 from the City of Richland's hotel/motel tax fund; and Cindy Kelly for a substantial Murdock Foundation grant for the models and related items, and a $25,000 matching/ challenge donation from member Clay Perkins. These funds, along with the $10,000 contributed by BRMA, will cover the two models and various related items such as the vignettes used with the models and other items for B Reactor displays and tours. At this point there's a contract in effect with Lockheed Martin for the two models with a delivery date of April 2013.

BRMA has long promoted lowering the age limit for B Reactor tour participants and that goal was realized starting with the 2012 tour season. DOE supported lowering the age limit to 12. Hopefully we will be able to lower the age limit in the near future so all family members can be accommodated. In April the Energy Communities Alliance hosted a workshop in Richland focused on the Manhattan Project National Historic Park. There were many attendees from throughout the country. For example, attendees included Los Alamos & Oak Ridge community leaders; the National Park Service; the National Parks Conservation Association; DOE (Richland, Oak Ridge & Headquarters); Washington & Tennessee State Historic Preservation Offices; Library, Museum, & Tourism Directors from all three sites; Tri-City community leaders; and many others. Pam Larsen of the Hanford Communities did a tremendous job of organizing this workshop and impressed all attendees with her effort in making the workshop a success. Attendees toured B Reactor and left with an inspiring appreciation of our treasure.

This year BRMA again thanks DOE and particularly Colleen French for her constant support and advocacy of B Reactor preservation and for supporting the inclusion of pre-Hanford facilities along with T Plant in draft legislation regarding the Manhattan Project National Historic Park. Likewise, a special thanks to Kirk Christensen of the MSA Company and his staff for their continued support of BRMA endeavors, including their gracious relations with B Reactor tour participants.

B-23-2 BRMA Members Gather T Plant Impressions, Facts

Colleen French of RL-DOE invited BRMA members to tour Hanford's T Plant, the world's first plutonium separations plant. A truly historical facility that has been identified as one of DOE's relatively few signature facilities, it's also identified in the draft Manhattan Project National Park legislation to be included in the Park.

B-23-3 Honoring Colonel Franklin Mathias

The August 24th dedication ceremony in memory of Colonel Franklin T. Matthias was a huge success thanks primarily to the efforts of Karen Miles, who initiated the event. BRMA was one of the key sponsors and advisors for the ceremony. A number of other community contributors to the ceremony joined to make the event truly memorable. Colonel Matthias was the Army Corps of Engineers' "man in charge" for the construction of the Manhattan Project facilities at Hanford. The dedication ceremony included the placement of a sculpture of the Colonel on a nicely landscaped area created on the Richland library grounds for the event.

B-23-4 B Reactor Models Completed and Installed

Two models were completed and installed at B Reactor. As mentioned elsewhere in this document, one model is that of the 100 B Area, and the other shows graphite components of the reactor core. The 100 B Area model includes B Reactor and twenty support facilities that were required for B operations. The model is three-dimensional (on a scale of 1 to 450) and is placed on an eight-foot-square platform. Features such as steam and water lines are also identified. The model clearly demonstrates the enormity of many of these facilities---some bigger than the reactor itself. A vignette describing the function of each facility is provided. Pushing appropriate buttons illuminates the flow of water at different stages as it advanced from the river pump house through various facilities, into and out of the reactor, and back to the river. The other model is a sophisticated recreation of a four foot-square horizontal section of the reactor core. The graphite is milled to exact dimensions of actual reactor core graphite components. It depicts the channels for process tubes and horizontal and vertical safety rods and includes such details as the weep holes. This model also uses a vignette and lighted points to identify key features. The graphite used for the model is graphite remaining from the construction of B Reactor. BRMA thanks DOE for granting us the graphite. BRMA members Hank Kosmata and Del Ballard were key contributors for the 100 B Area model. Gene Woodruff was the expert designer of the graphite model. Also, thanks go to Cindy Kelly from the Atomic Heritage Foundation for all her help toward accomplishing both models. The Lockheed model makers are commended for their excellent construction of the models---a first class job with precise detail and workmanship.

B-24 2014

B-24-1 2014 Hopes for Designation of A National Park

We continue to work with Tri-City community leaders and those from the Oak Ridge and Los Alamos sites for Congressional authorization of the Manhattan Project National Historical Park. Washington Senators Murray and Cantwell, as well as Representative Hastings, continue to provide full support in Congress to pass legislation. It appears our congressional delegation as well as those from the other two sites are optimistic that authorizing legislation will be passed. Hopefully THIS IS THE YEAR OF SUCCESS.

B-24-2 70th Anniversary Celebration

September, Celebration of B Reactor 70th (1944-2014) Anniversary

The 70th Anniversary of the startup of B Reactor was held at B Reactor. The event was coordinated by a joint committee chaired by Colleen French of the DOE. Many local organizations were again represented such as The Tri-City Development Council, BRMA, Richland Public Library, and Visit Tri-Cities with $9000.00 being raised by BRMA President Maynard Plahuta dedicated to the costs of the event. This was the first-time beer was served legally on the Hanford Site since WWII. Keynote talks were given by David Klaus, Deputy Under Secretary US DOE and Congressman Doc Hastings. Other presenters were former DOE managers Mike Lawrance, Keith Kline, Dave Brockman, and Matt McCormick as well as acting DOE-RL Manager Doug Shoop.

Hanford: A Tribute To Those Who Served

Former Richland city council member Clark Crouch is a well-known western & cowboy poet with nine books in international distribution. In a note to BRMA President Maynard Plahuta, he wrote: “The other day I was thinking of Hanford and of the pride that Hanford workers felt at the contributions they made to end World War II. As a result, I penned the following tribute. “ Printed by permission of Clark Crouch. (Thank you, Clark!)

Monolithic structures rose from the desert sand,
shrouded in secrecy, protection for our land.
The fires of hell, some said, of outcomes not yet seen,
a danger to mankind, a science said unclean.
Yet, many labored there to build the monoliths,
harvest the elements, and shatter ancient myths.
It was the leading edge for science of that day.
Responsibly cautious, they entered war's foray.
To face that distant war. conflict in far off lands,
They knew they must not lose they must meet war's demands.
Despite their shrouded days, some suffered from their work,
the price for victory, but still, they did not shirk.
They provided a way to finally end that war,
saving uncounted lives on that far distant shore.
One monolith now stands on land they helped defend,
remembering all who served in war they’d helped to end.

B-24-3 B Reactor Becomes Part of the Manhattan Project National Historic Park

On December 4, 2014, the House passed the 2015 National Defense Authorization Act, which included provisions authorizing the Manhattan Project National Historical Park. The Senate passed the bill on December 12. President Obama signed the National Defense Authorization Act into law on December 19, 2014, authorizing the Manhattan Project National Historical Park. This legislation authorizes Historical Park, consisting of historic facilities at Hanford, Los Alamos and Oak Ridge.

B-25 2015

B-25-1 BRMA Sales

Our BRMA Sales Partner, Debbie Burnet, continues to provide display and sales locations for BRMA sales items in her shop at 2000 Logston Blvd, Bay 133A, in Richland. Several new items were added to the varied collection of sales items (see photo above). We are very grateful for Debbie's efforts in displaying and marketing our souvenirs.

B-25-2 MOU Between DOE and NPS

A joint team has been identified from the DOE and NPS and is working diligently on the Memorandum of Agreement (MOA) between the two agencies which must be completed and approved by the Secretary of the Interior and the Secretary of DOE. We are fortunate that RL-DOE's Colleen French is a participant on this joint team and can provide valuable input affecting decisions favorable to the entire Park, and particularly for the Park at Hanford. We also are fortunate that DOE Secretary Moniz and Dr. David Klaus (DOE Acting Under Secretary for Management and Performance) who heads up the DOE staff on the NPS/DOE joint team, both are extremely supportive of establishing the Park at the earliest date. The MOA was issued for public comment late this past summer.

BRMA supplemented the comments with a letter that in summary stated the three following items:

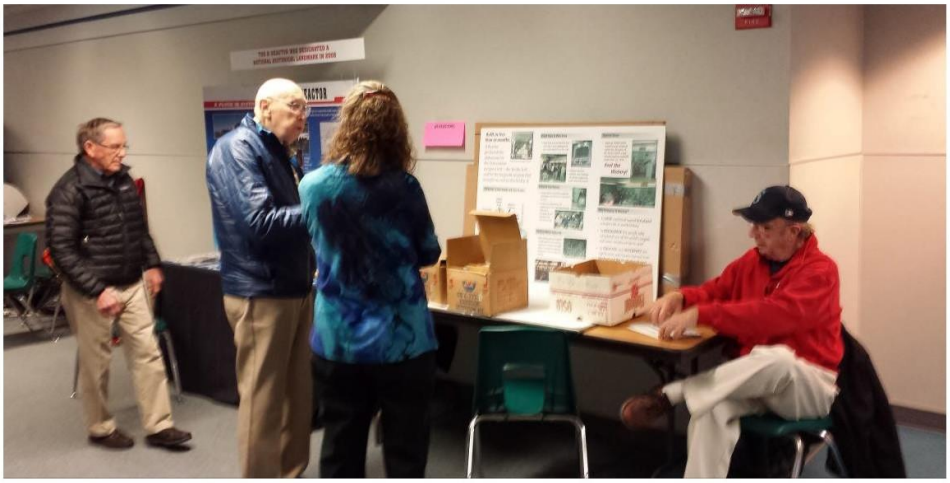
(1) BRMA wishes to work cooperatively with both agencies in developing the operations plan.
(2) BRMA has technical and historic background to assist NPS in developing interpretive services and activities; and
(3) BRMA particularly wishes to assist NPS in developing material for docents.

NPS has indicated during the past year that they look forward to working with BRMA to achieve an interesting and informative experience for Park visitors, particularly for the Hanford portion of the Park. We can be fairly certain the Park will evolve over the next few years. However, it is very likely that there will not be a substantive change for the next tour season. NPS has limited funding for the Park in the current fiscal year 2016.

B-25-3 BRMA Members Participate in Energy Communities Alliance Planning Meeting

John Fox and Del Ballard attended the Energy Communities Alliance (ECA) meeting in Los Alamos on July 15- 17. The ECA is an organization of the cities at all major DOE sites across the nation---a total of

approximately 9 sites. The July meeting only involves the three Manhattan Project National Historical Park sites. It is similar to the ECA meeting of the three Park sites held in Richland in April 2012. The Los Alamos meeting is entitled ECA Peer Exchange on the Implementation of the Manhattan Project National Historic Park. John and Del participated on several panel discussions----each of us on separate panels. BRMA member Ben Johnson began the process of documenting "THE DuPONT STORY" with the intent to publish the story in a professional journal upon completion of the article. BRMA feels that the DuPont story has not been adequately told as a significant part of the Manhattan Project story and wishes to document and publish an article/story that highlights the contributions of DuPont during the startup and early years of the Manhattan Project.



BRMA members (from left) Maynard Plahuta, Bob Smith, and Gary White staffed this B Reactor display at Chief Joseph Middle School in Richland. The pho-tographer was BRMA member Richard Romanelli. (2015)

Table B. 24 BRMA Members Support NPS at School Event

November 2015 - When we stop and reflect on how far BRMA has come in achieving its basic mission, we need only reflect on the events that occurred at B Reactor the weekend of September 30-- October 2. This includes the Mastersingers concerts on Friday night and Sunday afternoon, and the REI-sponsored 15-mile bike ride around the B Reactor area on Saturday Oct 1. This demonstrates how events involving a variety of interests can utilize a national park. We look forward to having similar future events with a wide range of sponsors and participants.

B-25-4 Manhattan Project National Historical Park Established

Without a doubt, the highlight of this year was the establishment of the Manhattan Project National Historical Park. This pinnacle of success for BRMA is particularly due to the foresight and unceasing and persistent efforts of BRMA's original founders to preserve the history of B Reactor, and to convince others to join these efforts. This Park is a well-deserved salute to all past and present BRMA members! The establishment of the Park would likely not have occurred this past year without the legislation proposed by Rep. Doc Hastings and the support of Senators Murray and Cantwell. Doc's approach to putting the Park in the Defense Authorization bill was a key factor. As we proceed, we as well as Los Alamos and Oak Ridge may need similar help from our collective representatives in Washington D.C.

Appendix C Supplemental Information/Citations

C-1 Criteria for qualification as an ASCE National Landmark

To qualify for ASCE National Landmark recognition, sponsors needed to meet the following criteria. Judging national historic significance is not easy, so specific guidelines have been established:

The nominated project must be of national historic civil engineering significance. Size or technical complexity of design or construction is not sufficient in itself.
The project must represent a significant facet of civil engineering history but does not have to be designed or constructed by a civil engineer.

Projects must have some uniqueness (e.g., a first project constructed), or have made some significant contribution (e.g., the first project designed by a particular method), or used a unique or significant construction or engineering technique. The project itself must have contributed to the development of the nation or at least a very large region. Thus, a project that did not make a contribution, did not lead to some other development, or was a technical “dead end” might not be of national historic significance, even if it might have been the first or only one of its kind.

Projects should be generally available for public viewing, although safety considerations or geographic isolation may restrict access.
Nominated projects should be at least 50 years old from the substantial completion at the time the ASCE plaque is presented.

A place on site, viewable by the public, must be available to mount a 19” x 13” plaque, to be supplied by ASCE headquarters.(4 – American Society of Civil Engineers Web Site)

C-2 105-B Reactor Facility Museum Phase 1 Feasibility Study Report.

Approved September 18, 1995, Document Number: BHI-00076 Rev. 01

EXECUTIVE SUMMARY

Six alternatives were evaluated in this Feasibility Study. The first five alternatives (Alternatives A through E) each address the use of B Reactor as a museum, while the sixth alternative (Alternative F) addresses issues associated with dismantling the reactor. A table included in the released document Table ES-1) summarizes the key aspects of each Alternative. Reference: BHI-00076 Rev. 01 “105-B Reactor Facility Museum Phase 1 Feasibility Study Report Approved September 18, 1995.

Full text of this document can be found on the Web at: https://www.google.com/search?client=firefox-b-1-d&q=B+reactor+feasability+study

C-3 Special Resource Study/Environmental Assessment of 105-B Reactor

FINDING OF NO SIGNIFICANT IMPACT
MANHATTAN PROJECT SITES
LOS ALAMOS, NEW MEXICO / HANFORD, WASHINGTON / OAK RIDGE,
TENNESSEE / DAYTON, OHIO
SPECIAL RESOURCE STUDY / ENVIRONMENTAL ASSESSMENT

Executive Summary

The purpose of this study is to comply with the Manhattan Project National Historical Park Study Act (Public Law 108-340), passed in 2004, which directed the Secretary of the Interior to "conduct a study on the preservation and interpretation of historic sites of the Manhattan Project for potential inclusion in the National Park System."

The Manhattan Project was a highly significant chapter in America's history that expanded scientific research, developed new technologies, and changed the role of the United States in the world community. This focused effort, combining military and scientific resources and involving hundreds of thousands of workers at multiple sites, was kept secret and out of public view for the duration of the project.

The Study Area

The NPS study team, consisting of staff from the National Park Service's Pacific West, Midwest, Intermountain, and Southeast regional offices; Denver Service Center; Bandelier National Monument; Dayton Aviation Heritage National Historical Park; and the Department of Energy, was directed by Congress to study the specific sites of the (1) Los Alamos National Laboratory and townsite in New Mexico; (2) Hanford site in Washington; and (3) Oak Ridge Reservation in Tennessee. A fourth site at Dayton, Ohio—where polonium, used as a trigger, was refined and produced—was added to the study by Congressional colloquy. While the four sites—Los Alamos, Hanford, Oak Ridge, and Dayton—are part of a larger story, Congress specifically directed the National Park Service to examine these four as potential units of the national park system using NPS criteria for inclusion.

Evaluation of Significance

Cultural resources associated with the Manhattan Project are not currently represented in the national park system, and comparably managed areas are not protected for public enjoyment. The comprehensive story of the Manhattan Project is not interpreted by other federal agencies; tribal, state, or local governments; or the private sector. Various sites have some protection (such as those managed by the Department of Energy), and some sites and museums tell parts of the story, but the comprehensive story of the nationally significant Manhattan Project is not told anywhere. Including Manhattan Project-related sites in the national park system will expand and enhance the protection and preservation of such resources and provide for comprehensive interpretation and public understanding of this nationally significant story in 20th century American history.

Accordingly, revisions have been made to alternative E. The revised alternative is contained in the document in its entirety. The revised alternative does not include Dayton as one of the sites that are included in the national historical park. Although the Dayton sites are potentially suitable and may possess national significance, the individual sites do not meet the same level of integrity as those in the other three

locations. Nor do they meet the feasibility factors considered necessary for effective and efficient management to the extent the other sites do. In particular, there are no entities, forthcoming at this time, who are committed to preserving the historic Manhattan Project facilities in Dayton. Should interest in Dayton develop in the future, once the sites are preserved, these sites may be considered as an affiliated site along with other Manhattan Project associated resources at other locations throughout the nation.

Alternative Considered
Alternative A: No-action Alternative
Alternative B: Nationwide Nonprofit Consortium
Alternative C: National Heritage Area
Alternative D: Area Affiliated with the National Park System
Revised Alternative E: Manhattan Project National Historical Park (with units at Los Alamos, Oak Ridge, and Hanford)

Alternatives Considered But Dismissed

1. The following alternatives were considered but dismissed in the environmental assessment. They are presented here as background to the process that brought the study team to revise alternative E. Designation as a National Historical Park Encompassing Los Alamos, Oak Ridge, Hanford, and Dayton
2. Designation as a National Monument under Department of Energy Administration

The Selected Alternative

Alternative E was revised to include Oak Ridge, Tennessee, and Hanford, Washington, as locations to be included in the national historical park along with Los Alamos, New Mexico. The revision was carried out in response to overwhelming public input and substantive comment, as well as the Department of Energy's commitment to maintain complete responsibility for safety and security.

Evaluation of Suitability

A Letter from the Department of Energy dated May 13, 2010, signed by Dr. Ines R. Triay, Assistant Secretary for Environmental Management at the Department of Energy refutes NPS determination of infeasibility of establishing a multi-location National Park, and in September, The Special Resource Study/Environmental Assessment was issued, as "DOE/EA-1868"

C-4 American Society of Mechanical Engineers Citation National Historical Landmark Designation [#14 Hanford B Reactor]

1944 First US plutonium production reactor placed in commercial operation
The Hanford B-Reactor was the first plutonium production reactor to be placed in operation. Its success made possible the subsequent development of atomic energy. The research work, engineering, and planning required to make the reactor operate is one of our most advanced achievements. Much of the reactor core, cooling system, shielding, and auxiliary systems were designed by mechanical engineers.

Located near the Columbia River, with a sure electric power source from the Bonneville and Coulee Dams, the Hanford B reactor was a graphite-moderated, water-cooled reactor, designed to operate at 250 million watts. It was loaded in September of 1944 under the personal charge of Enrico Fermi and went critical on September 26 that year.

During World War II, Hanford was the site for fuel fabrication plants and chemical separation facilities. B reactor plutonium was used in world's first nuclear explosion at the Trinity Test in Alamogordo, N.M., in 1945, and also in the bomb dropped on Nagasaki, Japan, August 9 of that year, prior to the end of World War II. B Reactor tritium was used in the world's first test detonation of a hydrogen bomb on Bikini Atoll in the South Pacific in 1952.

The plant was retired in 1968. Environmental restoration began in 1994 under the US Dept. of Energy-Richland Operations Office and managed by Bechtel Hanford Inc. for cleanup along the Columbia River corridor and on Hanford's Central Plateau.

Update: On Aug. 19, 2008, the Hanford B Reactor was designated a National Historic Landmark by the U.S. Department of Interior's National Park Service. This Historic Mechanical Engineering Landmark is best described as the world's first full-scale plutonium production reactor. Being a government installation, it was never in "commercial" service.

In November 2015, the B Reactor along with sites at Los Alamos NM, and Oakridge TN were designated the Manhattan Project National Historical Park under the joint management of the Department of the Interior and The Department of Energy.

Figure C. 1 Photo of 100 B Area During Construction

Reference Source: https://www.asme.org/about-asme/engineering-history/landmarks/14-hanford-b-reactor

C-5 Designation of B Reactor as a National Historic Landmark By U.S. Department of the Interior

NEWS MEDIA CONTACT:
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Monday, August 25, 2008
DOI Designates B Reactor at DOE's Hanford Site as a National Historic Landmark

U.S. Department of the Interior Deputy Secretary Lynn Scarlett (right) and U.S. Department of Energy Acting Deputy Secretary Jeffrey F. Kupfer announced the designation of DOE's B Reactor as a National Historic Landmark on Monday August 25, 2008.

EXECUTIVE SUMMARY

WASHINGTON, DC – U.S. Department of the Interior (DOI) Deputy Secretary Lynn Scarlett and U.S. Department of Energy (DOE) Acting Deputy Secretary Jeffrey F. Kupfer today announced the designation of DOE's B Reactor as a National Historic Landmark and unveiled DOE's plan for a new public access program to enable American citizens to visit B Reactor during the 2009 tourist season. The B Reactor at DOE's Hanford Site in southeast Washington State was the world's first industrial-scale nuclear reactor and produced plutonium for the atomic weapon that was dropped on Nagasaki, Japan to end World War II (WWII).

"B Reactor has a special feeling and association – as a landmark should. For its role in the events that ended World War II, the B Reactor holds a powerful historic significance," DOI Deputy Secretary Lynn Scarlett said. "Scientists, engineers, and skilled workers showed the power of human ingenuity and enterprise in serving at this significant point in U.S. history."

"The men and women who worked on the B Reactor made their mark on history with an extraordinary technological and human achievement," said DOE Acting Deputy Secretary Jeffrey F. Kupfer. "Preservation of the B Reactor will ensure their groundbreaking role in American history remains visible for future generations to see. Their accomplishments will serve as inspiration to others as we continue to apply science and technology to address today's most pressing global challenges."

The designation of the B Reactor as a National Historic Landmark, which was formally signed by Secretary of the Interior Dirk Kempthorne on August 19, 2008, signifies the site as one of national historic significance. National Historic Landmarks can be nationally significant districts, sites, buildings, structures, and/or objects that possess exceptional value or quality in illustrating or interpreting the heritage of the United States. Fewer than 2,500 historic places bear this national distinction. The National Historic Landmark program is administered by the National Park Service. Four other Manhattan Project sites have already gained recognition that comes with a National Historic Landmark designation – the Los Alamos Scientific Laboratory, the X-10 Graphite Reactor at Oak Ridge, the Trinity Site, and the Chicago Pile I.

Five of Hanford's nine plutonium production reactors have been dismantled and "cocooned" as part of a closure contract covering cleanup of Hanford's 210-square-mile Columbia River Corridor and B Reactor could have undergone this process as early as 2009. In March 2008, DOE announced a policy directive to support preservation of the B Reactor that required the reactor to be maintained in a state that preserves its

historical significance. Part of that preservation was the installation of a new roof completed just this month.

The B Reactor, built between 1943 and 1944, was an original Manhattan Project facility that made the plutonium for one of the atomic bombs that ended WWII and provides a physical link to both the end of WWII and the start of the Cold War. Its plutonium was also used in the first atomic device ever exploded near Alamogordo, New Mexico, on July 16, 1945. B Reactor produced fissionable material from 1944 to 1968, and its water-cooled, graphite-moderated design served as the model for all U.S. nuclear reactors until 1952.

Reference:
Https://www.doi.gov/sites/doi.gov/files/archive/news/archive/08_News_Releases/082508.html 2 008

C-6 Letter to members of Congress re H.R. 3207 and S. 1687, March 2004

The following letter was drafted by BRMA Board of Directors and forwarded to members of the U.S. Senate and U.S. House of Representative requesting support for H.R. 3207 and S. 1687 which would initiate a Feasibility Study conducted by the National Park Service for protection of the B Reactor.

Title: "An opportunity to preserve and present United States history"

Dear [title & name]

In the Fall of this year, just six months from now, the B Reactor Museum Association (BRMA) will be commemorating the 60th anniversary of the startup of the world's first full-scale nuclear reactor, Hanford's historic B Reactor. We hope to present this unique artifact to the world as a future museum and memorial to a milestone in human evolution and history. B Reactor is an historical and engineering treasure, worthy of both national and international attention.

B Reactor was the first reactor built during World War II at Hanford, Washington, the plutonium-production plant for the top-secret Manhattan Project. The brand-new technology proved to be a resounding success. The plutonium produced at B Reactor was used both in the world's first atomic bomb (the test at Alamogordo) and, weeks later, in the bomb that destroyed Nagasaki, helping to bring a quick and decisive end to the war.

Although it was part of the wartime effort, B Reactor was really the start of the nuclear age and has forever changed the world in which we live. To stand in front of the reactor's forty-foot-tall front face, or in its now antiquated control room, one gains a sense of the scientific, engineering, and social enormity of those "critical" days. It has been said that never has anything been built "so big, so secret, so singular, and so fast." However, unless the reactor is transferred from one government agency to another, B Reactor could soon face the wrecking ball.

Currently, there are two bills pending that would move B Reactor a step closer to national recognition and preservation -- H.R.3207 and S. 1687, "The Manhattan Project National Historical Park Study Act of 2003." This legislation would direct the Secretary of Interior to conduct a study on the preservation of historic sites of the Manhattan Project for potential inclusion in the National Park system. B Reactor would be a central part of that study.

Time is of the essence. The Department of Energy (DOE), in its efforts to accelerate the environmental cleanup at Hanford, is pushing to finalize B Reactor's future. The DOE understands the historical significance of B Reactor but does not have the mandate or the funds to preserve it for future generations. Thus, unless B Reactor stewardship is transferred to the National Park Service (NPS), the outcome could very well be demolition, not preservation. We ask for your support of this legislation (HR 3207 and S 1687) to have the Park Service officially conduct the study for keeping B as a museum. The B reactor building would require no new major construction costs, the building is safe for public viewing, and the cost of the study is minimal.

We ask you, as a member of Congress, to look to our future by preserving our past. For more information, visit http://www.b-reactor.org/nps/. We thank you for your support of this effort.

Sincerely,

(Signed) Del Ballard, President, BRMA

C-7 Text of MOU Between Department of The Interior and The Department of Energy for The Manhattan Project National Historical Park (MAPR)

Beginning excerpt from the Memorandum of Agreement for the Manhattan Project National Historical Park.

Memorandum of Agreement
Between the
United States Department of the Interior
and the
United States Department of Energy
for the
Manhattan Project National Historical Park

This Memorandum of Agreement ("Agreement") is entered into by and between the Secretary of the Interior ("DOI") and the Secretary of Energy ("DOE") to implement § 3039 of the Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015 ("Act"), Pub. L. No. 113-291. Among other things, the Act directs the two Secretaries to enter into an agreement governing their respective roles in administering the facilities and areas under the DOE's administrative jurisdiction that are included in the Manhattan Project National Historical Park ("Park"). In accordance with § 3039(f) of the Act and in partnership with the Secretary of Energy as set forth in this Agreement, the Secretary of the Interior, acting through the National Park Service ("NPS"), will administer the Park in accordance with the Act and this Agreement.

A. Definitions.—In this section:
   (1) HISTORICAL PARK The term "Historical Park" means the Manhattan Project National Historical Park established under subsection (c).
   (2) MANHATTAN PROJECT.—The term "Manhattan Project" means the Federal military program to develop an atomic bomb ending on December 31, 1946.
   (3) SECRETARY.—The term "Secretary" means the Secretary of the Interior.

B. Establishment of Manhattan project national historical park.—
   (1) ESTABLISHMENT.—
      (A) DATE.—Not later than 1 year after the date of enactment of this section, there shall be established as a unit of the National Park System the Manhattan Project National Historical Park.
      (B) AREAS INCLUDED.—The Historical Park shall consist of facilities and areas listed under paragraph (2) as determined by the Secretary, in consultation with the Secretary of Energy. The Secretary shall include the area referred to in paragraph (2)(C)(i), the B Reactor National Historic Landmark, in the Historical Park.

      (C) ELIGIBLE AREAS.—The Historical Park may only be comprised of one or more of the following areas, or portions of the areas, as generally depicted in the map titled "Manhattan Project National Historical Park Sites", numbered 540/108,834–C, and dated September 2012. The following areas were designated as the boundaries of the Manhattan Project National Historical Park:
         (a) OAK RIDGE, TENNESSEE.—Facilities, land, or interests in land that are

(i) Buildings 9204–3 and 9731 at the Department of Energy Y–12 National Security Complex.
(ii) The X–10 Graphite Reactor at the Department of Energy Oak Ridge National Laboratory.
(iii) The K–25 Building site at the Department of Energy East Tennessee Technology Park.
(iv) The former Guest House located at 210 East Madison Road; and
(v) At other sites in Oak Ridge, Tennessee, that are not depicted on the map but are determined by the Secretary to be suitable and appropriate for inclusion in the Historical Park, except that sites administered by the Secretary of Energy may be included only with the concurrence of the Secretary of Energy.

(B) LOS ALAMOS, NEW MEXICO.—Facilities, land, or interests in land that are—
(a) Within the Los Alamos Scientific Laboratory National Historic Landmark District, or any addition to the Landmark District proposed in the National Historic Landmark Nomination—Los Alamos Scientific Laboratory (LASL) NHL District (Working Draft of NHL Revision), Los Alamos National Laboratory document LA–UR 12–00387 (January 26, 2012).
(b) The former East Cafeteria located at 1670 Nectar Street; and
(c) The former dormitory located at 1725 17th Street.

(C) HANFORD, WASHINGTON.—Facilities, land, or interests in land on the Department of Energy Hanford Nuclear Reservation that are—
(a) The B Reactor National Historic Landmark.
(b) The Hanford High School in the town of Hanford and Hanford Construction Camp Historic District.
(c) The White Bluffs Bank building in the White Bluffs Historic District.
(d) The warehouse at the Bruggemann's Agricultural Complex.
(e) The Hanford Irrigation District Pump House; and
(f) The T Plant (221–T Process Building).

The full text of the document can be obtained at the following Web Address:
https://www.energy.gov/sites/default/files/EIS-0222-FEIS-Summary-1999_0.pdf

Specifically, Executive Order 12512, Federal Real Property Management, requires executive agencies to ensure the effective use of real property in support of mission-related activities. Also, to stimulate the identification and reporting of excess real property and to achieve maximum utilization, the Federal Property and Administrative Services Act of 1949, as amended, requires all executive agencies to periodically review their real property holdings. These reviews identify property which is "not needed," "underutilized," or "not being put to optimum use." Property determined to be excess should be promptly reported to the Federal General Services Administration (DOE 1997b).

Final HCP EIS Introduction |1-1

1.0 Introduction

Coordinated land-use planning is one of the many trustee responsibilities the U.S. Department of Energy (DOE) has, as a federal agency holding Federal assets. This Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS) considers several land uses for the Hanford Site planned for at

least the next 50 years. As Hanford cleanup progresses through the next 40 years, cleanup Records of Decision (RODs) issued under the Comprehensive Environmental Response, Compensation, and Liability Act of 1989 (CERCLA) and decisions made through the Resource Conservation and Recovery Act of 197610 (RCRA) permitting process will impact some areas within the proposed land uses. Likewise, other DOE missions, such as research and development (R&D), might be collocated at Hanford because of DOE's continued Federal presence as the long-term caretaker of CERCLA/RCRA or low-level waste (LLW) disposal sites. Other DOE missions ,such as economic development or even other Federal mandates such as natural resource protection, could also impact Hanford land uses.

As with all Federal activities, where, when, and how quickly Hanford waste sites are remediated and proposed land uses are achieved depends on Congressional funding. It is DOE's responsibility to include in its annual budget request sufficient funds for applicable environmental requirements. The Tri-Party Agreement, which defines the schedule for clean-up activities at the Hanford Site is one source of such requirements and is itself dependent on Congressional funding. These cleanup activities are an important factor in determining when, or even if, proposed land uses might be fulfilled.

The DOE has prepared this HCP EIS to evaluate the potential environmental impacts associated with implementing a comprehensive land-use plan (CLUP) for the Hanford Site for at least the next 50 years. The DOE is expected to use this land-use plan in its decision-making process to establish what is the "highest and best use" of the land (41 Code of Federal Regulations [CFR] 101-47, "Federal Property Management Regulations"). The final selection of a land-use map, land-use policies, and implementing procedures would create the working CLUP when they are adopted through the ROD for this EIS.

In this EIS, DOE is working with Tribal governments and Federal, state, and local agencies to develop several land-use alternatives – specifically, the potential environmental consequences associated with each alternative – for at least the next 50-year time frame. These individual land-use plans, together with a common set of policy statements, represent the distinct alternatives developed by the cooperating agencies and consulting Tribal governments on this document. The cooperating agencies are the U.S. Department of the Interior (DOI), which includes the Bureau of Land Management (BLM), Bureau of Reclamation (BoR), and U.S. Fish and Wildlife Service (USFWS); Benton, Franklin, and Grant counties; and the City of Richland. The consulting Tribal governments are the Nez Perce Tribe Department of Environmental Restoration and Waste Management (Nez Perce Tribe) and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

With the exception of the required No-Action Alternative, each alternative presented represents a Tribal, Federal, state, or local agency's Preferred Alternative. Each alternative is presented independently. Effort was taken to present each alternative with equal measure to encourage public comment.

This CLUP's authority is limited to as long as DOE retains legal control of some portion of the real estate. This EIS does not contain any new mechanisms or preferences regarding the transfer of land, but with input from the cooperating agencies and consulting Tribal governments, this EIS would continue to be useful for considering proposals regarding Hanford lands that might be transferred beyond the control of DOE. This EIS is not focused on land transfer, but rather speaks to the integrated use and management of land and resources independent of who owns the land. Land transfer is a complicated and separate process from the CLUP and once property leaves DOE control, DOE has no more authority over the use of that land unless the property was conveyed with deed or other legal restrictions. For more information about the process for transferring property.

- The HCP EIS provides environmental review for the following DOE actions:
- Designation of existing and future land uses
- Land-use policies and implementing procedures adoption of a CLUP for the Hanford Site.
- Incorporation of site-specific CERCLA RODs into a regional land-use planning process.

For full text of this document see:
https://www.hanford.gov/files.cfm/Final_Hanford_Comprehensive_Land-Use_Plan_EIS_September_1999.pdf

C-8 Phase II Feasibility Study Summary 2000

BHI-01384 Rev. 0 105-B Reactor Museum Feasibility Assessment (Phase II) Project June 2000

The B Reactor is located within the Hanford Site in the 100-B Area, on the south bank of the Columbia River. It is approximately 35 mi upstream and 32 road miles from the city of Richland, in the southeastern portion of Washington State, and is one of nine plutonium-production reactors constructed during the 1940s and the Cold War. Construction of the B Reactor began June 7, 1943, and operation began on September 26, 1944. The B Reactor was the world's first full-scale production reactor and produced plutonium for the first man-made nuclear explosion for the Trinity Test in New Mexico on July 16, 1945, and the bomb dropped on Nagasaki, Japan, on August 8, 1945. The reactor permanently ceased its plutonium-production operation in 1968. Because of its historical significance, the reactor was listed in the National Register of Historic Places on April 3, 1992. A portion of the B Reactor is currently functioning as a controlled-access tour area; however, minor hazards and deficiencies exist within the tour area that require corrective action before the public is allowed unescorted access.

This Phase II report is expected to meet the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Milestone M-93-05 commitment for the third quarter of fiscal year 2000. The purpose of this report is to provide the basis and supporting documentation necessary to prepare the B Reactor as a facility open for partial, unescorted-access public tours.
To prepare the facility for unescorted access, potential hazards and deficiencies had to be identified by performing a walk-through with professionals representing the architectural, electrical, mechanical, and structural engineering disciplines; industrial and radiological health and safety; and fire and life safety. On the basis of a review of past evaluations and information gained from this walk-through, identification of the hazards and deficiencies in the B Reactor and proposed corrective actions are provided in this report.

The B Reactor Museum Association (BRMA), as the primary stakeholder, was provided a review and comment period for the 60% and 90% reporting phases of this project. On the basis of the proposed corrective actions described in the 60% draft report, BRMA (in conjunction with the U.S. Department of Energy, Richland Operations Office) participated in preparation and review of the 105-B Reactor Museum Feasibility Assessment (Phase II) Project June, 2000 The Department of Energy reached consensus on the final mitigative measures necessary to ensure the health and safety of potential tour members visiting the B Reactor and to protect the environment.

Engineering design drawings and associated costs to implement the measures were subsequently presented in the 90% draft report. Review comments received from BRMA on the 90% draft report have been incorporated into this final report. The selected measures reduce or eliminate risk to persons touring the facility, provide for appropriate accessibility under the Americans with Disabilities Act, and retain the character of the building to the maximum extent possible as a registered National Historic Place.

- The major selected mitigative activities include:
- Providing ventilation to reduce the naturally occurring radon that accumulates in the tour area
- Providing new electrical service and de-energizing the existing service
- Removing sources of radiological contamination
- Providing necessary egress in the event of an emergency

- Providing adequate barriers to prevent access by tour members to unauthorized areas of the facility that may have hazardous conditions.
- To provide for accessibility requirements, a restroom facility with showers is recommended to be built in the vicinity of the reactor
- Additionally, exits and tour areas will be upgraded where needed to meet code requirements.

Because of the B Reactor's historic significance and to maintain its historical integrity, all mitigative measures have been designed to be as visually unobtrusive as possible while correcting deficiencies. An example of these measures is that the existing lighting will be refurbished and used in the primary tour route. In addition, custom-made replicas of existing doors are recommended for installation where appropriate to meet current building codes.
During the review/assessment of the primary tour route, it was determined that an additional egress route was required from the "work area." This egress route will be along the southern end of the valve pit and lunchroom. In creating this egress, an additional area of the B Reactor will be opened for touring.

A comprehensive fire hazard analysis was also performed to evaluate the entire B Reactor as it relates to the tour route. Recommendations resulting from this analysis are included in the selected mitigative measures.

Finally, detailed engineering drawings and associated costs are provided in this report for completing recommended hazardous mitigation activities.
After the recommended actions of this report are implemented, the tour route portions of the facility will meet the safety requirements necessary to allow unescorted access by the public.
However, appropriate surveillance and maintenance activities must remain a key requirement to maintain the structure for public access. A corrective action for the aging roof and exterior ventilation ducting was beyond the scope of this work but will be necessary in the near future.

Reference: 105-B Reactor Museum Feasibility Assessment (Phase II) Project. BHI-01384, Rev.0

For full text of the Feasibility Study see:
https://www.google.com/search?client=firefox-b-1-d&q=BHI+01384

C-9 Letter to Congressional/Governmental Agencies Supporting Funding/Creation of B Reactor Museum

October 23, 2002

Draft of Letter for BFCG to use in contacting Congress:

Senator Maria Cantwell
Senator Patty Murray
Congressman Doc Hastings

Hanford' Historic B Reactor - A Public Museum

Dear Senator or Congressman,

This letter respectively requests congressional action to direct the National Park Service to initiate involvement and studies leading to the ongoing operation of the Hanford B Reactor as a Public Museum.

The gigantic historical significance of B Reactor is well documented both in government records and in public news articles, defining its contribution to the end of World War II and the introduction of the atomic age. It is listed in the National Register of Historical Places and has been designated as National Landmarks by three national Technical Societies. The B Reactor has been maintained and operated by the Department of Energy (DOE) as a part time museum during the last couple of decades.

During the past several years Bechtel Hanford, as the operating contractor responsible for the retired Hanford reactors, for the DOE, has prepared several studies relative to the feasibility of the B Reactor being a fully accessible museum and defining the safety concerns that need to be addressed to accomplish that end. Approximately $1M per year has been allocated during the past two years in safety mitigation and upgrades required for museum operation. No areas in the current tour route exceed natural radiation background levels. However, the DOE has recently stated that they are "not in the business of operating Museums", and that a new partner must be found to perform that function. All indications are that the National Park Service is the arm of the Federal government that is best suited for such a function.

Although the B Reactor site is just outside of the designated area of the Hanford Reach National Monument, the U.S. Fish and Wildlife Management organization has indicated that a museum at the reactor would be a welcomed adjunct to the Monument's operation.

Based on the above, we are asking for your help in obtaining funding, for FY-03, and to provide the necessary direction to the Park Service to initiate any further required studies and to proceed as the designated government managers/operators of the Hanford B Reactor Museum.

Respectfully,

The appropriate local governmental agencies.

The following documents were provided to the National Park Service as an appendix to this letter, in preparation of designation of the Manhattan Project National Historic Park:

1.	BHI-00076	105 B Reactor Facility Museum Phase I Feasibility Study Report
2.	BHI-01085	Preliminary Hazard Classification for the 105-B Reactor
3.	BHI-01172	Surplus Reactor Auditable Safety Analysis
4.	BHI-01241	Generic Waste Disposition DQO Workbook
5.	BHI-01250	DQO Summary Report for the 105-B, 105-D, 105-H, 105-KE, and 105-KW Reactor Building Standing Legacy Waste
6.	BHI-01282	Hanford B Reactor Building Hazard Assessment Report
7.	BHI-01384	105-B Reactor Museum Feasibility Study
8.	BHI-01385	105-B Reactor Museum Phase II Project Supplemental Cost Estimate
9.	BHI-12672	B Reactor Structural Analysis
10.	DOE/RL-99-012	Sampling and Analysis Plan for Disposition of the Standing Legacy Wastes in the 105-B, 105-D, 105-H, 105-KE, 105-KW Reactor Buildings
11.	DOE/RL-99-020	Waste Control Plan for the Legacy Waste Project
12.	DOE/RL-2001-009	Engineering Evaluation/Cost Analysis for the 105-B Reactor Facility
13.	DOE/RL-2001-068	Removal Action Work Plan and surveillance and Ma9ntenance Plan for the 105-B Reactor Facility
14.	DO/RL=2002-043	Evaluation of Final Configuration Alternative for the 15-B Reactor Facility (draft only, never issues.)
15.	DOE/RL-2004-055	Engineering Evaluation/Cost Analysis for the Final Configuration of the 105-B Reactor Facility (draft only, never used)
16.	DOE/RL-2001-16	Historic American Engineering Record of B Reactor (105B Reactor Building) [HAER No. WA. 164]
17.	WHC-SC-EN-RPT-004	Rev 0 Summary of 100 B/C Reactor Operations and resultant Waste, Hanford

Appendix D References

1. Request for Approval to Transfer Nuclear Grade Graphite and Associated Materials, letter to Kenneth E. Baker, DOE, from Chuck Willingham, PNNL, Nov. 30, 2000.
2. The Moderator, Vol 18, Issue No. 2. Spring 2012. Blocks recovery and model funding.
3. The Moderator, Vol 18, Issue No 4. Fall 2012.
4. The Moderator, Vol 19, Issue 2, spring 2013
5. The Moderator, Vol 20, Issue 1, winter 2014.
6. W.P. Eatherly, Nuclear Graphite. The First Years. Journal of Nuclear Materials 100 (1981) 55-63.
7. L.M Currie, V.C. Hamistor and H.G. MacPherson. The Production and Properties of Graphite for Reactors, A paper presented at the United Nations International Conference on the Peaceful Uses of Atomic Energy, Geneva, Switzerland, August 8-20, 1955.
8. American Society of Mechanical Engineers B Reactor Landmark Designation
9. Historical American Engineering Record for B Reactor HAER No. WA.164 DOE/RL-2001-16
10. BHI-00076 105 B Reactor Facility Museum Phase I Feasibility Study Report
11. BHI-01085 Preliminary Hazard Classification for the 105-B Reactor
12. BHI-01172 Surplus Reactor Auditable Safety Analysis
13. BHI-01241 Generic Waste Disposition DQO Workbook
14. BHI-01250 DQO Summary Report for the 105-B, 105-D, 105-H, 105-KE, and 105-KW Reactor Building Standing Legacy Waste
15. BHI-01282 Hanford B Reactor Building Hazard Assessment Report
16. BHI-01384 105-B Reactor Museum Feasibility Study
17. BHI-01385 105-B Reactor Museum Phase II Project Supplemental Cost Estimate
18. BHI-12672 B Reactor Structural Analysis
19. DOE/RL-99-012 Sampling and Analysis Plan for Disposition of the Standing Legacy Wastes in the 105-B, 105-D, 105-H, 105-KE, 105-KW Reactor Buildings
20. DOE/RL-99-020 Waste Control Plan for the Legacy Waste Project
21. DOE/RL-2001-009 Engineering Evaluation/Cost Analysis for the 105-B Reactor Facility
22. DOE/RL-2001-068 Removal Action Work Plan and surveillance and Ma9ntenance Plan for the 105-B Reactor Facility
23. DO/RL=2002-043 Evaluation of Final Configuration Alternative for the 15-B Reactor Facility (draft only, never issues.)
24. DOE/RL-2004-055 Engineering Evaluation/Cost Analysis for the Final Configuration of the 105-B Reactor Facility (draft only, never used)
25. WHC-SC-EN-RPT-004, Rev 0 Summary of 100 B/C Reactor Operations and resultant Waste, Hanford