



The Manhattan Project

an interactive history



U.S. Department of Energy - Office of History and Heritage Resources

Events	People	Places	Processes	Science	Resources
--------	--------	--------	-----------	---------	-----------

TIME PERIODS

1890s-1939:
Atomic Discoveries

1939-1942:
Early Government Support

1942:
Difficult Choices

1942-1944:
The Uranium Path to the Bomb

1942-1944:
The Plutonium Path to the Bomb

1942-1945:
Bringing It All Together

1945:
Dawn of the Atomic Era

1945-present:
Postscript -- The Nuclear Age

DUPONT AND HANFORD

(Hanford Engineer Works, 1942)

Events > [The Plutonium Path to the Bomb, 1942-1944](#)

- [Production Reactor \(Pile\) Design, 1942](#)
- [DuPont and Hanford, 1942](#)
- [CP-1 Goes Critical, December 2, 1942](#)
- [Seaborg and Plutonium Chemistry, 1942-1944](#)
- [Final Reactor Design and X-10, 1942-1943](#)
- [Hanford Becomes Operational, 1943-1944](#)

The scientists of the **Met Lab** had the technical expertise to design a production pile, but construction and management on an industrial scale required an outside contractor. The DuPont Corporation was an ideal candidate, but the giant chemical firm was hesitant to join the project due to concern over accusations that it had profited during World War I. On October 3, 1942, DuPont agreed to design and build the chemical separation plant for the production pile facility then planned for **Oak Ridge**. **Leslie Groves** tried to entice further DuPont participation by having the firm prepare an appraisal of the **pile (reactor)** project and by placing three DuPont staff members on the Lewis Committee. DuPont ultimately agreed to become the primary contractor for plutonium-related work, but because of continuing sensitivity about its public image its contract called for a total payment of only dollar over actual costs. In addition, DuPont vowed to stay out of the bomb business after the war and offered all patents to the United States government.

Groves had done well in convincing DuPont to join the Manhattan Project. DuPont's proven administrative structure assured excellent coordination (Crawford Greenewalt was given the responsibility of coordinating DuPont and Met Lab planning), and Groves and **Arthur Compton** welcomed the company's demand that it be put in full charge of the Oak Ridge plutonium project. DuPont had a strong organization and had studied every aspect of the Met Lab's program thoroughly before accepting the assignment. While deeply involved in the overall war effort, DuPont expected to be able to divert personnel and other resources from explosives work in time to throw its full weight into the Oak Ridge plutonium project.

Locating the full-scale production plant at Oak Ridge soon came into question. Du Pont expressed great concern about the hazards of producing plutonium on a large scale, and Groves had misgivings about placing the facility adjacent to electromagnetic and gaseous diffusion plants. Furthermore, the site was uncomfortably close to Knoxville should a catastrophe occur, and, aside from potential hazards, sufficient generating power was not available at the site for yet another major facility. Thus the search for an alternate location for the full-scale plutonium facility began soon after DuPont joined the production team. A site

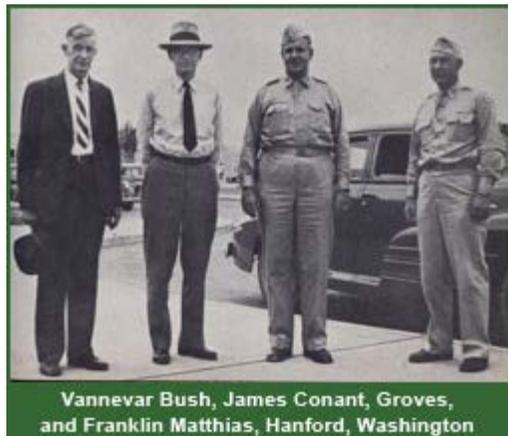


The president of DuPont, Walter Carpenter, with Generals Levin H. Campbell, Everett Hughes, and Charles T. Harris.



The X-10 complex at Oak Ridge. The reactor was housed in the large white building to the right. The chemical separations building is to the left of the reactor building.

with at least 225 square miles was required, according to Met Lab scientists and DuPont engineers. The planned three or four plutonium production reactors and one or two chemical separation complexes would need to be at least a mile apart for security purposes (ultimately three of each would be built during the war), and nothing could be allowed within four miles of the separation complexes for fear of radioactive accidents. Towns, highways, rail lines, and laboratories would have to be even further away.

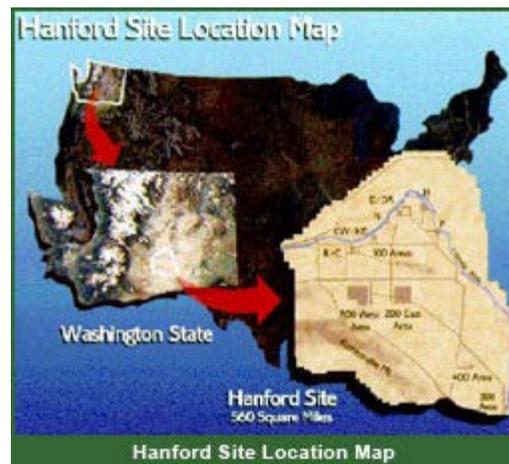


Vannevar Bush, James Conant, Groves, and Franklin Matthias, Hanford, Washington

On December 16, 1942, Colonel Franklin T. Matthias (far right in image at left) of Groves's staff and two DuPont engineers headed for the Pacific Northwest and southern California to investigate possible production sites. Of the possible sites available, none had a better combination of isolation, long construction season, and abundant water for hydroelectric power than those found along the Columbia and Colorado Rivers. After viewing six locations in Washington, Oregon, and California, the group agreed that the area around **Hanford**, Washington, best met the criteria established by the Met Lab scientists and DuPont engineers. The Grand Coulee and Bonneville Dams offered substantial hydroelectric power, while the flat but rocky terrain

would provide excellent support for the huge plutonium production buildings. The ample site of nearly one-half million acres was far enough inland to meet security requirements, while existing transportation facilities could quickly be improved and labor was readily available. Pleased with the committee's unanimous report, Groves accepted its recommendation and authorized the establishment of the Hanford Engineer Works, codenamed Site W.

- **Production Reactor (Pile) Design, 1942**
- **DuPont and Hanford, 1942**
- **CP-1 Goes Critical, December 2, 1942**
- **Seaborg and Plutonium Chemistry, 1942-1944**
- **Final Reactor Design and X-10, 1942-1943**
- **Hanford Becomes Operational, 1943-1944**



Previous  Next

Sources and notes for this page.

The text for this page was adapted from, and portions were taken directly from the [Office of History and Heritage Resources](#) publications: F. G. Gosling, *The Manhattan Project: Making the Atomic Bomb* (DOE/MA-0001; Washington: History Division, Department of Energy, January 1999), 28-29, and Richard G. Hewlett and Oscar E. Anderson, Jr., *The New World, 1939-1946: Volume I, A History of the United States Atomic Energy Commission* (Washington: U.S. Atomic Energy Commission, 1972), 188-90. Also used was Vincent C. Jones, *Manhattan: The Army and the Atomic Bomb*, United States Army in World War II (Washington: Center of Military History, United States Army, 1988), 108-9. Also used was Vincent C. Jones, *Manhattan: The Army and the Atomic Bomb*, United States Army in World War II (Washington: Center of Military History, United States Army, 1988), 108-9. The photograph of Walter Carpenter and the generals is courtesy the DuPont Corporation; it is reprinted in Stephane Groueff, *Manhattan Project: The Untold Story of the Making of the Atomic Bomb* (Boston: Little, Brown, and Company, 1967). The aerial photograph of the **X-10** complex is courtesy the [Oak Ridge National Laboratory](#). The photograph of **Vannevar Bush, James Conant, Leslie Groves**, and Franklin Matthias is courtesy the DuPont Corporation; it is reprinted in Stephane Groueff, *Manhattan Project: The Untold Story of the Making of the Atomic Bomb* (Boston: Little, Brown, and Company, 1967). The **Hanford** location map is courtesy the [Hanford Site](#).

[Home](#) | [History Office](#) | [OpenNet](#) | [DOE](#) | [Privacy and Security Notices](#)
[About this Site](#) | [How to Navigate this Site](#) | [Note on Sources](#) | [Site Map](#) | [Contact Us](#)



The Manhattan Project

an interactive history



U.S. Department of Energy - Office of History and Heritage Resources

Events

People

Places

Processes

Science

Resources

In a national survey at the turn of the millennium, both journalists and the public ranked the dropping of the atomic bomb and the end of the Second World War as the top news stories of the twentieth-century. The advent of nuclear weapons, made possible by the Manhattan Project, not only helped bring an end to the Second World War—it ushered in the atomic age and determined how the next war, the Cold War, would be fought.

The Manhattan Project: An Interactive History is intended to provide a comprehensive overview of the Manhattan Project. Five main topical areas—Events, People, Places, Processes, and Science—are further divided into sub-sections, each with an introductory page and as many as a dozen or more sub-pages. The site is interactive in the sense that it is designed with the flexibility to meet the needs of a variety of users. Those seeking a brief overview of the Manhattan Project, for example, should start with the introductory pages for the eight sub-sections of the Events Section. Users wanting a more in-depth chronological history should read, in order, the fifty-six Events sub-pages. Numerous internal links within the content of the pages allows the reader to easily move from page to page, wherever his or her interests lead. There are thus multiple ways for the user to approach the site. In addition, the Resources Section provides access to a variety of resource materials, including photos, documents, maps, and published histories.



Leslie Groves and J. Robert Oppenheimer

When completed, *The Manhattan Project* will total some 120,000 words and over 250 pages and 500 images. The site is being implemented incrementally, with the **Events** and **Resources** sections the first part to go online. The remaining sections are scheduled to go online in mid-2013. Click on the above buttons for listings of the projected web pages under each heading.

The Manhattan Project is the result of a collaborative effort headed by the United States Department of Energy's Office of History and Heritage Resources, with the assistance of graduate fellows in recent American history interested in the intersection of science and national security issues and supported by the Department's Office of Science and National Nuclear Security Administration. The Department's Office of Classification hosts the site on its **OpenNet** website, provided by the Office of Scientific and Technical Information, as part of the Office of Classification's partnership with the Office of History and Heritage Resources in making available Manhattan Project resource materials.

[Home](#) | [History Office](#) | [OpenNet](#) | [DOE](#) | [Privacy and Security Notices](#)
[About this Site](#) | [How to Navigate this Site](#) | [Note on Sources](#) | [Site Map](#) | [Contact Us](#)