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The Wahluke (North) Slope of the Hanford Site: History and Present Challenges

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THE WAHLUKE (NORTH) SLOPE OF THE HANFORD SITE: HISTORY AND PRESENT CHALLENGES

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ABSTRACT:

The Hanford Site was founded in early 1943 for the top secret government mission of producing plutonium for the world's first atomic weapons. A great deal of land was needed, both to separate various Site facilities from each other, and to provide buffer zones for safety and security purposes. In total, 640 square miles were occupied by the original Hanford Site and its buffer zones. Much of this land had been earmarked for inclusion in the Columbia Basin Irrigation Project (CBP). After World War II ended, a series of national decisions led to a long-term mission for the Hanford Site, and area residents learned that the Site lands they had hoped to farm would be withheld from agricultural production for the foreseeable future. A long set of negotiations commenced between the federal management agency responsible for Hanford (the Atomic Energy Commission - AEC), and the Bureau of Reclamation (BOR), Department of the Interior that managed the CBP. Some lands were turned back to agriculture, and other compromises made, in the Site's far northern buffer lands known as the Wahluke Slope, during the 1950s. In the mid-1960s, further negotiations were about to allow farming on lands just north of the Columbia River, opposite Hanford's reactors, when studies conducted by the BOR found drainage barriers to irrigation. As a result of these findings, two wildlife refuges were created on that land in 1971. Today, after the Hanford Site plutonium production mission has ended and as Site cleanup goes forward, the possibility of total release of Wahluke Slope lands from the control of the Department of Energy (DOE - a successor agency to the AEC) is under discussion. Such discussion encompasses not just objective and clearly visible criteria, but it resurrects historical debates about the roles of farming and government presence in the Columbia Basin.

SITE CREATION:

The Hanford Site was created in early 1943 to produce plutonium for the world's first atomic weapons. This top-secret, wartime mission required much land. Site selection criteria stated that the plutonium manufacturing site must be isolated from population centers, and must include enough acreage to separate the various production facilities from each other by miles and to ensure ample safety and security buffer zones. The sparsely populated tract that encompassed the tiny towns of White Bluffs, Hanford and Richland, Washington, stretching west to the Riverland Ranch along the Columbia River near Vernita, was ideal. Only 1,500 people lived in the entire area, although more were expected as the Columbia Basin Irrigation Project (CBP), on hold due to the war, carved irrigated farms out of the dry sagebrush land. Irrigation and government sale of nearly one million acres to farmers had been promised by President Franklin Roosevelt early in his New Deal administration in the 1930s. The Hanford/White Bluffs region was to be included. While construction of the Grand Coulee Dam and planning of the irrigation project and plots had consumed the remainder of the 1930s, World War II had imposed further delays just two months after Grand Coulee began producing electricity in 1941. The regions's people, mostly subsistence farmers, waited for war's end to realize their dreams of harnessing the Columbia for irrigated farming.

In February 1943, a directive issued by the Secretary of War, and a petition of condemnation filed in the U.S. District Court for Eastern Washington, brought 640 square miles of the eastern Washington desert into the control of the U.S. Army, Manhattan Engineer District (MED) for a top-secret war mission. Stunned, the residents left within time periods ranging from a few weeks to a

few months. A huge area totalling about 200,000 acres north of the Columbia River, known as the Wahluke Slope or North Slope and including the tiny settlements of Vernita, Wahluke and others, was included in the land package. Much of the Wahluke Slope land was already publicly owned, by the Bureau of Land Management (BLM), the U.S. Department of Interior's Bureau of Reclamation (BOR), Washington State, and three counties (Grant, Adams and Franklin). In the terminology of the new Hanford Engineer Works (HEW - today's Hanford Site), the Wahluke Slope was part of "Area B". Most of Area B was leased by the Army, for a term of one year with the right of renewal every year for 25 years. Some parcels of land in Area B were purchased outright. On the Wahluke Slope itself, no plutonium manufacturing facilities were built, but the land lay directly across the Columbia River from land that became Hanford's "100 Areas" -- the location of the Site's production reactors.

WAR'S END BRINGS UNCERTAINTY:

When World War II ended, a principal assumption among many residents of the Hanford region (and a fear among Hanford workers) was that the huge production facilities would close and the Site would be returned to its pre-war state. That, after all, was the fate of most WWII defense production plants that made smokeless powder, "TNT" and other explosives. Few people in the 1940s knew the nature of atomic production processes and their wastes. During 1946, the CBP's office in Pasco, Washington (largest off-Site town near the Hanford facilities) received a flood of calls from veterans wanting land to own and farm. A lottery was established to pick the land recipients. At the same time, national atomic energy policy drifted as the MED lived out its last months. Hanford facilities experienced a production lull, and Site employment fell from 10,000 at war's end to 5,000 in December 1946. The BOR planned its South District expansion to include the Hanford and Wahluke lands. However, the passage of the McMahon Atomic Energy Act of 1946, and the emergence of the Cold War manifested in the Truman Doctrine of March 1947, led to new policy directions and the creation of the Atomic Energy Commission (AEC) as of January 1, 1947. Meeting in the Spring of 1947, AEC leaders and President Truman determined a course of bold augmentation in atomic weaponry and ordered a large expansion of the Hanford Site production facilities.

COLD WAR HANFORD EXPANSIONS BRING MORE FACILITIES, CONTAMINATION:

The years 1947-49 were pivotal ones in determining the Wahluke Slope's fate and uses. National decisions and physical factors came together and resulted in land use determinations that kept the Slope under AEC control for at least the next 40 years. The Hanford's Site's postwar expansion (the first of three such expansions in rapid succession, as developments continued) built two more plutonium production reactors on the Columbia's shoreline, directly across from the Slope, in 1948-49. By 1950, these reactors, H and DR, were operating along with the three existing WWII reactors, B, D, and F. Plutonium production soared, so that in 1950 the total Site output was 299 per cent that of 1946. Due to the increased value of the Hanford Site to the nation, an anti-aircraft defense command known as Camp Hanford was established. Forward positions holding weaponry to defend the Site against potential attackers were established in a perimeter ring, some of which were located on the Wahluke Slope.

As Site production activities expanded in the Cold War, troubling data emerged from Hanford's environmental monitoring program. Active since the earliest months of Site occupancy by the MED, this program surveyed and sampled Columbia River water, fish, plankton, vegetation (aquatic and land), air, land-based wildlife and domestic animals, and other media to measure the levels of various radioactive substances entering the ecosystem. Vegetation contamination readings demonstrated that the primary radionuclides settling on regional vegetation, via the airborne pathway,

were iodine 131 (I-131), xenon 133 (Xe-133), ruthenium 103 and 106 (Ru-103, Ru-106), and trace amounts of plutonium 239 (Pu-239). These isotopes were generated by the operations of radiochemical separations facilities in Hanford's "200 Area," two large plots located in the north-central portion of the Site about five miles south of the 100 Areas and the Columbia River. Because I-131 was known to produce thyroid damage, and because it was measured on regional vegetation in greater abundance than other isotopes, this radionuclide became a benchmark indicator contaminant. A specific "tolerance level" of 0.2 microcuries per kilogram (mCi/kg) on vegetation for I-131 was established by Hanford's chief health physicist. According to documents now declassified but secret at the time, vegetation contamination readings taken during 1945 through early 1947 showed levels "above tolerance" for many areas "within a radius of about 50 miles" of the Site separations facilities. The Wahluke Slope, due to its upsloping terrain and the effects of prevailing wind patterns, demonstrated localized "hot spots" of contamination on several occasions. One survey map for February 1947 revealed 27 such hot spots on the Slope. As plutonium production rates climbed in late 1947, they were accompanied by a notable rise in I-131 contamination on regional vegetation.

BOR INCREASES DEMANDS TO FARM WAHLUKE SLOPE:

Ironically, at the same time that secret data revealed the Wahluke Slope to be contaminated beyond tolerance levels in many spots, the tolerance level itself was halved in 1948 due to increasing concerns about thyroid susceptibility to damage. Concurrently, public pressure to farm the Slope increased. In late 1947, the BOR protested to the AEC that it foresaw a "prospective increase in per acre construction costs on the remainder of the [CBP] project...and an added burden for operation of the rest of the project....[However] by far the most serious loss," according to the BOR, was the "blocking of agricultural production valued at...$22.5-million, based on 1946 farm prices." The Hanford Site land was not the only acreage affected, the BOR pointed out. Road and canal connections to the Prosser area west of the Hanford Site, and the Royal Slope area to the north, also were disallowed by the Hanford Project. The AEC responded by establishing "permanent boundaries required for the operation of the Hanford Project." In July 1948, it announced that much of the Wahluke Slope would remain closed due to "security needs and possible dangers to [potential] inhabitants." That December, 63,000 acres on the Slope were purchased outright by the AEC, and 11,000 acres were leased anew. Other boundary adjustments followed. The Wahluke Slope was divided into a central "control zone," containing about half of its acreage, and two secondary zones (one on either side of the control zone). At the same time, Chairman David Lilienthal of the AEC promised a meeting with the BOR, concerning the Wahluke Slope, in an April 1949 visit to the Hanford region. During that visit, Lilienthal declared that "Hanford Works is permanent....[and] until new safety factors have been developed...the Wahluke Slope cannot be opened." Unable, according to the policies of his era, to share with BOR officials the specifics of contamination on the Slope, Lilienthal nonetheless told them that "safety" was the reason the AEC was unwilling to open the land to agriculture.

PLUTONIUM PRODUCTION INCREASES CONCURRENT WITH PRESSURE FOR SLOPE ACCESS:

The years immediately following the 1949 decisions that closed the Wahluke Slope to farming witnessed still more dramatic increases in plutonium production at the Hanford Site. In 1951, total plutonium output was 141 per cent that of 1950, and the 1952 production was 44 per cent higher than that of 1951. C-Reactor, capable of operations at higher power levels than the existing five Hanford reactors, went into production in November 1952, and construction began on the "jumbo" K-East (KE) and K-West (KW) reactors in early 1953. However, the regional, off-Site economy also was growing,

as was pressure to develop a strong farm sector in the area. Such pressure was being brought by agricultural groups and by the influential local newspaper, the Tri-City Herald. Early in 1952, the question of releasing the Wahluke Slope to farming again was raised in a pointed manner. David Shaw, AEC manager at the Hanford Site, conferred with the agency Commissioners in Washington, DC, frequently on this topic. Many factors were weighed. One very important issue was a significant decline in the I-131 emissions from Hanford's separations plants. The key facilities had been fitted with special new "silver reactor" filters in late 1950. After some initial experimentation and operating problems in 1951, the filters were working well for the most part by 1952, and were cutting the regional I-131 emissions to small percentages of the former totals.

The primary deterrents to potential Wahluke Slope development then became the need to maintain a security buffer zone (to prevent spying) and the hazards associated with the production reactors in the 100 Areas. Reactor power levels were being increased, but the reactors also were being fitted with new tertiary safety systems known as the "Ball 3X" devices. Containers of small metal balls made of neutron-absorbing materials were being fitted at the tops of the reactors, to be released to fall into the vertical safety channels and stop the chain reaction process in case of accidents or operating problems. Calculations of radii of danger zones around the reactors were done, to simulate conditions at various power levels. For all six case study calculations, areas north and west of the Wahluke were found to be inside potential hazard areas in case of major reactor accidents. Yet, like the earlier surveys of vegetation contamination, these calculations were held in secret, and were not shared with the BOR or with local officials. On January 8, 1953, two parcels of land at the far northwest and northeast corners of the Hanford Site buffer zones were released to the BOR for farming development. The northwest parcel represented approximately 10 percent of the total Wahluke Slope area, and the northeast parcel represented about 18 per cent.

FURTHER COMPROMISES BRING ADDITIONAL SLOPE LAND INTO CULTIVATION

Throughout the years 1953-58, plutonium production continued to rise at a nearly exponential rate at the Hanford Site. Plutonium output in 1953 was 38 per cent higher than that of 1952; 1954's output exceeded that of 1953 by 26 per cent; 1955's production was 54 per cent above that of 1954; the 1956 figures were 59 per cent over those of 1955; the 1957 output was 54 per cent higher than that of 1956; and 1958's production exceeded that of 1957 by another five per cent. The KE and KW reactors came on line in January and April 1955, respectively, and by 1958 plans were in design for yet another reactor that would be known as the New Production Reactor (NPR - soon shortened to N Reactor). Between 1956-60, the older Hanford reactors (and even the KE and KW reactors) were retrofitted with larger pumps, pipes, and other accoutrements to raise their power and throughput levels by factors far beyond those originally designed. In some cases, power levels eventually reached nearly ten times those of nameplate design. And, during the same period, interest in farming the Wahluke Slope continued to be expressed by the BOR, local leaders, and by Washington Governor Albert Rosellini. The Hanford region's Tri-City Herald editorialized in September 1958: "If the Slope land is not released so it can be irrigated and developed, the [South Irrigation] District [of the BOR] will be injured on a permanent basis."

"Circles of influence" around the reactors were studied under every conceivable operating and accident scenario. Also like the previous studies of reactor hazards, these studies were not shared with the public or the BOR. Site scientists reported to the AEC's Advisory Committee on Reactor Safeguards (ACRS) that "in the absence of gross accidents...the general contamination of he Wahluke Slope is comparable with that of the Tri-City area...Restriction of the occupancy of the Slope against normal contamination is thus not plausible." However, in the case of a reactor meltdown or explosion,

they stated: "A release of reactor contents...[might be expected to] exercise its effect mainly over the Wahluke Slope." Senator Henry Jackson became involved in the controversy, at the request of local leaders in the Hanford region. He reached a compromise. In December 1958, at the same time that the AEC sold the town of Richland back from the government to its residents, a compromise was reached on the Wahluke Slope. Two more parcels of land at the northwest and northeast corners were transferred to the BOR. The northwest portion amounted to approximately 20 per cent of the former original Wahluke Slope total (from the 1948 boundaries), and the northeast parcel represented about 12 per cent of that total. Also, an allowance was made for the Wahluke Lateral Canal to be built through the remaining AEC control zone to deliver irrigation water to the western most BOR parcels located near Mattawa and Royal City. At the same time, Jackson arranged funding for a series of reactor safety upgrades known as the "Reactor Confinement Projects." Design work was initiated in early 1959, and construction occurred during 1960-61. The eight existing production reactors (N Reactor was still in the early construction phase) were modified by having large filtration systems built along side them and tied into their exhaust systems. Thus, reactor off-gases were routed through an additional exhaust "confinement" system that would capture much of the normal emissions and presumably would capture some of the off-normal emissions in case of a reactor accident.

HISTORIC MISSION CHANGES AT HANFORD SITE ALLOW MORE BOR DEVELOPMENT:

As a result of the easing of land restrictions in 1958, the BOR proceeded to develop about 11,000 acres of farm blocks and to construct the Wahluke Lateral Canal and other feeder units. The land was occupied, and water delivered, in 1961 and 1963, amidst great local celebration. In 1961, Camp Hanford closed and the military positions on the Wahluke Slope were abandoned. In December 1963, Hanford's N Reactor began operations with several then-new innovations providing for greater confinement and operating safety. In January 1964, President Lyndon Johnson announced a decreased national need for the production of special nuclear materials (including plutonium). That December, Hanford's reactors began to close. A program of phased closure of all eight of the older reactors (all excluding N Reactor) soon was announced. At the same time that the reactors' fate was sealed, discussions were renewed concerning future land releases on the Wahluke Slope. Only the central most control zone of the Slope (89,000 acres, or about 50 per cent of the 1948 total) remained in AEC hands. Commission deliberations throughout 1964 were announced in 1965: the AEC agreed to allow "daylight farming" (non-occupancy) of 39,000 acres of control zones lands, BOR development of the canals and other facilities necessary to achieve such, but the land would not be transferred to the BOR. Officially, it would remain under AEC control.

SURPRISE FINDING OF THE BOR LEADS TO NEW LAND USES:

During 1966-67, the BOR conducted drainage studies of the control zone land recently opened for daylight farm development by the AEC. The surprise finding of these studies, according to the BOR, was announced in the annual CBP report for 1967: "It was necessary to suspend consideration of irrigation development for the 14,300 potentially irrigable acres in the Control Zone that had previously been proposed for release by the...[AEC]. This decision was made after...it was found that...the land in underlain by a shallow, relatively impermeable drainage barrier. The estimated cost for correcting this deficiency through drain construction is significantly higher than the amount established for the [CB] Project as the maximum per-acre expenditure deemed to be economically feasible for drainage of new lands." Four years later, after extended deliberations concerning the BOR drainage information, it was decided that the majority of Wahluke Slope land remaining in AEC control would be divided into two wildlife preserves. In 1971, the western (smaller) portion became the Saddle Mountain National Wildlife Refuge, managed by the federal Fish and Wildlife Service, and

the eastern (larger) portion became the state-managed Wahluke Wildlife Refuge.

MAJOR SITE AND REGIONAL CHANGES AFFECT SLOPE DEBATE IN THE 1980S/1990S:

Time passed quietly at the two Wahluke Slope wildlife preserves for about 16 years after their creation. In the late 1980s, however, massive mission changes at the Hanford Site, as well as economic and physical realities within the CBP, combined to bring this early area of controversy once again into the center of a historic debate. At Hanford, the N Reactor closed in December 1986. After more than a year of debate and safety upgrades, the reactor was ordered to "cold standby" in February 1988. In 1991, the former Union of Soviet Socialist Republics (U.S.S.R.), America's principal rival in the Cold War, split into 15 independent states and the Cold War essentially ended. In 1994, N Reactor was ordered deactivated and closed permanently by the Department of Energy (DOE - a successor agency to the AEC). During the same time period, virtually all of the DOE's major Hanford facilities have received similar deactivation orders. In 1989, the Site's main mission was declared to be waste cleanup. No more nuclear defense production of any kind is foreseen. Likewise in 1988, the BOR initiated a large Environmental Impact Statement (EIS) concerning its continued development. Over the years since the 1940s, approximately half of the projected one million acres of the CBP have been developed. In 1990, the draft EIS found that public demand and the availability of water from the Columbia River would support no more than development of 87,000 additional acres. The remainder of the one/half million acres would not be developed. In 1994, the BOR reported that as the result of new strictures in water conservation, and uncertainties regarding water flow patterns for anadromous fish mitigation, a final EIS would not be issued and the development of even the 87,000 additional acres would be deferred indefinitely. In a third salient occurrence in the region, in 1988 Congressman Sidney Morrison, representing much of the area surrounding Hanford, introduced in Congress a bill to prepare an EIS to evaluate the "Hanford Reach" (the 50-mile stretch of the Columbia River that essentially borders the Hanford Site) as a candidate for designation as a federally protected Wild and Scenic River.

OLD ISSUES/NEW ISSUES:

Each of the three major developments described above helped to bring debate about the future of the Wahluke Slope to the forefront once again. In an effort to make visible, demonstrable progress in the cleanup effort, the DOE and its regulators agreed in 1993 on a expedited action to clean up the abandoned military sites, as well as a "2-4D" pesticide dumping area that the BOR had used, and miscellaneous other hazardous waste sites on the Wahluke Slope. Such expedited action was seen as a first step that could pave the way for the Slope to be released from DOE control. A report released in December 1992 by the "Future Site Uses Working Group" (a varied, representative group of regional stakeholders) had recommended that whichever large tracts of Hanford Site buffer land could be cleaned quickly, and with relatively small expenditures, should be so remediated, so as to make them available for other uses. At the same time that Wahluke Slope cleanup got underway in 1994, regional farm interests learned that future BOR development would stop. They shifted their focus to natural centers of power in rural county governments. Placing their emphasis now on local control, they began advocating that counties with land on the Wahluke Slope (Grant, Franklin and Adams counties) be given first rights to obtain the land once the DOE was finished using and remediating it. A "Wahluke 2000 Plan" advocating return of much of the land to county tax rolls, via farm development, was proposed. At nearly the same time, environmentalists were encouraged when the EIS on the Wild and Scenic River question was completed in 1992, recommending such a designation for the Hanford Reach. The stage was now set for a strident and heated public debate over future land use on the Wahluke Slope.

UNIQUELY AMERICAN DEBATE:

Today, the contest rages more strongly than ever, as representatives of the new agrarian (corporate farm) America debate in the role of developers opposed to environmentalists over the wisest and best use of shrinking resources. Deeply rooted in the events of the last 60 years, this debate is as historic and American as the John Scopes trial of 1925 or the "multiple uses versus protection" debates of the early U.S. Forest Service under Gifford Pinchot. Yet, it has its own, late 20th century aspects. The debate wears many disguises; most notably that it is a contest over local versus national control. However, it is fundamentally a debate over economic development and heritage, and about how, and whether, the two can live in balance in a world with too few jobs and too few resources. Men and women now grown to be county commissioners were raised on winter kitchen table lore and summer picnic stories of how the MED upset plans to turn the whole Columbia Basin into a rival of California's Central Valley in food production. Their distrust of the DOE runs deep. Having lost the BOR as their own federal champion, they are now free to make local control their rallying cry.

Environmentalists point to the "time-stood-still" natural heritage of the Hanford Reach and the Wahluke Slope in terms of salmon, steelhead, eagles, sage grouse, rare bunch grasses and shrub-steppe habitat, and many other endangered or threatened animal and plant species. Because the existence of the Hanford Site kept developers and irrigators away, the wildlife of the area appears as it did decades ago, and as it appears virtually nowhere else in the American West. Salmon restoration plans, mandated in law, are expensive. Saving the Hanford Reach could be the least expensive of all such plans, and the most effective, state the advocates of the Wild and Scenic designation. But salmon habitat is fragile, and could be easily destroyed if irrigation on the Wahluke Slope were allowed. Bank seepage, especially along the 400-foot high, ashy volcanic White Bluffs, would surely result if millions of gallons of irrigation water were pumped and dumped into this chalky soil. If the Bluffs eroded into the river, they could destroy not only the salmon redds (nests), but might divert the Columbia into Hanford's 100 Areas. At the least, important cultural and archeological sites could be destroyed if such erosion occurred. At the worst, buried contamination could be released that could pollute the great river all the way to its mouth. "Save the Reach" advocates add that the recreational value and sheer, drop-dead beauty of the river winding past the open Slope could help attract high-tech companies with discerning work forces to diversify the economy of the nearby Tri-Cities as Hanford operations close down.

At the present time, Washington's Governor Mike Lowry supports the Wild and Scenic designation and leaving the Wahluke Slope in its present mode as a wildlife area. Washington's two senators are split on the question; Senator Patty Murray favors Wild and Scenic and introduced a bill in Congress in December 1995 to make these policies into law. Senator Slade Gorton opposes Wild and Scenic and the preservation of the Wahluke Slope, as does the region's Congressman "Doc" Hastings. He has introduced a counter bill into the Congress that would prevent dredging in the Reach but would not preclude farming and development more than one/quarter mile from its shores. The City of Richland, Washington favors the Wild and Scenic designation, while the regional counties oppose it. Thus, the debate has never been more cogent nor tangible. Clearly the long history of the region is woven throughout this debate. The fate of the Wahluke Slope is tied to the Columbia River, tied to its past, its wildlife, its roots, its very soil, and tied to the people now fighting for its control.

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