The Beginning of a Long Conversation: Insights into Hanford Advisory Board Members Opinions on Diversity, Language Services, and Community Engagement.

By

Denise Jones

Capstone Advisor: Shannon Cram, PhD

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Abstract

The Hanford Nuclear Site is an important part of Washington state's past, present and future. Onsite cleanup of hazardous radioactive waste has been underway for more than 30 years and will most likely continue for another 70+ years. The Tri-Party Agencies and interested stakeholders saw the importance in community involvement in cleanup efforts when they established the Hanford Advisory Board, giving a voice to the community. This capstone research project focuses on how board members feel about community engagement, inclusion, and representation using mixed methodology for collecting and analyzing quantitative and qualitative data. Findings are summarized reflecting the sample group's feelings and understandings of topics focusing on site specific boundaries, diversity, language services for people with limited english proficiency, and community engagement. This case study is the beginning of a long conversation in understanding how community advisory boards give agency to underrepresented community groups.

Introduction

Over the past year, the United States has been forced to look introspectively at how our country is managed, how residents are treated, and the growing disparity between ethnic and socioeconomic groups. There is up-to-date data to support how people living in this country are affected by their environment. When looking at this information and the fact that our population demographics are changing, it is important to create systems and policies that alleviate hardships from those most impacted by climate change and environmental health issues. The purpose of this case study is to better understand how inclusion of underrepresented communities in participatory democracy can increase the quality of life for all residents.

Prior research has found that the United State's population demographics are shifting and the country is more diverse than ever before (Treuhaft 2014). Creating an inclusive government system that solicits information and understands a diverse population's needs and wants that helps reduce the growing disparities in our nation. Many cities, municipalities and counties are creating their own "equity tool kits" to increase underrepresented community engagement while reducing unintended negative externalities on marginalized communities. These tool kits focus on qualitative results from community members, self-assessed quality of life, as well as varying metrics as to how at-risk and frontline communities are affected by policy changes.

The Hanford Facility Agreement and Consent Order (Tri-Party Agreement) established the Hanford Advisory Board (HAB) in 1993 as a federally mandated community outreach group for citizen input on the estimated 30-year environmental

cleanup process. The goal was to create an advisory board made up of "...local and regional interests, environmental and business interests, worker and non-worker interests and different government entities at all levels." (Convening Report, Keystone Center, 1993) The HAB was the first advisory board established for public involvement in remediation of nuclear weapons production, energy and its byproducts sites run by the US government. The seats are composed of primary members and alternates representing specific stakeholders. The board's mission focuses on providing guidance and informed advice to the Tri-Party agencies (EPA, DOE, and Ecology) pertaining to policy issues concerning environmental remediation and cleanup processes. Meetings held by the HAB are open to the public and their secondary goal is transparency of policy advice and community engagement. This research will examine the HAB's representational practices in regards to environmental justice concerns.

Citizen advisory groups are a broad term used by the Environmental Protection Agency (EPA) to define any "committee, task force, or board composed of community members and other stakeholders affected by a Superfund site." (Community Advisory Group, 2021) The Hanford Advisory Board is an Environmental Management Site-Specific Advisory Board (EM SSAB), focusing directly on Hanford Nuclear Site environmental remediation and cleanup. EM SSAB's are governed by the Federal Advisory Committee Act (FACA) of 1972, "which was enacted to ensure that the general public has access to advisory board deliberations and recommendations." The original intent of these organizations was to create space for inclusion and diversity in community members, giving equitable representation in clean up planning and implementation.

This research focuses on inclusion and representation. Questions guiding this evaluation are based on board member ideologies and goals as well as current legislation on environmental justice and equal rights.

1. What do Hanford Advisory Board members think about current issues surrounding representation and equity?
2. How do Hanford Advisory Board members imagine the board's future (i.e. what changes should be made, what should stay the same, etc.)?

Onsite environmental remediation and long-term stewardship is expected to continue past the year 2100, the Hanford Advisory Board is looking to the future to continue to be a strong, community first advisory board focused on environmental remediation in and around the Hanford Nuclear Site. This case study and research goals focus on aggregating data to facilitate conversations among board members and to better understand how policy and federal guidelines affect community engagement.

Literature Review

The environmental health problems created by plutonium production at the Hanford Nuclear Site generated the need for environmental remediation. The legacy of weaponized fuel production has left its mark on the land and continues to affect the growing population of Kennewick, Pasco, and Richland, Washington (Tri-Cities) and the Northwest region. Common practice during the first four decades of onsite waste management was to dump and pump radioactive waste into the earth, which passively leaked into the soil and groundwater. The waste has and continues to leak into the Columbia River causing environmental issues throughout the Pacific Northwest. The radioactive nuclides present in the area cause significant health risks to humans and animals. The United States World War II effort and the cold war focused on creating weapons of mass destruction, with little regard for environmental health protection.

Segregation and marginalization in the Hanford area began in the 1880s, where virtually all non-white residents were expected to live on the east side of the railroad tracks in Pasco. This trend continued when the Department of Defense and DuPont solicited communities around the country for employees, to assemble and maintain the massive workforce needed to build facilities and fulfill production needs for weapons grade plutonium. The Fair Employment Practices Commission was established to enforce President Roosevelt's Executive Order 8802 "Reaffirming Policy of Full Participation in the Defense Program by all Persons, Regardless of Race, Creed, Color, or National Origin, and Directing Certain Action in Furtherance of Said Policy." This policy mandated that all Federal employers and contractors working on government

contracts uphold an “equal pay for equal work” policy. Black Americans were drawn to the prospect of higher than their usual wages and better working conditions, and moved to the Tri-Cities in search of a better life.

Before the Manhattan Project began actively recruiting workers, the population of black Americans in the Tri-Cities was about 27 in the 1940 census. East Pasco was the area designated area for non-white residents since the late 1800s. In 1948, of the approximately 10,000 residents in Pasco, 2,000 were black (Wiley, 1949). When the non-white community was small and percieved as non-threatening the residents of the Tri-Cities tolerated minority populations, but their fears and prejudice ran rampant once construction began on the Nuclear Reservation. The Department of Defense’s contractor DuPont wanted to reduce the fears of white residents of Pasco that the diverse workforce would not become permanent residents and stated they would “…pay to transport blacks back to the South after their work was completed” (Bauman, 2005). The Tri-Cities not only enforced current Jim-Crow era laws, but created new ordinances and barriers to keep black community members from experiencing the same quality of life as white residents. Segregation, poor city services, unequal education systems all added to the disparity felt among residents and created a perplexing dilemma in regards to the high wages and federally mandated working conditions on site.

The Civil Rights movement of the 1960s and 1970s helped the Tri-Cities and their residents move toward a community of equal opportunity and quality of life. The closing of Whittier Element in 1965 and bussing students to white schools reduced disparities in education, and in 1968, Richland and soon to follow Pasco passed ordinances reducing housing discrimination. These steps to desegregate the tri-cities community gave

opportunity for people of diverse backgrounds to intermingle. There is evidence that an ethnically diverse education system helps students have more empathy and appreciation for differences among community members during their education and be more open to living in diverse communities as adults (Stuart Wells, et al. 2005). Efforts to create a more open and inclusive society compound and reinforce ideas of inclusion.

The History of Hanford

"Yesterday, December 7, 1941, a date which will live in infamy - the United States of America was suddenly and deliberately attacked by Naval and Air Forces of the Empire of Japan." Former President Franklin Roosevelt gave an impassioned appeal to Congress and the American people to authorize a declaration of war with Japan. Congress agreed action was paramount and declared War against Japan, Germany and Italy. Albert Einstein and Leo Szilard wrote to President Roosevelt warning him of Germany's plans to create an atomic bomb after the first uranium atom was split in Berlin. The Manhattan Project was created in January 1942 in Los Alamos, New Mexico, and was the first site of the nuclear weapons project. In order to create weapons of mass destruction, the United States looked to its leading scientists for ideas. Unfortunately, Einstein was seen as a security risk and barred from working on the Manhattan Project, but the prominent Italian physicist Enrico Fermi was brought on board to the top secret project and built the first nuclear reactor on the University of Chicago's squash courts.

The original reactor design functioned at very low power levels and used ultra-pure graphite as a mechanism to stop any unruly chain reactions. But the goal was mass production of weapons grade plutonium and uranium, which would use

considerably more power and need a radiation shedding cooling system. Fermi and his team at the Met Lab worked to build a water-cooled production pile. The final design contained "...uranium slugs sealed in aluminum cans inside aluminum tubes. The tubes, laid horizontally through a graphite block, would cool the pile with water injected into each tube. The pile, containing 200 tons of uranium and 1,200 tons of graphite, would need 75,000 gallons of water per minute for cooling" (Gosling, 1999). The Department of Defense (DOD) needed a site for large-scale production that would not draw attention from forgein interests. After a trip to assess six different sites on the West Coast, Colonel Franklin Matthias and Leslie Grooves decided that Hanford and the surrounding area was the best match for site requirements. December 1942 the Hanford Engineer Works was established and given the codename Site W.

This site was chosen because of how it satisfied the requirements of this massive endeavor. The water-cooled production piles need immense amounts of free-flowing clean water. In order to create the desired amount of chain reactions to enrich uranium and create plutonium, massive amounts of local power were provided by the Grand Coulee Dam. Although the effects of radiation exposure and environmental health effects from production were not known at the time, Grooves and Matthias felt it best for the production site to be in a remote location that would most likely not become a metropolitan area in the future. The acquired 586-square-mile aird shrub-steppe location fulfilled criteria for the government project. Before construction could begin in 1943, the federal government issued a "Declaration of Taking" to the residents of Richland, Hanford, White Bluffs and the surrounding area. Residents were given anywhere from 90 days to as little as 48 hours to take their possessions and leave before

being evicted from their homes by the federal government. The Wanapum people were evicted from their winter village near Vernita Bridge. As a nomadic people, the Wanapum traveled year round to support a subsistence lifestyle and wintered in the Hanford area. They were not present when the eviction notices were issued, therefore they had no knowledge that their homes were no longer theirs and ultimately unable to retrieve their belongings (Bauman, 2020).

At the peak of construction, 45,000 employees worked on site. Most of these workers lived in military-barrack style housing, but many short-term workers (about 4,300) brought their own mobile trailers to live in (Matthias, 2002). The environment in the Columbia Valley proved to be a formidable adversary to the construction project and employee retention. Massive dust storms and the lack of entertainment and extracurricular activities made day-to-day life difficult for people employed with the project. In January of 1944, it was reported that 1,000 employees a week resigned from their positions. Site commanding officers worked to reduce this number by creating a better work/ life balance. More mess hall tents were built so that employees had quicker access to meals and snacks. On average twenty thousand lunches a day were consumed in six cafeterias. The DOD saw the importance in employee retention, and created a hospital, bank, school, and fire department. As the Tri-Cities themselves saw an influx of people, their civic amenities and services grew as well (Jordan, 2002).

Hanford's need for labor during WWII proved difficult at times. Most young, able-bodied men were enlisted in the military fighting for their country. The majority of the available workforce were established tradesmen; of about 15,000 of these workers were black. It was thought that southern white male workers brought their prejudiced

conventions with them and that management at the site was afraid to lose more of the workforce, so they allowed Jim Crow laws to fester and grow in the Tri-Cities. But in reality, systemic racism and oppression of those with different ethnic backgrounds has been prevalent in the Tri-Cities since the 1850s. The DOD and its contractors skirted federal policy by keeping quotas of black and brown employees around 20% of the workforce, high enough to meet compliance. Black and brown employees worked mostly in menial jobs and construction work regardless of skill level or qualifications for other positions. In 1949 Charles Larrowe from the Seattle Chapter of the ACLU exchanged a series of letters in a discrimination suit with the Hanford Nuclear Site about their direct and indirect discriminatory treatment of black people working and living in the vacinity of the site. Employees and their families were subjected to subpar living conditions and discriminated against to varying degrees in Pasco, Richland, and Kennewick.

Although it was important to retain employees to keep construction on schedule, there was a general lack of consideration for the inhabitants of the area. People with diverse ethnic backgrounds and indigenous people were not seen as individual community members with rights but another line item of plutonium production progress. This discriminatory attitude spilled over into waste management and personnel protection procedures. Standard operating procedures focused on an “out of sight, out of mind” approach to waste management. Wells were dug to pump radioactive waste into the soil, hoping its harmful chemicals would dissipate before reaching the ground water and migrating to the Columbia River. The Green Run off gassing occurred where residents and employees were knowingly exposed to radioiodine, causing serious thyroid issues and cancer. The local flora mistook cesium-137 for potassium, soaking up

the radioactive nuclides that cause decreased cognitive function, permanent DNA alterations, increased risk of cancer, and possible birth defects in future offspring of local fauna and residents.

1945 was a whirlwind year in nuclear research. The Bomb Research and Development Laboratory in Los Alamos, NM, had plans for atomic bombs using plutonium and enriched uranium, but their creations depended on production efforts at Hanford and Oak Ridge. Robert Oppenheimer believed the research facilities should remain independent from military control and fostered a culture of scientific discourse and an academic mindset. His team worked with universities and military personnel to collaborate on bomb design. The Cowpuncher Committee focused on the implosion-style nuclear bomb (Fat Man), which used 13.6 pounds of plutonium-239 to create the fissonable reaction needed to achieve the desired mass damage effect. On August 9, 1945, Fat Man was dropped on Nagasaki, Japan, creating a force equivalent to 21,000 tons of TNT that resulted in the deaths of 140,000 people.

After WWII ended, General Electric (GE) took over DuPont's contracts at the Hanford Nuclear Site. The United States had a new enemy, the Soviet Union. Russian spies fed the USSR information about the United States nuclear projects and creation of nuclear weapons from Los Alamos, NM. The US government felt it imperative to increase their arsenal, and the Hanford Nuclear Site was critical in the production of plutonium. GE submitted a bid for an expansion project including two new processing piles for 100 million dollars. Until 1987 Hanford produced 74 tons plutonium, with an estimated 981 kilograms (2163 pounds) of waste plutonium left onsite (Roetman, 1994).

In 1988 Hanford Nuclear Site was placed on the NPL and subject to long-term hazardous waste cleanup under RCRA and CERCLA law.

Federal Law and CERCLA

The 1960s and 70s were ripe with environmental laws and policies. The Clean Air Act of 1963 is still one of the most comprehensive environmental laws ever created. At the time, many different federal agencies had jurisdiction over environmental laws, policies and regulations. The lack of cohesive oversight made it easy for environmental regulation violators to circumvent the law. Former President Nixon understood the dire situation our country was facing; polluted waterways, contaminated drinking water, deadly smog from vehicle exhaust, pesticides contaminating crops, and countless other foes from uncontrolled waste. He reached out to Congress asking for bipartisan support of the Reorganization Plan Number 3 of 1970. His strategy was to reorganize all environmental laws, policies, and regulations under one federal agency, making it easier to track our environment's well being, analyze new areas of concern and implement policy in a timely manner. The Environmental Protection Agency (EPA) would take ownership of federal environmental justice from other agencies and become the sole authority of environmental regulation.

The new agency began with gusto and motivation to not only show that the federal government could get the job done, but also to improve the lives of residents all over the nation. Environmental policy incrementally grew, drawing inspiration from Nixon's plea to Congress asking for support in creating the EPA, "A single source may pollute the air with smoke and chemicals, the land with solid wastes, and a river or lake

with chemical and other wastes. Control of the air pollution may produce more solid wastes, which then pollute the land or water. Control of the water-polluting effluent may convert it into solid wastes, which must be disposed of on land." This speech spawned a multitude of legislative acts aimed to create a holistic approach to environmental remediation and public welfare. In the agency's early years, the public was so moved by the government's push for a healthy environment that tens of thousands of people sent in their resumes hoping to be part of the solution.

Corporations and manufacturers hoped the EPA would be a passing fad, but to their dismay, the agency grew stronger with bipartisan support. On October 21, 1976, Congress passed the Resource Conservation and Recovery Act (RCRA). This policy gave the EPA "cradle to grave" oversight of all solid and hazardous waste in the United States. RCRA is an amendment to the 1965 Solid Waste Disposal Act set up as an inter-governmental program to help states and the EPA work together to institute national standards and regulations. The goals set forth focus on environmentally sound waste management and cleanup in order to protect human health and the natural environment. This cradle to grave approach created a series of regulations that controlled the creation, handling, transportation, and disposal of hazardous materials. It also created guidelines for storage tanks for this waste. The EPA began to crack down on corporations that were knowingly polluting the ecosystem, but it was still difficult to track where and how waste was disposed of. In 1980, the RCRA put a stop to midnight dumpers, those who are in "the business of disposing of dangerous wastes as cheaply as possible--into sewers, fields, along the roadside--with no thought to the long-term public health or environmental effects," said EPA Administrator Douglas M. Costle. In

November of 1980, almost 60,000 individual businesses notified the EPA per mandate that they handle hazardous waste. Creating regulations for proper disposal of hazardous waste including an interstate tracking system which helped standardize the system. RCRA not only manages hazardous waste but also creates opportunities for more stringent legislation.

The 1970s focused on building agencies that implement scientific principles to better the quality of life for many citizens. The 1980s created action plans to reduce and reverse environmental damage caused by unchecked growth. At its core, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) is a tax bill established to create a trust fund of 1.6 billion dollars, collected over five years to be used for cleanup of abandoned or uncontrolled hazardous waste sites. In the first six years of this policy's life, it evolved its remediation tools and processes. The EPA listened to citizen complaints and mounting evidence of public health concerns about possible environmental health sites in order to begin cleanup. CERCLA categorized cleanup in two ways: (1) Short-term cleanup, which focuses on rapid response to an immediate health issue, and (2) Long-term remedial response focused on permanent solutions to reduce dangers imposed by hazardous substances that are not causing immediate health risks. For long-term cleanup, a site must be placed on the National Priorities List (NPL). The site in question must pass a series of tests and inspections in order to be placed on the NPL and ultimately become eligible for long-term cleanup and possible funding. In 1986 The Superfund Amendments and Reauthorization Act (SARA) increased the trust fund size to 8.5 billion dollars and increased emphasis on long term remediation and citizen participation.

Each contaminated site is different and it is important to assess its needs early in the cleanup process. This process begins with an official discovery or notice to the EPA that a site may have hazardous conditions that may cause adverse health effects to the population. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) is a database of all proposed NPL sites storing information about proposed sites, any inspections or official documentation about possible contamination and cleanup assessments. The Hazard Ranking System (HRS) uses a numeric-based score to determine the validity of a site's cleanup claim. The HRS gives sites a score from 0 to 100 based on three factor categories: (1) the likelihood of release or exposure, (2) waste characteristics, and (3) targets of the four evaluation pathways: (a) Groundwater migration, (b) Surface water migration, (c) soil exposure, and (d) air migration. The following root-mean-square equation is used for scoring and any site with a score of 28.50 or greater is eligible for the NPL.

$$S = \sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2}{4}}$$

where: S = site score
S_{gw} = ground water migration pathway score
S_{sw} = surface water migration pathway score
S_s = soil exposure pathway score
S_a = air migration pathway score

The traditional Superfund cleanup model relied heavily on study and assessment, often delaying cleanup efforts by ensuring that the course of action is the best use of time and funding. In 1994, the EPA adopted the Superfund Accelerated Cleanup Model (SACM), and CERCLA's budget was cut by 89 million dollars. SACM focuses on quick action, lean business practices, local oversight from Regional Decision Teams and

long-term cleanup efforts. Once a site's level of cleanup is assessed, the EPA works to hold any and all potentially responsible parties (PRPs) financially responsible for cleanup. The EPA can order or ask a court to order the PRPs to clean up the site, which may lead to a settlement agreement with the United States under CERCLA law. The agency can then use CERCLA funds to address cleanup and may recover those costs from the potentially responsible parties.

Cleanup at Hanford

On April 26, 1986, a disaster like no other befell the city of Chernobyl, Ukraine. The RBMK reactor failed killing 31 people within a few months and a possible 4,000 more may die from exposure. Chernobyl used their nuclear reactor to produce steam for energy production. Uranium-235 was used and created various wastes including radioiodine (iodine-131). People living in the area lived on an iodine-deficient diet. When the meltdown occurred, they were not only heavily dosed with radioactive isotope but their thyroids gobbled up the radioiodine (because of their iodine deficient diets) leading to increased rates of thyroid cancer similar to what happened to downwinders in the Tri-Cities. This disaster inspired the United States to inspect their country's nuclear production systems. By late summer at the Hanford Nuclear Site, reports of the aging N-reactor and its need for more than 1.2 billion dollars in upgrades led to the reactor's shut down in December of 1986. The accident abroad made United States government officials look to our own nuclear production sites and the possibility of health effects. This spurred a series of environmental and health studies to assess contamination at the Hanford Nuclear Site and if environmental remediation was necessary.

At the end of the 1987 fiscal year, the EPA requested a formal evaluation of the Hanford Nuclear Site to be conducted. The HRS department published their findings on October 1, 1988. Their analysis evaluated a total of 646 active waste sites on the premise, finding that 125 of them scored greater than 28.5. This ranking made them eligible for review and possible placement on the National Priorities List for long-term environmental remediation. With such a large number of sites, the EPA asked for sites to be grouped into four Aggregate-Area Sites; (1) U.S. DOE Hanford 100 Area, with HRS Migration Score of 46.38, (2) U.S. DOE Hanford 200 Area, with HRS Migration Score of 69.05, (3) U.S. DOE Hanford 300 Area, with HRS Migration Score of 65.23, and (4) U.S. DOE Hanford 1100 Area, with HRS Migration Score of 36.33 (Stenner, et al., 1988). Further research and environmental impact studies were requested to help better determine the best course of cleanup, and it was clear that Hanford Nuclear Site's Aggregate-Area sites needed to be placed on the NPL.

The cleanup operation is a multi-step process. Once the preliminary assessment is complete and the site is placed on the National Priorities List (NPL), a work feasibility study is used to determine possible cleanup strategies, possible health risks from the site (past, present, and future), and potential costs of the process. Because the Hanford cleanup is listed as four separate cleanup projects, each one needs its own feasibility study. However, the site is listed as only one RCRA site, therefore only one permit is issued for the entire cleanup process. The original agreement stated a 30-year complete cleanup timeline ending in 2018 (Izatt, 1990). RCRA regulates newly created waste from cradle to grave, while the CERCLA focuses on environmental remediation of specific sites with waste mismanagement. CERCLA and RCRA have overlapping

jurisdiction in some areas, especially concerning underground storage tanks, transportation, and disposal of hazardous waste. CERCLA stands out when it comes to enforcement of environmental cleanup, accountability of offending parties, long-term planning, and community engagement.

The Superfund Amendments and Reauthorization Act (SARA) put more emphasis on community involvement in NPL site cleanup efforts. Hanford cleanup is no small feat, and it needs continuous participation from many stakeholders. The Hanford Facility Agreement and Consent Order (Tri-Party Agreement) is an agreement for compliance and comprehensive cleanup efforts between the Environmental Protection Agency (EPA), US Department of Energy (DOE), and the Washington State Department of Ecology (Ecology), which was signed by the respective parties in 1989. This order not only lists the rights and responsibilities of participating stakeholders, but also the action plan for cleanup. Specifically related to CERCLA, SARA, and RCRA regulations, the Tri-Party Agreement holds these agencies accountable for the following: "(1) Identify RCRA treatment, storage, and disposal units that require permits and establish schedules to comply with interim and final status requirements. Where applicable, RCRA Part B Permit applications will be completed, closures accomplished, and post-closure care implemented. (2) Identify interim-action alternatives appropriate to implement the final RCRA corrective and CERCLA remedial actions. (3) Establish requirements for performing investigations to determine the nature and extent of threats to public health or the environment caused by actual or possible releases, and perform studies to identify, evaluate, and select alternatives for controlling possible releases. (4) Identify the nature, objective, and schedule of response actions for cleanup

of hazardous material spills. (5) Implement the selected interim and final RCRA corrective and CERCLA remedial actions" (Black, 1994).

The Remedial Action Plan uses the oversight agencies' regulations to determine the best course of action in cleanup. The Hanford Nuclear Site is such a large project, with more than 1,100 defined treatment areas, that a "one size fits all" plan would not work. The Tri-Party Agreement worked to address the biggest issues first. There are 149 single-shell waste tanks (SST) and 29 double-shell tanks (DST) that pose a serious threat to the local ecosystem. They range in size from 55,000 gallons to over 1,000,000 gallons of the United States most volatile radioactive waste. These tanks contain cocktails of various salts, liquid and soil waste materials in unknown quantities that have been blending together for decades, creating corrosive emulsions that jeopardize the integrity of the tank walls. The tanks are ultimately able to leak into the soil and groundwater supply migrating to the Columbia River. It is estimated that there are more than 56 million gallons of high-level radioactive waste in the 177 tanks. There are at least one million gallons of high-level radioactive waste that have leaked into the ground and water table from these tanks. The goal was to find cost-effective methods to remove sludge from the tanks, treat it, and prepare it for offsite storage while protecting employees and the local population's health. Once the tanks are emptied, an encapsulation process would capture any residual residue and seal the tanks shut. Emptying the double-shell waste tanks (DST) and encapsulating low-level radioactive waste for storage management is an important part of the original Tri-Party Agreement. The strategy in 1989 was to use grout to suspend the low-level waste particles and seal the emulsion in underground concrete vaults (Izatt, 1990).

In order to comply with EPA regulations, a number of processing plants and facilities needed to be built on site. The Hanford Waste Vitrification Plant (HWVP) was introduced to the cleanup plan to create a safe mechanism for storing and transporting high-level radioactive and transuranic (TRU) waste. Building the HWVP was scheduled to begin 1991 with a scheduled startup date of 1999. The scope work to build this treatment plant was initially estimated to be 1 billion dollars. The Waste Receiving and Processing Facility (WRAP) was designed to treat low-level hazardous waste and TRU waste. The waste processed at this facility will adhere to the Waste Isolation Pilot Plant (WIPP) standards for storage before transportation to its final storage destination. The two modules of this facility were scheduled to be completed and up and running by September 1999. The initial Tri-Party Agreement understood that with time, science evolves and better more efficient methods of waste management would present themselves. Therefore, the document contains language to allow for amendments (Izatt, 1990).

Hanford Nuclear Site cleanup continues beyond its original timeline of 30 years and now is estimated to continue cleanup and long-term stewardship (LTS) beyond 2100 (2019 Hanford Lifecycle Scope). Throughout its history, the United States government has contracted with private corporations for Hanford operations and continues with the cleanup process. Overall site cleanup and management has changed hands over the past 30 years. In 1986 Westinghouse was awarded a 4 billion dollar, five-year contract to oversee the shutdown of the N reactor and oversee the cleanup process. In 1996, Fluor Daniel Hanford, Inc. became the managing contractor for cleanup for a similar bid of 4.88 billion dollars. Thirty billion dollars has been spent on

site with an estimated 677 billion dollars more to complete the cleanup project. The Tri-Party Agreement was approved for amendments in 2010, making it difficult to gage the success of cleanup from the original scope of work. Current waste management is costing more than 1 billion dollars a year.

In 2000 Bechtel was awarded a 4.3 billion dollar contract to build a vitrification plant on site. Vitrification is a process of turning waste into glass making it impermeable to liquids so that the waste chemicals are unable to leak avoiding harmful health and environmental effects. This process has been tested all over the world and is a secure method of hazardous waste management. But the Hanford Nuclear Site is unlike any other place on earth, and many of the underground tanks were filled before the creation of government standards and regulations. In order to successfully seal hazardous materials in the vitrification process, the hazardous chemicals and their quantities need to be known. Bechtel's current plan of action is the Waste Treatment and Immobilization Plant consisting of many buildings over a 65-acre area (Gallucci, 2020). Without the vitrification processing facilities, tank waste cannot be properly treated and disposed of. There have been many issues with this course of action and offsite storage of high-level waste. Current cleanup efforts have refocused on protecting the Columbia River and reducing groundwater contamination.

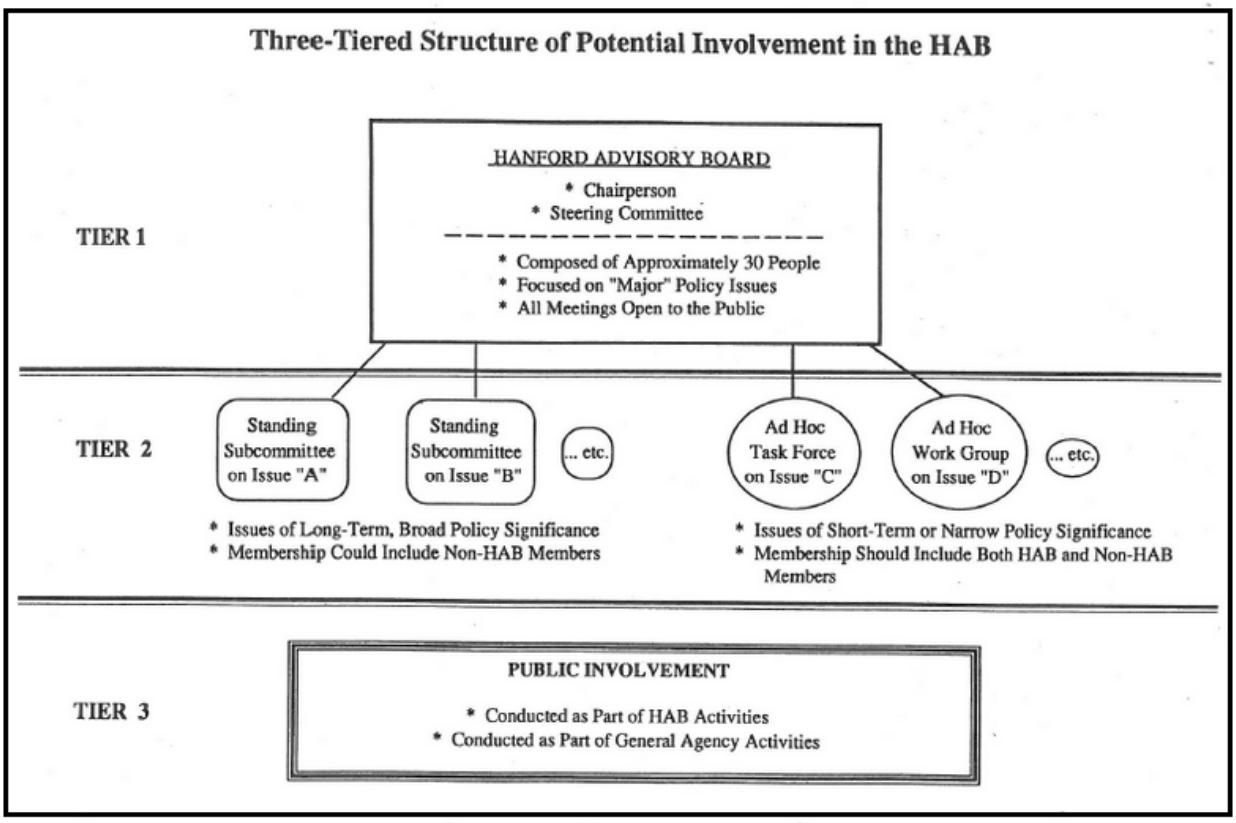
The Hanford Advisory Board

The Hanford Advisory Board was born out of the idea that Hanford cleanup affects many local and regional stakeholders. In August of 1993, The Keystone Center became the mediating party between Tri-Party agencies (DOE, EPA, and Ecology), and

stakeholders with an interest in site specific environmental remediation (Mealey, 1993). The Keystone Center interviewed more than 70 representatives for various stakeholder groups, and proposed a 3 tiered system with Tier 1 consisting of a 30-35 member board. The second tier includes subcommittees, working groups, ad hoc task forces and any non-member policy or technical experts. The final tier focuses on general public involvement activities related to Hanford cleanup and the HAB. Page 15 of the convening report shows an organization chart of the proposed tiered system.

The goal of this structure was to create respectful balance between community, stakeholder and agency needs in regards to onsite cleanup. Creating direct lines of communication between the site and HAB members allows for greater understanding and less opportunities for miscommunication. Allowing space for non-agency and non-member participation from subject matter experts in the second tier of this structure brings validity to understanding complex ideas and plans. This trickle-down system is one way to disseminate information into the community, giving opportunity for meaningful dialogue. As community members and the general population are brought into the conversation, agencies and HAB members have the knowledge to give thoughtful answers providing better understanding of cleanup strategy. There is also an opportunity to dispel any misinformation circulating in the community. Agencies and tier 1 entities should work together to avoid redundancies in information sharing and if possible, work together to create publicly consumable information (Mealey, 1993).

Figure 1: Proposed Hanford Advisory Board



Note. This figure was created by the Keystone Center to show possible structure for the HAB. *Mealey, T., & Stinson, B. (1993). (rep.). Convening Report on The Establishment of an Advisory Board to Address Hanford Cleanup Issues. The Keystone Center.*

In 1994, the Hanford Advisory Board was officially established as the first of eight citizen advisory boards under the Department of Energy focusing on environmental remediation for government Superfund Sites. These boards aspire to reduce myopic bureaucracy through community participation focused on providing "...a forum for bringing together diverse views, cultures, and demographics from communities and regions affected by Hanford Site cleanup activities." -According to the Hanford Advisory Board 2020 Annual Report. Since inception the HAB has provided ~300 pieces of advice to the Tri-Party Agencies. The HAB has six standing committees: Executive

Issues (leadership), Budgets and Contracts, Health, Safety, Environmental Protection, Public Involvement and Communications, River and Plateau, and Tank Waste. These committees identify areas of significance for research and need for HAB input. Through a defined consensus process, the board collaboratively works to create documents expressing their concerns, positions, and expert opinions on specific issues.

The Memorandum of Understanding (MOU), last updated in June of 2008, sets forth the ground rules and operating principles for the Hanford Advisory Board. Although a volunteer board, the HAB is chartered by the DOE and reports to the Tri-Party agencies, it operates under the Federal Advisory Committee Act (FACA) of 1972 and Environmental Management Site-Specific Advisory Board (EM SSAB) guidelines. FACA is a holistic approach to advisory boards, giving guidance and regulation for basic functions of any government advisory board. The EM SSAB was established by the DOE, adhering to FACA regulations. Although purely advisory, their goal is to foster public involvement inorder to help decision makers have a more well-rounded understanding of community wants and needs.

The MOU goes on to describe in detail the need for diversity and broad representation of stakeholders and board members. The stakeholders that represent the interests listed below are asked to submit no more than three possible nominees per seat to the Tri-Party agencies, which may choose to interview and consult with the stakeholder before submitting nominees for formal approval to the DOE. These interests include:

- Local government interests
- Local business interests for (TRIDEC)

- Local environmental interests
- Regional citizen, environmental, and public interests
- Local and regional public health concerns
- Representation for the Confederated tribes of the Yakima Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, and the NezPerce Tribe
- Representation from the State of Oregon
- Regional Universities
- Citizens with a general interest in Hanford Cleanup

The HAB's primary goal is to develop and provide policy recommendations for a variety of issues related to on site environmental cleanup and remediation, finding consensus and expressing the views of all board members (Frost, 2008). It's secondary goal is "…to be an integral component for some Hanford tribal and general public involvement activities, but not to be the sole conduit for those activities. The Board should assist the agencies in focusing public involvement and make efficient use of Board members' time and energy. According to The Ground Operating Rules,through its open public meetings, advice on agency public involvement activities, and the responsibilities of Board members to communicate with their constituencies, the Board will assist the broader public in becoming more informed and meaningfully involved in Hanford cleanup decisions." The HAB as a whole and individual board members are expected to create opportunities for meaningful interaction with stakeholders and the general public. Inorder to help the board reach these goals, support staff can be provided by the Tri-Party agencies. All HAB meetings are open to the public and are to give notice at least 15 days in advance. Subsection IX. B. Public Participation Plan,

Mailing List of Interested Persons, and Public Notice briefly describes the use of mailing lists, newspaper advertisements and internet postings for public outreach.

As we move into a new era of Hanford cleanup, it is important to continue to work toward the goal of environmental remediation. Watchdog organizations and oversight committees like the Columbia River Keepers, Hanford Challenge, and the Hanford Advisory Board are striving to keep environmental remediation work moving forward, complying with CERCLA, SARA, and RCRA regulations, all while holding violators accountable. Former President Richard Nixon's address to Congress to create the EPA is as pertinent today as it was in 1972, "Each of us has a stake in maintaining and improving environmental quality, clean air, and clean water… water pollution, pesticide hazards, ocean dumping, excessive noise, careless land development and many other environmental problems. These problems will not stand still for politics or per partisanship. They demand to be met now… For environmental progress the time has come for man to make his peace with nature. Let us renew our commitment; let us redouble our effort. The quality of our life on this land is a cause to unite all Americans."

Civil Rights and Environmental Justice

My life has been colored by the ideology of the "American Dream" and "pulling oneself up by their bootstraps in order to create a better future for themself and their loved ones. This construct of meritocracy makes it easier to categorize and exclude community members because they are unable to adhere to unrealistic standards set forth by the ruling class. This research focuses on how critical race theory affects how underrepresented community members are able to participate in the decision making

process. Participatory democracy's aim is to make sure that all members of a community have the opportunity to participate in the decision-making process. Jean-Jacques Rousseau founded this theory in the idea that participating in the decision making helps community members learn to be part of and contribute to an ethical society. Even when community members have a rudimentary understanding of government systems or proposed topics, their participation gives legitimacy to the system. Using a bottom-up approach, community engagement and collaboration helps community members feel empowered in the decision-making process and more likely to be satisfied with outcomes (Head, 2007).

Although Rousseau's approach can be broadly applied to everyone, not all community members have equal access or opportunity to participate. Philosopher Charles W. Mills, PhD gives another perspective to participatory democracy and the ideologies set forth by great philosophers like Thomas Hobbes, John Locke, Jean-Jacques Rousseau, and Immanuel Kant. The social contract set forth in participatory democracy gives legitimacy to a governance system that thrives on inequality. This system works to define differences in order to show the ruling class (those in power) have authority and the right to govern and impose laws upon the others in society. Political expansion pushed into geographical domination with the Colonial expansion of western European cultures focused on spreading their ideologies and superiority over people in colonized lands for economic exploitation inorder to build the white capital that currently controls the modern world (Mills, 2014). Western European Ethnocentrism enforces the notion that there is a hierarchy of cultures and only a select few are capable of understanding and participating in polity.

Critical Race Theory has been in the academic world for more than forty years, focusing on the critical analysis of American systems, policies and how they affect different racial groups (Sawchuk, 2021). Critical Race theory focuses on the notion that scholarship is incapable of being neutral or objective, and reexamines how race and racism are understood in American society. In regards to our implicit social compact, Critical Race Theory works to understand and expose how our legal system rejects fundamental and systemic changes in order to preserve the status quo (Critical Race Theory, 1995). The social and government systems our country has held onto for so long have created cavernous disparities between groups of people making it implausible for those who have been marginalized to participate in the democratic process.

Living in a system that focuses on our differences for exploitation makes it easy for our personal implicit biases to have more control over our decision making process. We have evolved to categorize and track everything around us, this includes people. Implicit bias can be understood as the unconscious categorization of people based on perceivable features that is shaped by everyday stimuli. Implicit bias is difficult to detect, but can color the decisions we make causing explicit bias to occur without realizing it. Small, what may seem harmless events of exclusion can add up to socially significant problems. When one person is denied opportunity to participate it is a shame, but when a community is denied the opportunity to participate it can affect that outcome and future outcomes (Eberhardt, 2020).

The Civil Rights Act of 1964 builds on the 14th Amendment, giving equal protection to all citizens including those who are systematically disenfranchised. Title VI of the Civil Rights Act “Nondiscrimination in federally assisted programs” states that

any federally funded recipient may not discriminate based on race, color or national origin. The Civil Rights Restoration Act of 1987 reinforces that recipients and their subrecipients who receive federal funding must comply with federal civil rights laws in all areas, not just the individual programs receiving aid. This legislation works in tandem with Executive Order 13166 “Providing meaningful access to individuals who are Limited English Proficient.” Creating meaningful access to information for all citizens and an opportunity to be part of the decision-making process is at the heart of EM SSABs and the Hanford Advisory Board.

Executive Orders come in all shapes and sizes, here we focus on ones that affect federal agencies and how recipients and subrecipients of federal funding comply with Title VI. In 1994, Former President Bill Clinton signed Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, focusing on how federal actions affect underrepresented and marginalized communities within the United States. The EPA’s Office of Environmental Justice (OEJ) works to build equitable policy, taking into account the disproportionate effects of environmental degradation on underrepresented communities. The Office of Land and Emergency Management found that “While there is no single way to characterize communities located near our sites, this population is more minority, low income, linguistically isolated, and less likely to have a high school education than the U.S. population as a whole.

Executive order 13166 "Improving Access to Services for Persons with Limited English Proficiency," focuses on providing access to services provided by federal agencies and their subrecipients. The Department of Energy’s Limited English

Proficiency Plan, released by the Office of Impact and Diversity Titled "Ensuring Access to Federally Conducted Programs and Activities by Individuals with Limited English Proficiency (LEP) Plan" was last updated July 26, 2011. DOE uses the four factor analysis as outlined by the Department of Justice to understand a community's eligibility for written and oral translation services. These steps include "(1) the number or proportion of LEP persons in the eligible service population; (2) the frequency with which LEP individuals come into contact with the program; (3) the importance of the service provided by the program; and (4) the resources available to the recipient." DOE has also created a categorical guidance system to help the organization better understand how LEP services are utilized within their agency.

In 2019, DOE released their "Second Five-Year Implementation Plan." This plan states goals defined by Title VI and EO 12898 requirements. The plan breaks down its goals by site. Hanford site specific goals include:

1. Use the Hanford Speakers Bureau to educate area schools with high minority area students about Hanford history, challenges, opportunities, and participation in decision making (information provided in both English and Spanish)
2. Encourage continued tribal participation and increase recruitment of low income and minority residents to serve on the Hanford Advisory Board
3. Abide by commitments made to area tribes and meet regularly with tribal representatives to discuss protection of traditional property and resources on the Hanford site
4. Facilitate the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement Administrative Record and Public Information Repository [TPA]) for achieving compliance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA)

remedial action provision and the Resource Conservation and Recovery Act (RCRA) treatment, storage, and disposal unit regulation and corrective action provisions, including the Community Relations Plan

5. Support the Public Information Repositories to give the public access to information on TPA activities and provide documents for public comment
6. Support the TPA-Searchable automated database found at the internet website: Tri-Party Agreement Administrative Record and Public Information Repository (https://pdw.hanford.gov/arpir/).

In June of 2017, the Tri-Party Agencies released a document titled " Hanford Federal Facility Agreement and Consent Order: Hanford Public Involvement Plan 2017," which was formerly the Community Relations Plan. This document focuses on the Tri-Party Agencies understanding of the need for public involvement in site related decision making. They emphasize the importance of timely outreach with the community. The Hanford Advisory Board is referenced on page 17. This document briefly references a link to Environmental Justice and does not address language services (LEP). The documents created by DOE and the Tri-Party Agencies make it difficult to understand their processes and implementation of required services under Title VI, and how federally mandated services and systems for inclusion apply to organizations like the Hanford Advisory Board .

President Joe Biden's Executive Order 14008 "Tackling the Climate Crisis at Home and Abroad," in which section 219 gives clear directions to build holistic processes that address how environmental justice is governed, reducing the negative externalities of policy on disadvantaged and overburdened communities. The Treaty with the Yakama Nation of 1855 should be considered when looking at the future of the Hanford Advisory Board, reserving the right of the Yakama and Wanapum people to use

the ceded lands. The cultural heritage of southeastern Washington and how different groups of people use the land is an important component in public involvement for environmental remediation. Loss of cultural resources has greatly impacted local indigenous people. Robert Bauman's book *Echos of Exclusion and Resistance: Voices from the Hanford Region* details how the loss of access to ceded lands on the Hanford Nuclear Reservation creates undue burdens resulting in a loss of long-term relationships, traditional knowledge transfer, and use of lands for subsistence resources.

It is difficult to understand the entirety of environmental remediation issues and how they affect different community groups. When a more diverse group of people are involved in the decision-making process, we see a bigger picture of the problem or task at hand and have a more holistic understanding of how the entire community is affected. If we look for representation on the HAB based on population demographics (what groups are the largest percentages of the population), some minority groups are left out. This means that voices are heard and environmental health problems their community may be facing are not addressed, causing an ever-growing disparity in cleanup efforts.

Methodology

Data collected for this research is informed by both quantitative and qualitative data. Quantitative information pertains to demographic markers such as age, ethnicity, and proximity to the Hanford Nuclear Site. I use this information to understand the complexity of who is serving on the Hanford Advisory Board and how it aligns with the general population. Qualitative information comes from both surveys and interviews and considers how a board member feels about representation, effectiveness of the board, and its future.

This research study uses a mixed methodology approach. First, I surveyed HAB board members online using Likert-style, multiple choice, and open-ended questions (Appendix A). After the survey, respondents were able to opt into a one-on-one ethnographic style interview to discuss their wants, needs, and goals pertaining to the HAB, onsite environmental remediation and general future of the Tri-Cities. The sequential nature of the single case study uses the survey as an opportunity to learn more about the respondents' mindset toward the questions as well as influencing the direction and approach in the one on one interviews.

The study population is small (about 35 people) and reachable through the HAB Facilitation Team who advertised the survey and opportunity for one on one interviews through HAB weekly newsletters from May to June in 2021. Board members were able to access the survey through a link in the newsletter. Some HAB members chose not to take the survey but reached out to me to partake in the one on one interviews. Those who took the survey had access to the consent form (Appendix A) via hyperlink in the

survey created in google forms. Surveys were confidential with the only identifying information being the option to give contact information for a follow-up interview. Respondents who participated in interviews were sent a copy of the consent form with the confirmation email of their scheduled interview time. The one on one interviews are designed to have a relaxed flow, allowing participants to talk about their experiences, wants, needs and hopes for the HAB.

Eight participants took part in the survey and 11 participants took part in the interviews. The survey was anonymous unless a participant wanted to give their contact information inorder to opt-in to a one-on-one interview. There was some overlap between survey and interview participants, five of the eight survey participants were part of the one-on-one interviews. Data was collected from a total of 14 Hanford Advisory Board Members. It is important to note that due to the small number of survey participants, this data is used as a source of qualitative information and not making broad quantitative claims about the study population.

This study's limitations are founded in relationship and time constraints. Political Anthropology builds connections and understanding of policy through community relationships, which take time to foster. This research study has a short window of operation (only a few months) and the global COVID-19 pandemic is impacting how people communicate and interact with participants making it difficult to conduct interviews and distribute surveys, which does not allow for meaningful relationships to be built. There is however time to open the door and plant seeds of interest in the study population. My hopes to build relationships with the Hanford Advisory Board members

and eventually the impacted community for further discussion, understanding and plans of action.

Results

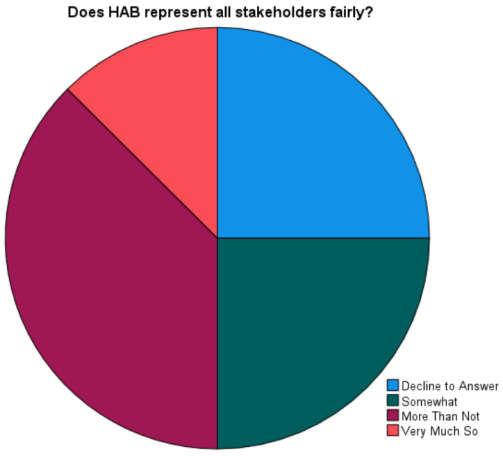
Survey Results

This survey was available to Hanford Advisory Board members from May to July 2021. Of the 31 potential interviewees, 8 people completed the survey (n=8). Quantitative questions in the survey helped me understand the participants' demographics. This information is used to better understand the background of who I am engaging with. The demographic information shows a difference in participants and the average population. As of 2019, the US Census Bureau found the average age of Washingtoians is 37.7 years old. The average age of residents in Benton, Franklin, and Wala Wala Counties as of 2019 is 35.8 years old.

Figure 2: Age and time served on the Hanford Advisory Board

		How long have you served on the Hanford Advisory Board? (Years)	What is your age?
N	Valid	8	8
	Missing	0	0
Mean		11.25	62.00
Range		24	42
Minimum		2	40
Maximum		26	82

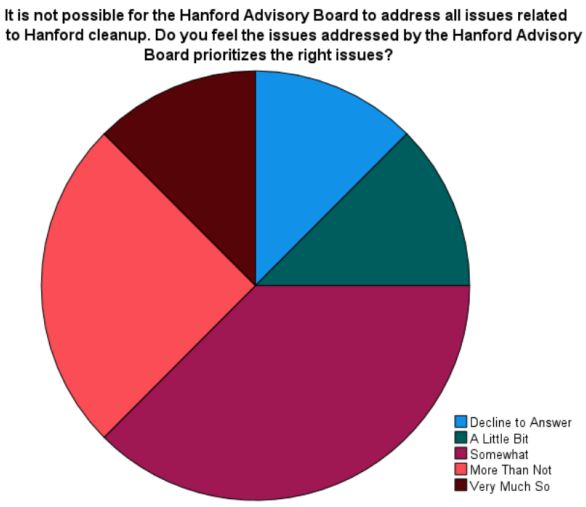
Note. This numbers reflect basic quntitative data about the board members that participated in this survey. Specifics are not given as this study is meant to be anonymous. The study population is small, making it easy to identify participants.



The first qualitative question asked in the survey is “Why or why not do you think stakeholders are represented fairly?” This followed a likert style question asking participants to rate on a scale from Not At All to Very Much So “Does the HAB represent all stakeholders fairly?”

Participants felt that there is equal representation among stakeholders, but some members' attendance can affect their participation and inhibit their stakeholder's representation on various issues. Some participants interpreted the question to include all stakeholders that have an interest in Hanford cleanup, in which they stated that there are missing and underrepresented stakeholders. One participant called out that the current stakeholder / HAB member population tends to be "...largely older, white, and male." This theme of identifying this ingroup continues in the survey and in the interviews.

The second qualitative question asked in the survey is "Who are some examples of underrepresented stakeholders?" This followed a yes or no question asking " Are there stakeholders with interest in Hanford cleanup that are underrepresented or not represented by the Hanford Advisory Board? Four of the participants said yes, three said no, and one declined to answer. This question led to diverse answers about who should be thought of as underrepresented stakeholders which includes taxpayers, Afro-Americans, Asians & East Indians, Latinx communities, agricultural communities, downwinder communities, the Wanapum, and future generations. One participant commented that it is difficult to keep historically minority board members, but did not elaborate on why it is difficult to keep them.



The third qualitative question asked in the survey is "What are some issues that should be addressed by the Hanford

Advisory Board but are not currently being addressed?" This followed a Likert-style question asking participants to rate on a scale from Not At All to Very Much So "It is not possible for the Hanford Advisory Board to address all issues related to Hanford cleanup. Do you feel the issues addressed by the Hanford Advisory Board prioritizes the right issues?" A variety of topics are addressed including the current 70+ year plan, future land use, and long-term stewardship. One particpicpant's answer focused on DOE's involvement in education and training for HAB members. This lack of training makes it difficult for HAB members to reach out to the general public.

The fourth qualitative question asked in the survey is "This survey focuses on the Hanford Advisory Board as a case study on local political bodies. Is there anything you would like me to know about the board, its dynamics, the cleanup process, or anything else related to the Hanford Advisory Board?" Participants themes in response focus on the interconnectedness and relationships between board members, how their diverse backgrounds and opinions enrich discussions and advice. Participants also feel that the level of impact the board has is dependent on DOE and presidential leadership, at this time it feels like an all time low.

One-on-one Interviews

During the month of June 2021, I interviewed 11 HAB members (n=11). These volunteer participants shared with me their personal feelings about specific topics and questions focused on meaningful engagement with underrepresented populations.

These interviews were conducted remotely via zoom video conference and telephone calls. These interviews lasted from 30 minutes to 2 hours.

The questions asked in these interviews are:

7. I am curious about you. Could you tell me a little bit about yourself?
8. What got you interested in the HAB?
9. In March, DOE brought up the idea that the affected area is a 50-100 mile radius around the site. What is your idea of the physically affected area?
10. How do you feel about the diversity of stakeholders on the board? Do you have any thoughts or recommendations about the future makeup of the board?
11. I am having trouble finding information in languages other than English on the HAB website. Do you know if there are language services available? If not, how do you feel about translation and interpretation services for community members with limited English proficiency?
12. What does meaningful interaction with the public look like to you?
13. Do you have any last thoughts or any other information you would like to share with me?

Qualitative Themes

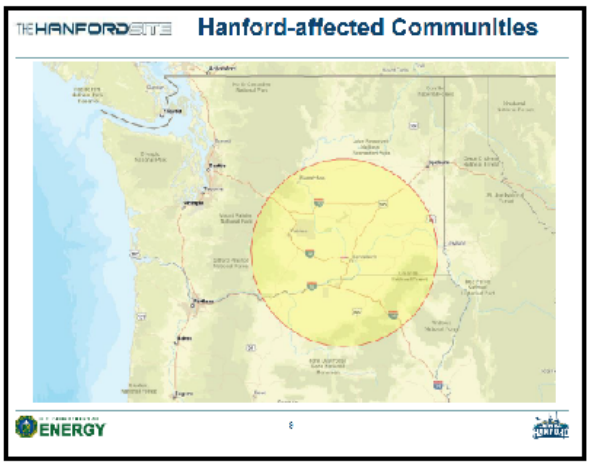
This section is organized by themes discovered in the survey and interviews process. The appearance of these themes gives opportunity for discussion. Prominent findings focus on meaningful interaction and community outreach, language services, board diversity, and interaction with TriParty Agencies. There is research and agency

guidance for recipients and subrecipients of federal funding, but it focuses on agencies not volunteer appointed community advisory boards. Themes discussed in this research are to provide a better understanding of member mindset and policy understandings. Further research can help the board and the community create substantiated conclusions pertaining to meaningful public involvement.

Site Specific Boundaries

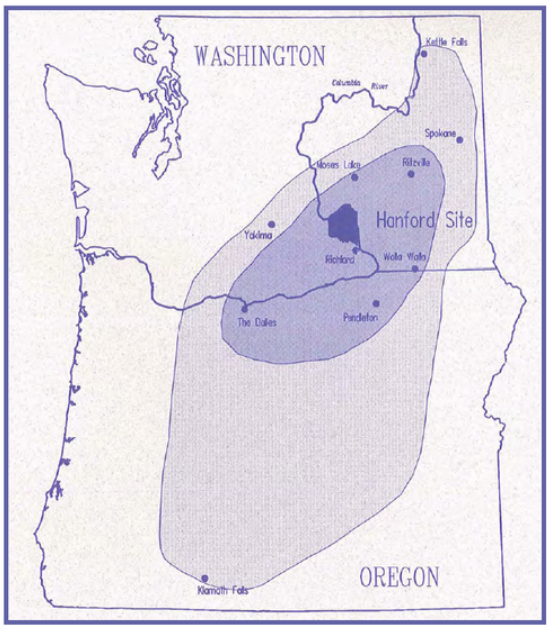
Since the war effort during World War II, the federal government has been trying to define and create boundaries for the Hanford Nuclear Site. At the March 2021 HAB meeting, DOE presented the case for adding seats to create more diversity on the board to comply with DOE and FACA policy. They also brought up the idea of creating a 50-100 mile radius boundary around the site defining who is eligible for nomination and future participation. The adjacent graphic was distributed by DOE to show the proposed affected area boundary. There was pushback from HAB members during the meeting, and little information was given by DOE on implementation or further steps. There is currently no new information readily available on the HAB website on this issue. Interview participants were asked their opinion on the idea of this boundary around the site. Participants' views followed certain themes but there is diversity in opinions on those themes.

Figure 3: Hanofrd Affected Communities



Note. This map was created by the DOE to give visual representation of the proposed site specific boundaries. *Branch, S. (2021, March 17). Hanford Advisory Board: Adding New Voices for Hanford Cleanup.*

Figure 4: Map of Iodine-131 Contamination Found in Vegetation



Note. This map was created byt the Technical Steering Panel of the Hanford Enviromental Dose Reconstruction Project for the March 1992 Fact Sheet #12. It shows where radioactive iodine-131 has been found in local flora. *Environmental Protection Agency. (1992, April 13). The Green Run. Technical Steering Panel of the Hanford Environmental Dose Reconstruction Project.*

Three participants stated that they feel there is no historical precedence to support creating a boundary around the site. Five participants felt that the geographical features surrounding the site and that particles do not adhere to human constructs of boundaries, it is impossible to claim that there is a clearly defined boundary of an affected site area. Some argued that this is not only a regional but international issue due to off gassing during the Green Run in 1949.

The Hanford Nuclear Site and its cleanup is paid for by federal tax dollars. This leads four participants to state that stakeholders should not be bound by a 50-100 mile radius, and it might be worth investigating bringing in more interest groups from other areas like off-site waste storage facilities. One participant talked about the importance of stakeholder autonomy from DOE. They feel that stakeholders have the right to choose their nominees without DOE scrutiny. The nomination process and checkpoints reduce opportunity for stakeholders to choose board members that best represent their interests in cleanup.

Creating a defined boundary around the site creates two distinct opinion groups, an in-group of local residents and interests and an out-group of regional residents and interests. Dividing board members in this way can create negative effects in HAB group

dynamics and the process of creating advice for TPA agencies. Some participants that consider themselves part of the local community in-group commented that outsiders from regional seats have more power over clean-up. Six participants commented on how this dynamic is occurring and/ or exacerbated by creating a boundary around the site. One participant talked about the PUREX Tunnel and how delays in cleanup for the sake of study puts the local community at jeopardy. A few local in-group participants feel that the board members living in the Tri-Cities are marginalized by the regional board members and their stakeholders, making it difficult for them to feel heard and their need for swift remediation is sidelined. Regional out-group participants that commented on this issue spoke to the other side of this issue stating that local board members are often desensitized to the long-term cleanup and stewardship goals for the site, opting for the quick and easy solution that will be harder to fix in the future like grouting. One participant commented that the issue of creating a boundary was dropped due to backlash, but two participants stated that the site specific boundary is in effect "…a done deal" and DOE is moving forward with adding more seats / appointees to the board.

Diversity

A central question in this research paper focuses on diversity among board members and the communities the HAB engages with. Participants were asked in the online survey and in the one-on-one interviews about their perception of diversity. The researcher has continued to learn about the board's processes through this research project. The recruitment and nomination of new board members comes from the stakeholder (Hanford Challenge, University of Washington, Citizens for Clean Eastern

WA, etc.) that board member represents. Once a stakeholder has nominated a board member, the nominees application is sent to DOE Richland to be then sent off to DOE for a formal review. One participant told me the review consists of 23 steps and a nominee can be denied at any point. Although citizens at large seats go through the same process, they have term limits and DOE is able to hand pick these nominees. When looking at the uniqueness of the HAB, it is not a board made up of only citizens at large seats and that stakeholders are doing diligence in picking their nominees; why does DOE have the opportunity to deny those nominees?

In the interview, participants were asked two questions about diversity on the board. The first question "How do you feel about the diversity of stakeholders on the board?" focuses on the current state of the board. Two participants said that the current board is diverse, and seven participants felt the board is not currently diverse. Both of the board members that feel the board is diverse spoke about the higher education advanced degree subject matter of board members that makes the board diverse, not physical attributes or lived experiences. One of the participants with a mixed answer talked about the idea that many of the board members have not dealt with their own complacency with white supremacy and their white fragility. This isn't saying that some board members are actively trying to perpetuate systems of oppression and create barriers of entry for underrepresented communities. From interviews with board members, it is apparent that there are blindspots and a lack of current cultural awareness and understanding. There is opportunity for individual and group education and growth, learning how to better understand and serve the diverse community.

Further questions and dialogue gave more depth and understanding to the participants' understanding and views of current board diversity. A common theme talked about is how we classify diversity. Do we value diversity in race, ethnicity, location, viewpoints, subject matter expertise, lived experiences, the individual or in the stakeholder? Tokenism occurs when we focus on attracting members of diverse backgrounds and communities for the sake of appearance. When recruiting in this manner, we miss an opportunity to enrich the narrative of the organization and these vain efforts can be seen through by outsiders and onlookers. One participant asked an important question, “Does the public feel they are being heard and represented when they don’t see themselves in board members?” This question looks into the heart of what diversity means to the community and how it relates to board member ideals of diversity. Including the community in conversations about the future of the board will help answer this question and prepare the board for future changes that foster growth and community engagement.

Old, White, and Male

The prior section talked about what the board isn’t, this section focuses on what the board is based on the opinions of survey and interview participants. The average age of participants who filled out the survey is 62 years old, and the youngest person surveyed is 40 years old. Six interview participants are male, five interview participants are women, and three interview participants are from diverse ethnic backgrounds. Looking at population demographics for the Tri-Cities, the median residents’ age is 33.44 years old, 49.43% male and 50.57% female, and 40.37% of the population from diverse ethnic backgrounds (Planning GIS). Zooming out further for a wider

understanding of demographics with the Washington Census profile, as of 2019 the median age in Washington state was 37.9 years old, 49.8% male and 50.2% female, and 32.6% of the population are from diverse ethnic backgrounds. Looking at these numbers alone, it seems the board is not demographically representative of people living in the Tri-Cities or in Washington state, but that's not the whole picture.

When speaking with board members, eight participants commented on the amount of time they spend on board related work and that it is comparable to a full time job. Participants talked about their passion for this subject matter, but it is time consuming to participate in board activities. One of the younger female participants talked about her passion for all things Hanford and that she feels there are times when being on the board is very rewarding. She as well as other board members talked about how the board as it was pre-COVID pandemic was a community, making life-long friends and having the ability to learn from the immense knowledge (topics range from site specific nuclear technology and cleanup, radiation biology, long-term local community knowledge, etc.) the older board members possess. If a nominee were to become a new board member, they would need to spend countless hours a week on HAB related work, spend at least two full days a month during the week off work to participate in general board meetings, and find time to communicate with their stakeholders. It makes sense that many board members are at retirement age or their job is HAB, cleanup, or site specific. As a 36 year old mother with a full-time job, I can't imagine how board members are able to do what they do with the limited time each day.

The expertise held by board members is invaluable to the HAB and onsite cleanup. Nine interview participants have been involved with the Hanford Site in some

professional capacity for at least a decade and 3 survey participants have served on the HAB for more than 15 years. HAB members interviewed have a wealth of experience and knowledge that is integral to understanding site politics, cleanup strategy, and the technical aspects of what goes on at Hanford. A lot of this knowledge exists in the minds of board members, it is important that we cherish the insight these people have and work together to preserve and disseminate for current and future board members.

It is important to talk about technocracy and its role in reducing diversity among subject matter experts in Science, Technology, Engineering, and Mathematic education and professions. In interviews, participants talked about the board's preference for nominees to have a technical background and be very knowledgeable about the site. When looking at the time commitment and preferred expertise, a large portion of possible candidates are overlooked and encouraged not to participate in board activities. There is strength in the knowledge and understanding of the site and HAB policies and procedures, but diversity brings new perspectives and opportunities to better understand the whole picture.

Implicit or unconscious bias can play a large role in how people reach out to the community. Stanford psychology professor and 2014 MacAuthor genius grant winner, Jennifer Eberhardt, PhD, pioneered research in implicit bias looking beyond surface level constructs of racism. Her research found that people have evolved in a way that we try to make sense of our surroundings and keep ourselves safe from harm by categorizing the world around us. We start to do this from a very young age, and continue to categorize as we age. Dr. Eberhardt's research found that everything we are exposed to in our culture can compound and reinforce unconscious associations. We

may not realize we are making biased decisions that disclude and marginalize others around us. It's easy for implicit bias to cloud judgement when social and professional factors around a group member or organization push for homogeneity.

According to recent Pew Research findings, women, black and hispanic college students are continuing a trend that they are "...less likely to earn degrees in STEM than other degree fields, and they continue to make up a lower share of STEM graduates relative to their share of the adult population. And while women now earn a majority of all undergraduate and advanced degrees, they remain a small share of degree earners in fields like engineering and computer science – areas where they are significantly underrepresented in the workforce" (Fry, et al., 2021). This coupled with the notion that they are all less likely to be employed as STEM professionals gives some insight into how perception of preferred skills and backgrounds for HAB nominees may discourage or eliminate candidates that are interested participatory democracy through EM Site-Specific Advisory Boards (*EM SSAB*), like the HAB.

Language Services

In one-on-one interviews, participants were asked about language services for community members with limited English proficiency. This question was asked not only to get the participants thinking about the communities reached through the HAB's public involvement, but also how they are reaching out to the community. Like many themes in this research. The first question participants were asked was "I am having trouble finding information in languages other than English on the HAB website. Do you know if there are language services available?" Of the 11 participants, one participant said there are services available, seven participants said they are not aware

of, or there are not any services available, and three participants said this is DOE's issue and the HAB is not responsible for providing these services. One participant commented that language services are available and this was advertised in English in the Tri-City Herald for one board meeting. Although it is good that one participant was able to give an example of a public notice of language services, if someone has limited English proficiency skills and needs interpretation and translation there may be difficulty being able to understand this notice of services. As the recipient of federal funding, DOE is responsible for educating subrecipients of expectations under Title VI of the Civil Rights Act of 1964 and the Civil Rights Restoration Act of 1987. This includes and not limited to Executive Order 13166 "Improving Access to Services for Persons with Limited English Proficiency (LEP)." DOE stated in the March 2021 HAB meeting that they need to adhere to FACA and DOE regulation with board members and community participation, but did not give detail about how this will affect the HAB and how it conducts business.

The second question asked participants was "How do you feel about providing translation and interpretation services for community members with limited English proficiency?" Of the 11 participants, seven participants said this is a good resource to provide for public outreach, four participants said they are fine with these services being provided but don't feel they will be used, and no participants said that they are not comfortable providing LEP services to the community. The Hanford Nuclear site affects a substantial area of the Pacific Northwest. Using services available through the Tri-Party Agencies, the Hanford Advisory Board will be able to create an action plan making outreach to LEP community members a simple process.

Community Engagement

Interview participants were asked “What does meaningful interaction with the public look like to you?” This question focuses on the current public outreach and how board members define this very broad topic. Questions arose around how one defines meaningful interaction not only as individual board members but also for stakeholder organizations and the HAB as a whole. From its inception, community engagement has been a central focus for the Hanford Advisory Board. As a subrecipient of federal funding, the Board should follow guidance and regulation as defined in The Civil Rights Act of 1964 and other Federal and State Nondiscrimination statutes including but not limited to Federal Advisory Committee Act of 1972, Executive Order 12898, and Executive Order 13166. These address proper protocol and the need for inclusionary practices in disseminating information to the public. What is not entirely addressed is how to reach out to the public, especially historically marginalized communities.

Participants talked about ways they think would be most useful in reaching out to communities as well as interesting outreach ideas to explore. The use of technology for public outreach was a common theme among five participants. Webinars with options for language translation were a popular idea in getting basic, high-level information about the site or specific topic areas out to the public. This would allow for more people to consume basic knowledge in order to have more productive conversations and community engagement. One interview participant commented that technology is important and has its place in educating and involving the community, but there are access and cultural barriers that may inhibit the use of these services by community members. For example, people living further away from higher population density areas

may have slower or no internet connection. Although many young people use smartphones, not everyone has access to them creating a barrier with using only multilingual QR codes for notifications. Working with community leaders in underrepresented population groups will help build bridges between the HAB, Tri-Party Agencies, and the general public.

These five themes show there is a variety of opinions among surveyed and interviewed Board Members. Summarized responses can be found in Appendix D. It is recommended that this information is seen as an introduction to a much longer conversation between board members, the Tri-Party Agencies, and the community.

Recommendations

Representation matters. When underrepresented communities are unable to participate in the decision making process, it reduces the richness and quality of life not only for that group but all members of society. Research shows that the United States' racial demographics are changing. We, as a nation, are morally bound to understand how the United States Government can better serve its diverse population. This starts with conversations at all levels of government to better understand how those in positions of power view the communities they serve and their interactions with them. This case study focuses on Hanford Advisory Board members' feelings on inclusion, representation, and engagement and is the beginning of a long conversation the board can choose to have among members, stakeholders, and the community.

Interview and survey participants shared their honest opinions on a variety of topics including but not limited to Site Specific Boundaries, Diversity, Language Services, and Community Engagement. Their opinions helped me better understand how some individuals in positions of power interpret the space they and their organization occupy in relation to the general public. Allowing yourself to be honest about your feelings regardless of how they may be interpreted creates opportunity for growth and positive change. Participants in this research study showed an overwhelming appreciation for their community and passion for the work they do. Board Members are in their positions because they care. They should be championed for the countless hours and decades of service they have given being a voice of reason in Hanford cleanup and environmental remediation. Now is the time to return to the

original purpose of the Hanford Advisory Board and double down on community engagement. The Public Involvement and Communications Committee (PIC) should be given agency to discuss and build a foundation for organization wide conversations on intercultural awareness.

This research study sought to answer the following questions:

1. What do Hanford Advisory Board members think about current issues surrounding representation and equity?
2. How do Hanford Advisory Board members imagine the board's future (i.e. what changes should be made, what should stay the same, etc.)?

This capstone research project was not able to answer these research questions, but we can use knowledge gained from this project to create better parameters and methods of measurement in order to answer these questions in future research. Board members asked pertinent questions about the definition of terms that can have different meanings (e.g. diversity, representation, meaningful engagement, etc.) as well as who they are speaking for (e.g. themselves, their stakeholder or the HAB). Understanding how these terms are defined under Federal regulations then sharing preferred definitions of key terms with participants may help to reduce confusion and focus on specific preferred information.

Ethnographic Research is a marathon not a sprint. Building relationships with participants and community members in order to understand the entirety of Hanford cleanup culture will take time. Civil Rights, inclusion, and representation are hard topics for people to talk about, but once the pathways of communication are open it's easier to have candid discussions about how we feel and what we want to accomplish. Once we

understand personal and societal needs, we can work to build a shared vision of environmental remediation answering the second research question. It is estimated that cleanup and long-term stewardship will last past 2100. As long as there is cleanup happening in the Tri-Cities, we need a public oversight board to give advice on cleanup strategy and create meaningful dialogue with the public.

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42 U.S. Code Chapter 103 - COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY. (n.d.). Retrieved October 24, 2020, from https://www.law.cornell.edu/uscode/text/42/chapter-103

Barnett, H. (1993). Crimes against the Environment: Superfund Enforcement at Last. *The Annals of the American Academy of Political and Social Science, 525*, 119-133.
Retrieved November 21, 2020, from http://www.jstor.org/stable/1046842

The EPA emphasizes cooperation over confrontation when working with PRPs to clean up contaminated sites. By 1985, William Ruckleshaus worked to restore the public's faith in the EPA and increase investigation and cleanup of superfund sites. The Superfund had grown substantially and subsidized cleanup was used as an incentive for PRPs to settle out of court and comply with strict cleanup policy. Corporations criticized the EPAs strict policy and felt they were being discriminated against based on their past actions and environmental degradation.

Bauman, R. (2005). Jim Crow in the Tri-Cities, 1943-1950. *The Pacific Northwest Quarterly, 96*(3), 124-131. Retrieved August 10, 2021, from http://www.jstor.org/stable/40491852

This article chronicles the migration and story of black Americans living and working in the Tri-Cities. It all started when 15,000 black workers moved to the Tri-Cities from 1943 to 1945 to work on defense contracts. DuPont, the main contractor for Hanford, heavily recruited white and black workers from the south. Before 1950, there was little diversity in the area and the influx of black population bore the brunt of racist tendencies from their white neighbors. DuPont had a quota of no more than 10% black employees at any given time. Of these employees, all worked construction or menial jobs and were not promoted at the same rates as their white counterparts. The NAACP's ER Dudley spearheaded a formal investigation into the segregation at Hanford.

This article recounts the findings of a Washington State College study conducted by Dr. TH Kennedy to understand the causes of increased racial tensions in the tri-cities. The study used quantitative measures to back the findings of qualitative interviews and surveys.

Bauman, R., Franklin, R. *Echoes of Exclusion and Resistance: Voices from the Hanford Region*. (2020). United States: Washington State University Press.

Black, D. (1994). *2.1 Environmental Compliance and Cleanup* (pp. 17-20, Rep.). Environmental Annual Report

Branch, S. (2021, March 17). *Hanford Advisory Board: Adding New Voices for Hanford Cleanup*. https://www.hanford.gov/files.cfm/HAB_Seat_Update_FINAL_March_17_2021_Update.pdf.

Cases: Discrimination Against African-Americans-Washington State. 1949. TS Years of Expansion, 1950-1990: Series 3: Subject Files: Equality Before the Law, 1941-1987 Box 1100, Folder 11, Item 821. Mudd Library, Princeton University. The Making of Modern Law: American Civil Liberties Union Papers.

This is a series of letters between the Hanford nuclear site and the ACLU addressing discrimination and inappropriate living conditions for black workers in the Tri-Cities. The letter titled "Memo on Status of Negros in the Hanford, Washington area" details inappropriate and discriminatory living conditions. It is apparent from this memo that skilled black laborers migrated to the Tri-Cities area for the prospect of work in regards to the nuclear facility. Of the 2,500 black people living in the Tri-Cities most worked in construction, but none of them had full-time employment. This memo and subsequent letters is a great artifact showing how social issues were addressed.

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Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Overview. (n.d.). Retrieved October 24, 2020, from https://libraryguides.law.pace.edu/CERCLA

On December 11, 1980, former President Jimmy Carter signed the Comprehensive Environmental Response, Compensation, and Liability Act into law. This bill is also known as CERCLA or Superfund. Congress passed this bill in order to help residents living near sites found to cause health problems from the physical environment. Love Canal, New York and Elizabeth, New Jersey are two places that spurred the need for monitored cleanup. The Pace Law School Library has a comprehensive list of scholarly materials available pertaining to CERCLA and hazardous waste cleanup, including but not limited to legislative review and legal briefings.

Convening Report on the Establishment of an Advisory Board to Address Hanford

Cleanup Issues (Convening Report, Keystone Center, 1993).

Critical Race Theory: The Key Writings that Formed the Movement. (1995). United States: New Press.

December 8, 1941 - Franklin Roosevelt asks Congress for a Declaration of War with Japan. (n.d.). Retrieved November 14, 2020, from http://docs.fdrlibrary.marist.edu/tmirhdee.html

President Roosevelt's "Infamy Speech" is an impassioned plea transcribed by Grace Tully from the president to congress (and the American people) to engage in military actions with the Japanese empire. Although his staff wanted him to read a 17 page speech that recounts the Japanese - American relations, President Roosevelt felt it best to read his very relatable 6 ½ minute speech expressing the importance of securing our borders and interests, and reducing future threats from abroad. He begs congress to see that the unprovoked attack from Japan was their declaration of war to the United States and we should respond in kind.

Department of Energy 2019 Environmental Justice Second Five-Year Implementation Plan. 2019 Environmental Justice Second Five-Year Implementation Plan. (2019, May).https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwis-oW4mvDxAhXKvJ4KHSgzBsQQFjAAegQIBxAD&url=https%3A%2F%2Fwww.energy.gov%2Fsites%2Fprod%2Ffiles%2F2019%2F05%2Ff62%2F2019FiveYearImplementationPlan_ONLINE.pdf&usg=AOvVaw0mPrqZqpphW2MU-k0HjJXc.

Eberhardt, J. L. (2020). *Biased: uncovering the hidden prejudice that shapes what we see, think, and do*. Penguin Books.

Environmental Protection Agency. (1992, April 13). *The Green Run*. Technical Steering Panel of the Hanford Environmental Dose Reconstruction Project. http://library.state.or.us/repository/2013/201309171606142/index.pdf.

EPA Completes Land Disposal Restrictions for Hazardous Wastes. (2016, August 08). Retrieved November 03, 2020, from https://archive.epa.gov/epa/aboutepa/epa-completes-land-disposal-restrictions-hazardous-wastes.html

This press release occurred May 8, 1990. The EPA set up a national program restricting the land disposal of hazardous waste in order to protect groundwater supply. The new regulations will help create a holistic approach to hazardous waste management. Treatment of hazardous substances will have new guidelines and standards. Compliance cost was estimated around 350 to 450 million dollars per year.

"EPA History: Resource Conservation and Recovery Act". Washington, DC: U.S.

Environmental Protection Agency (EPA). 2018-08-08.

EPA's Hazardous Waste Regulations Effective November 19, 1980. (2016, August 11). Retrieved November 02, 2020, from https://archive.epa.gov/epa/aboutepa/epas-hazardous-waste-regulations-effective-november-19-1980.html

On November 19, 1980 regulations for handling hazardous waste under The Resource Conservation and Recovery Act went into effect. Producers of such waste are responsible for proper disposal of hazardous byproducts in compliance with EPA standards. This includes a nationwide tracking system to reduce the number of "midnight dumpers." "...the business of disposing of dangerous wastes as cheaply as possible--into sewers, fields, along the roadside--with no thought to the long-term public health or environmental effects," said EPA Administrator Douglas M. Costle. One week before this press release was given, "58,800 businesses had officially notified EPA that they were in the business of handling hazardous waste. Of these, 46,800 generate hazardous waste, 9500 transport hazardous waste, and 30,300 operate or own hazardous waste treatment, storage or disposal facilities." At the time of this press release, congress was still weighing the decision whether to enact CERCLA.

EPA Sets Standards For Underground Storage Tanks. (2016, August 11). Retrieved November 03, 2020, from https://archive.epa.gov/epa/aboutepa/epa-sets-standards-underground-storage-tanks.html

This is a Press Release from the EPA on September 13, 1988 focusing on underground storage tanks. The EPA recognizes the threat posed by these tanks to local water supplies regardless of contents (petroleum or chemical), and provides funds to help states identify and safely clean up existing contamination from leaky tanks. The Leaking Underground Storage Tank Trust Fund will collect 500 million dollars over five years, being paid for through a tax of $0.001 (1/10 of a cent) on gasoline. This press release gives a small financial impact statement including costs of individual tanks. As of May 7, 1985 all newly installed tanks must have corrosion control to prevent leakage and to be installed in accordance with federal regulations. At the time of this press release, 54,000 chemical tanks accounted for almost 4% of the total tank population and were subject to additional guidelines under CERCLA. This includes dual containment or dual walled tanks with detection systems between layers to alert users in case of leakage.

EPA Tightens Standards for Air emissions From Hazardous Waster Combustors. (2008, May 15). Retrieved 03, 2020 from https://archive.epa.gov/epapages/newsroom_archive/newsreleases/54ade58e1ac53804852567be0067ffc6.html

This briefing was released to the public on July 30, 1999. This press release

describes new EPA standards focusing on reducing air emissions from hazardous air pollutants. Kilns and incinerators that burn hazardous waste will need to improve their efficiency. There is concern for public exposure to byproducts that can cause cancer, stunted childhood development, and long-term health and environmental issues.

Executive Order 13166. LEP. (n.d.). https://www.lep.gov/executive-order-13166.

Executive order on tackling the climate crisis at home and abroad. (2021, January 27). Retrieved April 14, 2021, from https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/

FEDERAL ADVISORY COMMITTEE ACT. (n.d.). Retrieved May 14, 2021, from https://www.gsa.gov/cdnstatic/FACA-Statute-2013.pdf

Final Environmental Impact Statement. Disposal of Hanford Defense High-level, Transuranic and Tank Wastes [PDF]. (1987, December). Washington, D.C.: US Department of Energy. EIS-0113-FEIS-1987_Vol1Part1.pdf Retrieved November 19, 2020, from https://www.energy.gov/nepa/downloads/eis-0113-final-environmental-impact-statement-0

This EIS study from December 1987 weighs in on options for environmental remediation and waste disposal alternatives. "The following alternatives are considered in this EIS: 10 in-place stabilization and disposal, where waste is left in place but is isolated by protective and natural barriers, 20 geologic disposal, where most of the waste (by actively and to an extent practicable) is exhumed, treated, segregated, packaged and disposed of in a deep geologic repository; waste classified as high-level would be disposed of in a commercial repository developed pursuant to the Nuclear Waste Policy Act; transuranic waste would be disposed of in the Waste Isolation Pilot Plant near Carlsbad, New Mexico; 3) a reference alternative, where some classes of waste are disposed of in geologic repositories and other classes of waste are disposed of by in-place stabilization and disposal; 4) the preferred alternative, in which double-shell tank wastes strontium and cesium capsule, and irretrievably stored TRU wastes are disposed of according to the reference alternative, and in which decisions are deferred on disposal of single-shell tank wastes and on further remedial action for TRU-contaminated soil sites and pre-1970 buried suspect TRU-contaminated solid wastes (except the 618-11 site) until additional information is obtained on waste characterization, retrieval methods, and performance of near surface disposal systems; and 5) a no disposal alternative (continued storage)." (P.1) This report states that the waste located on site is diverse and located in a variety of storage containers and facilities and there is much more waste than previously stated. This report states that there may not be a single remediation alternative and most likely a combination of actions for responsible site cleanup. The least expensive disposal action (no disposal action) will cost 1.8 billion for

the first century and 1.3 billion for each succeeding century. The most expensive disposal action will cost 17.2 billion dollars.

Florio, J. (1980, December 11). H.R.7020 - 96th Congress (1979-1980): An act to provide for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites. Retrieved October 24, 2020, from https://www.congress.gov/bill/96th-congress/house-bill/7020

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Izatt, R. D., Babad, H., Dixon, W. T., & Lerch, R. L. (1990). *The Hanford Site: Then,*

Now, and Tomorrow. Richland, WA: Westinghouse Handford.

January 22, 1970: State of the Union Address. (2017, May 03). Retrieved November 02, 2020, from https://millercenter.org/the-presidency/presidential-speeches/january-22-1970-state-union-address)

Full transcript and video of Nixon's 1970 State of the Union Address.

Jordan, J. W. (Ed.). (2002, June 27). Status Report - Hanford Engineer Works as of 1 January 1944. War Department, United States Engineer Office, Manhattan District. Retrieved October 27, 2020, from http://reading-room.labworks.org/Files/GetDocument.aspx?id=D0141532

The Hanford project as a whole is 22% complete with a workforce of 31,000 people. Services for workers are about 85% complete with "all major items, such as hospital, bank, school, 6 cafeterias, fire protection, etc. are completed and in use. A lunch service, with a capacity of 20,000 lunches a day, is now operating." Cost of construction is estimated at 300 million dollars and 40 million dollars is subcontracted to Du Pont. This document expects the entire project to be completed by the end of 1944. This document contains many maps and blueprints of the facilities.

Matthais, F. T. (2002, March 13). Constructing the Hanford Atom Factory. Retrieved October 28, 2020, from http://reading-room.labworks.org/Files/GetDocument.aspx?id=D0824069

This declassified document from January 1, 1946, is a broad overview of the Hanford Nuclear Site. As opposed to other documents, this uses less jargon and field specific terms. It seems to be geared towards an audience that is not part of the scientific community. The site contains 3 uranium piles, plutonium separation plants, pumping stations, water treatment plants, and a low-power chain reacting pile for material testing. E.I. duPont de Nemours & Co. was the original contractor for the site, but they did employ subcontractors for less sensitive site work (like concrete mixing which lacked consistency among vendors). This document stresses the importance of shielding and treating the elements (air, water, and soil) from contamination and the serious threat any leakage poses. The overall construction project cost 350 million dollars, making it one of the largest military projects to date. The labor population peaked at 45,000 employees, most lived in military barracks for the duration of construction. 131 30x130 foot barracks style dwellings were created to house 24,000 men. 5,000 women received similar housing accommodations. Later, 900 15x40ft hutment (war time tent housing) was used to house nother 10,000 men. Construction projects during this time provided short term employment and many workers provided their own housing in the form of trailers. Trailer parks and areas were set up to accommodate employees with central bathhouses and laundry facilities. 4,300 privately owned trailers were used by employees.

The 2,500 operators and long term employees received conventional style housing in the Richland area.

McVey, M. (2018, July 09). A brief history of the EPA. Retrieved November 02, 2020, from https://www.humanitiesebook.org/a-brief-history-of-the-epa/

This article states it gives an abridged timeline of the EPA from 1973 to 2013, but mostly recounts big environmental events. Important to this topic of study is on Feb. 16, 1994 "President Clinton issues an executive order that all federal agencies prioritize environmental justice for minorities and low-income population after an EPA report revealed that those populations were exposed more than others to air pollution and other environmental hazards."

Mealey, T., & Stinson, B. (1993). (rep.). *Convening Report on The Establishment of an Advisory Board to Address Hanford Cleanup Issues*. The Keystone Center.

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This analysis discusses the effects of nuclear component production and waste on Native American populations in the United States. Although there is little information, the paper does give insight into how nuclear waste run off may have affected Native Americans living an indigenous lifestyle. "During the period from 1944 to 1972 Hanford released 25 million curies of radioactive contamination into the environment as a comparison the Chernobyl plant released between 35 and 49 million curies of iodine-131 (I-131) [29]." The Hanford Thyroid Disease Study found that any exposure to radiation near the site resulted in thyroid cancer and thyroid related diseases.

National Academy of Sciences (US) Committee on an Assessment of Centers for Disease Control and Prevention Radiation Studies from DOE Contractor Sites: Subcommittee to Review the Hanford Thyroid Disease Study Final Results and Report. Review of the Hanford Thyroid Disease Study Draft Final Report. Washington (DC): National Academies Press (US); 2000. Public Summary. Available from: https://www.ncbi.nlm.nih.gov/books/NBK225225/

New Law to Control Hazardous Wastes, End Open Dumping, Promote Conservation of Resources. (2016, August 11). Retrieved November 02, 2020, from https://archive.epa.gov/epa/aboutepa/new-law-control-hazardous-wastes-end-open-dumping-promote-conservation-resources.html

This is the original press release issued by the EPA on December 13, 1976. It

details the Resource Conservation and Recovery Act (PL 94-580) and that it has been signed into federal law. Its main purpose is to prevent uncontrolled and improper dumping or disposal of substances that can cause adverse environmental and health effects. President Ford cited the special threat in hazardous waste disposal, calling it "one of the highest priority environmental problems confronting the Nation." This law establishes civil and criminal penalties for noncompliance. This law also states the importance of community engagement and research.

Nixon Foundation. (2012, August 14). President Nixon's 1970 State of the Union. Retrieved November 02, 2020, from https://www.youtube.com/watch?v=5LpspwT0ZwA

The latter half of former President Nixon's state of the Union address focuses on a 10 billion dollar environmental cleanup plan. His speech reaches out to middle and low income USA residents, emboldening them to take notice and be part of the solution, working towards a cleaner, healthier America.

Nixon, R. (2010, August 2). President Richard Nixon's Message to Congress on the Environment : February 8, 1972. Retrieved November 24, 2020, from https://www.google.com/url?sa=t%2C

Overview of CERCLA and PRP Searches (Chapter 1). (2009). In *PRP search manual: Prepared for personnel performing PRP searches* (pp. 1-51). Washington, DC: U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance.

Patterson, C. M. (2002, July 12). Surveys of area and operation. Retrieved October 27, 2020, from http://reading-room.labworks.org/Files/GetDocument.aspx?id=DA02060962

Declassified land survey from 1/1/1940. This research focuses on the 100 area laboratories. Upon first reading, this paper looks to be standard operating procedures for conducting experiments with radioactive materials. It focuses on reading alpha, beta and gamma radiation levels within the "pile" and the facilities themselves. Exact measurements are given for creating intrusion points for studying radiation levels. This document acknowledges that air, water, and soil quality will be affected by the nuclear processing plant and most likely cause adverse effects to employees. It is recommended that employees wear Personal Protective Equipment at all times while working on site and wash tools with soap and water to dilute any radioactive substances. This document is a scanned hardcopy of the original and often difficult to read due to age.

Peach, D. (1986, August 5). *Nuclear Safety. Comparison of DOE's Hanford N-Reactor With the Chernobyl Reactor*. [PDF]. Washington, D.C.: United States Accounting Office.

On August 5, 1986, Dexter Peach wrote a memo for the dGeneral Accounting Office about the similarities between Chernobyl and the N reactor at Hanford. This memo states that the N reactor is still in constant use three years past its expected lifespan and much needed repairs will cost an estimated 1.2 billion dollars. This article draws similarities between the two sites, but makes the differences abundantly clear. Chernobyl's reactor had upwards of 180,000 people living within 18 miles of the reactor, and Hanford 10,000 people within 20 miles. Hanford also uses a uranium metal as the fuel type which is more volatile than uranium oxide used in Chernobyl. Hanford's N-reactor has multiple fast acting fail safes where Chernobyl had none.

Planning, G. I. S. (n.d.). *Cities, WA. Demographics*. Tri. http://www.trytricitiessites.org/demographics.html?icTool=demographics&geoId=r483&geoEntId=483.

Reorganization Plan No. 3 of 1970. (2016, September 06).

Resource Conservation and Recovery Act (RCRA) Overview. (2020, May 26). Retrieved October 24, 2020, from https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview

Reorganization Plan No. 3 of 1970. (2016, September 06). Retrieved October 24, 2020, from https://archive.epa.gov/epa/aboutepa/reorganization-plan-no-3-1970.html

On July 9, 1970, former President Richard Nixon penned a letter to congress. This letter focuses on the efforts to establish the Environmental Protection Agency (EPA) and National Oceanic and Atmospheric Administration (NOAA). Richard Nixon felt it is important to have a federal effort to thwart what is now known and climate change. The letter so eloquently states, "A single source may pollute the air with smoke and chemicals, the land with solid wastes, and a river or lake with chemical and other wastes. Control of the air pollution may produce more solid wastes, which then pollute the land or water. Control of the water-polluting effluent may convert it into solid wastes, which must be disposed of on land." Reorganization Plan No. 3 combines the many agencies and the majority of their functions into the EPA. Nixon's compassion for the health of the nation is apparent in this letter. This is an in-depth look at this industry through original intent.

Roetman, V. E., Roblyer, S. P., & Toffer, H. (1994). *Estimation of plutonium in Hanford Site waste tanks based on historical records*. Richland, WA: Westinghouse Hanford Company.

Rothman, L. (2017, March 22). Environmental Protection Agency: Why the EPA Was Created. Retrieved November 02, 2020, from https://time.com/4696104/environmental-protection-agency-1970-history/

Time magazine gives a look at the history of the EPA and why it was created. Former President Nixon understood the importance of clean air, water, and land setting to work to enact policy to help reduce and reverse the destruction created by American companies and our laissez faire lifestyles. This new area of government oversight gave different agencies overlapping jurisdiction without coordination. In the summer of 1970, Former President Nixon pled his case to congress that there should be one agency in control of cleanup and regulation control.

Snyder, T. (2004, December 12). Public Release Hanford Site Construction 01/01/1947. Retrieved October 28, 2020, from http://reading-room.labworks.org/Files/GetDocument.aspx?id=D6758931

This declassified press release is to inform (unknown entities) that the "extensive peacetime expansion program" is to begin. General Electric will take over duPont's site contracts moving forward. Studies have concluded about how to make site improvements and plant expansion. Housing development will be required to accommodate new permanent employees and research staff. The expansion program will likely exceed 100 million dollars, but details of the project are not released due to security issues.

Sorensen, GC. (2002, July 24). Status Report - Hanford Engineer Works as of 1 January 1944 to 31 March 1944. War Department, United States Engineer Office, Manhattan District. Retrieved October 27, 2020, from http://reading-room.labworks.org/Files/GetDocument.aspx?id=D0141647

This declassified document is a quantitative update on the progress of the site. Since the prior status update, overall progress is now at 37% (up from 22%) and 36,354 employees. There are entertainment services and medical services on site. Piles 100-B, 100-D, and 100-F are still under construction and hoped to be finished by the end of summer. 100-B is the most complete at 47% and workers are learning on the job in order to more efficiently complete 100-D and 100-F Piles. Leads on site see that there are morale issues and actively working to address this problem. At this time, there are 1,000 employees leaving their positions for various reasons, the Hanford Engineer Employees Association is working to create a more balanced work/ life balance to boost morale. There are lots of cool maps and blueprints with the word "secret" crossed out.

Statement by the U.S. EPA on the President's Signing of the Hazardous and Solid Waste Amendments of 1984. (2016, August 16). Retrieved November 03, 2020, from https://archive.epa.gov/epa/aboutepa/statement-us-epa-presidents-signing-hazardous-and-solid-waste-amendments-1984.html

This press release from November 9, 1984 highlights the newly signed into legislation bill HR 2867. The Hazardous and Solid Waste Amendments of 1984

strengthens federal regulatory powers relating to disposal of hazardous waste; banning all production and disposal without the EPA's approval. This bill strengthens the EPAs current powers by increasing criminal and civil charges against regulation violators.

Stenner, R D, Cramer, K H, Higley, K A, Jette, S J, Lamar, D A, McLaughlin, T J, Sherwood, D R, & Van Houten, N C. *Hazard Ranking System evaluation of CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) inactive waste sites at Hanford: Volume 1, Evaluation methods and results*. United States. doi:10.2172/6849042.

This document is the original Hazard Ranking System Evaluation for the Hanford Nuclear Site from October 1, 1988. This analysis evaluated a total of 646 active waste sites on premise, finding that 125 of them scored greater than 28.5, meaning they are applicable for review and placement on the National Priorities List for long term cleanup. For the sake of simplicity, these sites were aggregate into 4 Aggregate-Area Sites; (1) U.S. DOE Hanford 100 Area with HRS Migration Score of 46.38, (2) U.S. DOE Hanford 200 Area with HRS Migration Score of 69.05, (3) U.S. DOE Hanford 300 Area with HRS Migration Score of 65.23, and (4) U.S. DOE Hanford 1100 Area with HRS Migration Score of 36.33. This report focuses on waste management practices before the 1970s because later practices didn't create measurable public health risks. Assessing the chemicals contained in the 100 and 200 areas was done using journals, ledgers, and other documents that contained information about waste added to these areas.

Superfund Accelerated Cleanup Model (SACM) (pp. 13) [PDF]. (1993, July). Washington, DC: The Bureau of National Affairs, INC.

Superfund: CERCLA Overview. (2018, June 04)

Sawchuk, S. (2021, July 14). *What Is Critical Race Theory, and Why Is It Under Attack?* Education Week. https://www.edweek.org/leadership/what-is-critical-race-theory-and-why-is-it-under-attack/2021/05.

Stenner, R D, Cramer, K H, Higley, K A, Jette, S J, Lamar, D A, McLaughlin, T J, Sherwood, D R, & Van Houten, N C. *Hazard Ranking System evaluation of CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) inactive waste sites at Hanford: Volume 1, Evaluation methods and results*. United States. doi:10.2172/6849042.

Stuart Wells, A., Jellison Holme, J., Revilla, A., & Atanda, A. (2005, January). *(Pdf) How desegregation changed us: The effects of racially mixed schools on students and society*. ResearchGate. https://www.researchgate.net/publication/254430527_How_Desegregation_Changed_Us_The_Effects_of_Racially_Mixed_Schools_on_Students_and_Society.

Summary of executive order 12898 - federal actions to address environmental justice in minority populations and low-income populations. (2020, July 23). Retrieved April 14, 2021, from https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice

Superfund: CERCLA Overview. (2018, June 04). Retrieved November 05, 2020, from https://www.epa.gov/superfund/superfund-cercla-overview

Tank Waste. (n.d.). Retrieved November 23, 2020, from https://www.hanfordchallenge.org/tank-waste

The confederated tribes of the UMATILLA Indian Reservation (CTUIR) in Oregon. (n.d.). Retrieved April 26, 2021, from https://www.ncai.org/tribal-vawa/get-started/the-confederated-tribes-of-the-umatilla-indian-reservation-ctuir-in-oregon

The Department of Energy's Limited English Proficiency Plan. Energy.gov. (n.d.). https://www.energy.gov/diversity/downloads/department-energys-limited-english-proficiency-plan.

The Superfund Amendments and Reauthorization Act (SARA). (2018, June 04). Retrieved November 11, 2020, from https://www.epa.gov/superfund/superfund-amendments-and-reauthorization-act-sara

Treaty with the Yakama, 1855. (n.d.). Retrieved April 26, 2021, from https://goia.wa.gov/tribal-government/treaty-yakama-1855

Treuhaft, S., Scoggins, J., & Tran, J. (2014, October 22). The Equity Solution: Racial Inclusion Is Key to Growing a Strong Economy [PDF]. PolicyLink

Tri-Party Agreement: U.S. Department of Energy, Washington State Department of Ecology, U.S. Environmental Protection Agency. (2017, June). *Hanford Federal Facility Agreement and Consent Order - Hanford Public Involvement Plan 2017*.

U.S. EPA, Office of Land and Emergency Management 2020. Data collected includes: (1) Superfund site information from SEMS as of the end of FY2019 and site boundary data from FY 2014 FOIA Request; and (2) population data from the 2015-2018 American Community Survey.

Wiley, J. T. (1949). Race Conflict as Exemplified in a Washington Town. (n.p.): State College of Washington.

Williams, D. (2016, September 06). The Guardian: EPA's Formative Years, 1970-1973. Retrieved October 24, 2020, from

https://archive.epa.gov/epa/aboutepa/guardian-epas-formative-years-1970-1973.html

Wolfe, Joel D. (July 1985). "A Defense of Participatory Democracy". *The Review of Politics*. **47** (3): 370–389. doi:10.1017/S0034670500036925. ISSN 1748-6858.

Yakama Indian Nation. (n.d.). Retrieved April 26, 2021, from https://www.npaihb.org/member-tribes/yakama-indian-nation/

Appendix A - Survey

Capstone Survey

Thank you for taking part in this survey, it is an assessment of how you feel as a Hanford Advisory Board Member. All answers are confidential. If there are any questions that make you uncomfortable, you do not have to answer those questions. You can stop this survey at any time. If you are interested in a follow-up interview, please add your email in the last question of the survey.

A copy of the consent form was sent in an email with this survey. It is also available through this link, https://docs.google.com/document/d/1mFyPeaFr_6qJYkgkaFTjnQ0z0u_d3-WHgA9YAlv60h0/edit?usp=sharing.

Thank you again for helping with this research.

How long have you served on the Hanford Advisory Board?

Short answer text

What is your age?

Short answer text

What are your ethnic origins? (Check all that apply)

- [ ] White
- [ ] Hispanic or Latino
- [ ] Black or African American
- [ ] Native American or American Indian
- [ ] Asian / Pacific Islander
- [ ] Decline to answer
- [ ] Other...

Do you live within 50 miles of the Hanford Nuclear Site?

- ( ) Yes
- ( ) No

Have you served on the board while living more than 50 miles away from the site?

- ( ) Yes
- ( ) No

Does Hanford cleanup affect communities more than 50 miles away from the site?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

Do you feel the Hanford Advisory Board facilitates representation for stakeholders with an interest in Hanford cleanup?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

Does HAB represent all stakeholders fairly?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

Why or why not do you think stakeholders are represented fairly?

Long answer text

Are there stakeholders with interest in Hanford cleanup that are underrepresented or not represented by the Hanford Advisory Board?

- ○ Yes
- ○ No

Who are some examples of underrepresented stakeholders?

Long answer text

Does the Hanford Advisory Board actively recruit new board members from underrepresented communities?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

It is not possible for the Hanford Advisory Board to address all issues related to Hanford cleanup. Do you feel the issues addressed by the Hanford Advisory Board prioritizes the right issues?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

What are some issues that should be addressed by the Hanford Advisory Board but are not currently being addressed?

Long answer text

Does the Hanford Advisory Board create a forum where public agencies are held accountable for Hanford cleanup?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

Is the Hanford Advisory Board easily accessible to the general public? Can citizens easily attend meetings and comment on issues?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

Do you serve on one or more sub-committees? (River & Plateau Cleanup, Tank Waste Cleanup, Health, Safety & Environmental Protection, Budgets & Contracts, or Public Involvement)

- ○ Yes
- ○ Not currently serving on a sub-committee, but have in the past
- ○ Have not served on a sub-committee, but would like to in the future
- ○ Not interested in serving on a sub-committee

Do you feel the Hanford Advisory Board has a direct impact cleanup strategy?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very much so

This survey focuses on the Hanford Advisory Board as a case study on local political bodies. Is there anything you would like me to know about the board, its dynamics, the cleanup process, or anything else related to the Hanford Advisory Board?

Long answer text

Would you like to participate in a follow-up interview? If so, please add your name and email address below.

Short answer text

Appendix B - Consent Form

University Of Washington

Consent to Participate in Research

The Politics of Community Organized Environmental Cleanup

Introduction and Purpose

My name is Denise Jones. I am a graduate student at the University of Washington Bothell in the Masters of Arts in Policy Studies program. This study focuses on how you feel about the Hanford Advisory Board. The goal of this survey is to assess how Hanford Advisory Board members feel about the Hanford Advisory Board and its work to aid onsite cleanup. Your honest opinions will help me better understand how the board works and its effectiveness in the Hanford cleanup process.

Procedures

If you agree to participate in this research study, I will send you a questionnaire asking for your opinion about issues surrounding Hanford cleanup and the Hanford Advisory Board. This survey will ask you to rate your answers on a scale from Strongly Disagree to Strongly Agree and will take about 10 minutes. The survey is anonymous and no identifying information is recorded unless you are interested in participating in a follow-up one on one interview. The (optional) follow-up interview will take about 30 minutes to an hour and with your permission, I would like to take notes. If you are uncomfortable at any time, you can stop the survey or interview.

Benefits

There is no direct benefit to you by taking part in this study.

Risks/Discomforts

The politics of environmental remediation can be overwhelming and cause you to experience emotional discomfort. If this occurs, please let me know. You can stop the survey or follow-up interview at any time. You do not have to answer anything that makes you uncomfortable. My goal is to keep all personal information confidential. Because my research focuses on the Hanford Advisory Board, there is a chance that others may uncover your identity based on past public statements.

Confidentiality

The information you provide will be handled confidentially. I will use pseudonyms in notes and any research documents. To keep track of participant interview data, I will keep a separate database participants' personal information. This allows me to not only keep track of participants' information but also to follow-up with any research related questions. I will be the only person who has access to this information.

After completion of this research, I may save this research information (surveys, follow-up interview notes, etc.) for future research. This data will be password protected and I will be the only one with to access this information.

Compensation
You will not be paid for taking part in this study.

Rights
Participation in this study is voluntary. You have the right to decline to take part in this study. You have the right to decline to answer any questions and you have the right to stop participating in this study at any time. Regardless of your choice to participate in this study, should you choose not to answer specific questions, or choose to stop participating, there is no penalty to you.

Questions
If you have any questions or concerns about this study, please contact me. My email address is djones08@uw.edu.

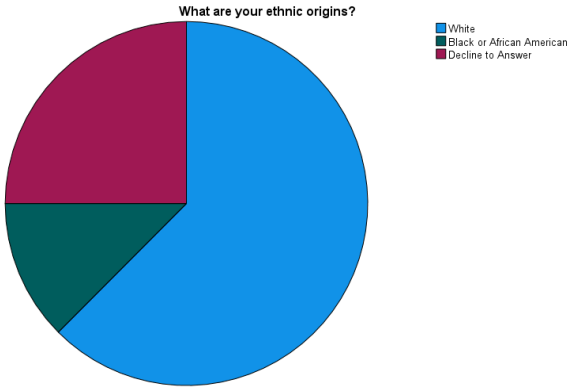
Consent
If you agree to be part of this study, please say so. You will be given a copy of this document to keep for your records.

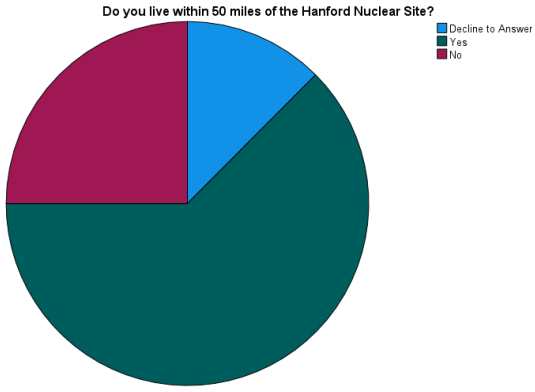
****

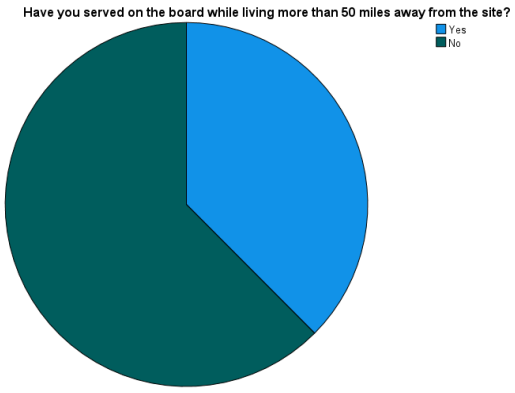
Appendix C - Survey Data and Visuals

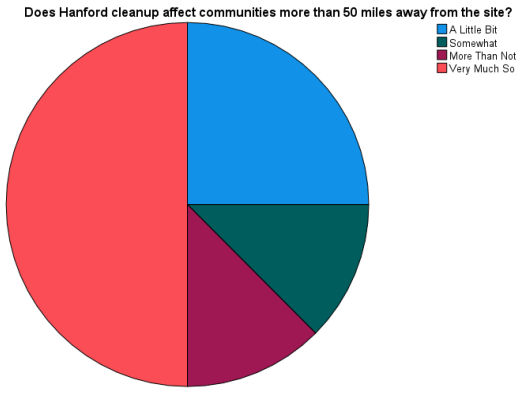
Statistics

		How long have you served on the Hanford Advisory Board? (Years)	What is your age?	What are your ethnic origins?	Do you live within 50 miles of the Hanford Nuclear Site?	Have you served on the board while living more than 50 miles away from the site?	Does Hanford cleanup affect communities more than 50 miles away from the site?	Do you feel the Hanford Advisory Board facilitates representation for stakeholders with an interest in Hanford cleanup?	Does HAB represent all stakeholders fairly?	Are there stakeholders with interest in Hanford cleanup that are underrepresnted or not represented by the Hanford Advisory Board?	Does the Hanford Advisory Board actively recruit new board members from underrepresnted communities?	It is not possible for the Hanford Advisory Board to address all issues related to Hanford cleanup. Do you feel the issues addressed by the Hanford Advisory Board prioritizes the right issues?	Does the Hanford Advisory Board create a forum where public agencies are held accountable for Hanford cleanup?	Is the Hanford Advisory Board easily accessible to the general public? Can citizens easily attend meetings and comment on issues?	Do you serve on one or more sub-committees? (River & Plateau Cleanup, Tank Waste Cleanup, Health, Safety & Environmental Protection, Budgets & Contracts, or Public Involvement)	Do you feel the Hanford Advisory Board has a direct impact cleanup strategy?
N	Valid	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		11.25	62.00	1.63	1.13	1.63	3.88	3.75	2.88	1.25	1.50	3.00	3.00	3.75	1.00	2.63
Range		24	42	2	2	1	3	5	5	2	3	5	4	4	0	4
Minimum		2	40	1	0	1	2	0	0	0	0	0	1	1	1	0
Maximum		26	82	3	2	2	5	5	5	2	3	5	5	5	1	4

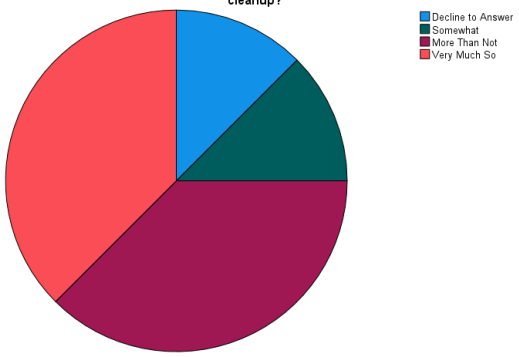




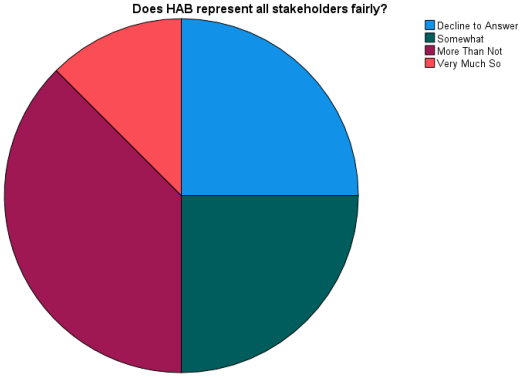




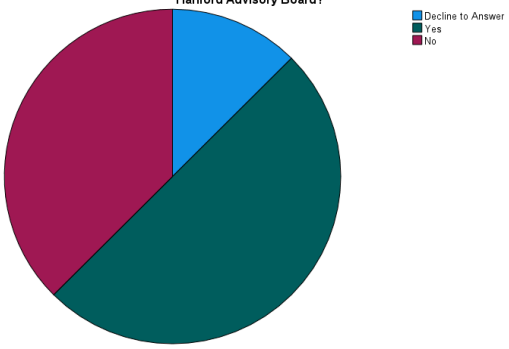
Do you feel the Hanford Advisory Board facilitates representation for stakeholders with an interest in Hanford cleanup?



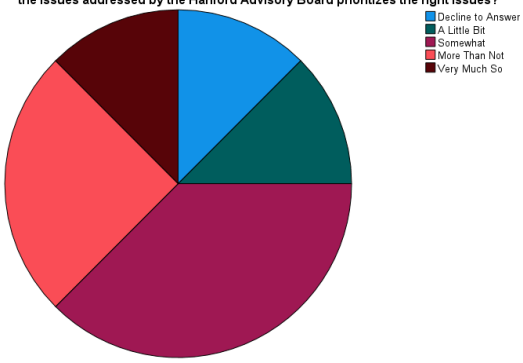
Does HAB represent all stakeholders fairly?



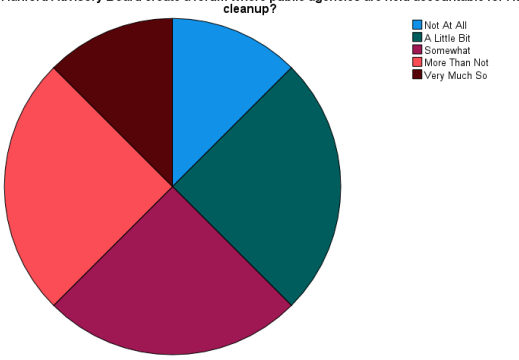
Are there stakeholders with interest in Hanford cleanup that are underrepresented or not represented by the Hanford Advisory Board?



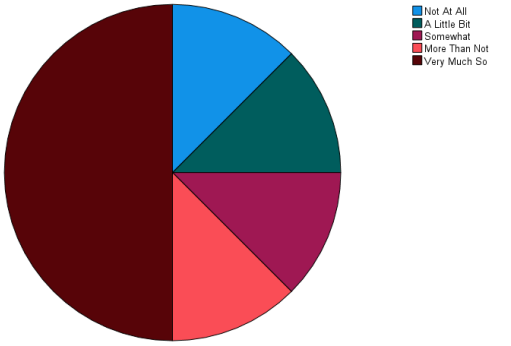
It is not possible for the Hanford Advisory Board to address all issues related to Hanford cleanup. Do you feel the issues addressed by the Hanford Advisory Board prioritizes the right issues?



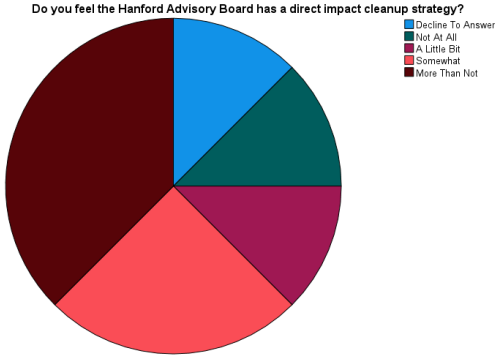
Does the Hanford Advisory Board create a forum where public agencies are held accountable for Hanford cleanup?



Is the Hanford Advisory Board easily accessible to the general public? Can citizens easily attend meetings and comment on issues?



Do you feel the Hanford Advisory Board has a direct impact cleanup strategy?



Appendix D - Interview Summaries

The questions asked in the one-on-one interviews:

1. I am curious about you. Could you tell me a little bit about yourself?
2. What got you interested in the HAB?
3. In March, DOE brought up the idea that the affected area is a 50-100 mile radius around the site. What is your idea of the physically affected area?
    a. The idea of creating a boundary defies historical precedence of the HAB being a regional board. It does however follow precedence set by the downwinders studies.
    b. Hanford is paid for by all taxpayers. By creating physical boundaries, are we excluding interests that have a right to be part of the board? However, from a fiscal perspective, creating boundaries may make cleanup more tenable long term.
    c. Some interviewees stated this idea has been discarded due to pushback from HAB members. One interviewee stated that the perimeter is a done deal and new board members have been selected.
    d. The science of the site doesn't adhere to ideals and constructs. The affected areas can be as close as Spokane if there is an accident on a breezy day, everything downstream, and everywhere affected by off gassing tests.
    e. This idea may be a distraction to divide board members based on location and ideologies about who is most affected by the site. Creating an ingroup (locals) and outgroup (regional) interests although there is no set parameters of beliefs for either group.
4. How do you feel about the diversity of stakeholders on the board? Do you have any thoughts or recommendations about the future makeup of the board?
    a. There is poor racial diversity. There is little representation of Latinx, Russian, Loation, Waanapum, etc. populations.
    b. Hanford can be described as old, white, and male with little diversity.
    c. There is diversity in the educational and professional pursuits of board members, but I have not heard any information from / about members without professional degrees. (this would be a good follow up question).

d. The board and DOE's move to diversify the board may have ulterior motives.

e. The board lacks self-awareness. The board may not realize it is perpetuating exclusionary practices in their meeting times and lengths, lack of child care, member selection process, time consumption, etc.

f. The board has reached out to the Latinx community

g. The site has a history of exclusionary practices dating back to the Manhattan Project. Some members may not recognize or have the opportunity to evaluate and understand how their narrative affects how they see the world and interact with other cultures, making it difficult to find opportunities to have meaningful connections.

h. There is cultural privilege and struggles in volunteering. Different cultures and committees interact differently and may not adhere to the current practices of the HAB.

5. I am having trouble finding information in languages other than English on the HAB website. Do you know if there are language services available? If not, how do you feel about translation and interpretation services for community members with limited English proficiency?

    a. The general consensus was that there are no Languages available on the website, but DOE advertises ADA accommodations and Ecology has advertised translation services but they were not used. One streaming / online meeting had the options of subtitles in different languages.

    b. DOE is the agency leading cleanup and should be financially responsible for providing LEP services.

    c. Some of the participants have mixed feelings about language services and feel first generation residents would not be interested in the content because they have different priorities than second or third generation residents that have english proficiencies.

    d. Some participants feel language services are a great idea and feel this will give agency to communities that have been passively excluded from HAB meetings and conversations.

    e. Translation and interpretation needs to focus on explaining and understanding the content. Special emphasis should be placed on acronyms and technical jargon. Without a concrete understanding of the site, some information may be misinterpreted causing unnecessary worry or panic.

f. Advertising LEP services is focused on English speaking periodicals like the Tri-Cities Herald.

6. What does meaningful interaction with the public look like to you?

    a. How do stakeholders get information back to their organization/ sponsor? What do they share and what does it mean?

    b. How do we incorporate more technology based outreach (social media, webinars, online meetings, etc.)?

    c. Technology based outreach is wonderful, but should not be the only form of communication with the public.

        i. Diverse communities participate differently. How can we reach out & partner with local community leaders?

        ii. One way communication doesn't work for complex issues or in asking for feedback. In person communication makes dialogue possible, and gives opportunities to form lasting relationships with the community.

        iii. Education system plays a big role in disseminating information. How can the HAB make it more accessible for all levels of education?

    d. Are there untapped resources to create Public involvement? The arts? Maybe place a non-radioactive canister in front of city hall?

    e. There are no set guidelines for public outreach and involvement. Each board member does it differently. Time and resources of the stakeholder can play a big role in how much information is spread.

    f. How can board members and stakeholders work together to create meaningful interaction?

    g. Covid changed the way the board holds meetings. Making it easier for people to connect remotely, but the personal connection is lost.

    h. What is the purpose in outreach? Is it to inform? Solicit feedback? Create a bottom up movement on issues?

    i. How do we ask the community what they want? Who is incharge of reaching out to what parts of the community?

    j. Need to create a targeted plan, not tokenized involvement. This needs funding to be successful

k. How do we remove barriers for engagement (time of meetings, childcare, education, learning process, etc.)?

l. How do you reduce misinformation in the community? Do we address fears one by one in a way that the public can understand? Do high level research papers alienate people and sound dismissive of the public's fears? Can agencies get more involved in this?

m. Fear driven advertising and misinformation normally comes from outside the tri-cities

    i. How to reduce misinformation: TPA agencies don't fight information point for point and try to give transparent communication. Not a challenge they have taken on.

n. Do diverse communities see themselves in the board? Is there culture being represented and respected?

o. People from diverse backgrounds don't participate in HAB

p. Locals don't care much about the nuts and bolts and let the HAB take care of it.

7. Do you have any last thoughts or any other information you would like to share with me?

    a. DOE wants all CABs to function the same and doesn't work to represent the public interest

    b. Lot of people involved are technal and smart. Advice was valued by the TPA, there has been a slow decay.

    c. DOE is hostile towards stakeholder involvement

    d. The board used to be independent and is now DOE stranglehold

    e. It is better that the board exists than not exist

    f. The HAB is important in being a presence that is watching creating accountability among TPA

    g. There are moments when the board influences policy, giving hope.

    h. This topic is *Not worthy of a paper more than 5 pages*

    i. What makes the board special is that people build personal relationships

    j. Why hasn't anyone called Senator Murray or congressional leadership for help

k. 6 year term limit can inhibit understanding of materials