

# Proposed Reuse and Redevelopment of the Salem Harbor Power Station, Salem, Massachusetts

Item Type	article;article
Authors	Matchak, Peter
Download date	2025-05-07 22:49:50
Link to Item	https://hdl.handle.net/20.500.14394/32071

# Proposed Reuse and Redevelopment of the Salem Harbor Power Station,

# Salem, Massachusetts

A Master Project Presented

by

Peter Matchak

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of the requirements for the degree of

# MASTER OF REGIONAL PLANNING

September 2012

Department of Landscape Architecture and Regional Planning

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#### Abstract

#### Proposed Reuse and Redevelopment of the Salem Harbor Power Station,

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September 2012

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This master's project analyses the potential reuse of the Salem Harbor Power Station. The station is slated to close June 2014. The closure is an opportunity for Salem, Massachusetts, to redevelop this site and to envision its future socio-economic possibilities. In this project, the parameters of potential development are reviewed, potential reuses are examined, and the best redevelopment strategies are presented.

This project uses five basic steps. The first was a literature review that focuses on planning concepts for the waterfront industrial landscape and its redevelopment. The second a site analysis of the power plant that discusses the characteristics of the study area and its abutters. Special attention will be paid to regulatory factors such as Chapter 91, Designated Port Areas, waterways regulations, and easements while conversations with local stakeholders were held to grasp the professional and public perspective. In addition, socio-economic anchors currently present within the community were identifying future uses and developments can proceed.

Foreshadowing my conclusion, through my five steps of research have brought me to believe the best possible reuse of the Salem power plant will be to convert the plant into a natural gas fired power plant. This would continue to use the existing easements and contribute to Salem's tax base. It would also require significantly less space allowing for the coal pile and oil tank farm to be removed and the brownfield mitigated. This future vacant space should be converted to regional cruise ship terminal that would also service the Salem/Boston ferry service. Any additional area could be landscaped into recreational areas allowing for public access or be used to develop Salem's maritime infrastructure.

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#### Chapter I

#### Introduction

This masters project for the Master of Regional Planning Program will analyze the potential reuse and redevelopment of an industrial parcel of land on the Salem, Massachusetts, waterfront by examining its existing conditions and site limitations as well as by analyzing alternative development scenarios and, finally, by proposing the best course of redevelopment.

Dominion Power Corporation, one of the nation's largest producers and transporters of energy, bought the Salem Harbor Station in 2005. Today, Dominion has begun the process of decommissioning the power plant for a combination of reasons including the age of the facility, escalating environmental regulations, and noncompetitive operating costs. Dominion applied to the Independent Systems Operator (ISO) New England for permanent decommissioning of the four power generators at the power station. Permission has been granted and the plant will close in December 2014. Moreover, Dominion has settled law suit concerning infractions of environmental regulations. Dominion has also agreed that the plant will never use coal to produce electricity as part of a sales agreement.

While the power plant's closure is now a certainty, its future use remains unknown. The parcel could be bought for a variety of uses or languish deserted. Consequently, the City of Salem has recently begun the task of site planning and has developed a report to better understand alternative future uses for the site. Salem needs to better understand the site's current state and potential. A brief glance at the site identifies it as an industrial facility, a brownfield, a substantial parcel of land adjacent to a deep-

water channel, and a unique opportunity for redevelopment. In addition, Dominion has been a major employer and the largest generator of tax revenue in the city. The plant's closure could either be an economic disaster or a historic opportunity to enhance the waterfront and city.

The goal of my research will be to discover and explore reuse possibilities appropriate for the existing site, stakeholders, and regulatory mandates. After weighing all options, I will propose a course of action that answers the question: What is the best reuse strategy for the waterfront site currently occupied by the Salem Harbor Power Station?

This project has five basic steps. The first is a literature review that focuses on examples of industrial redevelopment and principles of sustainability. Planners base their decisions on theoretical concerns, case studies, and the practicalities of place. There is rich literature on industrial redevelopment. As many cities have faced problems associated with deindustrialization, planners have had opportunities to develop procedures for understanding the dynamics of industrial change. Consequently, there are structured approaches to understand the dynamics of site evaluation and to prioritize the most important elements of the planning process. In addition, there are federal and state regulations and mandates that influence the decision making process. Finally, the literature is also rich in case studies. These studies provide potential examples of what other municipalities have done in similar situations. The literature review, then, will outline the appropriate steps of the planning process, present material germane to the regulatory process, and offer examples of possible reuse.

The Commonwealth Designated Port Area legislation and Chapter 91, which concern tidelands ownership and infilling are major factors in determining appropriate land use and redevelopment. The former mandate regulates the types of reuse allowed for development. The latter legislation regulates public ownership over former tidelands. The Commonwealth specifies that tidelands that have been filled in still are in the public domain. Both these regulations pertain to the study site. In addition, there is an adjacent ship channel and turning basin that are included under state regulations. Finally, there is municipal zoning for the city with special regard to the waterfront.

In addition to theories and regulation, the literature is rich in case studies of redevelopment for similar locations. These studies include the development of an entertainment center in a former Baltimore power plant and the power plant conversions from coal to natural gas at the Fore River Station in Weymouth, MA, as well as the effects of decommissioning the nuclear plant in Rowe, MA. The literature review, then, will be a rich mixture of planning concepts and procedural approaches, the presentation and discussion of the multi-governmental level regulatory framework, and examples of redevelopment.

A second step will be the presentation of qualitative information from selected stakeholders. Planners, city officials, local business people, and concerned citizens have already begun a dialogue over the power plant's fate and the city's future. This will be a historic moment in Salem's history. If the site is successfully redeveloped, Salem could maintain its economic viability and chart new directions both industrially and economically. If redevelopment fails, it will be a major economic blow to the city. For planners, however, there is another purpose to eliciting local opinion. As planners serve

the community, they have to be aware, cognizant, and responsive to their community. Planning has to be a transparent and public process that respects the public and the community's will.

At the moment, several alternate developments are being discussed. These include keeping the site as an electric power generating station, leveling the site into a public park, building housing units, adding retail space, using the ship channel for cruise ships, and building marine oriented services. All of these proposals have merit, limitations, and followers. Within the project, I plan to review the waterfront's inner workings from its natural geography to its historical use and connection to the sea as well as to its present land uses. In addition reviewing the major proposals based upon the foregoing literature review. After reviewing several proposals, I will make a final recommendation on the best future use for the site.

By way of introduction, Salem is one of the Commonwealth's most historic and famous municipalities. Founded in 1626, Salem traded with Native Americans and fishing was its first economic base. While the initial settlement grew and thrived, it was always in Boston's shadow. However, Salem remained competitive until the 1830's. In the colonial era, Salem's merchants traded with Caribbean islands for sugar based products, with Mediterranean Europe for wine and luxuries, and with Western Europe for metals, necessities, and cash. The federal era was Salem's golden age. Its merchants sailed to the farthest ports of the rich East for pepper, spices, tea, silk, and sundry imports. By the 1830's, Salem's fortunes faded because of competition from Boston, the shallowness of the harbor, and local politics.

Salem's merchants, like those in many other coastal communities, turned their backs to the sea and invested in the industrial revolution. Salem became a major industrial center. It complemented both Peabody, where leather tanning grew into a major industry, and Lynn, which became a shoemaking center. Salem had leather tanneries, shoe factories, textiles, tool and dye making, and a host of chemical companies. It was a broadly based industrial economy that grew more dependent on its rail connections than its shipping. Salem however was still an international port servicing maritime Canada and participating in coastal commerce. Salem's industry started to fail in the mid twentieth century. As with other New England cities, industries fled to the American South before globalizing abroad. Industries closed and Salem's citizens departed for the suburbs taking much retail commerce with them as shopping malls replaced Salem's central business district.

Salem reaction was the economic turn toward tourism. The increased interest and popularity of Halloween and witchcraft drove the tourism base. In 1692, Salem experienced a series of witchcraft trials that found 20 individuals guilty of witchcraft and executed them by hanging or crushing. These trials have been a dark page in Salem's history. Recently, they have become the base of tourism promotion that lasts from September through October. Other aspects of a growing tourism industry are based upon maritime history. Many take great pride in Salem's heritage and point to existing community resources as a tourism base. These resources include the Peabody Essex Museum and the Salem Maritime National Historic Site, which is part of the National Park Service.

Salem's history has passed from fishing community to international port to industrial city to declining community to tourist town. Today, Salem has about 38,000 residents. The major employers are the Commonwealth through county government and the court system, the Salem Hospital, and Salem State University. All are nonprofits that bring in little tax revenue. The major rate payer is the soon-to-close power plant. Salem's diverse tourism attractions, restaurants, and small businesses have developed into a second tier tax base for the city. Many Salem residents commute to regional locations as Salem drifts into becoming a bedroom community within the greater Boston region. This history reinforces the point that the closure of the power plant and its redevelopment will have major implications for the city.

The power plant's site is part of this overarching history. Originally a tideland, local merchants filled parts of the salt marsh to build wharves. These wharves served international and local trade for generations. As the railway came to Salem in 1839, these wharves were used for industrial purposes. Since the mid 1850's, coal has been dumped on the site for transportation by train to regional industrial cities. Salem was a second tier industrial port for raw material. This parcel was part of the process. In the 1920's, additional tidelands were filled as the coal dump expanded. Plans for an electrical power plant existed but building was disrupted by the Great Depression and World War II (Jacobs, 2012, p3). The current power plant opened in 1952 and has passed through several owners. The current owner, Dominion, bought the plant in 2005.

Over the last few decades, there has been considerable criticism of the plant. It's a huge structure that dominates the city's skyline. Its chimneys can be seen for miles as well as plumes of smoke. A 2000 study published by the Harvard School of Public

Health, <u>Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the</u> <u>Salem Harbor and Brayton Point Power Plants</u>, found that the Salem Harbor Power Station is the root cause of 53 premature deaths, 570 emergency room visits, 14,400 asthma attacks, and 99,000 daily incidents of upper respiratory symptoms annually. (Levy, Spengler, 2000, p4) These statistics underscore the assumptions that emissions and pollution have caused downwind communities to have above average cancer rates.

The plant's closure is both dreaded and welcomed. Those welcoming it look to a non-polluted city with open vistas and new land uses. These will improve the quality of life and enhance Salem's image. Those dreading the plant's closure point to the potential loss of jobs and tax revenue. They also point to the expenses of redevelopment, the need to recoup municipal investments and the economic threat that the plant's closure could entail.

This planning decision, then, is exceptionally important. Salem's future rides on it. Because of this importance, the role of planning is enhanced. Planners must contribute to their communities by designing the best future possible given the realities of the times which create diverse and sometimes conflicting restrictions and possibilities. As a planner, I am drawn to this project because it will affect the North Shore landscape significantly and to contribute to the planning process.

#### Chapter II

#### Literature Review

Within this literature review, I will address the topic of the adaptive reuse of industrial waterfronts as well as a perspective on how contemporary planners evaluate structures, sites, and harbor developments. This review will draw upon both planning theory and reference case studies. First, I will consider the revitalization of industrial waterfronts theoretically. Then, the focus will shift to methodologies through which planners perceive structure and site redevelopment before ending with ways in which planners envision the broader topic of harbor redevelopment in an urban context. This review will create a perspective from which material on the Salem Power Plant and Salem's potential harbor developments will be discussed in the following chapter.

Within the past half century, many waterfront communities have been transformed by the nation's socio-economic forces. Technological developments, including containerized shipping and the promotion of roll-on/ roll-off cargo, made the traditional waterfronts consisting of finger piers jutting into the harbor obsolete infrastructure for the movement of cargo. (Brown 2009, p105) With the advent of containerization, vessels became much larger therefore requiring deeper channels, different docking systems, greater port acreages, and superior areas for intermodal transportation networks. General port developments now call for thirty five acres of land for each ship's birth. (Wrenn 1983, p12) Transportation trends have also shifted within the past century. The use of waterway transportation has been complemented by railroads and trucking with the creation of the interstate highways after World War II. (Hayes, 2005) In addition, the development of jet airplanes provided more efficient transportation

in terms of cost and time than ocean travel. The changing dynamics and use of the waterfront caused port operations and activities to shift from smaller regional supply ports to waterfront areas that geographically and dimensionally support larger ships with deeper drafts and connections to rail and road networks with land areas that allow port operations to grow and prosper alongside technological advancements in the shipping industry.

These changing port operations have had a negative effect on urban port operations. Once waterfront dependent industrial and marine activities have been closed or moved to less expensive locations. (Kotval, Mullin, 2007) The development of the rail and road networks allowed industrial activities to move inland, which changed the transportation reliance from water to rail. Remaining water dependent land uses shifted to areas that could support greater economies of scale. In many cities, the industrial waterfront moved away from its historical urban location to waterfront areas outside of the urban core where water depths were deeper and land was readily obtainable. These changing port dynamics ended industrial activities in many smaller ports due to the lack of resources compared to larger cities. The resulting abandonment of urban industrial land left behind large tracks of barren waterfront land, scattered with outdated infrastructure. As a result the industrial waterfront land, in many communities, has been downzoned to either commercial or residential uses at a cost to local employment and industrial activities. (Kotval, Mullin, 2007)

Zenia Kotval and John R. Mullin state that "local planners are neglecting their industrial resources and are therefore endangering their economic base."(Kotval, Mullin 1994, p302) This statement encapsulates the situation that Salem faces. Salem's

industrial waterfront activities ended years ago and the sole waterfront industrial land use left is the Salem Power Plant.

An impediment to development is the negative perception of industrial land use, specifically the local unwanted land uses (LULU) movement. (Kotval, Mullin 1994, p303) This movement advocates for rezoning of industrial land to residentially friendly land uses for commercial, residential, or mixed land uses.

Another issue is the eroding connection between the place of work and the place of home. Historically, worker housing was built in close proximity to the factory and places of employment during New England's industrial revolution. Today, longer commuting times are acceptable and preferred. This trend reinforces the idea that people support large scale industrial development away from residential living areas. (Kotval, Mullin 1994, p303) A third point is that within the last half century, there has been a transition from an industrial-manufacturing economy to service-commercial. Hayes states that because of this economic shift "the facilities that support our way of life have become invisible."(Hayes, 2005) Furthermore many citizens now fear issues of industrial land use and zoning. Citizens relate industrial uses to many unwelcome types of pollution. This fear only bolsters a community's unwillingness to allow for industrial development. The citizens of Salem have lived in close proximity to the power station for sixty year and many feel that they have borne heavy burdens. As a result, many municipalities are looking to zone industrial areas with no by-right uses, which allow the community total control over development. This often discourages any developer's interest in developing industrial sites.

As these public perceptions make redevelopment difficult, there are infrastructural considerations that also impact development. Key attributes that planners examine in terms of industrial development include buildable acreage, proximity to major transportation routes, connections to water and sewer, environmental conditions, current zoning, and environmental regulation. In addition, there are numerous easements and a deep water channel that abuts the Salem power plant property.

Marie Howland presents a methodology for confronting issues of rezoning industrial land to either commercial or residential uses. In her opinion, as the American economy shifts from industrial to post-industrial economic sectors, unused industrial sites should be reused in new ways. Industrial zones and its infrastructure are critical to the local economy. While these areas can be used for commercial or residential uses, industrial zones are sources of local jobs, which are critical to the operation of governments, and home to activities that support the local population. (Howland, 2011) Howland examines Prince George's County in Maryland as a case study evaluating industrial land and identifies what parcels need to be protected, persevered, or rezoned. Howland's methodology can be applied to Salem when understanding the current zoning, land use, health and future prosperity of industrial land within a city. This underscores the potential viability of the Salem Power Station site.

Waterfront communities need to build on historic and cultural assets that are important to their community. Incentives to spur development can be used by communities for proper use and planning of waterfronts. (Balsas, Kotval & Mullin, 2000) One way to begin the redevelopment process is by drafting a waterfront master plan that provides a vision for the site and the city. While many working waterfronts need to be

protected from competing non maritime dependent uses, Salem has evolved into a tourism destination based upon historic connections to its witchcraft trials and rich maritime history that attract local, regional, national, and international visitors. In doing so, Salem has seen a decline in its industrial water dependent uses. Currently, Salem has a dismal commercial fishing fleet and little commercial dock space as it has become a recreation boating dominated harbor. This trend has encroached on the existing industrial land.

Economically, the decommissioning of the Salem Power Station will have a major effect on the local economy. Regionally, the Rowe, Massachusetts nuclear power plant was decommissioned in 1992. In their review of the effects and impacts of the decommissioning of the Yankee Atomic Electric Company's nuclear power plant in Rowe, Kotval and Mullin focus on the contributions and roles that state and federal governments can play to help local communities transfer their economic dependence away from a power station. In this instance, the closing of the nuclear power plant created economic hardships for the community with the absence of tax revenue which didn't allow for investments to the local infrastructure and school system. The loss of wellpaying jobs led to increased unemployment and an out-migration of those leaving to find work. "The effect for towns losing power plants is similar to those that lose military bases or mental hospitals." (Kotval, Mullin 1997, p455) In reference to The City of Salem, Dominion is the single largest contributor to the tax base. The City and Essex County will certainly feel a significant financial loss. Analyzing Rowe's decommissioning, "it is clear that, without assistance from the government or the utility companies, communities will struggle economically for years and possibly decades." (Kotval, Mullin 1997, p455)

These concerns indicate the importance of the power plant to Salem, the local economy, and future of the city and waterfront.

#### **Case Studies**

Within the literature there are several case studies that demonstrate industrial reuses of waterfront properties that can serve as potential models for the development of this study site in Salem's harbor. A famous example concerns the redevelopment of a power plant in Baltimore Harbor. In the inner harbor of Baltimore, Maryland, there is a very successful project of industrial waterfront reuse that created economic forces which drove the redevelopment of the city's waterfront. This project has been anchored by the redevelopment of the city's historic Power Plant which was owned by the City of Baltimore (Sheridan, 2007). After the plant closed in 1995, the City of Baltimore worked with the locally based Cordish Company to redevelop the building. The Cordish Company won a 75 year lease agreement from the city to transform the brick structure into a mixed use entertainment destination. Since the redevelopment of the power plant, the space has seen one hundred percent occupancy and has turned a profit from the very first year of operation. Corporations like ESPN, Hard Rock Café and Barnes and Noble have opened facilities there. (Sheridan, 2007) Even though the power plant was built before World War II, it has been reinvented as a catalyst for the city's entertainment venues and as a tourist hub.

Another example is the redevelopment of the Fore River Shipyard in Quincy, Massachusetts. General Dynamics Fore River Shipyard is a 180 acre track of industrial land. At the height of its shipbuilding, during World War II, the shipyard employed

30,000 workers. The shipyard was famous for the production of naval vessels. General Dynamics purchased the shipyard in 1960 and closed it in 1986. The Fore Rive Shipyard was purchased by the Massachusetts Water Resource Authority with plans to redevelop the site. Future development plans had to coincide with Massachusetts DPA regulations since the shipyard was considered an important industrial waterfront. In 1994, a development plan was created for the site by a planning team composed of invested stake holders. Five key points of interest were established. These were to maintain the site, to serve a maritime function, to preserve the industrial integrity of the site, to enhance public use and access, and, finally, to create a balance of land use. These five goals were developed to guide future investments while diversifying the site's economy and employment. The next step in the redevelopment process was to identify constraints and opportunities intrinsic to the site. At the Fore River Shipyard site, planners acknowledged that the industrial scale, vested infrastructures, access, and the shipyard's historical involvement in the country's wartime effort were all opportunities for development. However, on the other hand, there were constraints on the site's potential development. These included environmental contamination and outdated piers and wharfs. The development team drafted a baseline for infrastructural improvements that would support a range of opportunities. (Rafferty, 1996)

The final plan for the Fore River Shipyard, as composed in 1994, was to anchor the redevelopment with centers for technology and tourism. To meet the goals set forth in the initial planning steps, the plan proposed a center of maritime technology, a shipbuilding museum and future shipbuilding production. The plan would create greater public access though tourism, and ferry services while maintaining the integrity of the

industrial port through maritime technology and shipbuilding. At the same time, redevelopment would maintain the site's historical heritage and balance of land use. Today, the United State Shipbuilding Museum is located on the 180 acre redeveloped site. Docked onsite is the USS Salem, a 717 foot heavy cruiser, launched in 1947 and decommissioned in 1959. The site acts as a MBTA passenger ferry terminal connecting Quincy to downtown Boston. However, aerial photos of the shipyard, from GOOGLE Earth and a site visit show no signs of shipbuilding or maritime technology present.



Two major motivating factors for redeveloping the industrial waterfront land are to improve the economic and environmental health of a community. As industrial land uses moved from the historic waterfront because of multiple factors, a side effect has been that these industries often left contaminated sites, defined either as a brownfield or, in the case of waterfront land, a portfield, defined as a contaminated track of land which abuts water. The Environmental Protection Agency's definition describes brownfields as

abandoned or idled or underutilized industrial or commercial facilities where expansion or redevelopment is complicated by real or perceived environmental conditions. However, "Brownfield clean up and site redevelopment poses economic and environmental windfalls for communities. Brownfield programs and policy goals are to turn contaminated and underutilized land into environmental and economic assets that yield dividends for a community." (Bacot, O'Dell 2006, p 143) Economically the rejuvenation of a brownfield can create jobs and tax revenues for the host communities which are two things that cannot be obtained when a site is either abandoned or is not used to its greatest potential. Second, reclamation and redevelopment of a brownfield will improve the environmental quality and integrity of a site, area, and community through the clean-up and removal of hazardous and toxic materials. The cleaning of portfields also has positive impacts on both the land and abutting waterways. "In doing so, redevelopment of once contaminated sites initiate economic growth, improves the environment, and enriches communities which all add to the quality of live" (Bacot, O'Dell 2006, p144) The redevelopment and reuse of a brownfield depends on the preexisting site and the final outcomes. However an article, Measuring Site-Level Success in Brownfield Redevelopment: A Focus on Sustainable and Green Building, by Christoper Wedding and Douglas Crawford-Brown identifies four groups of useful indicators that create a measure to gauge reclamation success. These measure environmental/health, financial, social/economic, and livability factors. Within each sub group are qualitative and quantitative values ranging from improving access, additional green space, building reclamation, and the number of developed jobs to the improvements of one's view. These indicators can be used either to measure the

performance and success of a project or to forecast the effects and improvements within a community which undertakes a project.

In conclusion, the literature review discusses the major perspectives and methodologies planners use in assessing the redevelopment of waterfront industrial sites. Planners understand the needs and issues of maintaining active industrial activities that support the regional economy and industrial vitality. Planners identify critical features of redevelopment sites and of governmental regulations. Within this framework, planners assess the site's architectural structure, site conditions, and abutting land use. Finally, planners consider the broader vision of urban development within a historical and cultural context. This approach is both flexible and thorough.

#### Chapter III

#### Site Analysis

Salem Harbor Station was built by the Tenney Company and operated by New England Power. The Power Plant and was first put on the electrical grid in 1951. It has changed owners over its existence, and is now owned by the Dominion Power Company, which plans to close the plant in 2014. Today, the Salem Power Station encompasses 62.1 acres of waterfront land including a 6.7 acre substation and transmission easement as part of the site. The station houses four power generation units. Units 1, 2 & 4 are all coal fired combining to produce 312 megawatts while unit 3 is oil fired producing 433 megawatts. Overall, the plant can produce 745 megawatts of power making it the fifth largest power plant in the Commonwealth while providing 745,000 homes with electricity. (Jacobs, 2012)

The ISO-New England approved Dominion's 2010 request to take units 1&2 offline by the end of 2011. The remaining units 3&4 will remain in operation until the end of the 2014 calendar year allowing for upgrades on regional power lines to take place. Currently the site is zoned for industrial use. The Commonwealth has identified the site as a Designated Port Area (DPA) to promote water dependent marine industrial uses. Additionally, a Massachusetts Chapter 91 historic shoreline runs through the property. The abutting properties are a mix of land uses and zoning classifications. Residential land uses include both single and multi-family properties as well as industrial zoning. In addition the Essex County Sewerage District facility abuts the site, as well as Winter Island, a municipal park, which lies across a narrow channel from the plant.

Economically the plant plays a major role in the community by being the largest source of tax revenue for the city and by providing jobs. Dominion annually paid \$ 4.75 million to the City of Salem (\$3 million in taxes and \$1.75 million in pilot host fees to the city) (Jacobs 2012, p18). The mayor of Salem, Kim Driscoll, has acknowledged that "there are some folks kicking the tires but... a large industrial 62 acre, highly contaminated parcel isn't your usual transaction, it has some challenges, demolition cost, existing regulations... but it also has great opportunity to redevelop the waterfront."(Jacobs, 2012, p18)

#### Historical Use of Site

Salem's waterfront has historically played an indispensable economic roll to the city's development. Salem was founded in 1626 and quickly became a successful fishing port. Salem's naturally protected harbor became a center of trade. Salem's ships sailed around the world developing trade routes with the West Indies and Far East. As Salem's predominance grew so did its population. "In 1790, Salem was the sixth largest city in the country." (Jacobs, 2012, p14) Salem's waterfront grew and expanded with the construction of piers which were necessary for shipping. In the current power plant's location, the India Company constructed India Wharf in 1800 to service the loading and unloading of goods. Salem's waterfront remained a bustling port until the 1850's when shipping and trading passed Salem for larger trading centers such as Boston.

However, the East India Company sold the India Wharf to Stephen Phillips in 1836. "Mr. Phillips was interested in building a railway connection between Salem Harbor and the industrial mill towns of Lawrence and Lowell. In 1850 the railway was

complete running twenty-four miles and having the ability to deliver coal to the industrial mills located along the Merrimac River." (Jacobs 2012, p14) Coal became a dominant fuel in the region and was used to produce stream for driving industrial factories as well as heating homes. Coal became such a commodity that the Philadelphia and Reading Coal built a neighboring wharf, the Philadelphia Pier, in 1873. By the turn of the century, Salem was unable to continue as the North Shore's major coal hub. Boston with its deeper channels, greater land mass, and superior transportation network overshadowed Salem. Salem's waterfront continued to shrink as coal shipments ceased and activity along Philips and Philadelphia piers slowed.

In 1916, the City of Salem used the power of eminent domain to take control of the two wharfs and adjacent land. Then, the City of Salem sold the land to the Tenney Company, which proposed to develop a super power station upon the site. Prior to the construction, over 30 acres of tide lands were filled for the proposed use. Construction of the present power station started in 1948 and the first electricity was generated in 1951.

Salem Power Station is a steel frame brick-wall structure. The plant raises fourteen stories high and is 144 feet wide and extends 355 feet. Salem Harbor Station was operated by New England Power from 1952 until 1998, when the Tenney Company sold the plant to USGen a subsidiary of Pacific Gas & Electric of California. In 2003, USGen filed for bankruptcy and sold the power station to Dominion.

Dominion filed for permanent delisting of the power station in October of 2010 citing that "given the significant cost requirements to keep the station in compliance with pending environmental regulations and the falling margin for coal stations selling

electricity in New England."(Jacobs 2012, p18) Because of pending environmental improvements required from legislation amendments to the Clean Air Acts new Mercury and Air Toxics Standards to reduce mercury emissions, it was expected that Dominion would have to spend hundreds of millions of dollars to make the necessary improvements to Salem Harbor Station (Jacobs 2012, p29). Since the development of ISO-New England whose job it is to regulate reliability of the market and administer energy planning, "Salem Harbor Station has been selected to run infrequent daily energy production."(Jacobs 2012, p26) The ISO cites that there are newer power plants in the region that can produce the daily consumption of energy for less money with lower emissions. The effect is Salem Harbor Station has not been selected to run daily and is used to meet load requirements when needed. With the age of the power station's technology and with addition to environmental emissions mitigation required as well as with the decreasing economic potential, Dominion decided to file for permanent delisting.

One consequence is that the City of Salem has begun the planning process to find and promote new uses for the power plant. A recent master plan discusses the condition of the property while identifies potential new uses for the site. At the time of its completion, the Salem Power Plant was a state of the art facility. However, today it's an aging and outdated power station despite several alterations and additions. There is little public knowledge about the inner workings and current condition of the structure and site.

Site Review

It is imperative that the City of Salem plan an appropriate reuse of the power plant site. This plan rests on a careful analysis of many factors. Planners have approached these topics from various perspectives. In this review, the initial concerns start with the building and expand to the site before concluding with an overarching vision of the current state of Salem's waterfront.

Two planners, J. Stanley Rabun and Richard Kelso, focus on buildings in their book, Building Evaluation for Adaptive Reuse and Preservation (Rabun and Kelso, 2009). Babun and Kelso state that for any redevelopment or adaptive reuse the current use and present form of the structure must be evaluated both in its exterior and interior. In addition, the planned physical change and economic impacts that a project would have on a structure need to be taken into account. Any new use or continued uses within the existing building require knowledge of the building, utilities, and code requirements as well as financial challenges. Most projects require a team of planners, architects, and engineers. A team's decision falls into three categories either to keep the building intact, modify the configuration, or to remove and replace a structure. Architectural characteristics are taken into consideration as well as a building's footprint, construction type, foundation, the form and massing of a structure, materials, craftsmanship, and architectural articulation details. Rooted systems such as plumbing, electrical, heating and cooling all need to be assessed. In addition, to understand the current physical attributes of a structure, planners must document the surrounding area's physical condition as well as buildings that have already have been redeveloped or repurposed to

measure an economic plan for a project and to understand the net worth and economic return of a proposed development.

Examining possible building reuse, Joseph M. Danatzko and Halil Sezen wrote a paper entitled <u>Sustainable Structural Design Methodologies</u>. They acknowledge key indicators to measure sustainable reuse opportunity of a structure. The main objective in any reuse or redevelopment of a building type is to reduce the amount of required raw materials, and, in turn, reduce the project's impact on the environment. (Danatzko & Sezen 2010, p186) In their method, there are five goals in a reuse project. The first is to minimize the material used within the construction phase. This is accomplished through the reuse of present structures and materials. This leads to the second and third reuse goals which are to minimize material production energy and the embodied energy invested in a project. While maximizing material reuse and minimizing resource consumption, building reuse becomes an alternative to demolition which reducing debris. Fourth, structural calculation of life-cycle analysis can measure the proposed economic investments and potential economic returns for the forecasted life span of a building's proposed second life cycle. The fifth consideration is an assessment of a reuse project that maximizes the structural systems and investments that have been previously made into the building and surrounding site. (Laefer & Manke, 2008)

In a related paper, <u>Building Reuse Assessment for Sustainable Urban</u> <u>Reconstruction</u>, the authors further advances the five goals of sustainable construction. Debra F.Laefer & Jonathan P. Manke, propose that the calculation of possible reuse of a building can be divided into three sections: the above ground structure, basement, and the foundation of a building. Attributes for examining the integrity of an above ground structure are the building's interior and exterior geometry and the load bearing capacity of the structure and an attention to the condition of the building's appearance and material. The foundation is inspected for reuse possibilities in light of its space, geometry and load bearing capacity. The reuse of a foundation must not exceed its prior load capacity. If it does, additional support will have to be increased and strengthened for greater weight bearing capacity. Quantifying the reuse and redevelopment of a building in monetary values must be calculated for each individual project. However if all three sections of a building can be reused and redevelopment it is estimated the 65% of the replacement cost can be saved by a project's developer. If a basement and foundation can be salvaged 10% of a project's cost can be saved, while if only a foundation of a structure can be reclaimed roughly 4% of the projects cost can be avoided. However any reuse of a building is considered a sustainable practice, the clearest advantage of building reuse is the location of the building and surrounding natural features either be naturally occurring or built into the urban fabric.

This site analysis of Salem Harbor power station was done from afar. The power station is a secure site therefore no site visit was conducted. From both public documents and aerial photography the site can is described as the following. The main structure of the power station includes the fan house, boiler room, and turbine room housing the four power generators and used in the production of electricity. The power plant is a steel framed structure. The exterior walls are wrapped with concrete brick. Standing fourteen stories high, 144 feet wide and 355 feet long, the power plant is an enormous structure. There are three smoke stacks for the exhaust. Connecting the coal pile to the power plant is a gradual sloped conveyer belt that delivers the coal to furnaces. Given that the power

station was constructed in the early 1950's, the building, boilers, and turbines will likely contain significant amounts of lead paint and asbestos insulation. (Jacobs 2012, p50)

Architecturally the power plant has little value. The structure was designed to serve its function without any architectural appeal. However the power plant is the most visible building on the North Shore's water front. The two larger stacks serve as a point of reference for residents of multiple abutting municipalities and mariners approaching from off shore waters. Little public information exists about the building's interior condition or systems. Functioning as a power plant for the past 60 years an extensive plumbing system connecting the boilers to the generators as well as an extensive electrical system for the generation process are believed to be present.



(Salem Power Station, view from water)

On a broader scale, Douglas Wrenn explores the characteristics of site and location in Urban Waterfront Development. When examining development opportunities, there are several factors related to waterfront such as geographical location, urban context and jurisdiction boundaries that have to be taken into account. (Wrenn, 1983) As a planner assessing development opportunities one must consider multiple attributes. One fundamental attribute of a site is its geographical location. A site's geographic location is described as the relation to the naturally occurring environment.

Wrenn divides geographic location into three subsets. First, water resources are defined by the type of water body and surrounding geographic nature of the abutting land. The most important features of a water body are its natural or manmade physical geography, dimensions, and configuration. For Example, depicting the waterway as a riverfront or protected harbor, planners need to be aware of the natural movement of the water, the depth of the channel and all elements of the water's natural dynamics.

Salem Harbor is considered to be a small, protected harbor, which opens to the north, northeast. The power plant site is located on the northwestern shore. The town of Marblehead lies directly across the harbor. The power plant occupies roughly one-half mile long shore line, oriented to the southeast, naturally protected from northeast winds and wave actions that increase during winter storms from the north east. A federally regulated and maintained deep-water channel has been dredged to sustain the depth of 32 feet, with a horizontal clearance of 280 feet for the delivery of coal. Salem Harbor is affected by a local ebb and flow of tidal fluctuation. Waters levels in Salem harbor rise and fall on six hour increments.

The second subset takes into account the land resources of a waterfront site. Crucial factors of the site include the acreage land or parcel size, geographical arrangement within the surrounding area, surrounding patterns of development and existing environmental conditions and the properties ownership. The natural water resources features dictate the opportunities of development upon a waterfront site. (Wrenn, 1983)

The urban context of a waterfront site depicts the geographical arrangement and relationship between the land use and water. The urban context is defined as the sites land uses that have existed over time, and current surrounding land uses and access to the site. Waterfront land use can be categorized as water dependent, water related, and non-water dependent. Water dependent uses depend on their geographic proximity to the shore line and the water. Examples of water dependent uses include fishing piers, shipping terminals and large scale boat manufacturing. Water related uses are activities that are assisted by their proximity to the water's edge but do not rely on the waterfront to function. For example, commercial developments, such as hotels, restaurants, or tourists attractions can be enhanced by a waterfront location.

The power station is a water dependent land use relying on the shipment of coal via water transport and water for the production of electricity. The power station is located on the north western edge of the property. Included between the power station and the property line is a 6.7 acre easement. This easement is



owned by National Grid housing substations including connections to high voltage transmission lines. The central section of the property has four oil tanks and an ash settling pond. In the southern section of the property, there are an additional four large oil tanks as well as larger area for coal deposits. A docking area is adjacent to the coal pile, with a 580 foot long berthing area where coal delivery ships dock and unload coal. Geographically the property sits on a peninsular know as Salem Neck, away from the commercial downtown.

Today the power station is situated in a tightly knit urban fabric surrounded by diverse land uses ranging from industrial use along the northern edge to a residential historical district. Adjacent to the power station on the north edge of the property is the Southern Essex County Sewage District treatment plant which services six local municipalities. Along the front of the power plant runs Derby Street. This street is a bordering edge to the Derby Street Historically District which is a residential historical neighborhood. In part, Derby Street is a narrow one-way street that runs from the center of Salem past the plant towards Salem Willows, a residential neighborhood and Public Park. Located on Derby Street are several historical landmarks such as Derby Wharf, Pickering Wharf and the Salem Maritime National Historic Site, which is part of the National Park Service, and the House of Seven Gables. Bordering the southern edge of the property is Blaney Street where the MBTA Salem ferry terminal provides seasonal ferry service to Boston. Finally there is a twenty foot landscaped buffer surrounding the power plant site to mask and separate the industrial uses from the abutting residential neighborhood.

Along the waterfront Salem Harbor Station is surrounded by recreational uses. The northern portion of the site is across from Winter Island, an open space recreational area which includes a recreational boat launch. Abutting the southern edge of the site is Hawthorne Cove Marina which provides slips and morning for recreational boaters.

In addition to these primary considerations, transportation via both water and land is crucial to a site's redevelopment and proposed reuse. Access from land to the water front can be defined in terms of distance to the commercial center and the surrounding transportation network. Water transportation access can be determined by shipping channels, berths and piers. Land transportation connections are through rail networks, road infrastructure and proximity to major highways and routes.

The access and movement around the power station site is limited. Access by water is extensive as the property abuts a 32 ft. deep water channel; there are no vertical clearances to enter Salem Harbor. On land, access to the site is limited. Located toward the end of a peninsula and near residential neighborhoods, Salem Harbor Station has restricted roadway access. The main access roads are Derby Street, Webb Street, and Fort Avenue. Fort Avenue allows for the easiest access as it is a 36 ft. wide local access road connecting to Route 1A, a major route through Salem and the region. Alternative transportation, such as rail or immediate access to major highways does not exist. The rail lines that historically connected the Salem waterfront to inland industries hubs were abandoned as coal usage declined, and major highways were never built into Salem. An aerial map shows the site in relation to surrounding roadways.



The environmental conditions of the site are unknown and are outside the scope of this project. However, it is assumed that the site is a brownfield contaminated by coals, oil, and ash deposits.

The regional climate can play a major role effecting use and form of a waterfront property. Wrenn notes that "in regions where there are dramatic seasonal variations in temperature, precipitation and wind conditions, there are corresponding variations in the patterns and intensities of waterfront use". (Wrenn 1983, p27). Waterfronts that are affected by seasonal interaction need a variety of uses to provide the waterfront with year around activity.

Salem's three waterfront uses are recreation, tourism, and industrial. Recreationally the waterfront has an active vibrant shoreline from Memorial Day to Labor Day. During this period, hundreds of boaters moor their boats in the harbor. There are entertainment and sailing cruises available to the public. As the weather cools, these activities stop, and the harbor activities slow. The only year around water related use in Salem Harbor are the two industrial uses power generation and the sewage facility. Neither attracts much attention.

Development or redevelopment should look to create waterfront land uses and human waterfront interaction opportunities that the existing waterfront lacks. With the newly emerging public interest in the waterfront, pedestrian access and recreational opportunities, the waterfront needs to balancing economic prosperity and human interaction along the shore line. In several states, including Massachusetts, waterfront development often depends on the inclusion of public benefits and recreational opportunities.

When examining redevelopment opportunities, governmental regulations that apply to sites are major considerations in the redevelopment and reuse of a parcel of land. Site regulations can be derived at the federal, state, or municipal levels of government. Each type of regulation promotes or protects each stakeholder's interest, investment or involvement. Federal regulations typically involve waterway classification such as a federal channel. The maintenance and dredging of channels falls under the authority of the Army Engineers for continued commerce and port access. The state of Massachusetts has created its own waterfront protection laws through the development of the Public Waterfront Act known as Chapter 91 and the creation of a Designated Port Area Program. At the local level, municipal zoning codes enforce land use with the intent to protect the public's health and welfare.
The Public Waterfront Act dates back to the colonial time period. This act regulates dredging, the placement of fill, and the movement or alteration to a structure within a coastal area. Coastal areas by definition consist of tidelands and filled tidelands. (CZM, 2011) In general terms, the public trust doctrine requires that tidelands be used only for water-related activities or otherwise serve a public purpose, and that the public has the right to "fish, fowl and navigate" along the shoreline. (Cook, Marshell &Raine, 2001) The Chapter 91 boundary is measured by the historical mean high tide prior to human alteration; this includes tidelands and the seafloor that have been filled. Any development that constitutes a Chapter 91 permit is reviewed by the Massachusetts Department of Environmental Protection. Projects reviewed ensure that they do not:

- Unreasonably interfere with navigation
- Are structurally strong
- Provide proper public purpose
- Do not interfere with adjacent property owners
- Will not adversely affect natural resources
- Preserve Designated Port Areas for maritime industrial use

In 1978, the Commonwealth of Massachusetts developed the Massachusetts Coastal Zone Management Program. An outcome of the program was the development of the Designated Port Area (DPA) Program. This Program established a priority of protecting maritime industrial development and water dependent industrial uses which are described as uses that rely on the functional connection to water to exist (CZM, 2011). The program promotes the continued industrial use of areas where industrial activities are able to capitalize on prior infrastructural investments and environmental impacts that have already occurred. (Rafferty 1996, p276) There are three essential components that make a DPA restricted area. First, there is a waterway and associated developed waterfront. Second, backland area is able to support industrial facilities and operations. Third, transportation and public utilities are similarly capable of supporting industrial operations (CZM, 2011). The DPA program allows water dependent uses to occupy DPA sites, while supporting uses are limited to 25% of the site. Specifically excluded for a DPA are residential structures, hotels, recreational boating facilities, and large sport/ amusement complexes. The purpose of the DPA program is to protect areas that are geographically important and where major public investment has been made for future water dependent uses.

Local zoning ordinances and site regulations were legislated by a municipal governing body to protect the health, welfare, and safety of the residents. The regulations are codes outlining allowable uses within site limitations. However most urban industrial zoning codes were created at a time when waterfronts were primarily used for commercial shipping, storage and industrial proposes. As historic waterfronts have been transformed to less intensive uses, waterfront land regulations have remained tied to industrial uses. Wrenn "notes that conventional zoning often fails to provide the essential flexibility required to respond to the changing market conditions that occur as areas are redeveloped. A solution to reform obsolete zoning codes would be to rezone the areas or sit for a verity of compatible and creating uses." (Wrenn, 1983, p 54) However the appropriate uses differ from parcel to parcel, and no two community zoning codes are alike. Consequently rezoning should be tailored to the existing site and infrastructures as well as the community's interest.

The power station site is subject to two state regulations, Chapter 91 and Designated Port Area restrictions. Chapter 91, also known as the Massachusetts Public Waterfront Act, "seeks to preserve and protect the rights of the public and to guarantee that private uses of tidelands and waterways serve a public purpose. (Jacobs, p39) Chapter 91 uses the historical high tide line before any human alteration to designate its mandated jurisdiction. Any proposed project on the water side of the Chapter 91 are reviewed to follow stringent criteria that developments do not interfere with navigation, are structurally sound, provide for proper public use, do not interfere with property rights of owners of adjacent neighbors, do not have negative effect of the natural environment, and preserve DPAs for maritime industrial use. (Massachusetts Coastal Zone Management Plan, 2002)

Analyzing the map below, it is evident that the Chapter 91 line is present through the 62.1 acre tract of land. In the process of building the power station in 1924, "the Middlesex, an ocean going ship called a sand sucker, was brought in and was used to vacuum the sand from the harbor bottom and dump it onto the mud flats behind a granite retaining wall, expanding the site for the plant while deepening the ship channel."(Jacobs, 2012 p15) A great portion of the land on the south and middle sections of the plant containing large oil tanks and the coal pile are relevant to Chapter 91 law. It is evident that the majority of the power station building was built behind the Chapter 91 line.



In 1978, the Commonwealth created the Office of the Coastal Zone Management and the established policies of the Designated Port Area (DPA) program. This program was established to "maintain existing port infrastructure that was built over time and expense to the public. The DPA program looked to promote maritime industrial use in port areas where infrastructure existed."(Jacobs 2011, p41) The Salem site is one of eleven DPA's in Massachusetts. The DPA has set a priority for power generation as well as for the turning basin and federal channel. DPA regulations are strict codes protecting maritime industrial land use from non-maritime land use that don't depend on the proximity to the water for existence or take advantage of existing infrastructure. Since power generation upon the site relies on the delivery of coal and oil plus relative geographical siting to sources of water, power generation is an acceptable marine dependent use. On the local level, the site is zoned for industrial use. In addition, the City of Salem holds three abandoned right of ways: Beckett Lane, India Street, and English Street, which were lost in the construction of the power plant. Within Salem's industrial land use code, no industrial land uses are allowed as by-right uses. Permission for any industrial, light manufacturing, warehousing, or development facility uses must be obtained through the Zoning Board of Appeals.

On a larger scale, Salem's waterfront is an extension of its downtown core. Salem's waterfront and connection to the sea was the core of the city and its hinterland as Salem developed into the economic hub of the North Shore and later southern Essex County. Today Salem's water front is segmented into diverse land uses, woven together by a historical thread. Salem's core waterfront is located on the western side of Salem Harbor.



Municipal Harbor Plan Map

On its southern edge, the South Commercial Waterfront is predominantly occupied by Shetland Park. Shetland Park is a 30 acre tract of land which has 1.5 million square feet of floor space used as mixed use facility zoned for industrial use. Shetland Park offers office space, warehousing, self-storage, and light manufacturing opportunities. Today there are no maritime dependent uses active on the property. (Salem Harbor Plan, p16) Currently many non-conforming uses exist within the industrial zoned office park including a charter school, self-storage, and a community health facility. This site is bordered by a residential neighborhood and has very poor access to major transportation networks.

Across the South River from Shetland Park is Pickering Wharf which is a mixed use development and provides residential units, commercial activities, and a marina. Pickering Wharf is zoned as a central business district and acts as a vital commercial area



on Salem's waterfront. Prior to its current use, Pickering Wharf was owned by Pickering Oil Company and used for oil storage. In 1976, the city was able to purchase and redevelopment the property for

half the estimated price in turn for a city permit for Pickering Oils' proposed new oil distribution center. (Wrenn, p57) Today, Pickering Wharf offers a variety of shops, dining opportunities, docking space of visiting recreation boaters, and residential living opportunities.

Moving from west to east, the Municipal Harbor Plan classifies a large section of the waterfront as the Historical Waterfront. Salem's rich maritime history is preserved through the National Park Service. In the 1930s, Salem's historic Customs House, Derby Wharf, and adjacent buildings became the Salem Maritime Historic Site. Derby Wharf extends a half-mile into Salem Harbor with a light house at its end. The Customs House built in 1819 is an exceptional example of federalist architecture and is where Nathanial Hawthorne worked. The Customs House is also described in *The Scarlet Letter*. Today, the National Park Service has built a reproduction of a Salem merchant vessel, the Friendship, which is moored on Derby Wharf. The park also includes several historic houses, an orientation center, and an old commercial building which was used as the Polish Club.



Continuing east, Derby Street has a stretch of commercial shops, restaurants, and a residential neighborhood. This area is protected by the Derby Street Historical District zoning overlay. At Historical District's eastern edge stands the House of Seven Gables, which is associated with Hawthorne's novel and open to the public.

Between the historic district and the Salem Power Plant lies a small North Commercial District comprised of Hawthorne Cove Marina, a private yacht club offering recreational docking and facilities including boat slips and moorings. The Salem ferry terminal is the point of arrival and departure for the MBTA seasonal ferry which connects Salem to downtown Boston. This property is included in the DPA area and is the site of the Salem Wharf project currently in construction to build a permanent docking facility for the ferry and small coastal cruise ships. To the east of the Salem Power Plant is the already mentioned Southern Essex County Sewage Treatment facility.



Across Cat Cove is the community waterfront, known as Winter Island. This is a city owned recreation facility that includes a boat launch, camping facilities, and waterfront accessible open space. Originally, Winter Island was a fish-flake yard where local fishermen dried their catches of cod. Latter, it was the site of an 1812 era fort, Fort Pickering, whose ruins are still visible. For generations, the Coast Guard staffed a seaplane base on the island with dormitories, an airplane hangar, and other buildings. When the base closed in 1962, the City of Salem agreed to maintain it. Today, although the site is in a general state of disrepair, it is used as a city beach and campground. Salem's harbor also provides multiple opportunities for recreational boats. In 2008, Salem registered 1,400 recreational boats anchored in six mooring fields.

Salem's waterfront is multi-faceted and divided into sections of either industrial, mixed use, residential, or preserved open space anchored by Derby Wharf in the historic waterfront. "In regions where there are drastic seasonal variations in temperature, precipitation, and wind conditions there are variations in the patterns of uses and

intensities," (Wrenn 1983, p27) allowing for year around waterfront activities.

**Planning Process** 

In 2008, the City of Salem as part of the planning process developed the Salem

Harbor Plan to update the previous 2000 Harbor Plan. The planning effort developed

eight goals:

• Re-establish the identity of Salem as an active seaport by developing new and improved facilities serving a variety of vessels on the waterside, and by enhancing access to the visibility of the harbor on the landside for residents and visitors. This is to be done by defining a specific program of activities to enhance use of the harbor, as well as funding to implement priority projects.

• Maximize the economic potential of the harbor in the context of the economic development goals of the city as a whole, while enhancing the quality of life for residents in adjacent areas.

• Promote the waterfront as a focal point for Salem's visitor economy, emphasizing culture tourism, high quality recreational experiences and longer visitor stays.

• Protect and enhance access to the waterfront and on the water for the Salem community for passive and active recreation; reconnecting the community to its waterfront where the connection does not currently exist.

• Identify and preserve those aspects of Salem's waterfront experience that should be preserved and protected from change.

• Protect and preserve those aspects of Salem's waterfront experience which can beneficially link the city to its maritime past.

• Ensure that public investment in waterfront infrastructure will support and encourage private investment. Develop long-term capital maintenance/management strategies to ensure public investment will result in infrastructure that is sustainable over the long term.

• Protect and enhance the environment quality of the harbor and its environs as an integral component of any proposed development of revitalization efforts.

Overall the City's vision is for the waterfront to become a vibrant hub with

increased recreational and commercial uses while protecting its industrial and working

heritage and vitality. Salem looks to develop infrastructure both on and along the water

for recreational vessels. Plans call for creating harbor tours, water taxi services, and

increasing mooring fields. In addition to developing a harbor walking path along the waterfront and improved signage. The plan recognizes the designated port area and the existence and importance of the Salem Power Station as well as the federal and state regulations imposed on the land and channel. However the Salem Harbor Plan was produced without the knowledge of the power plants closing.

Consequently, this has become a historic moment in Salem's history. Any decision will have far reaching consequences. This closing comes at a time when municipalities including Salem are faced with operate under declining budgets. Nevertheless this is a time for great opportunities to guide Salem's future. The understanding of the current state of the building, site, geographic surrounding, development, access and the legal regulations that have been placed upon the site will all have major implications for the future of the site.

### Chapter IV

## Stakeholder Conversations

Part of the planning process is to gather input from stakeholders and to discuss the foreseeable effects of the decommissioning of the power station as well as the reuse options that the site presents. In this chapter, I will present summaries of conversations with three individuals who are involved with the planning process. Each conversation developed from three main points. The first is the importance of the power station within the host community of Salem and surrounding is region. The second is the development concerns of the local stake holders. The final point discussed the best possible reuses of the site relevant to the geography or surrounding and historical land uses.

Three community stakeholders were contacted:

Frank Taormina: Staff Planner at the Salem's Planning Office and the Salem Harbor Coordinator.

John Keenan: State Representative of the 7<sup>th</sup> Essex District, House Chairman of the Joint Committee on Telecommunications, Utilities, and Energy.

Bill McHugh: Salem Harbor Master

In addition to the three conversations, I will refer to the Jacobs's report titled  $\underline{A}$ 

#### Site Assessment Study on Potential Land Use Options At The Salem Harbor Power

<u>Station Site</u>. The consulting team held several public meetings to ascertain local priorities on redevelopment. At the meeting held on June 30<sup>th</sup>, 2011 two questions were asked to local residents measuring redevelopment priorities. I will summarize the findings of the report.

My first conversation was with Salem's Harbor Coordinator and Staff Planner

Frank Taormina on January 15, 2012. Mr. Taormina acknowledged the City is in a

unique position by identifying many key attributes of the power facility ranging from the strategic siting of the station along Salem's waterfront to the financial riches the plant brings to the city. He emphasized that the power station is the city's largest financial asset and contributor to the cities tax roll. Currently, Dominion, the owner of the Power Station, pays 4.75 million dollars to the city in taxes. In effects, Mr. Taormina observes that the scheduled closure of the power station and the uncertainty of the site is the greatest concern to the city, as the collected tax revenue will dramatically decrease with the parallel decrease in energy production because taxes collected from Dominion are dependent on the amount of generated power on the site. A second concern lies with the control of the land or decisions made about the plant's reuse. The city of Salem is not the owner of the property and the city and public are facing and fearing that Dominion could lock the front door and leave allowing the site to fall into decay for decades.

Mr. Taormina identifies over the course of Salem's rich history that the site and land now encompassed by the power station has historically played a significant role in the development of the city. Therefore, he sees the 62.1 acre site having great reuse potential with the ability to distinguish Salem's waterfront from comparable second tier ports. Mr. Taormina understands that the site is protected by Designated Port Area which mandates that the site stay as water-dependent industrial zone. While in addition the site is likely to be declared brownfield. In conclusion, Mr. Taormina sees that there are many difficult questions that need to be answered and that private investments will be required for the regeneration of the land. However, he thinks redevelopment of the site needs to be envisioned in staged development while taking advantage of the surround amenities on

both the land and sea to accurately redevelop the site while providing a comparable tax generation from the site regeneration.

A second conversation was held with John Keenan, State Representative of the 7th Essex District on January 18, 2012 at the Joho Café. Representative Keenan serves as House Chair of the Joint Committee on Telecommunications, Utilities, and Energy. Rep. Keenan is a Salem native and currently lives in the city he represents. Within the conversation Rep. Keenan highlighted his believes of the importance of the power station emphasizing that the power station is crucial to the region in helping to meet electrical base loads on the electrical grid. Rep. Keenan believes that the power station is an enormous asset for the local economy as well as being superior to imported energy. Keenan identifies the power station as an economic development tool attracting industry and commerce to the city.

A concern in the scheduled closure of the power station, Rep Keenan acknowledges it will harm Salem financially. Acknowledging this, Rep. Keenan with help from Senator Fred Berry, have passed legislation that will appropriate funds from Regional Greenhouse Gas Initiative (RGGI) to help the city of Salem to balance the yearly budgets from 2011 until 2016 which is two years after the closure of the plant. However Rep Keenan states that "the city has become too dependent on the tax revenue that is generated off of the site," and sees that the city needs to diversity the local economy and move away from non-renewable power generation.

Focusing on the future, Rep Keenan sees great potential in the site moving forward while noting that "it is the largest redevelopment project that the city of Salem

and the region of Essex County will take on within the next century." Keenan sees a bright future promoting mixes of use containing industrial/commercial land use as the most viable option with respect to the historical land use of the site and the regulations places upon the site. Rep Keenan identifies that power generation is a good use of the site building from its geographic location along the water front and surrounding infrastructure which includes water for cooling, proximity to substations, and the connection to the regional electrical grid. He states, geographically the land which the plant encompasses has played a major role in the local and regional economies and needs to continue to play an important role.

The third conversation was held with the City of Salem's Harbor Master, Bill McHugh on January 19, 2012 at the Harbor Masters Station on Salem's waterfront. Harbor Master McHugh states, that the power plant owner Dominion has been a good neighbor for the city by providing jobs and taxes for the local economy and that the closure of the plant was forecasted because of its fuel source, coal, and the increasing environmental restrictions. He acknowledges the symbolic industrial presence of the power station brings to the community and waterfront of strength and economic might representing Salem's colorful past. It is understands that the power station and site have played an important role within the local economy and believes the closure of the power station will have a financial impact on the city due to the fact that the city had become highly dependent of the revenue collected from the power plant

A major concern of Mr. McHugh sees is that the Designated Port Area which encompasses the site and is the third deepest channel in the Commonwealth will remain underutilized; believing that the deep water channel has unrealized potential for both industrial and commercial development. A second concern is that any redevelopment will be hindered by the insufficient land access to the site, as well as the surrounding residential neighborhood leading the land to unrealized potential. Currently there is no supporting infrastructure for intermodal commercial traffic which would include either rail or close proximity to regional highways linking both water and land transportation networks.

Harbor Master McHugh believes that future development of the site needs to take full advantage of the protected water dependent industrial land use code that the state mandates for the site through the Designated Port Areas restrictions, and the deep water channel that abuts the property. "Great potential lies in the reuse of the site as marine industrial /educational use." He points to anchors within close geographic proximity that will spur the site's redevelopment. Related to industrial development is the existing connection to the 6.7 acre substation easement that currently exists on the site, the growing tourist economy in Salem, and the development of the liquefied natural gas network which lies off shore. This developing natural gas network includes the Algonquin Hubline LNG pipeline connection to both Weymouth and Beverly. Also the Neptune LNG pipeline and the Northeast Gateway LNG pipeline which delivers liquefied natural gas to the northeast from ocean going vessel via a buoy/mooring system. The availability of liquid natural gas will become a major regional resource.

Moreover, Harbor Master McHugh believes that the city of Salem became a predominant regional hub due to its maritime trade. Over the years the port has lost its historical heritage and is becoming a recreational harbor. While redevelopment of the last remaining water dependent industrial site needs to take advantage of the DPA regulations and the deep water channel, he believes that the best reuse for the remainder of the site would allow for multi-use industrial/commercial activities.

A consulting team led by Jacobs held three public meetings with local residents. Their final report, released in January 2012, included public recommendations and comments pertaining to the reuse and redevelopment of the site. In a public meeting held on June 30<sup>th</sup>, 201, two questions where handed to the attendees of the meeting of which there were over sixty responses.

The first question asked, "What are your priorities for the redevelopment of the Salem Harbor Power Station site?" Respondents were asked to rank each item in order of priority, choices for response were.

- Generating significant tax revenue to the city
- Cleaning the site and remediating any soil contamination

• Minimizing impacts from traffic or noise on the nearby residential neighborhoods

- Providing waterfront access for the public
- Other

In review of the citizens' responses, the number one priority seen by the citizens was to clean and remediating the site with attention given to the possibility of its soil contamination that is forecasted to exists on the site. This response coincides with the historical land use being used as a coal dumping area for the past one hundred and fifty years and the belief that coal is a dirty form of power generation. Reduced priorities were the concerns of city lost tax revenue when the plant is taken offline; while intermediate attention was given to increase the amount of waterfront access for the citizens of Salem. The lowest priority was given to minimizing impacts from traffic or noise in residential neighborhoods.

The second question asked the citizens to rank in order of their priorities, "What

use would you like to see in the future redevelopment efforts pertaining to the site?

Choices for response were.

- Highest market value
- Tourism related activities
- Natural gas power generation facility
- Renewable energy related
- An expanded port
- Marine facility
- An activity that will generate many jobs
- Residential
- Commercial
- Open space
- Other

The citizens responded that the highest priority for the site's reuse was to expand the port of Salem, develop renewable energy, and see continued marine facilities onsite. Lesser priorities were to promote tourism related activities and open space and commercial activities that generate jobs for the community. The Lowest priorities for the reuse of the site were natural gas power generation, highest market value, and residential land use.

In conclusion, the general public and professional stakeholders see the site's potential differently. The professionals perceive the Commonwealth's overriding mandates that the public may not know about. Secondly, the professional's concern for supporting the local economy is not matched by the overall public. The general public is focused on the environmental cleanup of the site and not the financial factors and mandates that surround the site. Interestingly, although there is an interest in finding the

"highest market value," it seems to be unconnected with a practical application of specific uses allowed onsite.

In development and property reuse, all things are never equal. Both the profession and public stakeholders seem to disagree on the financial outlook and visions for the site. While three educational meetings have been held with the general public, residents felt that for the past 60 years they have been negatively impacted by the location and their living proximity to the power plant. With the slated closure of the power station and redevelopment, less intensive land uses are most attractive to the general public.

### Chapter V

### Potential Developments

Analyzing the potential reuse for any site is a difficult proposition. Elected officials, planning professionals and the general public have different ideas and visions. Moreover, it seems that there are always underlying realities that shape the decision making process. A coherent strategy is to list these realities as the parameters of the decision-making process and then discuss the alternatives in light of the known possibilities. In this way, the doable is quickly separated from the unrealistic.

Every viable reuse plan can be further evaluated by its potential impacts as well as benefits for a community. In this study, I plan to analyze the potential reuses of the study area based upon the already discussed documentation and collected conversations to define what I believe will be the best reuse of the study site. I will present a list of parameters that focus on the limitations and feasibility of the decision making process before reviewing specific plans. Conditions are listed in no special order and they may not be mutually exclusive.

• As owners of the site, Dominion will still exercise control over it. Their intentions remain unknown. What the timing of Dominions decisions will be and what contributions Dominion will make towards the site's clean up remain unknown. The working assumption is, however, that Dominion will sell the site in the near future and that all the funds for site refurbishment will have to be found.

• Since the power station is a sixty-year old coal and oil burning power plant, which is being closed down due to its lack of profitability and environmental regulations, the new owners will not be able to continue power generation with coal as the fuel source. It will not be profitable to add the pollution-reducing technologies to meet recent environmental guidelines. The site will have to find either a new use and/or fuel source for power generation.

• Although the power plant is seen by the community as having no architectural importance, it cannot be torn down; because of assumed asbestos and lead paint, the building would have to be dismantled piecemeal. One estimate puts the cost of removal in the range of \$80-\$85 million dollars. (Jacobs 2012, p49) The assumed salvageable metals are worth approximately \$20-\$25 million dollars. (Jacobs 2012,p 51)

	Low Estimate	High Estimate
Site Remediation	\$5 Million	\$20 Million
Abatement	\$10 Million	\$10 Million
Demolition	\$70 Million	\$75 Million
Salvage Value	(-\$20 Million)	(-\$25 Million)
Total Cost of Demolition and	\$60 Million	\$85 Million
Remediation		

• Environmentally the site is believed to be contaminated. There have been a reported 16 reportable releases since 1987. Records show that all complaints have been dealt with and there are no outstanding issues. (Jacobs 2012, p48) However, it has been assumed and stated that the land under and near the coal piles and oil-tank farm will need extensive remediation. Locals estimate the cost at between five and twenty million dollars.

• The Commonwealth has a vested interest in the site and will place restrictions on any redevelopment. As a Designated Port Area (DPA), restrictions dictate that developments will promote water dependent industrial uses. The site also falls under Chapter 91 jurisdiction which mandates public uses and access to former tidelands.

• There are public and private easements, restrictions, and conditions. National Grid holds a ten-acre easement housing substations and connections to the regional power grid. In addition, there is a ship channel that includes a large turning basin, which falls under federal control.

• The power plant has limited landside access. The site is serviced by Derby and Webb streets, both are narrow residential streets. Moreover, accesses to major roadways such as Route 128 or Route 1 are difficult. There are no longer any rail connections from the site. The City of Salem has no plans to build major interstate connections. In sum, the greatest access to the site will remain from the water.

• The City of Salem is in difficult financial straits and needs this site redeveloped to generate revenue for the city. Dominion is the city's largest tax generator and a major employer. Both the jobs and the money have to be replaced by this redevelopment. Also the City has inadequate financial resources to undertake significant redevelopment on its own.

With these conditions in mind, the discussion will turn to suggested

redevelopments. One option that many have suggested is that the site be redeveloped as a

recreational open space area. No one argues with the fact that the study site would make a magnificent waterfront park and would create open space allowing residents and visitors access to the waterfront. A park would elevate the human relationships with the water and conform to Massachusetts Chapter 91 approved land uses. However, there are difficulties with this type of recreational development. Open space would not generate the comparable tax revenue which is produced by the current power station. Second, the DPA restrictions do not allow for open space recreational areas. Finally, the environmental remediation would be too expensive to undertake without the promise of future funds.

Another suggested reuse is that waterfront housing would create an attractive living environment with close proximity to the city center and allow for sweeping views of Salem Harbor. Residential housing would provide sustainable development and add to the city's tax base. Moreover, housing is usually considered the highest best land use. However, residential units are not allowed under DPA restrictions nor do they adhere to Chapter 91 requirements. Finally a large residential unit would include a significant increase in traffic on Derby and Webb Streets as well as add stress to the surrounding road network. Consequentially, residential housing is not a viable development option.

A third possibility is a retail and commercial development. Today, Salem's retail and commercial zones are within the Central Business District and in the Pickering Wharf District. Salem's retail businesses consist of 350 retail establishments occupying over 800,000 square feet of ground floor space. (Jacobs, 2012, p64) Commercial land provides a stream on tax revenue for the city and generates many jobs within the local economy. However, Salem's commercial core pales with the malls and shopping districts

in abutting towns and too frequently has empty storefronts. To become a retail center, Salem would have to reverse fifty years of commercial decline.

Moreover, commercial uses are not viable for other reasons as well. Currently, the DPA regulations allow for up to 25% of the restricted land to operate as supporting commercial operation to the water dependent industrial land use. Retail areas would face permitting challenges under Chapter 91 as well. In addition, a major retail development would simply overwhelm the restricted road network.

While the three proposed land uses are not compatible for the reasons discussed above, there are viable types of redevelopment that utilize presently existing socioeconomic anchors within Salem. In the previous chapter, I discussed that planners often base their plans upon a city's geography, heritage and existing economic strengths.

The Commonwealth employs niche developments for the eleven Designated Port Areas. Each DPA site has a niche conducting diverse water-dependent industrial activities tied to the natural geography, historical land use, existing community anchors, and vested infrastructure. Within the Commonwealth there are three parallel ports to Salem where DPA restrictions protect the marine dependent industrial activities contribute to historic economic niches. First, the port of Gloucester, one of the oldest fishing ports in the nation and located on Cape Ann, is the regional hub and leader in the fishing industry. (Jacobs, 2012, p45) Gloucester's DPA area has access to both highway and rail, creating a multi-dimensional transportation access to the waterfront. The State Fish Pier in Gloucester is one traffic light away from Route 128 and the interstate road

network. Additionally, their DPA has both the fish processing plants and marine repair services to support the fishing industry.

Second, the Port of New Bedford, located in south eastern Massachusetts along Buzzards Bay, is the nation's top commercial fishing port (http://www.worldportsource.com/ports/NewBedford.php). In addition, the port of New Bedford has diversified by becoming an active cargo facility receiving both international and domestic commerce. Furthermore, the port area is within close proximity to both railroad and highway transportation. A third example is the port of Fall River located along side Narragansett Bay in Southeastern Massachusetts. Fall River first developed as a textile mill city. Today, the port has become the second busiest cargo port in the Bay State. (http://www.worldportsource.com/ports/Port\_of\_Fall\_Rive.php) In addition, Fall River is home to Battle Ship Cove with a large collection of World War II Navy vessels. (Jacobs, 2012, p45) The harbor and DPA sites are connected to both railroad and highway transportation infrastructure. The port of Boston leads the region in cargo handling and the importing of cars and fuel among other commodities and marine services. Also, Boston has become a part of the regional and international cruise ship industry with its facilities at the Black Falcon Terminal. Finally, the Charlestown Navy Yard has been integrated into the National Park Service and berths the USS Constitution and other naval vessels.

Port:	Salem (Dominion)	Gloucester	Boston	Quincy	Fall River	New Bedford
Protected Harbor	Yes	Yes	Yes	Yes	Yes	Yes
Channel Depth	32'	16'-19'	40'-45'	32'	40'	30'
<b>Exclusive Use</b>	Yes	No	No	No	No	Yes
<b>Berth Length</b>	580'	1,400'	1,800'	800'	620'	1,600
Land Area	45 acres	7.8 acres	14-17	111	7 acres	10+
			acres	acres		acres
Rail/Highway	Rail: No	Rail: Yes	Rail: Yes	Rail: Yes	Rail: Yes	Rail: Yes
Access	Hwy: No	Hwy: Yes	Hwy: Yes	Hwy: No	Hwy: Yes	Hwy: Yes

The DPA which is most like Salem, however, is Quincy. Quincy's overarching niche is twofold: the first Fore River Shipyard and second, electric power generation based upon coal and oil. The shipyard closed and the plans for maritime related industries, a maritime museum and recreational boating, have failed to reverse the shipyard's fortunes. Across the river from the shipyard, the power plant has proven to be successful. The plant has been converted from coal and oil to natural gas with nearby access to major gas pipelines.

In conclusion, the Commonwealth's DPA harbors protect historically significant industries such as commercial fishing, handling of cargo, and providing the infrastructure for electrical power. Most ports have direct access to highway networks and rail connections. Moreover, the Commonwealth has also tied the DPA activities to locally important socio-economic anchors.

Turning to Salem, the situation is different. There is no fishing industry to maintain or revive. Likewise, textile and other industries have passed into history. Power generation is the only major industry in the harbor. The only other viable anchor is tourism based upon the Witchcraft Trials of 1692 and the maritime heritage of the Federalist Era. However, Salem offers the promise of increasing maritime related tourism and of continuing power generation. Any industrial activities that would depend upon land-based transportation infrastructure seem doomed, as do factories tied to major industries. While 62.1 acres present a rather large parcel for development, the site is certainly not big enough to support a major industrial expansion. Finally, any redevelopment will abut residential neighborhoods, which precludes many types of facilities.

Based upon the patterns of historic land use documentation and the conversations that I have had, I feel that the best way to remediate the site, conform to Commonwealth mandates, and contribute to Salem's economy would be to divide the site between power generation and marine related activities. Over the past decade natural gas combined cycle power plants have been developed replacing coal fired power stations. They accounting for 88% of new generation stations within the United States. Environmentally natural gas combined cycle using modern generation technology releases less than half of the carbon dioxide per megawatt hour as a coal power plant. Economically natural gas power generation has seen growth due to favorable technological, cost, environmental, and power market characteristics. Three positive attributes of natural gas combined cycle power plants are first, they are efficient power sources. Second, natural gas combined cycle plants can be build and put online quickly and less expensive compared to coal power plants. Natural gas combined cycle power plants can be built in roughly 2-3 year. At the expense of \$1,200 dollars per kilowatt hour compared to coal fired power stations that take 5-6 year of construction time and cost \$3,900 per kilowatt hour. Third, natural

gas combined cycle is suitable for small scale power generation facilities building at unit sizes of 100 megawatts per unit and larger (Kaplan, 2010). The existing power plant could be converted to burn natural gas or replaced with a modern natural gas combined cycle power station taking advantage of proximity to the development of offshore natural gas pipelines. The Salem Power Station building currently produces power and much of its needed surrounding infrastructure is already in place.

The current power plant is large and is forecasted to be expensive to dismantle. Any part of the building if passable for reuse should be used and repurposed. Perhaps in the future as more sustainable energy sources come on line and if economic times are better, the plant can be torn down. But for the foreseeable future, power generation in the existing structure is viable.

The critical key for success is the accessibility of natural gas through existing nearby pipelines. The HubLine opened in 2004 and extends 29 miles from Fore River Power Station through Massachusetts Bay and into Beverly Harbor. The Northeast Gateway Deepwater Port has been developed as an extension from the HubLine running 16 miles offshore. This pipe line allows liquefied natural-gas cargo ships to off load at sea without having to come into port to off load. This offshore platform was developed to avoid the highly explosive liquefied natural gas tankers from entering ports which is seen as a hazard and threat to the public safety. A third natural gas pipe line, the Maritimes & Northeast, extends from Nova Scotia, Canada, to the Massachusetts coast. All three off shore pipe lines connect to the North American pipeline in Dracut, Massachusetts. Salem's power plant is two miles away from this newly developed natural gas network.

An extension connecting the site to the gas network has been estimated to cost one million dollars. (Jacobs, p53)

Moreover, the existing National Grid substations on a ten-acre parcel and the other easement could continue. The presence of the existing substation lends itself to future power generation on the site. In addition the proximity of the substation easement to the waterfront will provide a connection for future off shore wind energy development.

From the City's perspective, this land use would continue to provide employment and generate tax revenue. It would not make additional demands on the transportation infrastructure and it would decrease existing pollution levels by converting from coal to gas. In addition, the electrical power would be cheaper and more competitive with other regional power plants. With increasing dependence and growth of electric consumption, the plant's usefulness is assured for the near future. With other marine located power generation, the site can continue to provide energy indefinitely.

This conversion, however, will not require the entire site. There will be no need for a deep-water channel or turning basin. There will be no coal piles or oil-tank farms. A few ancillary buildings will become obsolete. Perhaps twenty acres or more on the south side of the site will become developable. Any development will, of course, have to be marine related and publically oriented. Moreover, this development should complement Salem's community anchors one of which tourism. Salem is one of the most historically rich communities in the Commonwealth. Salem's origin and history derive from its relationship with the water. This maritime history is displayed at the National Parks Service's Derby Wharf, the Peabody Essex Museum, and through the federalist

architectural woven throughout Salem. Salem has also developed a tourism industry centered on the 17<sup>th</sup> century Witch Trials. Salem labeled itself the "Witch City," making it the epicenter for all Halloween celebrations which draws thousands of visitors from around the world. In addition, Salem is proud of its maritime history, architectural treasures, and association with Nathanial Hawthorne. Salem's tourism involves these other types of tourism, which could be further developed to help turn Salem from a seasonal to a year-round tourist destination. In large measure, Salem's economy now revolves around tourism which is the only growth industry in the foreseeable future.

As others have suggested, I feel that the development of a cruise ship terminal, along with marine tourism, and recreational boating would be an ideal use for the southern portion of the site currently where the coal pile and oil tank farm stand. Cruise ship tourism has grown into a major segment of the tourism industry. Reported by the cruise industry news indicates the Canada/New England cruise region is the 12<sup>th</sup> largest within the industry and is forecasted to service 277,000 passengers with 33 ships for the 2012 season (www.cruiseindustrynews.com). Cruising offers convenience, luxury, and safety which millions of tourists find appealing. International ships sailing to international destinations immediately come to mind; for example, cruise ships leaving Boston's Black Falcon Terminal for Caribbean ports. However, the growing markets for regional cruises along the Atlantic coast from New York to Nova Scotia offer a range of destinations. Smaller tourist port of calls such as Newport, RI, and Bar Harbor, ME, are already cruise destinations. In this growing market, Salem offers unique opportunities because of its heritage and location to regional tourist attractions with its unique Halloween tourism.

The study site has a federal deep-water channel and turning basin. Small cruise ships would replace coal ships. A new building and site remediation would be required. Mediation of the existing brownfield site is reasonable estimated at five to twenty million dollars. A new structure would provide tourist services. Tourists from the ships could walk or ride the short distance to downtown Salem.

This terminal facility could be further developed for local maritime tourism. Already, there is a ferry terminal for service to and from Boston. In addition there have been whale watches, deep sea fishing, and coastal cruises leaving from Pickering Wharf. Their success has fluctuated over the years and all have suffered because of the lack of services on Pickering Wharf, which is a retail enterprise with a many recreational boats moored alongside. A designated facility for maritime tourism would be a natural fit with the cruise ship terminal.

There is a third maritime use that should be proposed for this site. The Harbor Master has noted that Salem lacks a marine service area for recreational boaters. There are no waste services or fueling stations within Salem Harbor. Likewise none of the local marinas can perform major repairs. Development of recreational boating services would bolster Salem Harbor's appeal for recreational boaters. The addition and development of a fuel station, waste station, temporary moorings and docking spaces with access to fresh water would attract visiting recreational boaters. This use is complementary and would bolster maritime tourism.

These developments would impact the transportation network. The site would need additional parking. However, this will not be a major impact because these

activities will not attract crowds and there is sufficient land for development. Additional parking lots will be required as well as traffic remediation in the adjoining neighborhoods.

In conclusion the best redevelopment for the Salem Power Plant site is twofold. One is to convert the production of electrical energy from coal to natural gas. The other is to use part of the existing parcel for maritime tourism. This would include a cruise ship terminal for ships involved in regional cruising, facilities for boats to provide diverse excursions, and services for recreational boating. This development would be the most sustainable in that it utilizes existing structures, increases the efficiencies of production, while reducing pollution, and improves the city's tourism infrastructure, while supporting the local economy with a minimal impact on traffic and residential neighborhoods.

#### Chapter VI

# Conclusion

The closure and redevelopment of the Salem Power Plant presents a historic redevelopment opportunity. This will be a very political and complex challenge that will certainly impact Salem for generations.

I feel that the best reuse will be to divide the site into several parcels each with a different appropriate land use. The primary use of the site will be to continue electrical power generation fueled by natural gas. The reasons for this are many. One is that the building itself cannot be demolished because of its environmentally dangerous conditions and because dismantling the building piecemeal will be too expensive. Another reason is that by keeping the power station active, the plant will continue to be a source of employment and contribute to Salem's economy. A power plant would also meet DPA mandates and fall under Chapter 91 guidelines.

From a practical perspective, the conversion from coal and oil to natural gas is very practical. The region has access to an extensive natural gas pipeline system. Natural gas would be a cleaner and cheaper fuel that would decrease costs to the customer and decrease pollution levels.

Recently, the Footprint Company announced their intentions to buy the site from Dominion and begin just such a conversion. I think that the city should welcome this gratefully.

However, this redevelopment would also miss several opportunities for the city to increase its tourism industry and to help promote a new vision for the city. The point is

that the proposed conversion will need substantially less acreage and not utilize the shipping channel or turning basin. In addition, the plan will not contribute to the working waterfront or promote marine industries. These types of activities are essential to the DPA concepts and Commonwealth legislation. Moreover, the power plant will not provide additional public access to the waterfront as Chapter 91 regulations require.

I would think that the Footprint Company would realize the potential loss of income. Obviously, part of the plant's conversion will require the elimination of the coal dump, the dismantling of the oil tank farm, and the demolition of a few ancillary buildings, such as the conveyor belt building. Certainly the EPA will require that the remaining brownfield be remediated, which has been estimated to cost between five and twenty million dollars. Perhaps, the Footprint Company would like to recoup some of their investment and eventually turn a profit by leasing unused sections of their property for appropriate maritime-related uses.

One such use would be a cruise ship terminal. Cruise ships could dock at the existing facilities using the ship channel and turning basin. Tourists from the ship would bolster the local tourist economy and raise Salem's visibility. This type of tourism is increasingly developing along the Atlantic seaboard. This terminal does not need to be an architecturally significant facility or require much municipal infrastructure. There are a few trolley companies that could provide ship-bound tourists easy access to the downtown without very much strain on the existing road network. The Footprint Company could make money by docking and landing fees. The city would realize funds through increased commercial activities and taxes.

There are two additional maritime uses that could also use the site appropriately. One would be additional tourist related maritime activities. Salem has tried and somewhat succeeded with deep-sea fishing, whale watches, and coastal tours as well as a ferry service to Boston. The ferry service is establishing itself with a new pier and additional parking. The other services would need a serviceable location and infrastructural support. A terminal and some additional parking would underwrite this activity. Building on what already exist, these facilities could be built reasonably. Secondly, Salem and the North Shore need marine services for recreational boating. Salem's harbor is full of recreational boats and coastal cruising has increased in popularity. However, Salem has no significant resources to offer recreational boaters. There is no pump-out station, fuel station, marine repair services, or enough moorings. A marina located on the site could provide these services. These activities would bolster Salem's economy by drawing more tourists to Salem and increasing the variety of economic activities in the city.

Therefore, I feel that this multi-use solution would be the best redevelopment for the site. Beyond the immediacy of this planning problem, this redevelopment project will be a historic moment for Salem. This is an opportunity for Salem to think about its future and envision a new city. On another level, there is the opportunity to plan for Salem without a power plant. Certainly there are movements toward sustainable energy production. Several communities are starting wind farms. Other communities are exploring wave generated power production or methods of solar power generation. However, that is a generation away. This conversion to natural gas buys time and will allow for funds to be set aside for dismantling the building. Salem should be part of the

region's energy production and power grid long into the future. This conversion should provide a twenty-year time period to be profitable and to prepare for power generation based upon alternate energy sources in a new facility.

Another part of Salem's future lies with tourism for the foreseeable future. Salem has made several transitions through its history. Salem was a fishing community, a trading town, an international port, an industrial center, and now a tourist destination. The problems with Salem's tourism are that it is too one dimensional and too seasonal. Witchcraft has great appeal, but not enough to base the city's economy. One solution will be to develop additional types of tourism that spread over longer portions of the calendar year. Marine oriented tourism has great potential. It builds upon Salem's history and existing tourist infrastructure. Salem's future will be tied to maritime tourism and recreation, along the waterfront. This proposed plan would enhance it.

Subsequently, this problem, presented by the closing of the Salem Power Plant, is an opportunity, to transform Salem into a viable tourism destination, to promote Salem's economy, and to solve this difficult development problem.

## Glossary

Berth: the place where a ship is anchored or docked at rest.

Brownfield: An abandon, idled or underutilized industrial or commercial facilities where expansion or redevelopment is complicated by real or perceived environmental conditions.

Channel: the deeper part of a waterway.

Chapter 91: Massachusetts General Law Chapter 91 protects the public's interest in waterways of the Commonwealth. It ensures that public rights to fish, fowl and navigate are not unreasonably restricted. The Chapter 91 line is represented by the historical high water mark before human alterations with the shoreline.

Designated Port Area (DPA): Are both land and waterways that have been identified by the commonwealth of Massachusetts to promote and protect marine industrial activities. These identified areas have particular physical and operational features important for commercial fishing, shipping, and other vessel-related marine commercial activities, and/or for manufacturing, processing, and production activities that require marine transportation or need large volumes of water for withdrawal or discharge.

ISO New England: The Independent Systems Operator of New England is the regions electrical grid operator that is responsible for the day-to-day reliable operation of the bulk power generation and transmission system. The ISO three responsibilities are to oversee and ensure the fair administration of the region's wholesale electricity markets, managing comprehensive and planning of the electrical grid.

Portfield: land described as a brownfield that abuts a harbor and or ocean.

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