

## 4.4 Socioeconomic Impacts

This section addresses the socioeconomic impacts of the construction of STP 3 & 4. Subsection 4.4.1 describes and presents an assessment of the physical impacts of construction. Subsection 4.4.2 describes the impacts of construction to the community in the areas of demography, economy, taxes, land use, transportation, recreational resources and aesthetics, housing, and public services. Subsection 4.4.3 assesses the construction of STP 3 & 4 with regard to disproportionate adverse impacts to minority and low income groups.

### 4.4.1 Physical Impacts

In accordance with 10 CFR 51.45(d), the COL applicant is required to submit, in the Environmental Report (ER), information needed for evaluating socioeconomic impacts of construction. Also, consistent with NUREG-1555 requirements, “impacts resulting from plant construction, transmission corridors and access roads, other offsite facilities, and project-related transportation of goods and materials” as applicable to the STP site are discussed in this section. In accordance with NUREG-1555, “Construction-related activities are those that occur solely as a result of plant construction.” Construction activities can cause temporary and localized physical impacts such as noise, vehicle exhaust, and dust. Preconstruction and construction activities for STP 3 & 4 are discussed in Section 3.9S. Vibration and shock impacts are not anticipated because of control of blasting and other shock-producing activities. Mitigative measures for any potential noise and vibration impacts from construction activities are addressed in Subsection 3.9S.2.1. This section addresses potential construction impacts that may affect people, buildings, and roads.

The STP 3 & 4 footprint is within an existing power plant facility, which includes land developed for industrial use, farmland, and undeveloped natural and man-made wetlands. The existing site facilities were sited to enable functional and safe operation of a nuclear power plant compatible with the natural environment of the surrounding site and community. Figure 3.9S-1 depicts the construction utilization plan, along with plant access roads, heavy haul roads, and other construction planning features. Impacts on existing STP facilities from constructing STP 3 & 4 would be small and incremental relative to those associated with their normal operation.

The preconstruction/construction activities associated with this project would be performed in the following sequence:

- Preconstruction planning and exploration activities that include such site activities as soil boring/sampling, installation of and monitoring wells or additional geophysical borings as allowed by 10 CFR 50.10(b)(1) and the removal and/or relocation of existing facilities in the new plant footprint.
- Site preparation activities, including installation of temporary facilities, utilities, unloading/docking facilities, installation of a slurry wall, and excavation of the power block.

- Construction activities, including the major power plant construction activities included in the COL (Section 3.9S).

#### 4.4.1.1 Groups or Physical Features Vulnerable to Physical Impacts

##### 4.4.1.1.1 People

According to 2005 census data, approximately 5170 people live within 10 miles of STP (Table 2.5-2). Population distribution details are given in Subsection 2.5.1. The nearest full-time residence is approximately 1.5 miles (west-southwest) from the Exclusion Area Boundary (EAB). There are 10 residences within a 5-mile radius of STP 1 & 2 (Reference 4.4-1). The Lower Colorado River Authority (LCRA) Park (FM 521 River Park) is approximately 6 miles east of the STP site. Road systems in the vicinity of the site are discussed in Subsection 2.2.1. The vicinity is predominantly rural and characterized by farmland with occasional wooded tracts. There are three offsite industrial facilities within the 10-mile radius.

People who could be vulnerable to noise, fugitive dust, and gaseous emissions resulting from construction activities are listed below in order of most vulnerable to least vulnerable:

- (1) Construction workers and personnel working on site
- (2) People working or living immediately adjacent to the site
- (3) Transient populations (i.e., temporary employees, recreational visitors, tourists)

Construction workers would have required training and would don personal protective equipment to minimize the risk of potentially harmful exposures. As presented in Subsection 3.9S.2.1, procedures related to mitigating noise and vibration impacts from construction activities may include measures such as restricting noise and vibration generating activities to daylight hours, prohibiting construction traffic from driving on specific roads and through specific neighborhoods, use of less vibration producing equipment and/or methods (e.g., dampeners, staggering activities), and verifying that noise control equipment on vehicles and equipment is in proper working order. Notifications to regulatory agencies (e.g., Texas Commission on Environmental Quality [TCEQ]) and nearby residents regarding atypical noise and vibration events (e.g., pile driving, steam/air blows) may also be performed.

Emergency first-aid care would be available at the construction site, and regular health and safety monitoring would be conducted during construction. Also, in an effort to minimize traffic congestion and any potential accidents resulting from STP 3 & 4 construction-related activities, the construction labor force would use the existing south extension from Farm-to-Market (FM) 521 to access STP 3 & 4 (see Figure 3.9S-1). The construction labor force would avoid the existing East Site Access Road to minimize disruption of traffic patterns to STP 1 & 2 (Subsection 3.9S.3.2).

People working on site or living near the STP site would not experience any physical impacts greater than those that would be considered an annoyance or nuisance. In the event that atypical or noisy construction activities would be necessary, public announcements or notifications may be provided. These construction activities would be performed in compliance with local, state, and federal regulations, and site-specific permit conditions.

Fugitive dust and odors could be generated as a result of normal construction activities. Odors could result from exhaust emissions and would dissipate on site.

Mitigation measures to minimize fugitive and vehicular emissions (including paving disturbed areas, water suppression, covering truck loads and debris stockpiles, reduced material handling, limiting vehicle speed, and visual inspection of emission control equipment) would be instituted. Additional mitigation control measures would address any nuisance issues case by case.

All equipment would be serviced regularly and operated in accordance with local, state, and federal emission requirements discussed in detail in Subsection 4.4.1.3. Given the fugitive/exhaust emission control measures discussed above, it is anticipated that no discernible impact on the local air quality would be realized.

As discussed in Subsections 2.2.2 and 4.1.2, no new transmission corridors would be constructed for STP 3 & 4; however, some upgrading of transmission line conductors and replacement of towers would be necessary in the STP to Hillje transmission line corridor. This kind of work normally involves a crew with several flatbed “conductor trucks” (carrying large cable spools) and large bucket trucks. There would be a small impact associated with noise/movement of construction equipment and workers involved in changing out conductors.

Any effects of physical impacts to people from construction activities would be SMALL and would not warrant mitigation other than that discussed above.

#### **4.4.1.1.2 Buildings**

Construction activities would not impact any offsite buildings because of distance to any such structures. The nearest full-time residence is approximately 1.5 miles from the EAB (Figure 2.1-1). In the event that pile-driving is necessary, the building(s) most vulnerable to shock and vibration would be those within the STP site boundary. Onsite buildings have been constructed to safely withstand possible impacts, including shock and vibration, from construction activities associated with the proposed activity.

Table 3.9S-2 presents data on attenuated noise levels expected from operation of construction equipment. Applying the Inverse-Square Law to the highest level listed in Table 3.9S-2 (84 dBA) at 400 feet), a decrease in noise levels of over 20 decibels would be expected at the EAB, with even greater decreases occurring at the site boundary.

Although there are cultural resources located within the 10-mile radius of the site (see Subsection 2.5.3), none are located adjacent to the STP site. The closest historical

landmark is the St. Francis Catholic Church, which is located 6 miles to the east of the site. No impacts due to vibration or shocks from construction activities would be expected.

Any effects of physical impacts to buildings from construction activities would be SMALL and would not warrant mitigation.

#### 4.4.1.1.3 Transportation Routes

The transportation network in Matagorda and Brazoria counties is rural, fed by traffic from urban roadways. Material transportation routes (haul routes) would be selected based on equipment accessibility, existing traffic patterns, and noise restrictions, logistics, distance, and costs. Methods to mitigate potential impacts include: (1) avoiding routes that could adversely affect sensitive areas (e.g., housing, hospitals, schools, retirement communities, businesses) to the extent possible, and (2) restricting activities and delivery times to daylight hours.

As discussed in Subsection 4.4.2.2.4, it has been determined that construction workers would have a MODERATE to LARGE impact on the two-lane roadways in Matagorda County, particularly FM 521 and its feeder roads. Mitigation may be necessary to accommodate the additional vehicles on Matagorda County roads, particularly FM 521.

Mitigation measures would be included in a construction management traffic plan developed before the start of construction. Potential mitigation measures could include installing turn lanes at the construction entrance, establishing a centralized parking area away from the site and shuttling construction workers to the site in buses or vans, encouraging carpools, and staggering construction shifts so they do not coincide with operational shifts. STPNOC could also establish a shuttle service from the Bay City area, where many of the construction labor force is likely to reside. The operations work force would continue to enter the plant at the current entrance on FM 521 (Subsection 3.9S.3.2).

No new public roads would be required as a result of construction activities. Public roads may be altered (e.g., widened, turn lanes installed) as a result of construction activities. Minor road repairs and improvements in the vicinity of STP (e.g., patching cracks and potholes, adding turn lanes, reinforcing soft shoulders) may be necessary to enable equipment accessibility and reduce safety risks. Any damage to public roads, markings, or signs caused by construction activities would be repaired to preexisting conditions or better. The construction site exit onto FM 521 would be marked clearly with signs maintained such that they are clear of debris and markings are visible.

A heavy haul route from the barge facility on the Colorado River would support construction activities (Figure 3.9S-1). This road would be private and fully contained within the existing site boundary. If barge shipments of Nuclear Steam Supply System heavy components are consistent with STP 1 & 2 levels (approximately 10 shipments), impacts on river traffic would be minimal (Reference 4.4-2). Refurbishment of the rail spur would result in minimal impacts.

As stated above, the impact construction workers would have on the two-lane roadways in Matagorda County, particularly FM 521 and feeder roads, would be a MODERATE to LARGE impact and mitigation would be required. The effects of physical impacts from other transportation routes would be SMALL and would not warrant mitigation.

#### 4.4.1.2 Predicted Noise Levels

As presented in Section 2.2, Matagorda and Brazoria counties are predominantly rural and characterized by farmland with occasional wooded tracts. Areas that are subject to farming are prone to seasonal noise-related events such as planting and harvesting. Wooded areas provide natural noise control to reduce noise propagation. Table 4.4.1 identifies expected noise levels in the immediate vicinity (less than 10 feet) of a variety of construction tools that might be used (Reference 4.4-3).

Noise level attenuates with distance. A 3-decibel (dBA) decrease is perceived as roughly halving loudness; a 3 dBA increase doubles the loudness. The noise from an earthmover can be as high as 94 dBA from 10 feet away, and 82 dBA from 70 feet away. A crane lifting a load can make 96 dBA of noise; when idling, it may make less than 80 dBA. Moderate auto traffic at a distance of 100 feet (30 m) rates about 50 dBA. To a driver with a car window open or a pedestrian on the sidewalk, the same traffic rates about 70 dBA (Reference 4.4-3); that is, it sounds four times louder. The level of normal conversation is about 50 to 60 dBA.

Section 3.9S discusses noise levels during construction, which could be as high as 113 dBA in the immediate area of the equipment listed. Construction workers would use hearing protection in accordance with good construction practices. Noise attenuates quickly with distance (see Table 3.9S-2) so that the loudest construction noise would register 55–85 dBA 400 feet from the source, and would continue to attenuate with distance.

The EAB is greater than 1,000 feet in all directions from the STP 3 & 4 footprint. No major roads, public buildings, or residences are located within the exclusion area. Attenuation of noise, through distance, associated with STP 3 & 4 construction activities is expected to result in noise levels less than 65 dBA to the EAB. As reported in NUREG-1437 (Reference 4.4-4), and referenced in NUREG-1555 (Reference 4.4-5), noise levels below 65 dBA are considered of small significance.

The following controls or similar ones could be incorporated into activity planning to further minimize noise and associated impacts:

- Regularly inspecting and maintaining equipment to include noise aspects (e.g., mufflers)
- Restricting noise-related activities (e.g., pile-driving) to daylight hours
- Restricting delivery times to daylight hours

Impacts from the noise of construction activities would be SMALL and temporary and would not require mitigation.

#### 4.4.1.3 Air Quality

Matagorda and Brazoria Counties are part of the Metropolitan Houston-Galveston Intrastate Air Quality Control Region (AQCR) (Reference 4.4-6). All areas within the Metropolitan Houston-Galveston AQCR are classified as achieving attainment with the National Ambient Air Quality Standards (NAAQS), with the exception of the Houston-Galveston-Brazoria 8-Hour Ozone Non-attainment Area (Reference 4.4-7). A discussion of current and projected regional air quality conditions is contained in Subsection 2.7.2.

The NAAQS define ambient concentration criteria for sulfur dioxide (SO<sub>2</sub>), particulate matter with aerodynamic diameters of 10 microns or less (PM<sub>10</sub>), particulate matter with aerodynamic diameters of 2.5 microns or less (PM<sub>2.5</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), and lead (Pb). These pollutants are generally referred to as “criteria pollutants.” Areas of the United States having air quality as good as, or better than, the NAAQS are designated by the U.S. Environmental Protection Agency (EPA) as attainment areas. Areas having air quality that is worse than the NAAQS are designated by EPA as non-attainment areas (Reference 4.4-8). The Houston-Galveston-Brazoria area holds non-attainment status for ground-level ozone under the 8-hour standard, which became effective June 15, 2005. Counties affected under this status are Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller. The region was classified as being in “moderate” non-attainment of the 8-hour standard and was given a maximum attainment date of June 15, 2010.

Temporary and minor impacts to local ambient air quality could occur as a result of normal construction activities. Fugitive dust and fine particulate matter emissions—including those less than 10 microns (PM<sub>10</sub>) in size, would be generated during earth-moving and material-handling activities. Construction equipment and offsite vehicles used for hauling debris, equipment, and supplies also produce emissions. The pollutants of primary concern include PM<sub>10</sub> fugitive dust, reactive organic gases, oxides of nitrogen, carbon monoxide, and, to a lesser extent, sulfur dioxides. Variables affecting construction emissions (e.g. type of construction vehicles, timing and phasing of construction activities, and haul routes) cannot be accurately determined until the project is initiated. Actual construction-related emissions cannot be effectively quantified before the project begins. General estimates are available and the impacts on air quality can be minimized by compliance with all federal, state, and local regulations that govern construction activities and emissions from construction vehicles.

Specific mitigation measures to control fugitive dust would be identified in the Construction Environmental Controls Plan, which implements TCEQ requirements and would be prepared before project construction. Mitigation measures could include any or all of the following:

- Stabilize construction roads and spoil piles

- Limit speeds on unpaved construction roads
- Periodically water unpaved construction roads to control dust
- Implement use of soil adhesives (i.e., soil cement) to stabilize loose dirt surfaces
- Perform housekeeping (e.g., remove dirt spilled onto paved roads)
- Cover haul trucks when loaded or unloaded
- Minimize material handling (e.g., drop heights, double-handling)
- Cease grading and excavation activities during high winds and during extreme air pollution episodes
- Phase grading to minimize the area of disturbed soils
- Revegetate road medians and slopes

While emissions from construction activities and equipment would be unavoidable, some methods, such as those mentioned above, could minimize impacts to local air quality and the nuisance impacts to the public in proximity to the project. To this effect, the Construction Environmental Controls Plan would contain environmental management controls strategy including:

- Phase construction to minimize daily emissions
- Performance of proper maintenance of construction vehicles to maximize efficiency and minimize emissions

Given the control measures discussed above, impacts to air quality from construction would be SMALL and would not warrant mitigation.

#### **4.4.2 Social and Economic Impacts**

This section evaluates the demographic, economic, infrastructure, and community impacts to the region as a result of constructing STP 3 & 4. The evaluation assesses impacts of construction-related activities and of the construction labor force on the region.

The assumed construction schedule projects a construction start date in 2009, and commercial operation dates of 2015 and 2016 for STP 3 & 4, respectively. STPNOC anticipates employing 5950 construction workers at peak construction activity with a 79% to 21% proportion of manual labor to non-manual labor (Table 3.10-2). Figure 3.10-1 illustrates the distribution of the construction labor force over the anticipated construction period.

Major factors in determining socioeconomic impacts are the number of workers that relocate into the area and where they settle. In determining a methodology to use to determine this information for construction of STP 3 & 4, STPNOC evaluated related

NRC studies for other sites: Malhotra (Reference 4.4-9), Mountain West (References 4.4-10, 4.4-11, 4.4-12, 4.4-13, and 4.4-14), and the Generic Environmental Impact Statement (GEIS) for License Renewal (References 4.4-15 and 4.4-16). The Malhotra study was based on 28 surveys of 49,000 workers during construction at 13 sites. The Mountain West study was based on post-licensing data from 12 sites. The GEIS study was prepared in support of rulemaking for license renewal and analyzed impacts of constructing and operating the existing fleet and used several case studies in its socioeconomic analysis.

STPNOC has determined that changes in the industry since publication of the studies may call into question the applicability of study results to future plant construction. Principal among these changes are new licensing procedures (10 CFR 52) and improved construction technologies such as prefabrication, preassembly, modularization, and offsite assembly, which may affect the number of workers and skills mix needed. The changes dictate caution in applying the results of the studies to STP 3 & 4. However, the studies provide insights from at least 30 sites representing a broad sampling of socioeconomic conditions and therefore warrant consideration. STPNOC has used study input, together with site-specific information, in predicting worker relocations and settlement patterns.

The studies showed that usually less than 50% of the labor force relocated to work on the job sites, with sites located in denser population areas having the least in-migration. The remaining workers already lived within daily commuting distance. STPNOC chose to use the 50% value as a reasonable estimate to avoid underestimating impacts caused by in-migration and because the STP site is located in a less-dense population area. Malhotra evaluated settlement patterns within a specified distance to sites (e.g., highway miles or radius), whereas Mountain West and the GEIS focused on geopolitical boundaries (e.g., counties). STPNOC evaluated both approaches and found them to reasonably approximate the residential locations of the workers at STP 1 & 2. For this reason, STPNOC used the residential locations of the existing workers to predict the settlement patterns for the new workers. Based on these data and considerations, STPNOC has made the assumptions presented in Table 4.4-2 for construction labor force migration and residential distribution patterns at STP.

Please note the following:

- (1) For all socioeconomic analyses, a “mover” is defined by NRC (Reference 4.4-9) as a worker who changes residence to work at the construction site. Workers who do not change residence to work at the site are classified as “nonmovers.” This definition is sufficiently broad to include the small percentage who would move from one place within the 50-mile radius to another place within the 50-mile radius, possibly to improve their access to the site. However, in an effort to be conservative, STPNOC has assumed that all movers would be migrating into the 50-mile region.



- (2) In Subsection 4.4.2, STPNOC has identified the significance of the impacts as either small, moderate, or large, consistent with the criteria that NRC established in 10 CFR 51, Appendix B, Table B-1, Footnote 3, as follows:

**SMALL** — Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, NRC has concluded that those impacts that do not exceed permissible levels in the NRC's regulations are considered small.

**MODERATE** — Environmental effects are sufficient to alter noticeably, but not to destabilize, any important attribute of the resource.

**LARGE** — Environmental effects are clearly noticeable and are sufficient to destabilize any important attributes of the resource.

#### 4.4.2.1 Demography

STPNOC based this analysis on the estimated peak construction labor force. STPNOC assumed that approximately 50% of the construction labor force would change their residence to work at the STP site (movers), and that they would relocate to approximately the same areas and in the same proportion as the existing operations labor force. Therefore, this analysis is restricted to the two counties expected to be most affected by the construction labor force, Matagorda and Brazoria Counties.

STPNOC estimates that the construction of both units would be completed by 2016. The 2000 population within the 50-mile radius was approximately 258,960 and is projected to grow to approximately 321,809 by 2020, for an average annual growth rate during the construction period of 1.1% (see Table 2.5-2). STPNOC anticipates employing 5950 construction workers at peak construction activity (Table 3.10-2). STPNOC anticipates that approximately 2975 workers (movers) would relocate to the same areas and in the same proportion as the existing operations labor force: 60.7% (or 1806 workers) in Matagorda County, 22.4% (or 666 workers) in Brazoria County, and the remainder would locate to one of the other counties within the 50-mile radius.

The in-migration of approximately 2975 movers would create new indirect jobs in the area because of the multiplier effect. In the multiplier effect, each dollar spent on goods and services by a mover becomes income to the recipient who saves some but re-spends the rest. In turn, this re-spending becomes income to someone else, who in turn saves part and re-spends the rest. The number of times the final increase in consumption exceeds the initial dollar spent is called the "multiplier." The U.S. Department of Commerce Bureau of Economic Analysis, Economics and Statistics Division provides multipliers for industry jobs and earnings (Reference 4.4-17). The economic model, RIMS II, incorporates buying and selling linkages among regional industries and was used to estimate the impact of new nuclear plant-related expenditure of money in the two-county region of interest. For every mover, an estimated additional 0.61 jobs would be created in the two-county area (Table 4.4-4 and Reference 4.4-17). For every dollar spent by a mover, an estimated additional 0.50 dollars would be injected into the regional economy (Reference 4.4-17).

Construction would create approximately 4790 permanent (direct + indirect) jobs in the 50-mile region.

Most indirect jobs are service-related and not highly specialized, so, for this analysis, STPNOC has assumed that most indirect jobs would be filled by the existing labor force within the 50-mile region, particularly the two-county area, because 83% of the labor force is expected to settle there. Using the Bureau of Economic Analysis employment multiplier would produce a total number of indirect jobs generated by construction of 1815 ( $2,975 \times 0.61$ ). This number represents approximately 20% of the unemployed persons in the two-county region in 2005 (Table 4.4-4).

According to the Malhotra study (Reference 4.4-9), approximately 80% of nuclear plant construction workers are likely to bring families. Therefore, of 2975 movers, 2380 would bring families into the 50-mile region and 595 movers would not. Assuming that the workers would relocate in approximately that same proportion as the existing operations labor force, approximately 1445 (60.7% of 2380) of those would locate to Matagorda County and 533 (22.4% of 2380) would locate to Brazoria County (Table 4.4-2). Approximately 361 of the workers without families (60.7% of 595) would locate to Matagorda County and 133 (22.4% of 595) would locate to Brazoria County.

According to the Malhotra study, the average household size of a nuclear plant construction worker is 3.25 people. Therefore, construction would increase the population in the 50-mile region by 8330 people ( $(2,380 \times 3.25) + (595 \text{ construction workers without families})$ ). Of those, 5056 people (60.7% of 8330) would locate to Matagorda County and 1866 (22.4% of 8330) people would locate to Brazoria County (Table 4.4-2). These numbers constitute 13.3% and 0.8% of the 2000 Census populations of Matagorda and Brazoria Counties, respectively. They constitute 11.3% and 0.6% of the projected 2020 populations of Matagorda and Brazoria Counties, respectively.

The movers and their families would represent a moderate increase in Matagorda County's total population, a small increase in Brazoria County's total population, and smaller increases in the total populations of the other counties in the 50-mile region.

Based on the Malhotra study, STPNOC estimates that 50% of the movers (1488) would remain in the 50-mile region and the remainder would migrate back out of the 50-mile region after construction is complete. Including families, the number of people remaining in the 50-mile radius would be 4165. Applying the same percentage to the movers residing in Matagorda County and Brazoria Counties, STPNOC estimates that 903 and 333 movers, respectively, would remain in these counties. In Matagorda and Brazoria Counties, the remaining workers and their families plus workers without families would number 2528 and 933, respectively.

#### 4.4.2.2 Impacts to the Community

This section evaluates the social, economic, infrastructure, and community impacts to the two-county area and 50-mile region as a result of constructing STP 3 & 4. It is expected that site preparation and construction activities would continue for

approximately 7 to 8 years, be completed by 2016, and employ as many as 5950 construction workers at peak employment.

#### 4.4.2.2.1 Economy

The impacts of construction on the local and regional economy depend on the region's current and projected economy and population.

As stated earlier in Subsection 4.4.2, approximately 2975 construction workers (50% of the peak construction labor force) would already reside within a 50-mile radius of the STP site. STPNOC believes that the regional construction labor force can support this estimate, based on the size of the construction labor force in the area. In 2005, there were 16,718 construction workers in Matagorda and Brazoria Counties (Table 2.5-7). Including the construction labor forces from the other counties within a 50-mile radius, the peak number of movers—2975—would represent less than 18% of the pool of construction workers within the 50-mile radius.

As stated in Subsection 4.4.2, 2975 construction workers would be considered movers who would migrate into the 50-mile radius. This in-migrating labor force would create additional direct jobs in the region. The expenditures of the construction labor force in the region for shelter, food, and services would, through the multiplier effect of expenditures, also create a number of new indirect jobs. An influx of 2975 movers would create 1815 indirect jobs, for a total of 4790 jobs (Table 4.4-4).

The employment of up to 2975 movers over a 7- to 8-year period could have SMALL to LARGE economic impacts on the surrounding region. The creation of these jobs could inject between ~~\$67.6 and \$676~~ \$100.3 and \$1,003.3 million dollars into the regional economy during the life of the construction project, reduce unemployment by up to 20%, and create business opportunities for housing and service-related industries. However, after construction completion, a total of 50% of the movers would be expected to migrate back out of the 50-mile region, and the income associated with construction of Units 3 & 4 would cease. The estimated economic impact of this out-migration could be as high as ~~\$6,691,519~~ \$9,930,175 per month (during peak). These estimates are analyzed below.

Table 4.4-5 lists the estimated number of movers on site, by month, during construction. The number of movers is 50% of the total labor force on site per month. STPNOC obtained construction worker wage data for Matagorda and Brazoria Counties from the Department of the Interior's Bureau of Labor Statistics. In 2005, the average annual pay for a construction worker in Matagorda County was \$35,988, and, in Brazoria County, \$40,640 (Subsection 2.5.2.1). In 2006, the average annual for a heavy and civil engineering construction worker in Matagorda County was \$43,639, and in Brazoria \$53,746. To be conservative, STPNOC used the weighted average annual wage of a ~~construction worker in Matagorda County—\$35,988—in its analysis.~~ heavy and civil engineering construction worker in the two counties (weighted based on the number of heavy and civil engineering construction workers in each county) \$53,406 in its analysis. In Table 4.4-5, the average annual wage was divided by 12 to calculate an average monthly wage—~~\$2999~~ \$4,450. The monthly wage was

multiplied by the number of movers each month and then summed to calculate total dollars earned by the movers.

A sensitivity analysis, as shown in Table 4.4-5, was performed to further assess the impacts of the mover wages on the region. Because of uncertainty surrounding the amount of mover wages that would be spent in the 50-mile region, STPNOC provided a table depicting the dollar impact on the 50-mile region by percentage of the wages spent within the region. Additionally, an earnings multiplier for the construction industry in the two-county region was applied to the wages. According to these calculations, the total economic impact of mover wages on the 50-mile region would be between ~~\$67.6~~\$100.3 million and ~~\$676~~\$1,003.3 million dollars over the life of the construction project. (Note: STPNOC acknowledges that, although this earnings multiplier is for the two-county region, it reasonably represents the balance of counties within the 50-mile radius.) At construction peak, wages would total ~~\$8,922,025~~\$13,240,233 dollars per month. Multiplying ~~\$8,922,025~~\$13,240,233 by the earnings multiplier (1.5) would generate a monthly economic impact during peak construction activity of ~~\$13,383,038~~\$19,860,350 (if 100% of the earnings were spent within the region). This would be considered a positive impact.

After construction is completed, approximately 50% of the movers would remain in the 50-mile radius and the remainder would migrate out. Assuming a 50% decrease in the mover labor force, there would be a corresponding decrease in the economic impact to the 50-mile region. Any movers remaining in the ROI would continue to contribute to economic impacts in the ROI, but these impacts would not be associated with STP 3 & 4 construction. As noted above, monthly earnings during construction peak total \$13,240,233 per month. With the earnings multiplier applied, impacts could be as high as \$19,860,350 in the unlikely case that all earnings were spent within the ROI. ~~A 50% decrease in the mover labor force would reduce the monthly economic impact to the region by up to \$6,691,519, half of the monthly economic impact of the mover labor force during peak construction (if 100% of the earnings were spent within the region)~~ (Table 4.4-5). This out-migration would be considered a negative impact. However, Figure 3.10-1 indicates that the out-migration would occur gradually over a 2-year period. The gradual reduction in the construction labor force and the in-migration of operations workers during the construction period, would assist in mitigating the impact to the community from the destabilizing effects of a sudden decrease in households. In addition to the gradual nature of the decline in the construction workforce, the incoming operations workers and their families would help to mitigate the negative impacts of the decreasing construction workforce. Another mitigating factor would be the substantially higher average annual wages expected for the operations workers. These higher wages, combined with larger multipliers for both earnings and employment, suggest that each operations worker would have a greater impact on the ROI economy than each construction worker.

Because of the estimated distribution of the movers, Brazoria County would experience approximately 22.4% of this economic activity and Matagorda County would experience 60.7% of the activity. Matagorda County would be the most affected. Beyond Matagorda County, the impacts would become more diffuse as a result of

interacting with the larger economic base of other counties, particularly Brazoria County, which contains a portion of the outskirts of Houston.

The magnitude of the positive economic impacts would be less discernible, diffused in the larger economic base of Brazoria County. Matagorda County, as the site of the construction and the county where most of the construction labor force would reside, would be affected more than Brazoria County. STPNOC concludes that the impacts of construction on the economy of the region would be SMALL everywhere in the region, except Matagorda County, where the positive impacts of an in-migrating construction labor force and the negative impacts of the departing labor force (upon construction completion) could be MODERATE to LARGE. Mitigation would be warranted. To mitigate these impacts, STPNOC would maintain communication with local and regional government authorities including the Matagorda County Commissioners Court, County Judge and nongovernmental organizations to disseminate project information that could have socioeconomic impacts in the community in a timely manner. These organizations would be given the opportunity to perform their decision-making regarding economic choices with the understanding that approximately half of the positive economic impacts of the construction project would be temporary and could disappear when the construction project is complete.

#### 4.4.2.2.2 Taxes

Construction-related activities, purchases, and labor force expenditures would generate several types of taxes, including corporate franchise taxes, sales and use taxes, and property taxes. Increased taxes collected are viewed as a benefit to the state of Texas and to the local jurisdictions in the region.

In the GEIS for License Renewal of Nuclear Plants (NUREG-1437), the NRC presents its method for defining the impact significance of tax revenue impacts during refurbishment (i.e. large construction activities). STPNOC reviewed this methodology and determined that the significance levels were appropriate to apply to an assessment of tax impacts as a result of new construction.

In NUREG-1437, the NRC concluded that changes in tax revenues (during refurbishment) at nuclear plants would be:

- SMALL – When new tax payments by the nuclear plant constitute less than 10% of total revenues for local taxing jurisdictions. The additional revenues provided by direct and indirect plant payments on refurbishment-related improvements result in little or no change in local property tax rates and the provision of public services.
- MODERATE – When new tax payments by the nuclear plant constitute 10% to 20% of total revenues for local taxing jurisdictions. The additional revenues provided by direct and indirect plant payments on refurbishment-related improvements result in lower property tax levies and increased services by local municipalities.

LARGE – When new tax payments by the nuclear plant represent more than 20% of total revenues for local taxing jurisdictions. Local property tax levies can be lowered substantially, the payment of debt for any substantial infrastructure improvements made in the past can easily be made, and future improvements can continue.

### **Personal Income and Corporate Franchise Taxes**

As noted in Subsection 2.5.2.3, Texas has no personal income tax, but recently amended the law to extend coverage of the franchise tax on corporations; the changes take effect January 1, 2008.

The franchise tax is a gross margin tax, meaning that it is calculated on revenues less allowable operating costs. Therefore, no franchise taxes would be assessed during the construction period for STP 3 & 4 because there would be no revenues during that time. In addition to direct taxes from the private owners of STP, local construction expenditures and purchases by the construction labor force would have a multiplier effect in the local economy, where money would be spent and re-spent within the region. Because of this multiplier effect, businesses in Matagorda County and adjacent areas, particularly retail and service sector firms, could experience revenue increases, and there could be prospects for new startup firms and additional job opportunities for local workers. Existing and new firms would generate additional profits, which would further contribute to increased franchise taxes, although the exact amount is unknown. Impacts would be positive and SMALL.

### **Sales and Use Taxes**

#### **Expenditures by Construction Labor force**

STPNOC estimates a peak construction labor force of 5950 workers, and further estimates that 5056 workers and family members would settle in Matagorda County during the construction period (Subsection 4.4.2 and Table 4.4-2). Their retail expenditures (restaurants, hotels, merchant sales, and other items) would yield an increase in sales and use tax revenues. As an indirect impact, the multiplier effect of the new jobs in the area (see Subsection 4.4.2.1) would also result in higher personal income for current residents in the region, more disposable income, and greater expenditures by individuals and families for items subject to sales or use taxes.

Taxable goods or services purchased anywhere within the state of Texas are subject to the current state sales tax of 6.25%. These revenues are remitted to the state of Texas, which received \$18.3 billion in sales tax revenues (accounting for 25% of state tax collections) in 2006 (Reference 4.4-18). Direct and indirect taxable purchases associated with the construction labor force would yield a relatively SMALL but beneficial impact to the state as a whole. Although sales tax revenues are not returned directly to the counties where the tax was collected, the state uses the sales tax revenues, along with other revenues, to fund numerous services within counties (as discussed in Subsection 2.5.2.3.2), and thus Matagorda County (and other Texas counties) would receive a SMALL positive indirect impact from the expected increase in taxable expenditures by construction workers.

Purchases made within Bay City and Palacios are currently subject to a 2% sales tax above the state's rate of 6.25%; these revenues are returned to the respective cities and are used to fund a variety of city services (see Subsection 2.5.2.3.2). Because of the small populations of these cities, revenues from worker purchases would provide a SMALL to MODERATE positive impact to these jurisdictions.

Purchases within cities outside of Matagorda County that impose an additional sales tax would also yield relatively SMALL to MODERATE beneficial impacts to those cities, with the magnitude depending on the size of the jurisdiction, the amount and variety of goods and services available for purchase, and the actual amount of purchases made within the jurisdiction.

### **Expenditures for Construction Goods and Services**

In addition to sales taxes paid by construction workers and families, the region would also experience an increase in the sales and use taxes collected from project expenditures for construction materials, supplies, and services. To the extent possible, STPNOC obtains goods and services from the local economy, including Bay City. Project expenditures are subject to sales tax in proportion to the percent of investor ownership (e.g., for STP 1 & 2, 44% of STPNOC's taxable purchases are currently subject to sales tax).

According to "Texas Sales Tax Frequently Asked Questions," (Reference 4.4-19), "manufacturers may claim a Texas sales tax exemption for tangible personal property directly used or consumed in or during the actual manufacturing, processing, or fabrication of tangible personal property for ultimate sale if the use or consumption of the property is necessary or essential to the manufacturing, processing, or fabrication operation and directly makes or causes a chemical or physical change to the product being manufactured, processed, or fabricated for ultimate sale."

This exemption applies to the production of electric power and would exempt approximately 90% of the materials used to construct STP 3 & 4, leaving approximately 10% of the construction costs subject to sales tax (6.25% to the state of Texas and 2.0% to Bay City). The owners of STP 3 & 4 have projected the sales tax payments on these expenditures at an estimated \$23.9 million per unit, with \$5.8 million due to Bay City and \$18.1 million to the state of Texas over the construction period. These payments would provide a total of \$11.6 million to Bay City over the 7-year construction period.

To determine the impact of these tax payments, Bay City sales taxes were projected from 2006 to 2015 based on the average annual growth rate of 2.2% between 1996 and 2005. The projected rate of increase in Bay City sales tax is conservative in that it does not take into account likely increases in population or business activity that could occur as a result of STP construction.

For the purpose of this analysis, it was assumed that taxable expenditures would occur evenly during the 6-year construction period for each unit, with construction on STP 3 beginning in 2009 and construction on STP 4 concluding in 2015. As Table 4.4-3 shows, Bay City sales tax collections would be 21% of the total Bay City sales tax

revenue collected in 2009. STPNOC tax payments between 2010 and 2014, while both units are under construction, would increase from 38% to 41% of Bay City sales tax revenue. In 2015, the final year of construction for STP 4, the STPNOC sales tax payments would be only 18% of Bay City sales tax revenue. Therefore, the positive impacts to Bay City sales tax revenues would be positive and MODERATE during 2009 and 2015, the first and last years of construction, and positive and LARGE between 2010 and 2014, and the city would be able to provide a higher level of services to its citizens and visitors.

Purchases made in Matagorda County outside of Bay City and Palacios would provide sales tax revenues to the state of Texas, and would constitute a relatively SMALL but beneficial impact. Purchases from taxing jurisdictions outside Matagorda County would yield relatively SMALL to MODERATE beneficial impacts, depending on the overall size of such jurisdictions. In more heavily populated nearby jurisdictions such as Brazoria County, the positive impacts would be relatively SMALL. It is not possible to assess which counties and local jurisdictions would be most affected, but all taxing entities would receive a SMALL to MODERATE positive impact.

In addition to the construction expenditures noted above, STPNOC has estimated expenditures for goods and services during the construction period, at \$212.7 million for construction-related items and \$13.4 million for office or administrative items. To approximate the impact on state and local sales tax revenues, the total of \$226.1 million was divided by 7 (years in construction period) to obtain an average annual expenditure amount (\$32.3 million), which was then taken as a percentage of increase over the latest year for which actual sales tax revenues were available. It was assumed that none of the items is exempt from sales tax, and that all are subject to Texas sales or use tax. Because of the limited retail opportunities in Bay City and Palacios, a sensitivity analysis was performed to assess the range of impacts from spending 10% to 100% in each jurisdiction. The analysis also addressed the uncertainty regarding private/public ownership of STP 3 & 4 (as noted above, STP 1 & 2 are currently 44% investor-owned and 56% publicly-owned). Only the privately-owned segment is subject to sales tax. Therefore, scenarios for 44%, 60%, 80%, and 100% private ownership were assessed. The analysis is presented in Table 4.4-8.

Depending on the ownership scenario, annual Texas sales tax revenues would range from \$888,230 to \$2.0 million, representing an increase over 2006 sales tax revenues from 0.005% to 0.011%, a SMALL and positive impact.

Annual impacts to Bay City or Palacios tax revenues were estimated to range from a low of \$28,423 (44% private ownership with only 10% subject to local taxation) to \$645,986 (100% private ownership and 100% spent in either city). (Both cities impose a 2% sales tax, so the potential sales tax revenues are identical.) The associated increases over Bay City's 2005 sales tax revenues (\$3.7 million) range from 0.8% to 17.5%, while the increases over Palacios' 2006 sales tax revenues (\$219,500) could range from 12.9% to 294.3%. However, because of the limited availability of goods and services, it is unlikely that a major proportion of expenditures would occur in Bay City. At the present time, it is not possible that more than a small proportion of purchases would occur in Palacios, whose population is roughly one-fourth of Bay City's. Based



on current retail opportunities, it is likely that impacts to either locale would be positive and SMALL to MODERATE. However, if additional STP suppliers were to locate within either city, sales tax revenue impacts could range from SMALL to LARGE.

### **Other Sales- and Use-Related Taxes**

Matagorda County imposes a hotel occupancy tax of 6% on the cost of each room. The revenues from this tax benefit tourism and convention marketing, programs to enhance the arts, and historic preservation projects that benefit tourism. Visitors during the construction period, as well as many construction workers themselves, would use local hotels and pay this tax. Although the exact number of visitors and workers who would use hotels is unknown, it is expected to be large during the construction period. Because of Matagorda County's small population, MODERATE positive benefits to the county would result from these tax collections.

The cities of Bay City and Palacios also tax telecommunications services; calls within Texas are subject to a 2% city tax in these locations, while the state sales tax applies to all calls. Both cities also impose their 2% sales tax on the residential use of gas and electricity. These cities would receive positive impacts from increased collections during an influx of construction workers and their families residing in those communities, with the actual impacts dependent on residence choices and usage patterns for telephone, gas, and electricity. The amounts are unknown at this time but are expected to be relatively SMALL and positive.

### **Property Taxes — Counties and Special Districts**

As discussed in Subsection 2.5.2.3, Texas property tax assessments are made by the county appraisal district, which bases its appraisal on a consideration of cost, income, and market value. This appraisal is used by all taxing jurisdictions within the county, including special districts and independent school districts (ISDs), which apply their individual mileage rates to determine the taxes owed.

In addition to Matagorda County itself, the special districts who receive property taxes from NRG for STP include the Matagorda County Hospital District, Navigation District #1, Drainage District #3, the Palacios Seawall District, and the Palacios ISD (see Subsection 2.5.2.3).

During construction of STP 3 & 4, STP's additional tax valuation would be based on the cost of construction, and determined in accordance with state law and appraisal formulas or some mutually agreed-upon valuation. Some inputs to the formulas would be discussed or negotiated between the appraisal district and the owners who participate in STP 3 & 4 (municipal utilities do not pay property taxes).

Matagorda County's status as a federal Historically Underutilized Business Zone (HUBZone) and Texas Strategic Investment Area makes tax abatements available for qualifying new businesses or expansions. Nuclear electric power generating facilities are now eligible for this abatement. To receive this abatement, NRG (as the only current owner subject to property tax) would apply to the Matagorda County Commissioners Court, the county governing body. NRG's eligibility and the terms of

the abatement would be determined by the Commissioners Court. The amount of any such abatement, the likelihood of NRG's applying for it, and the abatement's possible impact to the affected taxing jurisdictions are not known at this time.

Property tax payments to Matagorda County for STP 1 & 2 represented approximately 75% of the total county property tax revenues between 2000 and 2005. During the 7-year construction period for STP 3 & 4, NRG would likely pay additional property taxes to the taxing districts listed above. Although the amount of these payments is unknown at this time, it is likely that such payments would represent an increase over current payments, resulting in a MODERATE to LARGE positive impact to those taxing jurisdictions and a SMALL to MODERATE positive impact on the local economy.

A second source of revenue would be from property taxes resulting from housing purchases by the construction labor force. Developers would construct new housing or there would be an increase in the demand for existing housing, which would likely drive housing prices up, thus increasing values, assessments, and property taxes levied and collected. The change in tax revenues is not known at this time and would depend on worker choices regarding home location and home value. The increased housing demand would have relatively SMALL impacts on tax revenues in more heavily populated jurisdictions such as Brazoria County, but in Matagorda County, with a much smaller population, the relative impacts would be SMALL to MODERATE.

#### **Property Taxes — Independent School Districts**

The Palacios ISD encompasses the southwestern portion of Matagorda County and a small portion to the west in Jackson County. It is a largely rural district, containing the town of Palacios, a few smaller communities, and the STP site (see Figure 2.5-8 for a map of the school districts in Matagorda County).

School districts in Texas may tax only entities within their borders, so the owners of the STP facility pays school-related property taxes only to the Palacios ISD, and is the ISD's largest taxpayer. Between 2000 and 2005, between 71% and 99% of the ISD's property tax revenues (see Table 2.5-16) was attributable to STP 1 & 2. As noted in Subsection 2.5.2.3.3, the Palacios ISD received approximately 60% of its revenue from local property taxes for the 2004–2005 school year. The expected increases in the appraised valuation of the STP facility during the construction of STP 3 & 4 would result in larger tax payments to the taxing jurisdictions listed above and in Table 2.5-15.

The state of Texas has established funding guidelines to equalize wealth across school districts, and sets a statewide wealth limit per student each year (\$319,500 in 2006). This limit is multiplied by an ISD's weighted average daily attendance to obtain the total wealth limit for that district. If the ISD's property tax revenues exceed that amount, the district is considered "property-rich"; if revenues are below that amount, it is considered "property-poor." Revenues in excess of the wealth limit are returned to the State for redistribution to property-poor districts (see also Subsection 2.5.2.3.3).

Under the wealth equalization guidelines, additional revenues paid to Palacios ISD would not directly benefit the ISD, since their level of funding is based on a fixed per-pupil amount; therefore, the ISD's property tax revenues that remain in the district

would increase only if its attendance increased. Property tax revenues exceeding that year's wealth limit would flow to the state of Texas for redistribution to property-poor school districts. Although the amount of the increased tax payments is unknown at this time, the larger payments, while MODERATE to LARGE in absolute terms, would provide a relatively SMALL positive impact to the state of Texas as a whole and to those property-poor districts receiving the reallocated funds.

The influx of construction workers and their families could result in larger enrollments in Palacios schools (see Subsection 4.2.2.8). As explained in Subsection 2.5.2.3.3, the Texas school funding formula is based on weighted average daily attendance. While increases in the number of students could result in additional expenses, the ISD would receive increased revenues, and fiscal impacts to the Palacios ISD would be SMALL.

Other school districts in the area do not receive property tax revenues from STP, but could experience larger enrollments during the construction period. Fiscal impacts to these districts would vary from SMALL to MODERATE, depending on the size of their existing enrollment, the amount of enrollment increases, their existing property tax revenues, and their status as a property-rich or property-poor school district under Texas school funding wealth equalization guidelines (discussed in Subsection 2.5.2.3.3). The possible impacts to other school districts in the area are addressed in Subsection 4.2.2.2.8.

In its 2007 session, the Texas Legislature enacted legislation (House Bill 2994) that would expand the existing tax abatement laws (the "Property Redevelopment and Tax Abatement Act" and the "Texas Economic Development Act") to include nuclear electric power generation facilities (Reference 4.4-20). The legislation was signed into law by the Governor of Texas on June 15, 2007 (Reference 4.4-21), and essentially will allow school districts to reduce the taxable value of new construction of nuclear plants, and allow the plants to defer the effective date of an abatement agreement for up to 7 years after the date the agreement was made. Negotiations for this abatement between the owners of STP 3 & 4 and the Palacios ISD are underway. The law would also allow STP's investor-owned participant, NRG, to enter into a payment agreement with the Palacios ISD, whereby NRG could "share" some of its tax savings with the Palacios ISD. This payment would not be considered ISD tax revenue and would not be subject to recapture by the state of Texas (Reference 4.4-22). Passage of this bill may decrease NRG's tax obligations to the Palacios ISD for its share of the STP 3 & 4. Under current state funding formulas to maintain wealth equalization (described above and in Subsection 2.5.3.3.3), the Palacios ISD's overall revenues would not decline (Reference 4.4-23). The amount of any tax reduction and of any "sharing" payment on STP 1 & 2 from NRG to the Palacios ISD are unknown at this time, as are any tax arrangements between the Palacios ISD and the investor-owned operators of STP 3 & 4. However, any additional funds received by the Palacios ISD that would not be subject to wealth-equalization limits (and could thus remain within the ISD) would have a SMALL to MODERATE beneficial impact on the school district.

### **Summary of Tax Impacts**

In summary, the state of Texas would not collect franchise taxes from the privately-owned investors in STP 3 & 4 during the construction period for those units.

In absolute terms, the amount of state sales and use taxes collected over a potential 7-year construction period could be LARGE, but SMALL when compared to the total amount of sales and use taxes collected by Texas (\$18.3 billion in 2006). However, because of their small populations, sales taxes collected by the cities of Bay City and Palacios would have a MODERATE to LARGE positive impact.

The construction site-related property taxes collected and distributed to Matagorda County would be LARGE when compared to the total amount of taxes Matagorda County currently collects. In addition, Matagorda County would benefit from an increase in housing values and inventory caused by the influx of the permanent construction labor force, thereby further increasing property tax revenues for the county and special taxing districts.

If the valuation of the STP site increases during the construction period, any increased property taxes collected by the Palacios ISD for the STP site, its largest taxpayer, would have little effect on the ISD due to Texas school funding formulas (see discussion above and in Subsection 2.5.2.3.3). Increased property tax revenues would likely be a LARGE absolute amount, but relative to total property tax collections by the state of Texas, it would yield a SMALL positive impact overall.

Therefore, the potential beneficial impacts of taxes collected during construction would be MODERATE to LARGE in Matagorda County and to entities within the county, SMALL to MODERATE to the Palacios ISD, and SMALL in surrounding areas and in the state of Texas. Mitigation would not be warranted because all impacts are positive.

#### **4.4.2.2.3 Land Use**

In the GEIS (NUREG-1437) (Reference 4.4-4), the NRC presents their method for defining the impact significance of offsite land use during refurbishment (i.e., large construction activities). STPNOC reviewed this methodology and determined that the significance levels were appropriate to apply to an assessment of offsite land use impacts as a result of new construction. Matagorda and Brazoria Counties are the focus of the land use analysis because the new units would be built in Matagorda County and most of the construction labor force would reside in one of the two counties.

In NUREG-1437, the NRC concluded that land use changes during refurbishment at nuclear plants would be:

- Small – If population growth results in very little new residential or commercial development compared with existing conditions and if the limited development results only in minimal changes in the area's basic land use pattern.
- Moderate – If plant-related population growth results in considerable new residential and commercial development and the development results in some changes to an area's basic land use pattern.
- Large – If population growth results in large-scale new residential or commercial development and the development results in major changes in an area's basic land-use pattern.

Further, NRC defined the magnitude of population changes as follows:

- Small – If plant-related population growth is less than 5% of the study area's total population, especially if the study area has established patterns of residential and commercial development, a population density of at least 60 people per square mile, and at least one urban area with a population of 100,000 or more within 50 miles.
- Moderate – If plant-related growth is between 5% and 20% of the study area's total population, especially if the study area has established patterns of residential and commercial development, a population density of 30 to 60 people per square mile, and one urban area within 50 miles.
- Large – If plant-related population growth is greater than 20% of the area's total population and density is less than 30 people per square mile.

### **Land Use**

All or parts of nine Texas counties are located within the 50-mile radius of the STP site: Brazoria, Calhoun, Colorado, Fort Bend, Jackson, Lavaca, Matagorda, Victoria and Wharton. The 50-mile radius encompasses over 4873 square miles. Land use types (Figure 2.2-4 and Table 2.2-5) in the region consist of 61.3% agricultural, 18.3% forest, 10.1% rangeland, 5.3% wetland, 2.5% urban or built-up, 1.8% water, and 0.6% barren land (Subsection 2.2.3).

Matagorda County covers an area of 1114 square miles (Subsection 2.5.2.4.1). In 2002, approximately 70% of the land area of Matagorda County consisted of farms and ranches (Subsection 2.2.3). The chief agricultural products of Matagorda County are livestock, sorghum, corn, rice, cotton and hay. The chief agricultural products have not changed since the 1992 Census of Agriculture Summary (Reference 4.4-25).

There are only two incorporated cities in Matagorda County—Bay City, the county's seat, and the city of Palacios. These cities have the two largest concentrations of population.

There is currently no formal land use planning or zoning at the county, city, or town level in Matagorda County (Subsection 2.5.2.4.1); however, the city of Bay City is in the process of developing a planning committee and hopes to have it operating in the next several years (Subsection 2.5.2.4.1).

Brazoria County covers an area of 1386 square miles (Subsection 2.5.2.4.2). In 2002, approximately 70% of the land was used in farming and ranching (Subsection 2.2.3). Cattle, hay, rice, sorghum, corn, and cotton are the primary agricultural products. Since 1992, there has been a steady increase of cattle ranches and sorghum farms, while the amount of corn for grain and cotton farms has remained relatively unchanged. Rice production has been steadily declining from 1992 to 2002.

The principal urban centers in Brazoria County are: Angleton (the county seat), Alvin, Amsterdam, Brazoria, Damon, Pearland, Rosharon, West Columbia, Holiday Lake, Old Ocean, Bailey's Prairie, Iowa Colony, Bonney, Hillcrest Village, Brookside Village, Danbury, Liverpool, Manvel, Sweeny, and the towns that constitute Brazosport including Clute, Freeport, Quintana, Oyster Creek, Jones Creek, Lake Jackson, Richwood, and Surfside Beach.

While there is no formal land use planning or zoning at the county level in Brazoria County, there are subdivision ordinances for areas outside of the city limits. However, Angleton, Alvin, Pearland, Manvel, Lake Jackson, and Richwood have land use planning and/or zoning and subdivision Code of Ordinances to guide development (Reference 4.4-25).

### **Construction-Related Population Growth**

The construction of STP 1 & 2 began in the summer of 1975 and had large indirect impacts on the economy in the region, especially Matagorda County, as evidenced by an upswing in residential and commercial activity, but those were temporary, and the economy returned to preconstruction impacts levels when construction was completed.

The 2000 population of Matagorda County was 37,957 with a population density of 34.1 people per square mile (Reference 4.4-26). At its peak, construction-related population growth in Matagorda County would reach 5056 people (workers and families) (Subsection 4.4.2.1). According to NRC guidelines (Reference 4.4-5), construction-related population changes would be considered MODERATE to LARGE since the plant-related population growth would be 13.3% of Matagorda County's total 2000 population and 12.2% of Matagorda County's projected 2010 population (Subsection 2.5.1); Matagorda County has some established pattern of residential and commercial development, and the outskirts of the city of Houston are within 50 miles.

The 2000 population of Brazoria County was 241,767 with a population density of 174.4 people per square mile (Reference 4.4-26). At its peak, construction-related population growth in Brazoria County would reach 1866 people (workers and families) (Subsection 4.4.2.1). According to NRC guidelines (NUREG-1555), construction-related population changes would be considered SMALL since plant-related population growth would be 0.8% of Brazoria County's total 2000 population and 0.7%

of Brazoria County's projected 2010 population (Subsection 2.5.1); Brazoria County has established some patterns of residential and commercial development, and the outskirts of the city of Houston are within 50 miles.

Upon construction completion, STPNOC estimates that approximately 50% of the movers would migrate back out of the 50-mile region; the remaining 4165 (movers and families) would become permanent residents of the region; and 3461 of those would become permanent residents of Matagorda and Brazoria Counties (Table 2.5-2).

### **Conclusion**

From a land-use perspective, Matagorda and Brazoria Counties are still predominantly rural, and most of the land in both counties, especially Matagorda County, would likely continue to be used for agriculture into the foreseeable future. In Matagorda County, commercial and residential development is minimal and has experienced little change. In Brazoria County, there has been more development in its eastern half due to the expansion of the outskirts of Houston. Similar to the construction of STP 1 & 2, the construction of STP 3 & 4 would create an upswing in residential and commercial activity, possibly converting some land to other uses such as trailer parks, convenience stores, hotel/motel property, etc. In Matagorda County, because of its rural nature and the fact that most of the labor force would live there, these land use conversions would be more noticeable. In Brazoria County, the impacts would be smaller and more readily absorbed into the land conversion activities already taking place there.

Upon construction completion, approximately 50% of the movers would migrate back out of the 50-mile region and 50% would become permanent residents. Residential and commercial activity would continue at a higher-than-preconstruction level. Approximately 50% of the converted land could remain converted and the balance of the converted land could return to its preconstruction use. Land that could readily be converted back to its original land use could include, for example, open areas used to park mobile homes, RVs, campers, or similar vehicles used as temporary housing by some workers during construction. Therefore, employing NRC criteria (NUREG-1555), offsite land use changes would be considered SMALL in all surrounding counties with the exception of Matagorda County, where impacts could be MODERATE to LARGE. To mitigate these impacts, STPNOC would maintain communication with local and regional governmental and nongovernmental organizations, including but not limited to the Department of Housing and Community Affairs and the Matagorda County Economic Development Corporation, to disseminate project information such as housing, business development, and economic growth and stabilization, in a timely manner. These organizations would be given the opportunity to perform their decision-making with the understanding that, (1) a percentage of the land converted for this construction project could be permanently dedicated to its new use and, (2) other converted land could become available for other uses upon construction completion.

#### **4.4.2.2.4 Transportation**

Impacts of the proposed construction on transportation and traffic would be most visible in Matagorda County, particularly Farm-to-Market (FM) 521, a two-lane farm-to-

market roadway which provides the only direct access to the STP site. Impacts of construction on traffic are determined by five elements:

- (1) The capacity of the roads
- (2) The projected population growth rate in Matagorda County, the county most affected by the construction (Table 2.5-2)
- (3) The number of construction workers and vehicles on the roads
- (4) The number of truck deliveries to the construction site
- (5) The number of shift changes for the construction labor force

For this analysis, STPNOC has assumed that there would be three construction shifts. The first shift would include 70% of the total construction labor force, the second shift would include 25%, and the third shift would include 5%. Analysis conservatively assumes one worker per vehicle (Section 2.5).

### **Roads**

Construction workers would travel daily to the STP site, and truck deliveries would be made daily to the construction site. Truck deliveries and construction worker vehicles would enter the site via the north entrance where FM 1468 meets FM 521. The STP 1 & 2 labor force (and STP 1 & 2 outage labor forces) would all access the STP site via FM 521 (Subsection 3.9S.3.2 and Figure 2.5-5).

### **Public Transportation**

Public transportation in Matagorda County is provided by RTransit. RTransit provides services by appointment to the rural general public, elderly, and people with disabilities (Subsection 2.5.2.2). The increase in population of 60.7% (or approximately 5056 workers and family members) (Subsection 4.4.2.1), due to the construction of STP 3 & 4, could increase public transportation usage in the area as family members and workers would use these services.

### **Traffic Conditions**

Vehicle volume on the roads within a 24-hour period, as measured by Average Annual Daily Traffic (AADT) counts and ~~lead-zones-as-measured-by-esals~~ a "Functional Class" system (Texas Department of Transportation [TXDOT] does not use "Level of Service" [LOS] determinations for Texas roadways), reflect the urban and rural character of the counties.

The 2000 Matagorda County population was 37,957. It is expected to increase 9% by 2010 and 18% by 2020 (Table 2.5-5); however, because most of the traffic on FM 521 in the vicinity of the STP site is related to STP 1 & 2 and because of the conservative assumptions STPNOC has made regarding the timing of plant traffic on FM 521, local traffic was not factored into the analysis.



~~Texas Department of Transportation (TXDOT) considers 9600 passenger vehicles to equal one esal (the esal is currently the method used to compare axle weights of varying loads), or one 18,000 pound tractor trailer (Reference 4.4-27). FM 521 is load zoned for 58,420 pounds equaling 3.25 tractor trailers, or 31,200 passenger vehicles (Reference 4.4-28). Load zone limits for roadways in Texas are calculated taking fatigue cracking, rutting, pavement thickness, and soil composition into consideration. TXDOT considers FM 521 to have a Functional Class of two-lane, undivided, rural major collector with a threshold capacity of 55,200 vehicles per day (Table 2.5-12) (Reference 4.4-28). The daily traffic on FM 521 north of STP, as measured by the 2005 AADT count, was 2530 vehicles in the westerly direction and 1543 in the easterly direction in a single 24-hour period (Reference 2.5-29) (see Table 2.5-12). Most traffic on FM 521 is related to STP, although there is a minimal amount of local traffic.~~

The 2005 AADT unidirectional count on FM 521 was totaled to arrive at an estimate of 4073 vehicles on FM 521 north of the STP site in a single 24-hour period. For purposes of analysis, it was assumed that ~~100%~~67% of the 4073 vehicles were attributable to the current STP labor force. ~~After conservatively assuming that all traffic would be due to STP workers, it is assumed that all traffic on FM 521 would occur during shift change or operating hours. STP makes up 2730 vehicles (1365 vehicles traveling FM 521 twice daily) of the AADT count, representing 67% of the total 4073 vehicles counted in a 24-hour period, while non-plant related local traffic makes up the remaining 33%.~~ With the addition of 5950 construction workers (Table 4.4-4) at peak construction, to the current 1365 employees total for three shifts in a 24-hour period (a total of 7315 workers), it is assumed that the afternoon shift change would result in the highest hourly traffic count as approximately 5120 day shift workers (70% of 7,315) leave and 1829 night shift workers (25% of 7315) arrive and 134 non-plant related vehicles would travel FM 521.

The capacity of FM 521 is ~~31,200~~55,200 passenger vehicles in a 24-hour period, 5,520 during peak travel hours. During day/night shift change, peak travel hour, capacity will be reached as 7,083 workers (134 [non-plant related traffic] + 5,120 + 1,829) travel on FM 521. As a measure to alleviate traffic congestion construction workers will enter the site from the north via the intersection of FM 1468 and FM 521, or the west entrance of FM 521. The current STP workforce will enter from the east entrance of FM 521. ~~After factoring traffic from shift change and traffic as measured by the AADT, there is sufficient capacity for an additional 20,178 (4,073 + 5,120 + 1,829) passenger vehicles in a 24-hour period or an additional 840 vehicles per hour.~~ For the proposed construction schedule, road capacity could be reached during months 26 through 35. Traffic is expected to begin to abate during month 36 as fewer construction workers would be required for the remainder of construction (Figure 3.10-1).

In addition to the operations and construction work force analyzed above, an average outage work force of approximately 1500 to 2000 workers per unit would use FM 521 for approximately 17–35 days during each refueling outage scheduled for each reactor every 18 months.

Construction workers would have a MODERATE to LARGE impact on the two-lane roadways in Matagorda County, particularly FM 521 and its feeder roads. Mitigation,

including but not limited to, widening the roadway and reinforcing/repaving the current roadway, may be necessary to accommodate the additional vehicles on Matagorda County roads, particularly FM 521. These measures are discussed below.

Mitigation measures could be included in a construction management traffic plan developed by STPNOC before the start of construction. Potential mitigation measures could include installing turn lanes at the construction entrance, establishing a centralized parking area away from the site and shuttling construction workers to the site in buses or vans, encouraging carpools, and staggering construction shifts so they do not coincide with operational shifts. STPNOC could also establish a shuttle service from the Bay City area, where many of the construction labor force is likely to reside. The operations work force would continue to enter the plant at the current entrance on FM 521 (Subsection 3.9S.3.2).

### **Hurricane Evacuation Routes**

The designated Hurricane Evacuation Routes for Matagorda County are Highway 60, Highway 35, Highway 71, and FM 1095 (Figure 2.5-4) FM 521 and FM 1468 seeing transitional traffic in route to designated evacuation routes. In Brazoria County, the designated evacuation routes are State Highway 36 and State Highway 288 (Figure 2.5-4 and Subsection 2.5.2.2) (with Hwy 332 seeing transitional traffic in route to designated evacuation routes). The addition of 5950 construction workers at peak construction would result in an increase in traffic, should the need to evacuate arise, of an additional 1,143 vehicles per route for Matagorda County and an additional 844 vehicles per route for Brazoria County. Staggered departure times and counterflow on major roadways are commonly used during evacuations to alleviate traffic congestion.

### **Rail**

Some heavy modules, components, and oversized equipment would be delivered by rail, entering the STP site via a 9-mile railroad spur north of the plant (Figure 2.5-1 and Subsection 3.9S.3.2). The use of this rail spur, which is not currently in use, is not expected to impact alternate transportation systems used by the local communities.

### **Waterways**

Some large components would be delivered by barge and received at the STP barge slip along the lower Colorado River, 3.5 miles southeast of the STP site. To accommodate the increased usage of the barge slip, heavy equipment would be offloaded onto trucks and brought to the construction site via a heavy haul route (approximately 2-1/2 miles in length) that would be built from the barge slip to the construction area (Subsection 3.9S.3.2). The barge slip (Subsection 2.5.2.2) is in the U.S. Army Corps of Engineers' (USACE) Galveston District. The Texas Parks & Wildlife Department patrols the area and enforces boating and navigation safety regulations, while the LCRA manages the water quality and supply (Reference 4.4-30). STPNOC would use U.S. Coast Guard-licensed barge transport contractors for deliveries and coordinate with the appropriate authorities including the U.S. Coast Guard, Texas Parks and Wildlife Department, and the USACE (Subsection 2.5.2.2) to make arrangements for the increased barge traffic, as necessary.

#### 4.4.2.2.5 Aesthetics and Recreation

As part of construction, a total of ~~770~~540 acres would be cleared for the construction of STP 3 & 4 (Figure 3.9S-1). Most of the land clearing would be in the area of STP 3 & 4, and all clearing would be located within the existing STP site. The clearing and excavation for STP 3 & 4 and adjacent support facilities may be visible from offsite roads, depending on the activities being performed. The riverfront along the Colorado River would be a laydown area for heavy haul equipment. Additionally, the construction equipment could be visible from both FM 521 and the Colorado River. Because aesthetic impacts of construction would be primarily concentrated in the north portion of the STP site, away from the river, and the portion of the Lower Colorado River flowing near the STP site is primarily used for recreational boating by fishermen and seasonal residents, STPNOC has determined that impacts would be SMALL and not warrant mitigation.

The increased activity from the additional construction workers and equipment is not expected to impact the annual North American Audubon Christmas Bird Count, which draws approximately 100 visitors to Matagorda County from Texas and surrounding states, nor is it expected to impact the STP stop along the Great Texas Coastal Birding Trail. This trail runs through several areas within 50 miles of the STP site. With 110 acres of non-jurisdictional man-made prairie wetlands consisting of three seasonally flooded wetlands, the STP site hosts many species of wintering ducks and roosting geese.

The influx of additional construction workers could impact the FM 521 River Park, 4 miles west of the town of Wadsworth on FM 521 at the bank of the Colorado River (Figure 2.2-1). The FM 521 River Park has a boat landing, trails, and picnic areas scattered throughout the park on the Colorado River upstream of the STP property. The FM 521 River Park is used by visitors and the boat landing is used by fishermen and water recreationists during the appropriate seasons. Day use of the park/boat landing is seasonal and it would be unlikely that visitors and fishermen would be on FM 521 at the same time as the construction shifts (Subsection 2.5.2.5).

Construction impacts such as noise and air pollutants would be limited to the STP site and would not be noticeable from offsite. Construction would not affect any other recreational facilities in the 50-mile region. Impacts would be SMALL and would not warrant mitigation.

#### 4.4.2.2.6 Housing

Rental property and mobile home facilities are scarce in the rural counties within the 50-mile radius, but are more plentiful in the larger municipalities such as Bay City, Palacios, the Brazosport area, and Angleton. Generally, Brazoria County, the county with the larger population, has more available vacant housing. Subsection 2.5.2.6 details housing in Matagorda and Brazoria Counties.

### **Construction**

Impacts on housing from the construction labor force depend on the number of workers already residing within the 50-mile region and the number that would relocate and require housing.

Based on the assumptions presented in Table 4.4-2, approximately 2975 construction workers would migrate into to the 50-mile region (movers). Of these, approximately 1806 movers would settle in Matagorda County and 666 would settle in Brazoria County.

In 2000, 5081 vacant housing units were available for sale or rent in Matagorda and Brazoria Counties—3853 were vacant rental units and 1228 were vacant housing units available for sale (Subsection 2.5.2.6.1). The 2000 Census provides the latest housing data that are consistent across areas, objective, and sufficiently detailed for this analysis. In absolute numbers, the available housing would be sufficient to house the mover labor force. However, there may not be enough housing of the type desired by the movers in either of the two counties, especially Matagorda County. The median price of housing in Matagorda County in 2000 was \$61,500. The median price of housing in Brazoria County was \$88,500 for the same year (Reference 4.4-31). In this event, workers would relocate to other areas within the 50-mile region, have new homes constructed, bring their own housing, or live in hotels and motels. Given this increased demand for housing, prices of existing housing and rental rates could rise. Matagorda County (and other counties to a lesser extent) would benefit from increased property values and the addition of new houses to the tax rolls. However, increasing the demand for homes could increase rental rates and housing prices. It is possible that some low-income populations could be priced out of the housing market because of upward pressure on housing prices and rents. The increased demand for housing could increase the rate of new home and temporary housing construction. With time, market forces would increase the housing supply to meet this demand. Construction employment would increase gradually, reaching the peak of 5950 (2975 movers) after four years (Table 3.10-2), allowing time for market forces to accommodate the influx and allowing housing prices and rental rates to stabilize.

As noted above, some construction workers would elect to bring their own housing, such as RVs, mobile homes, campers, or other types of portable housing. These housing choice decisions would be influenced by workers' expected length of time at the work site, whether they are accompanied by household members, the cost, availability, and condition of local housing, and the distance from the family home. In turn, additional factors such as the capacity and quality of local schools and the cost of vehicle fuel could influence a worker family's decision regarding accompanying the worker to the construction site. Due to the multitude of factors, it is not possible to predict the proportion of workers who would choose portable housing over local housing units. However, to the extent that workers do bring mobile housing, the demand for local permanent housing units would be reduced, and there would be less upward pressure on home prices and rent that could adversely affect residents of the ROI. With a greater number of workers bringing their own housing, impacts to the local

housing market, both owner-occupied homes and rentals, would be less noticeable both during and after the construction period.

There are a number of RV parks already operating in the region. New RV parks could be situated at various locations in STP's vicinity. Few permitting or environmental constraints exist regarding the placement or abandonment of such facilities. RV parks may not be placed in a floodway (as defined by FEMA) but can be placed in a floodplain, and must have a septic system. The county must approve the RV park design and septic system; the approval process generally takes less than one month and no additional state approval is needed. Good quality drinking water is readily available from wells and no water rights issues are involved. According a local source, several developers have acquired land for expanding RV parks and permanent housing, although these locations are not known at this time. The developers plan to begin development shortly before the construction workers arrive. In summary, the short response time and minimal location and permitting constraints ensure that local landowners would be able to respond quickly to demand for RV parks for construction workers.

### **Post-Construction**

Upon construction completion, STPNOC estimates that approximately 50% of the 1488 movers would migrate back out of the 50-mile region. Of the 1488 movers that would migrate back out of the 50-mile region, approximately 903 movers would leave Matagorda County and 333 would leave Brazoria County. Some percentage of the 1236 vacated housing units would be housing units that would have been constructed as a result of the influx of construction workers for STP 3 & 4. This constructed housing would be vacated, potentially leaving the area with excess housing.

### **Conclusion**

Because Matagorda County contains the proposed construction site, has a small population, and has a relatively small economy, its housing market would likely be the most impacted. Brazoria County's housing markets would also experience an impact, though not as large.

The greatest shortage of housing would be in Matagorda County, and there could be upward pressure on rents and housing prices. Brazoria County would experience a similar impact, though to a lesser extent. Also, the post-construction exodus of workers could leave both counties with excess housing.

In Brazoria County, because there is a larger population and housing market, the upward pressure on rents and housing prices and excess housing would be absorbed into the housing market under normal market forces. In Matagorda County, the upward pressure on rents and housing and excess housing could take longer to be absorbed. However, the excess housing could also serve to reduce the rents and housing prices that would have been caused by the initial shortage in housing at the start of construction.

Therefore, the potential impacts on housing would be SMALL in Brazoria County and MODERATE to LARGE in Matagorda County. Mitigation would not be warranted in Brazoria County where the impacts would be small. Mitigation of the moderate impacts in Matagorda County would most likely be market-driven, but may take some time. To assist in mitigating these impacts, STPNOC would formally and informally maintain communication with local and regional governmental organizations, including the Matagorda County Commissioners Court, County Judge and local and regional economic development agencies, to disseminate project information in a timely manner. These organizations, and, ultimately, developers and real estate agencies, would be given the opportunity to perform their decision-making and plan accordingly, with the understanding that a percentage of the housing developed for this construction project could be difficult to absorb at construction completion.

#### 4.4.2.2.7 Public Services

##### Water Supply Facilities

STPNOC considered the impacts of both construction demand and population increases on local water resources. Construction could bring as many as 8330 people (construction workers and their families) to the region. Peak onsite construction labor force could be as high as 5950 workers. The average per capita water usage in the U.S. is 90 gallons per day (gpd) per person. Of that, 26 gallons is used for personal use (Reference 4.4-32). The balance is used for bathing, laundry, and other household uses.

STP does not use water from a municipal system. Therefore, water usage by the labor force, while onsite, would not impact municipal water suppliers. Five active onsite wells provide makeup water, process water, potable water, and supply for the fire protection system for STP 1 & 2. These wells would provide potable water for the construction project as well. The wells extend into the Chicot Aquifer, range in depth from 600 to 700 feet, and have design yields of 200 to 500 gpm. Current permitted total withdrawal rates are 3,000 acre-feet per year (approximately 2.7 million gallons per day). Average daily usage for STP 1 & 2 from 2001 through 2006 was approximately 1.1 million gallons per day (763 gpm), for all purposes (Subsection 4.2.2).

During peak construction, an additional 5950 people on site could increase potable consumption by a maximum of 154,700 gpd for personal use. Estimated maximum construction use, including personal use (potable), concrete batch plant operation, concrete curing, cleanup activities, dust suppression, placement of engineered backfill, and piping hydrotests and flushing operations is approximately 1.7 million gallons per day (1200 gpm) (Subsection 4.2.2). Therefore, STPNOC conservatively estimates that total daily groundwater usage during peak construction activities, including usage by STP 1 & 2, would be approximately 2.8 million gallons per day, which, at a sustained level, could push total annual groundwater usage above the current permitted limit. Therefore, construction impacts to groundwater use during peak construction activities (if peak groundwater usage were sustained) could be MODERATE and would warrant mitigation. To mitigate this shortage of capacity, STPNOC would implement water

conservation strategies for STP 3 & 4 construction activities. Conservation strategies for STP 3 & 4 construction activities could include such measures as stand-alone drinking water stations and portable toilets, optimizing the scheduling of water intensive operations, and reusing water from dewatering operations for functions such as dust control.

Municipal water suppliers in the region have excess capacity (see Table 2.5-17). The impact to the local water supply systems from construction-related population growth can be estimated by calculating the amount of water that would be required by the total population increase. The average person in the U.S. uses about 90 gpd (Reference 4.4-32). A construction-related population increase of 8330 people (5056 in Matagorda County; 1866 in Brazoria County; and 1408 in the remainder of the 50-mile radius) could increase consumption by 749,700 gpd. As discussed in Subsection 2.5.2.7.1.1, there is currently excess capacity in every major public water supply system in Matagorda and Brazoria Counties. The total increase in population would not stress these municipal water supplies or the infrastructure.

However, regional water planning groups (see Subsection 2.5.2.7.1.1) predict that there would be water supply (and, possibly, infrastructure) issues in both Regions K (which includes Matagorda County) and H (which includes Brazoria County) some time after 2010. As shown in Tables 2.5-24 and 2.5-26 for Region K and Tables 2.5-27 and 2.5-29 for Region H, demand is nearly equal to supply in 2010 and, by 2060, demand exceeds supply. Both regions are in the process of analyzing and implementing strategies to mitigate predicted water shortages. As stated previously, construction would increase the population in the 50-mile region by 8330 people. Of those, 5056 people (60.7% of 8330) would locate to Matagorda County and 1866 (22.4% of 8330) people would locate to Brazoria County. These numbers constitute 13.3% and 0.8% of the 2000 Census populations of Matagorda and Brazoria Counties, respectively, and 11.3% and 0.6% of the 2020 population projections of Matagorda and Brazoria Counties, respectively. Additionally, between 2000 and 2020, the in-migrations represent a 75% and 2% increase in the projected additional population for Matagorda and Brazoria Counties, respectively.

Based on current population growth trends, the incremental increase in population resulting from construction of STP 3 & 4 would represent a very small percentage of the Brazoria County's 2000 (0.8%) and 2010 population (0.6%) (see Table 2.5-2). The Region H planning group has already identified water shortage issues for the region and is planning and implementing strategies to mitigate these issues (Subsection 2.5.2.7.1.1). Based on the incremental increase in population of less than 1%, the addition of the construction-related population would not perceptibly add to current stresses experienced by Region H, and therefore, impacts of the in-migrating construction labor force on municipal water supplies in Brazoria County would be characterized as SMALL and would not warrant mitigation implemented by STPNOC.

Impacts of the in-migrating construction labor force on municipal water supplies in Matagorda County (Region K) could be MODERATE to LARGE. The incremental increase in population resulting from STP 3 & 4 construction would represent 13.3% and 11.3% increases in the County's 2000 and projected 2010 populations. This



incremental increase would represent 75% of projected additional 2020 population for Matagorda County (see Table 2.5-5 for projected population and annual growth rates). The Region K planning group has already identified water shortage issues for the region, which could begin before construction completion, and is planning and implementing strategies to mitigate these issues. The addition of the construction-related population, which increases the projected 2010 population by 11.3%, and their water needs would perceptibly add to current stresses experienced by Region K. Region K mitigation strategies include reuse, seawater desalination, conservation, and the LCRA/San Antonio Water System Project (Subsection 2.5.2.7.1.1). In addition to the Region K mitigations, STPNOC would maintain communication with local and regional governmental organizations, including the Matagorda County Commissioners Court, County Judge and local and regional planning groups, to disseminate project information in a timely manner. These organizations would be aware of the in-migration of the workers and their families and would have ample opportunity to plan for the influx.

### **Wastewater Treatment Facilities**

The STP site has two wastewater treatment systems. Both would be expanded or replaced to meet the increased need for wastewater treatment during STP 3 & 4 construction.

Subsection 2.5.2.7.1.2 describes the public wastewater treatment systems in the Matagorda and Brazoria Counties, their plant-designed average flows, and monthly average wastewater processed. Wastewater treatment facilities in the two counties have excess capacity (see Table 2.5-24). The impact to local wastewater treatment systems from construction-related population increases can be determined by calculating the amount of water that would be used and disposed of by these individuals. The average person in the U.S. uses approximately 90 gpd (Reference 4.4-32). To be conservative, STPNOC estimates that 100% of this water would be disposed of through the wastewater treatment facilities. As shown in Table 4.4-2, the construction-related population increase of 5056 people in Matagorda County and 1866 people in Brazoria County could require 622,980 gpd of additional wastewater treatment capacity in the two counties. Currently, as shown in Table 2.5-23, there is excess treatment capacity in both counties, which indicates that there is sufficient water and infrastructure to meet this need. However, regional water planning groups predict that there would be water supply (and, possibly, infrastructure) issues in both Regions K and H some time after 2010. As stated previously (Subsection 2.5.2.7.1.1), water demand is nearly equal to supply in 2010 and, by 2060, demand exceeds supply. Both regions are in the process of analyzing and implementing strategies to mitigate predicted water shortages. Therefore, impacts of the in-migrating construction labor force on wastewater treatment facilities in the region would be similar to those for public water supplies.

Impacts of the in-migrating construction labor force on wastewater treatment facilities in Brazoria County would be SMALL and would not warrant additional mitigation. The incremental increase in population resulting from STP 3 & 4 construction would represent 0.8% and 0.6% of Brazoria County's 2000 census and projected 2010



populations, respectively. As stated above, the Region H planning group has already identified water shortage (and, possibly, infrastructure including wastewater treatment) issues for the region and is planning and implementing strategies to mitigate these issues (Subsection 2.5.2.7.1.1). The addition of the construction-related population would not perceptibly add to current stresses experienced by Region H.

Impacts of the in-migrating construction labor force on wastewater treatment facilities in Matagorda County (Region K) could be MODERATE to LARGE. The incremental increase in population, resulting from STP 3 & 4 construction, would represent 13.3% and 11.3% of Matagorda County's 2000 census and projected 2010 populations. This construction-related population would have water and wastewater needs of approximately 90 gpd. As stated above, and as discussed in greater detail in Subsection 2.5.2.7.1.1, the Region K planning group has already identified water shortage (and possibly infrastructure including wastewater treatment) issues for the region, which could begin before construction completion, and is planning and implementing strategies to mitigate these issues. The addition of the construction-related population would perceptibly add to current stresses experienced by Region K. In addition to the Region K strategies, STPNOC would maintain communication with local and regional governmental organizations, including the Matagorda County Commissioners Court, County Judge and local and regional economic development agencies, to disseminate project information in a timely manner. Local governments and planning groups would be made aware of the in-migration of the workers and their families and would have ample opportunity to plan for the influx.

### **Police, Fire, and Medical Services**

#### **Police Services**

In 2002, Matagorda and Brazoria Counties' residents-per-police-personnel ratios were 380:1 and 418:1, respectively (see Table 2.5-30). Between the two counties, Matagorda County has the larger police force relative to the size of its population. Local planning officials state that police protection is adequately provided in the area at this time (Subsection 2.5.2.7.2). STPNOC does now and would continue to employ its own security force.

The construction project would produce an influx of approximately 5056 new residents to Matagorda County (Table 4.4-6). Approximately 1866 new residents would move into Brazoria County. The rest of the construction labor force and families would live in other counties in the 50-mile region. These population increases would increase the persons-per-police-personnel ratios slightly in Brazoria County and moderately in Matagorda County (Table 4.4-6). The percent increase in ratio attributed to construction would be 13% and 1% in Matagorda and Brazoria Counties, respectively.

Based on the percentage increase in the ratio of persons-per-police-personnel, the impact of the construction on police services would be imperceptible in Brazoria County. In Matagorda County, however, the percentage increase in persons-per-police-personnel ratio would be more perceptible. Therefore, the potential impact of construction on police services in Brazoria County would be SMALL and that mitigation would not be warranted. However, the potential impact on police services could be

MODERATE in Matagorda County and would most likely be mitigated by ensuring STPNOC maintains communication with local government officials, such as the Matagorda County Commissioners Court and County Judge, so that expansions in police services could be coordinated, planned, and funded in a timely manner. Most funding for these expansions would most likely be obtained from the increased property tax revenues from the construction project. Should property tax revenues from the construction project not be immediately available, local governments could access other funding sources or issue bonds until the tax revenues would be available.

This conclusion is based in part on an analysis presented in NUREG-1437 that NRC performed of nuclear plant refurbishment impacts sustained during original plant construction. NRC selected seven case study plants whose characteristics resembled the spectrum of nuclear plants in the United States today. NRC reported that, “. . . (n)o serious disruption of public safety services occurred as a result of original construction at the seven case study sites. Most communities showed a steady increase in expenditures connected with public safety departments. Tax contributions from the plant often enabled expansion of public safety services in the purchase of new buildings and equipment and the acquisition of additional staff.”

#### **Fire Protection Services**

In 2007, Matagorda and Brazoria Counties' persons-per-firefighter ratios were 217:1 and 477:1, respectively (Table 2.5-30). The construction project would produce an influx of approximately 5056 new residents to Matagorda County. Approximately 1866 new residents would move into Brazoria County. The remainder of the construction labor force and families would live in other counties within the 50-mile region. These population increases would increase the persons-per-firefighter ratios by 1% in Brazoria County and 13% in Matagorda County (Table 4.4-7). Brazoria County has the highest persons-per-firefighter ratio.

At 1% in Brazoria County, the percent increase in persons-per-firefighter ratio attributed to construction is considered imperceptible. At 13% in Matagorda County, the percent increase in persons-per-firefighter ratio is considered more perceptible.

Therefore, the potential impacts of nuclear plant construction on fire protection services in Brazoria County would be SMALL and mitigation would not be warranted. The potential impacts on fire protection services could be MODERATE in Matagorda County and would most likely be mitigated by ensuring STPNOC maintains communication with local government officials, such as the Matagorda County Commissioners Court and County Judge, so that expansions in fire protection services could be coordinated, planned, and funded in a timely manner. Most funding for these expansions would likely be obtained from the increased property tax revenues from the construction project. Should property tax revenues from the construction project not be immediately available, local governments could access other funding sources or issue bonds until the tax revenues would be available.

As with the analysis of the adequacy of police protection, the conclusions of this analysis are based in part on NRC's review of original construction impacts on public services. As stated, in NUREG-1437, NRC performed an analysis of nuclear plant

refurbishment impacts based on impacts sustained during original plant construction. NRC reported that, "(n)o serious disruption of public safety services occurred as a result of original construction at the seven case study sites. Most communities showed a steady increase in expenditures connected with public safety departments. Tax contributions from the plant often enabled expansion of public safety services in the purchase of new buildings and equipment and the acquisition of additional staff." Based on this statement, the moderate impacts to fire protection services in Matagorda County would be mitigated by the communication between STPNOC and local government officials, such as the Matagorda County Commissioners Court and County Judge, and the increase in tax contributions made by the owners of the plant to the local taxing jurisdictions.

### **Medical Services**

Detailed information concerning the medical services in the two-county region is provided in Subsection 2.5.2.7.3. Minor injuries to construction workers would be assessed and treated by onsite medical personnel. Other injuries would be treated at one of the hospitals in the two-county region or in the city of Houston, depending on the severity of the injury. For the existing STP 1 & 2 labor force, agreements are in place with some local medical providers to support emergencies. STPNOC would require the construction contractor to reach similar agreements to provide emergency medical services to the construction labor force. Construction activities should not burden existing medical services.

The medical facilities in Matagorda and Brazoria Counties provide medical care to much of the population in the counties. As indicated in Table 2.5-5, the combined 2000 population of Matagorda and Brazoria Counties was 279,724. According to Table 2.5-31, in 2006, there were 296 staffed hospital beds and an average daily census of 107 in the two-county region. Adding 6922 residents to the combined population of the two counties would increase the combined population by 2.5%. A 2.5% increase in the average daily census would increase that number to 110, well below the total number of staffed hospital beds in the two counties. Additionally, the total number of annual admissions, and annual outpatient visits for the two-county region, were 11,084 and 210,946, respectively. A 2.5% increase in these statistics would equate to 11,361 admissions and 216,220 outpatient visits. Adding the projected increase in population in the two counties during the construction period would not exceed capacity. Therefore, the potential impacts of construction on medical services would be SMALL and mitigation would not be warranted.

### **Social Services**

This section focuses on the potential impacts of construction on the social and related services provided to disadvantaged segments of the population. This section is distinguished from environmental justice issues, which are discussed in Subsection 4.4.3.

Construction could be viewed as economically beneficial to the disadvantaged population served by the Texas Health and Human Services Commission and the local governmental and nongovernmental organizations. Over the construction period, the

constructing contractor could hire local unemployed people, thus improving their economic position and decreasing their need for services. At a minimum, the spending by the construction labor force movers for goods and services would have a multiplier effect, increasing the number of jobs that could be filled by the economically disadvantaged.

STPNOC concludes that the potential impacts of construction on the demand for social and related services during the construction period would be SMALL and positive and would not warrant mitigation.

The construction of STP 3 & 4 is expected to bring 5056 additional residents into Matagorda County during peak construction, representing an increase of approximately 13.3% over the County's population in 2000. It is likely that some of the new residents would require assistance from these or other agencies at some time during their stay. Because the incoming workers are expected to be paid higher wages than the local average, it is unlikely that the in-migrants would create excessive demands on agencies that provide economic assistance, although other types of support may be required. It is not possible at this time to determine the extent to which demand for social services would increase, but impacts are expected to be SMALL.

In addition to government-provided services, a number of non-governmental agencies provide services to residents of Matagorda County. These non-profit, faith-based, or other types of organizations provide a wide range of social services that address disaster relief, substance abuse, domestic violence, illness, the needs of the elderly, economic hardship, and other issues. In addition, organizations such as the Boy Scouts, Girl Scouts, and 4-H provide opportunities for youths. Table 4.4-9 lists organizations who are part of the Matagorda County United Way; these represent a sample of all social service organizations in Matagorda County. While some newcomers would need services provided by the community, others would no doubt chose to participate in activities offered by the Boy Scouts, Girl Scouts, or similar opportunities, and some would choose to volunteer or donate funds. The higher personal income expected in the ROI from the construction of STP 3 & 4 is likely to lead to increased donations to agencies from firms and individuals. Although it is not possible to estimate changes in demand for specific services, or the amount of increased contributions, impacts are expected to be SMALL.

#### 4.4.2.2.8 Education

STPNOC assumes that 2380 of the peak construction labor force would relocate to the 50-mile region with their families, increasing the population by approximately 8330 people. Approximately 60.7% would settle in Matagorda County and 22.4% in Brazoria County. The remaining 16.9% would be distributed across the seven other counties within the region.

STPNOC conservatively estimates that in a construction labor-force-related population of 8330, approximately 1904 would be school-aged. Table 4.4-2 applies the population distribution percentage assumptions to the number of school-aged children in the construction labor force population to estimate the number of construction labor force related school-aged children that would settle Matagorda and Brazoria counties.

Based on these assumptions, there would be 1156 children added to the enrollments of the ISDs in Matagorda County and 426 children added to the enrollments of the ISDs in Brazoria County.

It is unlikely that the Matagorda County school systems could accommodate the increase in student population (Subsection 2.5.2.8). The analysis is based on the peak construction labor force, which would not be reached until the third year of construction, giving schools several years to make accommodations for the additional influx of students.

Overall, the impact to the counties within the 50-mile region would be SMALL. The Matagorda County student population could increase by 14%, which would be a MODERATE to LARGE impact on its education system and would require mitigation. Matagorda County is not planning to construct additional schools. The quickest mitigation would be to hire additional teachers and move modular classrooms to existing schools. Increased property tax revenues as a result of the increased population, and, in the case of Matagorda County, Palacios ISD, property taxes on the new reactors would fund additional teachers and additional facilities if necessary (Subsection 2.5.2.3). The remaining revenue tax monies not used by the school district would be collected by the state of Texas and combined with tax revenues from all other Texas counties. These monies would be redistributed to “property-poor” school districts throughout the state of Texas, determined annually by the Texas Legislature Texas Education Code (TEC) Chapter 42 (Subsection 2.5.2.3).

### **Matagorda County**

#### **Bay City ISD**

Bay City ISD had a Pre-K through Grade 12 total enrollment of 4140 students in October 2005 (Reference 4.4-33). The current ISD infrastructure could support approximately 4600 to 4700 students. However, if enrollments reach the historic peaks (4900 students) experienced during the construction of STP 1 & 2, the existing infrastructure would not be sufficient and portable buildings would be necessary.

#### **Matagorda ISD**

Matagorda ISD, consisting of only Matagorda Elementary, had a pre-K through grade 6 enrollment of 56 students in October 2005 (Reference 4.4-33). According to the superintendent, the ISD is only at 50% capacity; however, the Board of Trustees has recently called for a bond election to improve and enlarge the existing facilities. Because of the recent growth potential, the ISD is also considering expanding classes to include seventh and eighth grade.

#### **Palacios ISD**

Palacios ISD had a pre-K through grade 12 enrollment of 1638 students in October 2005 (Reference 4.4-34). According to the Director of Business Services for Palacios ISD, the current enrollment in the district is approximately 1540 students. The enrollment decreased from 2005 by approximately 100 students – indicative of a downward trend in their enrollment numbers.

**Tidehaven ISD**

Tidehaven ISD has a pre-K through grade 12 enrollment of 871 students (Reference 4.4-35). The district's Program and Facilities Committee is developing a recommendation concerning the facility needs of the district. According to the superintendent, the district has the capacity to handle approximately 1050 students. Based on the current enrollment, this would leave an available capacity of approximately 180 students.

**Van Vleck ISD**

Van Vleck ISD had a pre-K through grade 12 enrollment of 963 students in October 2005 (Reference 4.4-34).

**Brazoria County**

It is likely that Brazoria County school systems could accommodate the increase in student population (Subsection 2.5.2.8). The analysis is based on the peak construction labor force, which would not be reached sooner than the third year of construction, giving schools several years to make accommodations for the additional influx of students.

**Alvin ISD**

Alvin ISD has a pre-K through grade 12 enrollment of 14,300 students. The Board of Trustees estimates that approximately 12,000 more students will enroll in Alvin ISD in the next 10 years (Reference 4.4-36). As a result, Alvin ISD has an extensive building development program underway. Construction continues with plans for a new elementary school to open in August 2007. Two new junior high schools are scheduled to open in 2008—one in Alvin and one in Shadow Creek Ranch. The new academic building at Alvin High School is slated for occupancy in December 2007. When the two new junior high schools open in 2008, all junior high schools will be reconfigured to serve grades 6 through 8, and the elementary schools will serve pre-K through grade 5 (Reference 4.4-36).

**Angleton ISD**

Angleton ISD has a pre-K through grade 12 enrollment of 6380 students (Reference 4.4-37). The early childhood campus only has enough available capacity to accommodate 64 additional students; however the elementary school, middle school, intermediate school, and high school all have additional capacities available ranging from approximately 450 students to 900 students in the middle school and high school, respectively (Reference 4.4-38).

**Brazosport ISD**

Brazosport ISD has a pre-K through grade 12 enrollment of 13,043 students (Reference 4.4-39). A new elementary school, a new intermediate school, and a new middle/intermediate school have been built. These schools were built primarily to alleviate overcrowding, address growth, realign grade levels, and update old facilities. In addition to the new schools, renovations are taking place at the high schools and one of the existing middle schools to include additional classrooms. Because of the

construction and renovations, Brazosport ISD would have capacity for additional students.

### **Columbia-Brazoria ISD**

Columbia-Brazoria ISD has a current pre-K through grade 12 enrollment of 3107 students (Reference 4.4-40). The district recently opened a new junior high school and a new elementary school as replacements to older buildings, and the Board of Trustees is nominating members to a Facility Task Force Committee to study future building development plans. The district currently has five schools with available capacities ranging from approximately 120 students to 55 students.

### **Damon ISD**

Damon ISD had a pre-K through grade 8 enrollment of 164 students in October 2005 (Reference 4.4-33). The ISD is at maximum capacity with no official building development plans established. However, Damon ISD recognizes the need to address building development in the next year or two.

### **Danbury ISD**

Danbury ISD has a pre-K through grade 12 enrollment of 777 students. The district has a Facilities Study underway, but the study has not been completed. Renovations or new construction are expected to take place in the district in the next five years.

### **Pearland ISD**

Pearland ISD has a current pre-K through grade 12 enrollment of 16,116 students. According to the Pearland ISD Director of Communications, the district plans to open two additional elementary schools, one middle school, one junior high school, and one high school between the fall of 2007 and the fall of 2008. Once these new schools are used, the district will have an available capacity of over 1300 students in elementary schools, and 1000 students each in both junior high and high schools.

### **Sweeny ISD**

Sweeny ISD had a pre-K through grade 12 enrollment of 2086 students in October 2005 (Reference 4.4-41). The high school is currently undergoing construction and renovations that should be complete before the start of the 2008–2009 school year. The new high school will be able to accommodate over 800 students, increasing the capacity of the existing high school by approximately 150 students. In addition, there is available capacity at both the junior high and elementary schools.

Overall, the impact to the nine counties within the 50-mile region would be SMALL. The Brazoria County student population could increase by 5%, which would be a MODERATE impact on its education system and would require mitigation. Matagorda County is not planning to construct additional schools.

The quickest mitigation would be to hire additional teachers and move modular classrooms to existing schools. Increased property tax revenues as a result of the increased population, and the remaining revenue tax monies not used by the school district would be collected by the state of Texas and combined with tax revenues from

all other Texas counties. These monies would be redistributed to “property-poor” school districts throughout the state of Texas, determined annually by the Texas Legislature TEC Chapter 42 (Subsection 2.5.2.3), and would fund additional teachers and facilities.

#### 4.4.3 Environmental Justice Impacts

Environmental justice refers to a federal policy under which each federal agency identifies and addresses, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority or low-income populations. The NRC has a policy on the treatment of environmental justice matters in licensing actions (69 FR 52040), which states, “NRC believes that an analysis of disproportionately high and adverse impacts needs to be done as part of the agency’s National Environmental Policy Act (NEPA) obligations to accurately identify and disclose all significant environmental impacts associated with a proposed action. Consequently, while the NRC is committed to the general goals of Executive Order 12898, it will strive to meet those goals through its normal and traditional NEPA review process.”

STPNOC evaluated whether the health or welfare of minority and low-income populations could be disproportionately adversely affected by potential construction impacts. STPNOC first located minority and low-income populations within the 50-mile radius of the STP site (Figures 2.5-10 through 2.5-15). Nineteen census block groups within the 50-mile radius have significant Black or African American populations. One block group has a significant Asian minority population and six block groups have a significant “some other race” population. Thirty census block groups within the 50-mile radius have significant Hispanic ethnicity populations.

STPNOC next identified the most likely pathways by which adverse environmental impacts associated with construction at the STP site could affect human populations. Exhaust emissions from construction equipment and dust would cause minor and localized adverse impacts to air quality; however, the air quality beyond the site boundary would not be affected. No contaminants, including sediments, are expected to reach the Colorado River because all construction would be carried out using Best Management Practices as discussed in Section 3.9. Impacts could occur in Matagorda County, as the influx of construction workers could cause landowners to convert some undeveloped land to other uses such as trailer parks, convenience stores, hotel/motel property, etc. Local low-income and minority populations could benefit by gaining access to new services or employment at these small businesses. However, the new uses are considered temporary, as completion of the construction project would eliminate the demand for the services. Therefore, impacts in all of these resource areas would be SMALL and mitigation would not be required.

Traffic could increase beyond the capacity of some local roads; however, STPNOC would mitigate impacts by encouraging car pooling, providing van pools, or staggering work shifts. The construction project likely would provide additional temporary jobs for some of the unemployed work force, thus decreasing their need for social services and freeing funding up for other populations in need. Matagorda County’s police and fire protection services would be impacted by the increase in population due to



construction, but the increase in property tax revenues as a result of the construction project (particularly in the latter stages of construction) would fund facilities, equipment, and additional personnel to meet these needs. The local Matagorda County school systems would be adversely affected by an influx of new students; however, the additional property tax revenues would fund additional teachers and facilities. Rental housing rates could increase, potentially displacing low-income renters. However, it is unlikely the construction workforce would need low-income housing. Impacts to the local communities in these areas from construction of STP 3 & 4 would be MODERATE to LARGE and would be subject to the mitigation measures discussed above. Except for increased rental housing rates, no adverse impacts in Matagorda County would disproportionately affect minority or low-income populations.

Environmental impacts in the other counties in the 50-mile radius would be less than those in Matagorda County. Impacts in the other counties in the 50-mile region of interest would all be SMALL and mitigation would not be required. Therefore, the likelihood of disproportionate impacts to minority or low-income populations in those counties would be remote.

STPNOC also investigated the possibility of subsistence-living populations in the vicinity of the STP site by contacting local government officials, the staff of social welfare agencies, and local businesses concerning any known unusual resource dependencies or practices that could result in potentially disproportionate impacts to minority and low-income populations. STPNOC asked about the presence of minority, low-income, or migrant populations of particular concern, and whether subsistence living conditions were evident. No agency reported such dependencies or practices, such as subsistence agriculture, hunting, or fishing, through which the populations could be disproportionately adversely affected by the construction project.

Construction-related moderate adverse socioeconomic impacts were identified in Matagorda County. However, except for increased rental housing rates, no adverse impacts in Matagorda County would disproportionately affect minority or low-income populations. Impacts in the other counties in the 50-mile region of interest would all be SMALL. Mitigation beyond that previously described would not be warranted.

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**Table 4.4-1 Equipment and Approximate Noise Level in the Immediate Vicinity of the Equipment [1]**

<b>Equipment</b>	<b>Noise Level (dBA) within 10 ft</b>
Pneumatic chip hammer	103–113
Earth tamper	90–96
Jackhammer	102–111
Crane	90–96
Concrete joint cutter	99–102
Hammer	87–95
Portable saw	88–102
Earthmover	87–94
Stud welder	101
Front-end loader	86–94
Bulldozer	93–96
Backhoe	84–93

[1]Reference 4.4-3

**Table 4.4-2 Assumptions for Construction Labor Force Migration and Residential Distribution for the STP Site**

<b>Assumption</b>	<b>Description</b>
<b>Construction Labor Force Distribution</b>	
5,950	Peak number of workers during construction
2,975	Number of workers who change residence to work at site (movers) (50% of peak)
1,806	Number of movers who settle in Matagorda County (same percent as existing labor force) (60.7%)
666	Number of movers who settle in Brazoria County (same percent as existing labor force) (22.4%)
503	Number of movers who settle in other counties in the 50-mile region (16.9%).
<b>Families</b>	
2,380	Number of movers who bring families into 50-mile radius (80% of movers)
595	Number of movers who don't bring families into 50-mile radius (20% of movers)
1,445	Number of movers that bring families to Matagorda County (80% of movers who settle in Matagorda County)
361	Number of movers who move to Matagorda County and don't bring families (20% of movers who settle in Matagorda County)
533	Number of movers that bring families to Brazoria County (80% of movers who settle in Brazoria County)
133	Number of movers who move to Brazoria County and don't bring families (20% of movers who settle in Brazoria County)
402	Number of movers who locate outside of Matagorda and Brazoria Counties (within the 50-mile radius) and bring families
101	Number of movers that locate outside of Matagorda and Brazoria Counties (within the 50-mile radius) and don't bring families
3.25	Average mover family size (worker, spouse, children)
8,330	Total in-migration (7,735 (movers plus families) plus 595 (movers who don't bring families))
5,056	Total in-migration in Matagorda County (4,695 (movers plus families) plus 361 (movers without families))
1,866	Total in-migration in Brazoria County (1,733 (movers plus families) plus 133 (movers without families))
1,408	Total in-migration outside of Matagorda and Brazoria Counties and within the 50-mile radius (1,307 (movers plus families) plus 101 (movers without families))
<b>Children</b>	
1,904	Number of mover school-age children (0.8 per mover family)

**Table 4.4-2 Assumptions for Construction Labor Force Migration and Residential Distribution for the STP Site (Continued)**

<b>Assumption</b>	<b>Description</b>
1,156	Number of mover school-age children (0.8 per mover family) relocating to Matagorda County
426	Number of mover school-age children (0.8 per mover family) relocating to Brazoria County
<b>Post-Construction Labor Force Retention</b>	
1,488	Average number of movers who leave 50-mile radius post-construction (50% of movers)
903	Average number of movers who leave Matagorda County post-construction (50% of Matagorda County movers)
333	Average number of movers who leave Brazoria County post-construction (50% of Brazoria County movers)
4,165	Average number of movers plus families plus movers without families who leave 50-mile radius post-construction (50% of total in-migration)
2,528	Average number of movers plus families plus movers without families who leave Matagorda County post-construction (50% of Matagorda County in-migration)
933	Average number of movers plus families plus movers without families who leave Brazoria County post-construction (50% of Brazoria County in-migration)
952	Average number of mover school-age children who leave area post-construction (50%)
578	Average number of mover school-age children who leave Matagorda County post-construction (50%)
213	Average number of mover school-age children who leave Brazoria County post-construction (50%)



**Table 4.4-3 Bay City Sales Taxes Projected to 2015 with Estimated STP Sales Tax Payments During Construction of STP 3 & 4 [1]**

<b>Year</b>	<b>Sales Tax</b>	<b>Total Tax</b>	<b>Percent of Total</b>	<b>STP 3</b>	<b>STP 4</b>	<b>Estimated Pmts for STP 3 &amp; 4 as Percent of Total Sales Tax</b>
2006	3,762,374	8,793,315	43%			
2007	3,844,926	8,993,489	43%			
2008	3,929,289	9,198,220	43%			
2009	4,015,503	9,407,611	43%	827,706		21%
2010	4,103,608	9,621,770	43%	827,706	827,706	41%
2011	4,193,647	9,840,803	43%	827,706	827,706	40%
2012	4,285,662	10,064,823	43%	827,706	827,706	39%
2013	4,379,695	10,293,942	43%	827,706	827,706	39%
2014	4,475,791	10,528,277	43%	827,706	827,706	38%
2015	4,573,996	10,767,946	42%		827,706	18%

Data source for Taxes 1996-2005: Reference 4.4-42

[1] Projections based on average annual rate of change between 1996 and 2005.

*Calculation Assumptions:*

1. STP construction expenditures would be distributed evenly over a 6-year construction period for each unit.
2. Bay City sales taxes will increase at a constant rate based on historic rate (1996-2005).
3. The projected rate of increase in Bay City sales tax is conservative in that it does not take into account likely increases in population or business activity that could occur as a result of STP construction.

Table 4.4-4 Direct and Indirect Employment

Demographic	ABWR 2 Units
Construction Labor Force Peak (Table 4.4-2)	5,950
Number of workers who change residence to work at site (movers) (50% of peak) (assumed)	2,975
Indirect jobs (2,975 x 0.61)	1,815
2005 unemployed in the two counties [1]	8,870
Total number of indirect jobs as a percent of unemployed population in two-county area ((1,815 / 8,870) X 100%)	20%

[1] See Table 2.5-9

Table 4.4-5 Impact of Mover's Construction Wages on Regional Economy [1]

Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce
-24	50	\$2,999	\$149,950	15	2,240	\$2,999	\$6,717,760	53	1,650	\$2,999	\$4,948,350
-23	100	\$2,999	\$299,900	16	2,305	\$2,999	\$6,912,695	54	1,600	\$2,999	\$4,798,400
-22	150	\$2,999	\$449,850	17	2,370	\$2,999	\$7,107,630	55	1,500	\$2,999	\$4,498,500
-21	200	\$2,999	\$599,800	18	2,435	\$2,999	\$7,302,565	56	1,400	\$2,999	\$4,198,600
-20	250	\$2,999	\$749,750	19	2,500	\$2,999	\$7,497,500	57	1,300	\$2,999	\$3,898,700
-19	300	\$2,999	\$899,700	20	2,565	\$2,999	\$7,692,435	58	1,200	\$2,999	\$3,598,800
-18	350	\$2,999	\$1,049,650	21	2,630	\$2,999	\$7,887,370	59	1,100	\$2,999	\$3,298,900
-17	400	\$2,999	\$1,199,600	22	2,695	\$2,999	\$8,082,305	60	1,000	\$2,999	\$2,999,000
-16	450	\$2,999	\$1,349,550	23	2,760	\$2,999	\$8,277,240	61	900	\$2,999	\$2,699,100
-15	500	\$2,999	\$1,499,500	24	2,825	\$2,999	\$8,472,175	62	800	\$2,999	\$2,399,200
-14	550	\$2,999	\$1,649,450	25	2,900	\$2,999	\$8,697,100	63	700	\$2,999	\$2,099,300
-13	600	\$2,999	\$1,799,400	26	2,975	\$2,999	\$8,922,025	64	600	\$2,999	\$1,799,400
-12	650	\$2,999	\$1,949,350	27	2,975	\$2,999	\$8,922,025	65	550	\$2,999	\$1,649,450
-11	700	\$2,999	\$2,099,300	28	2,975	\$2,999	\$8,922,025	66	263	\$2,999	\$787,238
-10	750	\$2,999	\$2,249,250	29	2,975	\$2,999	\$8,922,025	67	0	\$2,999	\$0
-9	800	\$2,999	\$2,399,200	30	2,975	\$2,999	\$8,922,025				
-8	850	\$2,999	\$2,549,150	31	2,975	\$2,999	\$8,922,025				
-7	900	\$2,999	\$2,699,100	32	2,975	\$2,999	\$8,922,025				
-6	950	\$2,999	\$2,849,050	33	2,975	\$2,999	\$8,922,025				
-5	1,000	\$2,999	\$2,999,000	34	2,975	\$2,999	\$8,922,025				
-4	1,050	\$2,999	\$3,148,950	35	2,975	\$2,999	\$8,922,025				
-3	1,100	\$2,999	\$3,298,900	36	2,925	\$2,999	\$8,772,075				
-2	1,150	\$2,999	\$3,448,850	37	2,875	\$2,999	\$8,622,125				
-1	1,200	\$2,999	\$3,598,800	38	2,825	\$2,999	\$8,472,175				
1	1,250	\$2,999	\$3,748,750	39	2,725	\$2,999	\$8,172,275				

**Table 4.4-5 Impact of Mover's Construction Wages on Regional Economy [1] (Continued)**

Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce
2	1,325	\$2,999	\$3,973,675	40	2,625	\$2,999	\$7,872,375				
3	1,400	\$2,999	\$4,198,600	41	2,525	\$2,999	\$7,572,475				
4	1,475	\$2,999	\$4,423,525	42	2,425	\$2,999	\$7,272,575				
5	1,550	\$2,999	\$4,648,450	43	2,325	\$2,999	\$6,972,675				
6	1,625	\$2,999	\$4,873,375	44	2,225	\$2,999	\$6,672,775				
7	1,700	\$2,999	\$5,098,300	45	2,125	\$2,999	\$6,372,875				
8	1,775	\$2,999	\$5,323,225	46	2,025	\$2,999	\$6,072,975				
9	1,850	\$2,999	\$5,548,150	47	1,950	\$2,999	\$5,848,050				
10	1,915	\$2,999	\$5,743,085	48	1,900	\$2,999	\$5,698,100				
11	1,980	\$2,999	\$5,938,020	49	1,850	\$2,999	\$5,548,150				
12	2,045	\$2,999	\$6,132,955	50	1,800	\$2,999	\$5,398,200				
13	2,110	\$2,999	\$6,327,890	51	1,750	\$2,999	\$5,248,250				
14	2,175	\$2,999	\$6,522,825	52	1,700	\$2,999	\$5,098,300				
Subtotal =			\$117,485,825	Subtotal =			\$289,553,450	Subtotal =			\$43,672,938

Monthly \$ earned by a construction worker [2] =	\$2,999
Total \$ earned by construction workforce =	\$450,712,213
Earnings multiplier for two-county region =	1.50

**Table 4.4-5 Impact of Mover's Construction Wages on Regional Economy [1] (Continued)**

Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage [2] (\$)	\$ Earned by Construction Workforce
<b>Sensitivity Analysis</b>											
<b>% of Total Construction Workforce Wages that could be Spent in Region</b>				<b>Dollar Impact to Region (earnings multiplier applied)</b>							
			<b>\$</b>								
	10		\$45,071,221				\$67,606,832				
	20		\$90,142,443				\$135,213,664				
	30		\$135,213,664				\$202,820,496				
	40		\$180,284,885				\$270,427,328				
	50		\$225,356,106				\$338,034,159				
	60		\$270,427,328				\$405,640,991				
	70		\$315,498,549				\$473,247,823				
	80		\$360,569,770				\$540,854,655				
	90		\$405,640,991				\$608,461,487				
	100		\$450,712,213				\$676,068,319				

[1] Reference 4.4-43

[2] U.S. Department of Labor Bureau of Labor Statistics. 2005. "Quarterly Census of Employment and Wages." Available online at <http://data.bls.gov/>. Accessed March 7,2007.

Note: Table 4.4-5 is based on Table 3.10S-2.

**Table 4.4-6 Police Protection in the Two Counties of Interest, Adjusted for the Construction Labor Force and Associated Population Increase**

County	Total Population in 2000	Additional Population Due to New Plant Construction	Total Population	Police Protection in 2002	Construction Labor Force-Adjusted Persons-per-Police Personnel Ratio	Percent Increase from 2000 Persons-per-Police Personnel Ratio
Matagorda	37,957	5,056	43,013	100	430:1	13
Brazoria	241,767	1,866	243,633	578	422:1	1

Source: Table 2.5-30 Police and Fire Protection

**Table 4.4-7 Fire Protection in the Two Counties of Interest, Adjusted for the Construction Labor Force and Associated Population Increase**

County	Total Population In 2000	Additional Population Due to New Plant Construction	Total Population	Firefighters (Full time and Volunteer) in 2007	Construction Labor Force-Adjusted Persons-per-Firefighter	Percent Increase from Current Persons-per-Firefighter Ratio
Matagorda	37,957	5,056	43,013	175	246:1	13
Brazoria	241,767	1,866	243,633	507	481:1	1

Source: Table 2.5-30 Police and Fire Protection

**Table 4.4-8 Estimated Sales Tax Impacts of Expenditures For Goods & Services During Construction of STP Units 3 & 4**

<u>Summary of Estimated Construction-Period Expenditures:</u>					<u>Estimated Amount</u>			
Construction and Maintenance Equipment, Supplies, & Services					\$212,671,000			
Office and Administrative Equipment, Supplies & Services					\$13,424,000			
<b>Total Estimated Expenditures, Construction Period</b>					<b>\$226,095,000</b>			
<b>Average Annual Expenditures (7-year construction period)</b>					<b>\$32,299,286</b>			
<b>Estimated Annual Impacts to Texas Sales Tax Revenues<sup>1</sup></b>								
State sales tax revenues, 2006 <sup>2</sup>					\$18,275,209,754			
State sales tax rate <sup>3</sup>					6.25%			
<b>Ownership Scenario:</b>	<b>44% Private Ownership</b>		<b>60% Private Ownership</b>		<b>80% Private Ownership</b>		<b>100% Private Ownership</b>	
<u>Assumes 100% of Expenditures Subject To State Tax</u>	<u>State Sales Tax</u>	<u>% of 2006 Sales Tax Revenues</u>	<u>State Sales Tax</u>	<u>% of 2006 Sales Tax Revenues</u>	<u>State Sales Tax</u>	<u>% of 2006 Sales Tax Revenues</u>	<u>State Sales Tax</u>	<u>% of 2006 Sales Tax Revenues</u>
State Sales Tax	\$888,230	0.005%	\$1,211,223	0.007%	\$1,614,964	0.009%	\$2,018,705	0.011%
<b>Estimated Annual Impacts to Bay City Sales Tax Revenues<sup>1</sup></b>								
Bay City sales tax revenues, 2005 <sup>2</sup>					\$3,681,595			
Bay City sales tax rate <sup>2</sup>					2.0%			
<b>Ownership Scenario:</b>	<b>44% Private Ownership</b>		<b>60% Private Ownership</b>		<b>80% Private Ownership</b>		<b>100% Private Ownership</b>	
<u>% of Expenditures Subject to Bay City Sales Tax</u>	<u>Bay City Sales Tax</u>	<u>% of 2005 Sales Tax Revenues</u>	<u>Bay City Sales Tax</u>	<u>% of 2005 Sales Tax Revenues</u>	<u>Bay City Sales Tax</u>	<u>% of 2005 Sales Tax Revenues</u>	<u>Bay City Sales Tax</u>	<u>% of 2005 Sales Tax Revenues</u>
100.00%	\$284,234	7.7%	\$387,591	10.5%	\$516,789	14.0%	\$645,986	17.5%
90.00%	\$255,810	6.9%	\$348,832	9.5%	\$465,110	12.6%	\$581,387	15.8%
80.00%	\$227,387	6.2%	\$310,073	8.4%	\$413,431	11.2%	\$516,789	14.0%
70.00%	\$198,964	5.4%	\$271,314	7.4%	\$361,752	9.8%	\$452,190	12.3%
60.00%	\$170,540	4.6%	\$232,555	6.3%	\$310,073	8.4%	\$387,591	10.5%
50.00%	\$142,117	3.9%	\$193,796	5.3%	\$258,394	7.0%	\$322,993	8.8%
40.00%	\$113,693	3.1%	\$155,037	4.2%	\$206,715	5.6%	\$258,394	7.0%
30.00%	\$85,270	2.3%	\$116,277	3.2%	\$155,037	4.2%	\$193,796	5.3%
20.00%	\$56,847	1.5%	\$77,518	2.1%	\$103,358	2.8%	\$129,197	3.5%
10.00%	\$28,423	0.8%	\$38,759	1.1%	\$51,679	1.4%	\$64,599	1.8%
<b>Estimated Annual Impacts to Palacios Sales Tax Revenues<sup>1</sup></b>								
Palacios sales tax revenues, 2005 <sup>2</sup>					\$219,500			
Palacios sales tax rate <sup>2</sup>					2.0%			
<b>Ownership Scenario:</b>	<b>44% Private Ownership</b>		<b>60% Private Ownership</b>		<b>80% Private Ownership</b>		<b>100% Private Ownership</b>	
<u>% of Expenditures Subject to Palacios Sales Tax</u>	<u>Palacios Sales Tax</u>	<u>% of 2005 Sales Tax Revenues</u>	<u>Palacios Sales Tax</u>	<u>% of 2005 Sales Tax Revenues</u>	<u>Palacios Sales Tax</u>	<u>% of 2005 Sales Tax Revenues</u>	<u>Palacios Sales Tax</u>	<u>% of 2005 Sales Tax Revenues</u>
100.00%	\$284,234	129.5%	\$387,591	176.6%	\$516,789	235.4%	\$645,986	294.3%
90.00%	\$255,810	116.5%	\$348,832	158.9%	\$465,110	211.9%	\$581,387	264.9%
80.00%	\$227,387	103.6%	\$310,073	141.3%	\$413,431	188.4%	\$516,789	235.4%
70.00%	\$198,964	90.6%	\$271,314	123.6%	\$361,752	164.8%	\$452,190	206.0%
60.00%	\$170,540	77.7%	\$232,555	105.9%	\$310,073	141.3%	\$387,591	176.6%
50.00%	\$142,117	64.7%	\$193,796	88.3%	\$258,394	117.7%	\$322,993	147.1%
40.00%	\$113,693	51.8%	\$155,037	70.6%	\$206,715	94.2%	\$258,394	117.7%
30.00%	\$85,270	38.8%	\$116,277	53.0%	\$155,037	70.6%	\$193,796	88.3%
20.00%	\$56,847	25.9%	\$77,518	35.3%	\$103,358	47.1%	\$129,197	58.9%
10.00%	\$28,423	12.9%	\$38,759	17.7%	\$51,679	23.5%	\$64,599	29.4%

<sup>1</sup> Note: Assumes that these expenditures are subject to sales tax.

<sup>2</sup> Reference 2.5-25

<sup>3</sup> Reference 2.5-27

<sup>4</sup> Reference 2.5-46

<sup>5</sup> Reference 2.5-30

<sup>6</sup> Reference 2.5-109 [City of Palacios 2007-2008 Annual Budget, Approved 09/18/2007]