APPENDIX A

MITIGATION MONITORING AND REPORTING PROGRAM

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
Air Quality					
AIR-1: Require implementation of the following measures during construction: a) All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day or to maintain a minimum soil moisture of 12%. b) All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. c) The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time. d) All trucks and equipment, including their tires, shall be washed off prior to leaving the site. e) All haul trucks transporting soil, sand, or other loose material off-site shall be covered. f) All visible mud or dirt tracked-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping shall be prohibited. g) All vehicle speeds on unpaved roads shall be limited to 15 miles per hour. h) Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel. i) All paving shall be completed as soon as possible after pipeline replacement work is finished. j) Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent. k) Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 2 minutes (California airborne toxics control measure Title 13, section 2485 of	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS & ALL DEVELOPMENT PHASES. • Measures shall be included in the Construction Specifications for grading plans, subdivision improvement plans, and grading/construction plans for subsequent development phases. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.	The Petaluma Public works & Utilities Department is responsible for review of improvement plans and Building Department is responsible for review of the building plans to ensure that measures are included on construction specifications.	• Prior to the issuance of the grading permits for review of plans. • On-going site inspections during grading and construction, at the discretion of the City.	Construction Monitoring Report from Applicant that documents periodic site inspections during grading to ensure measures and verification that measures are in place.	Subdivision Improvements _____ Development Phases _____ _____ _____ _____ _____ _____ _____ _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
California Code of Regulations (CCR) establishes a maximum idling time of 5 minutes). Clear signage shall be provided for construction workers at all access points. l) All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. m) Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations. n) Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. o) Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings). p) All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading, unless seeding or soil binders are used.					
AIR-2: Include the following measures as part of the construction specifications (GP Policy 4-P-16): a) Maintain construction equipment engines in good condition and in proper tune per manufacturer's specification for the duration of construction; b) Use alternative fuel construction equipment if available (i.e., compressed natural gas, liquid petroleum gas); c) Require that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM through the use of add-on control devices such as diesel oxidation catalysts or particulate filters; and	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS & ALL DEVELOPMENT PHASES. • Measures shall be included in the Construction Specifications for all improvement and construction plans. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.	The Petaluma Public Works & Utilities Department is responsible for review of improvement plans and Building Department is responsible for review of the building plans to ensure that measures are included on construction plans.	• Prior to the issuance of the grading and building permits for review of plans. • On-going site inspections during grading and construction, at the discretion of the City.	Construction Monitoring Report from Applicant that documents periodic site inspections during grading to ensure measures and verification that measures are in place.	Subdivision Improvements _____ Development Phases _____ _____ _____ _____ _____ _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
d) Require all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.					_____ _____
AIR-3: Require that construction activities implement the following measures at the project sites to reduce construction equipment exhaust when building construction activities occur within 200 feet of any residential use. The contractor shall develop and the City shall approve a plan demonstrating that the off-road equipment (more than 50 horsepower and on site for more than 2 consecutive workdays) to be used in project construction (i.e., owned, leased, and subcontractor vehicles) would achieve an additional 60 percent reduction in exhaust particulate matter emissions, compared to similar equipment based on CARB statewide average emissions. Based on the CalEEMod modeling, a feasible method to achieve this objective would be the following: a) All diesel-powered construction equipment more than 50 horsepower used on-site during all construction phases for more than two days consecutively shall meet or exceed U.S. EPA Tier 2 standards for particulate matter emissions or substituted with alternatively fueled equipment (e.g., LPG fuel). b) Prohibit use of diesel-powered generators for more than two days when line power is available. c) All non-mobile construction equipment shall be alternatively fueled or meet U.S. EPA Tier 2 standards for particulate matter emissions	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS & ALL DEVELOPMENT PHASES. • Measures shall be included in the Construction Specifications for all improvement and construction plans. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.	The Petaluma Public Works & Utilities Department is responsible for review of improvement plans and Building Department is responsible for review of the building plans to ensure that measures are included on construction plans.	• Prior to the issuance of the grading and building permits for review of plans. • On-going site inspections during grading and construction, at the discretion of the City.	Construction Monitoring Report from Applicant that documents periodic site inspections during grading to ensure measures and verification that measures are in place.	Subdivision Improvements _____ Development Phases _____ _____ _____ _____ _____ _____ _____
AIR-4: Provide reimbursement to the City for the design and construction of the Primary Influent Pump Station mechanical odor control unit. The odor control unit shall meet current design criteria and be equivalent to the units installed at recent pump station upgrades within the City.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS. • City shall determine re-imbursement amount.	• The Petaluma Public Works & Utilities Department is responsible for determining the re-imbursement amount, and applicant is responsible	• Re-imbursement shall be paid prior to issuance of construction permits.	None Required	Subdivision Improvements _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
		for payment. • The Petaluma Public Works & Utilities Department is responsible for all improvements at the PIP pump station.	• PIP improvements shall be complete prior to issuance of occupancy.		
Biological Resources					
BIO-1: To mitigate for the impacts to 0.24 acres of seasonal wetland habitat, the developer shall consult with agencies to identify feasibility of creating onsite mitigation areas through remediation within the Riverfront park area. If onsite mitigation is determined to be infeasible then, credits shall be purchased from an approved mitigation bank at a ratio of one acre for every one acre impacted, or as otherwise directed by the regulatory agencies. Due to general low-quality of the existing wetland habitat (e.g. presence of non-native species, disturbed soils) within the project site, a mitigation ratio of one acre mitigated for each acre impacted is recommended by the biologist. Prior to issuance of grading permit, proof of purchase of mitigation bank credit or verification of onsite wetland remediation to offset losses shall be submitted to the City and U.S. Army Corps of Engineers. According to information provided by the project biologist, the Burdell wetland mitigation bank, located just south of Petaluma, has mitigation bank credits available.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS. • Purchase mitigation bank credit and submit proof to City, USACOE.	• The Applicant is responsible for purchase of wetland mitigation bank credit (including additional area that may be required as a result of Mitigation BIO-6), and shall provide proof to the City Community Development Department and the USACOE.	Prior issuance of grading permit and/or any removal of vegetation.	Applicant shall provide the pre-construction survey to Community Development Dept. If nesting birds are found, applicant shall provide documentation to the Community Development Dept. that demonstrates compliance with actions specified in the measure (i.e., delay construction or establish appropriate buffer).	Subdivision Improvements _____
BIO-2: Develop final Riverfront Park design that avoids and protects wetlands. The design shall also investigate the feasibility of creating wetland habitat as part of the proposed Riverfront Park, which could serve to offset losses in lieu of purchasing credits (See BIO-1). Implement standard best management	• Include measure as Condition of Approval. APPLIES TO RIVERFRONT PARK DEVELOPMENT. • Measures shall be included in the Construction Specifications for Riverfront Park grading plan and/or	The Petaluma Community Development Department is responsible for review of Riverfront Park grading and/or construction plans to ensure that measures are	• Prior to the issuance of the grading permits or initiation of Riverfront Park	Construction Monitoring Report from Applicant that documents periodic site inspections during	Riverfront Park _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
practices (BMP) to protect wetland areas during and after construction of the Riverfront Park to include, but not be limited to installation of protective staking and silt fencing to prevent inadvertent intrusion by equipment during construction.	construction plans. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.	included on construction specifications.	development. • On-going site inspections during construction, at the discretion of the City.	construction to ensure measures and verification that measures are in place.	
BIO-3: Conduct vegetation removal within areas to be developed between September 1 and January 30, outside of the general breeding bird season. If this is completed, no further mitigation is required. Otherwise, if vegetation removal or modification occurs between February 1 and June 15, require pre-construction nesting surveys within 14 days prior to such activities to determine the presence and location of nesting bird species. If vegetation removal or modification occurs between June 16 and August 31, pre-construction surveys shall be performed within 30 days prior to such activities. If active nests are present, establish temporary protective breeding season buffers to avoid direct or indirect mortality of these birds, nests or young. The appropriate buffer distance is dependent on the species, surrounding vegetation and topography and shall be determined by a qualified biologist as appropriate to prevent nest abandonment and direct mortality during construction.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS, RIVERFRONT PARK DEVELOPMENT, & ALL DEVELOPMENT PHASES. • Conduct pre-construction survey in accordance with actions specified in Measure.	• The Applicant is responsible for pre-construction survey if removal occurs within the nesting season and submittal to the Community Development Department for review. • The Petaluma Community Development Department staff are responsible for review of pre-construction survey.	Prior issuance of grading permit and/or any removal of vegetation.	Applicant shall provide the pre-construction survey to Community Development Dept. If nesting birds are found, applicant shall provide documentation to the Community Development Dept. that demonstrates compliance with actions specified in the measure (i.e., delay construction or establish appropriate buffer).	Subdivision Improvements _____ Riverfront Park _____ Development Phases _____ _____ _____ _____ _____ _____ _____ _____
Cultural Resources					
CULT-1: If during the course of ground disturbing activities, including, but not limited to excavation, grading and construction, a potentially significant prehistoric or historic resource is encountered, all work within a 100 foot radius of the find shall be suspended for a time deemed sufficient for a qualified and city-approved cultural resource specialist to adequately evaluate and determine significance of the discovered resource and provide treatment recommendations.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS, RIVERFRONT PARK DEVELOPMENT, & ALL DEVELOPMENT PHASES. • Measure shall be included in the Construction Specifications for grading plans, subdivision improvement plans, and grading/construction plans for	The Petaluma Public works Department is responsible for review of improvement and construction plans and Building Department is responsible for review of the building plans to ensure that measure is included on construction specifications.	• Prior to the issuance of the grading permits for subdivision improvements and grading, building and/ construction plans for other development.	None required unless resource is uncovered during construction.	Subdivision Improvements _____ Riverfront Park _____ Development Phases _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
Should a significant archeological resource be identified a qualified archaeologist shall prepare a resource mitigation plan and monitoring program to be carried out during all construction activities.	subsequent development phases. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.				_____ _____ _____ _____ _____ _____ _____
CUL-2: In the event that human remains are discovered, all work shall be suspended and the Sonoma County Coroner shall be contacted in accordance with provisions of the California Public Resources Code section 5097.98-99 and the Native American Heritage Commission shall be notified in accordance with the provisions of Public Resources Code 5097, so that the "Most Likely Descendant" can be designated.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS, RIVERFRONT PARK DEVELOPMENT, & ALL DEVELOPMENT PHASES. • Measure shall be included in the Construction Specifications for grading plans, subdivision improvement plans, and grading/construction plans for subsequent development phases. • Applicant shall notify the County Coroner and the City Community Development Department in the event that human remains are discovered.	The Petaluma Public works Department is responsible for review of improvement and construction plans and Building Department is responsible for review of the building plans to ensure that measure is included on construction specifications. The applicant is responsible for carrying out provisions and informing the City Community Development Department in accordance with the Public Resources Code.	• Prior to the issuance of the grading permits for subdivision improvements and grading, building and/ construction plans for other development.	None required unless resource is uncovered during construction.	Subdivision Improvements _____ Development Phases _____ _____ _____ _____ _____ _____ _____
Geology & Soils					
GEO-1: Require implementation of all recommendations as set forth in the geotechnical investigations and updates prepared for the subject property by Miller Pacific Engineering Group (dated March 2006, July 2009, August 2011, January 2013, December 2013), including but not limited to recommendations for site and soil preparation, foundation designs, drainage and installation of utilities.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS, RIVERFRONT PARK DEVELOPMENT & ALL DEVELOPMENT PHASES. • The applicant shall obtain a geotechnical engineer to review the final project plans and specifications to determine if they are consistent	• The Public Works & Utilities Department is responsible for review of geotechnical studies, Subdivision Improvement Plans, and construction plans. Building Dept. is responsible for review of plans to ensure measures	• Prior to Improvement Plan approval for applicant submittal of geotechnical reviews. • Prior to the issuance of the	None required.	Subdivision Improvements _____ Riverfront Park _____ Development Phases _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
Buildings shall require the following: a) structural foundation systems, such as mat slabs or rigid interconnected grade beams, able to resist the anticipated strong ground shaking and potential for differential movement caused by liquefaction and/or consolidation of the bay mud, b) soil improvement, c) deep foundation systems, or d) other engineering techniques as recommended in additional geotechnical investigations of liquefaction hazards. All structures shall meet the California Building Code regulations and design requirements for seismic safety.	with the recommendations as outlined in the geotechnical report(s) and provide a letter to the City with findings of the review. • The geotechnical engineer shall inspect the construction work and shall certify to the City, prior to acceptance of the improvements or issuance of a certificate of occupancy that the improvements have been constructed in accordance with the geotechnical specifications.	have been incorporated. • The applicant shall provide a letter to the City of findings of the geotechnical engineer's review of the project plans.	grading and building permits for City staff review of plans. • On-going site inspections during grading and construction, at the discretion of the City. • All construction shall be subject to inspection by the Building Division prior to issuance of a Certificate of Occupancy.		_____ _____ _____ _____ _____ _____ _____
GEO-2: Implement the recommendations of the project geotechnical investigations and updates prepared for the subject property by Miller Pacific Engineering Group (dated March 2006, July 2009, August 2011, January 2013, December 2013), except as modified based on site-specific refinements. Settlement mitigation measures shall include use of structural foundation systems (such as mat slabs or rigid interconnected grade beams) for residential structures, which can withstand the potential total and differential settlements in accordance with recommendations of the geotechnical investigations and deep foundations (driven piles or drilled piers) for heavier structures planned in the northern portion of the site. Ground improvement, such as with the use of Rammed Aggregate Piers (RAP), may also be appropriate at certain locations within the site.	• Include measure as Condition of Approval. APPLIES TO ALL DEVELOPMENT PHASES. • The applicant shall obtain a geotechnical engineer to review the final project plans and specifications to determine if they are consistent with the recommendations as outlined in the geotechnical report(s) and provide a letter to the City with findings of the review. • The geotechnical engineer shall inspect the construction work and shall certify to the City, prior to acceptance of the improvements or issuance of a certificate of occupancy that the improvements have been constructed in accordance with the geotechnical specifications.	• The Public Works & Utilities Department is responsible for review of geotechnical studies, Subdivision Improvement Plans, and construction plans. Building Dept. is responsible for review of plans to ensure measures have been incorporated. • The applicant shall provide a letter to the City of findings of the geotechnical engineer's review of the project plans.	• Prior to the issuance of the grading and building permit. • All construction shall be subject to inspection by the Building Division and must conform to all applicable code require-ments and approved improvement plans prior to issuance of a Certificate of Occupancy.	None required.	Development Phases _____ _____ _____ _____ _____ _____ _____ _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
GEO-3: Prior to the issuance of grading permits and in accordance with City of Petaluma Improvement Plan submittal requirements and procedures, the developer shall submit construction plans along with Design Level Geotechnical analysis that specifically addresses the thicker fills up to ten feet in the area near the Future Caulfield Lane Bridge in the southern portion of the site. The Improvement Plans and design level geotechnical analysis shall be subject to third party peer review in order to verify that recommended measures to address differential settlement of bay mud associated with thicker fills up to ten feet near the Future Caulfield Lane Bridge are adequate to accommodate potential settlement. In event that peer review concludes that the recommended design measures will not sufficiently minimize the effects of differential settlement, the developer shall be required to implement one of the following standard construction techniques: 1) the use of lightweight fill material in place of heavier, existing soils on areas that require thicker fill, or 2) pre-load areas that require thicker fill and allow settlement to occur prior to construction. The developer shall be responsible for the cost of the peer review and the City's Public Works Department shall coordinate the scope of service and approve findings of the peer review prior to the issuance of grading permits.	• Include measure as Condition of Approval. APPLIES TO ALL DEVELOPMENT PHASES. • The City shall obtain a third party geotechnical engineer to conduct a peer review of the final project plans and specifications to determine if engineering designs adequately address settlement.	• The Public Works & Utilities Department is responsible for review of geotechnical studies, Subdivision Improvement Plans, and construction plans. • The Public Works & Utilities Department is responsible for obtaining a third party peer reviewer and verifying findings the independent assessment. • The applicant shall provide re-imbursement for the cost of the peer review.	• Prior to the issuance of the grading permit.	None required.	Development Phases _____ _____ _____ _____ _____ _____ _____ _____
Hazardous Materials					
HAZMAT-1: Require that the quality of the stockpiled soils be reaffirmed / tested prior to use for onsite fill, which shall be done following the Clean Imported Fill Material Information Advisory prepared by the DTSC (DTSC 2001) in accordance with the recommendation set forth in the 2013 Iris Environmental Phase I Environmental Site Assessment.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISON IMPROVEMENTS. • The applicant shall provide the additional review by a qualified professional and provide a letter to the City with findings of the review.	• The Public Works & Utilities Department is responsible for review. • The applicant shall provide a letter to the Petaluma Community Development and Public Works & Utilities Departments.	• Prior to the issuance of the grading permits.	None required.	Subdivision Improvements _____ _____ _____ _____ _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
HAZMAT-2: Prepare and implement a Risk Management Plan (RMP) that provides the procedures to properly manage site groundwater that may be encountered during construction activities. The plan shall address procedures for discovery of any unknown features or environmental conditions that may be encountered during activities that will disturb site soils. The RMP shall include, but not be limited to the following components as set forth in the 2013 Phase I Environmental Site Assessment report: a) Soil management: Provide guidelines for identification and analysis of unknown environmental conditions and define responsibilities for management of discovery of unknown features or site conditions. b) Groundwater management: Prohibit use of groundwater encountered during construction activities for dust control and allow discharge of groundwater to surface waters only pursuant to a permit issued from applicable regulatory agencies. All permit conditions must be satisfied prior to discharge. c) Preparation and implementation of a site-specific Environmental Health and Safety Plan by the general contractor to ensure that appropriate worker health and safety measures are in place during redevelopment activities. Elements of the plan must include all practices and procedures necessary to comply with all new and existing Federal, California, and local statutes, ordinances, or regulations regarding health and safety. Specific components of the EHASP must include the following: identification of site hazards; assignment of specific health and safety responsibilities for site work; establishment of appropriate general work practices; establishment of control zones and decontamination procedures; job hazard analysis / hazard mitigation procedures; air monitoring; required personal protective and related safety equipment; and contingency and emergency information.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS & ALL DEVELOPMENT PHASES. • Applicant shall have a management plan prepared by a qualified professional and include measures in the Construction Specifications for grading and improvement plans. • Applicant shall have grading and utility plans reviewed by a qualified professional in accordance with actions specified in the measure.	• Applicant is responsible for having management plan prepared, incorporating measures in construction plans, and review of grading and improvements by qualified profession. • The Petaluma Public Works& Utilities Department is responsible for review of plans to ensure that construction specifications are included on construction plans.	• Prior to the issuance of the grading permits for review of plans.	None Required.	Subdivision Improvements _____ Development Phases _____ _____ _____ _____ _____ _____ _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
Hydrology & Water Quality					
HYDRO-1: Prepare final drainage plan as part of the Subdivision Improvement Plans that provide calculations and documentation that the site storm drain system and discharge culverts have adequate capacity to serve the project and watershed area at full buildout. The storm drain system design shall be reviewed and approved by the Sonoma County Water Agency.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS. • Applicant shall prepare final drainage plan. • Applicant shall provide evidence of RWQCB approval of discharge requirements.	• The applicant is responsible for incorporating the drainage plan recommendations into the subdivision improvement plans. • City Public Works & Utilities Department is responsible for reviewing plans and submitting to Sonoma County Water Agency for review and approval.	Prior to issuance of the grading and building permits.	None Required	Subdivision Improvements _____
HYDRO-2: In accordance with National Pollution Discharge Elimination System (NPDES) regulations, the developer shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for grading and construction of subdivision improvements. The SWPPP shall also include provisions for the offsite Riverfront Park. All subsequent development phases over one acre in size shall prepare and implement a SWPPP. The SWPPP shall address erosion and sedimentation controls during all phases of construction, storage and use of fuels, and use and clean-up of fuels and hazardous materials. The SWPPP shall prohibit fueling, cleaning, or maintenance of equipment except in designated areas located as far from the river as possible. As a precaution, require contractor to maintain adequate materials onsite for containment and clean-up of any spills. The developer shall provide approval documentation from the RWQCB to the City verifying compliance with NPDES requirements. Acceptable proof of compliance is the Notice of Intent with a WDID number or other equivalent documentation.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS, RIVERFRONT PARK DEVELOPMENT & ALL DEVELOPMENT PHASES. • Applicant responsible for preparing SWPPP. • Measures shall be included in the Construction Specifications for grading plans, subdivision improvement plans, and grading/construction plans for subsequent development phases and Riverfront Park. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.	The Petaluma Public Works & Utilities Department is responsible for review of SWPPP and construction plans to ensure that measures are included on construction plans and specifications.	• Prior to the issuance of the grading permits. • On-going site inspections during grading and construction, at the discretion of the City.	Construction Monitoring Report from Applicant that documents periodic site inspections during grading to ensure measures and verification that measures included in SWPPP are in place.	Subdivision Improvements _____ Riverfront Park _____ Development Phases _____ _____ _____ _____ _____ _____ _____ _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
HYDRO-3: The applicant shall prepare and implement an erosion control plan for the subdivision grading and each subsequent development phase site plan. The plan shall be reviewed and approved by the City of Petaluma prior to issuance of a grading permit for the proposed development. The erosion control plan shall include phasing of grading, limiting areas of disturbance, designation of restricted-entry zones, diversion of runoff away from disturbed areas, protective measures for sensitive areas, outlet protection and provision for revegetation or mulching. The plan shall also prescribe treatment measures to trap sediment, such as inlet protection, straw bale barriers, straw mulching, straw wattles, silt fencing, check dams, terracing, and siltation or sediment ponds. Catchment and settlement ponds will be constructed to contain silt being deposited at temporary outlets. Temporary outlets will be rocked with silt control. Fiber rolls, silt fences and fiber mats will be installed on all slopes.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS & ALL DEVELOPMENT PHASES. • Applicant shall prepare and submit an Erosion and Sediment Control Plan to City prepared by a qualified erosion control specialist. • Measures shall be included in the Construction Specifications for grading plans, subdivision improvement plans, and grading/construction plans for subsequent development phases. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.	The Petaluma Public works & Utilities Department is responsible for review of erosion control and construction plans to ensure that measures are included on construction plans and specifications.	• Prior to the issuance of the grading permits. • On-going site inspections during grading and construction, at the discretion of the City.	Construction Monitoring Report from Applicant that documents periodic site inspections during grading to ensure measures and verification that measures included in erosion control plan are in place.	Subdivision Improvements _____ Development Phases _____ _____ _____ _____ _____ _____ _____
HYDRO-4: The applicant shall prepare and implement an erosion control plan for construction of the trail and improvements for the offsite Riverfront Park, including, but not limited to: installing hay bales or appropriate temporary silt fencing adjacent to the perimeter of the work area to prevent inadvertent transport of sediments into the Petaluma River; limiting ground disturbance and vegetation removal during construction; conducting work prior to the rainy season; protecting disturbed areas during the rainy season; and immediately revegetating disturbed areas.	• Include measure as Condition of Approval. APPLIES TO RIVERFRONT PARK & ALL DEVELOPMENT PHASES. • Applicant shall prepare and submit an Erosion and Sediment Control Plan to City prepared by a qualified erosion control specialist. • Measures shall be included in the construction plans. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.	The Petaluma Public works & Utilities Department is responsible for review of erosion control and construction plans to ensure that measures are included.	• Prior to the issuance of the grading permits. • On-going site inspections during grading and construction, at the discretion of the City.	Construction Monitoring Report from Applicant that documents periodic site inspections during grading to ensure measures and verification that measures included in erosion control plan are in place.	Riverfront Park _____ Development Phases _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
HYDRO-5: Subsequent development phases over one acre in size shall submit plans and detailed calculations to show that requirements for post-construction runoff treatment have been met in accordance with the City's stormwater management regulations.	• Include measure as Condition of Approval. APPLIES TO ALL DEVELOPMENT PHASES. • Applicant shall prepare stormwater treatment plan for each development phase.	The Petaluma Public works & Utilities Department is responsible for review of stormwater management plans.	• Prior to the issuance of the grading permits.	None required.	Development Phases _____ _____ _____ _____ _____ _____ _____ _____
Noise					
NOISE-1: Pursuant to General Plan Policy 10-P-3C and the CPSP EIR Mitigation Measure 10-1, a detailed acoustical report shall be prepared by a qualified acoustical specialist as part of design phase to determine the noise control treatments for the residential buildings, offices and the hotel to meet local and state standards. Noise attenuation measures shall include as appropriate thicker walls, stucco siding, sound insulating windows and/or doors, building and bedroom orientation, and other measures pursuant to the detailed acoustical report. To achieve the noise reduction requirements, some form of forced air mechanical ventilation, satisfactory to the local building official, would be required in all residential units and the hotel. Special sound rated building elements such as windows and doors may also be necessary to reduce the intrusiveness of the train noise given that typical noise levels could reach 95 dBA Lmax outside the nearest townhomes if Quiet Zone status is not approved.	• Include measure as Condition of Approval. APPLIES TO ALL DEVELOPMENT PHASES. • The applicant shall obtain the services of an acoustical specialist to provide acoustical study and recommendations for development phases and provide the reports to the City.	• The Petaluma Building Department is responsible for review of acoustical studies and building plans to ensure measures have been incorporated.	• Prior to the issuance of the building permits.	None required.	Development Phases _____ _____ _____ _____ _____ _____ _____ _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
NOISE-2: In accordance with Mitigation Measure 10-2 of the Central Petaluma Specific Plan, require implementation of the following measures during all phases of project construction: a) *Construction Scheduling.* Limit noise-generating constructions activities to daytime, weekday hours (7 AM to 6 PM) and 9 AM to 5 PM on weekends and holidays. When construction is occurring within 100 feet of existing residences then construction shall be initiated no earlier than 8 AM during weekdays, 9 AM on Saturday and shall be prohibited on Sundays and Holidays. b) *Equipment.* Properly muffle and maintain all construction equipment powered by internal combustion engines. c) *Idling Prohibitions.* Prohibit unnecessary idling of internal combustion engines. d) *Equipment Locations and Shielding.* Locate all stationary noise-generally equipment, such as air compressors as far as practical from existing nearby noise sensitive receptors. e) *Quiet Equipment Selection.* Select quiet construction equipment, particularly air compressors, whenever possible. f) *Noise Disturbance Coordinator.* Designate a project construction supervisor as "Noise Disturbance Coordinator" who would be responsible for responding to any local complaints about construction noise. The Disturbance Coordinator would determine the cause of the noise complaint and institute reasonable measures to correct the problem. Conspicuously post a telephone number for the Disturbance Coordinator at the construction site and submit to the City of Petaluma Building and Police Departments. g) *Notification.* Notify nearby residents (within 300 feet) in writing of the construction schedule.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS & ALL DEVELOPMENT PHASES. • Measures shall be included in the Construction Specifications for grading plans, subdivision improvement plans, and grading/construction plans for subsequent development phases. • Applicant shall provide for periodic inspection during construction to ensure that measures are in place.	The Petaluma Public works Department is responsible for review of improvement plans and Building Department is responsible for review of the building plans to ensure that measures are included on construction specifications.	• Prior to the issuance of the grading permits for review of plans. • On-going site inspections during grading and construction, at the discretion of the City.	Construction Monitoring Report from Applicant that documents periodic site inspections during grading to ensure measures and verification that measures are in place.	Subdivision Improvements _____ Development Phases _____ _____ _____ _____ _____ _____ _____ _____

Mitigation Measure	Implementation Actions	Monitoring / Reporting Responsibility	Timing Requirements	Reporting Requirements	Verification of Compliance
Traffic					
TRAF-1: If SMART rail service (and the supplemental safety measures that may be needed for it) is delayed to such an extent that the Riverfront project is built first, require installation of the supplemental safety measures at the existing Caulfield Lane at-grade crossing to include an additional exit gate on the southwest side of the crossing to preclude vehicles from navigating around the entry gates to proceed eastbound on Caulfield. The exit gate and related items shall be installed by SMART's contractor and funded by the City. The applicant shall contribute funds equal to half the cost of construction.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS. •	• The Petaluma Public Works & Utilities Department is responsible design and construction of the exit gate system. • Applicant is responsible for payment of half the total cost.	Concurrent with recordation of Final Map.	None Required	Subdivision Improvements _____
Cumulative - Traffic					
CUM-1. Require payment of the project's 21% pro-rata share of the cost of signalization at Hopper Street/Caulfield Lane in the future when an extension of Caulfield Lane over the Petaluma River is completed.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS. • City shall determine pro-rata share.	• The Petaluma Public Works & Utilities Department is responsible for determining pro-rata share, and applicant is responsible for payment.	Concurrent with recordation of Final Map.	None Required	Subdivision Improvements _____
CUM-2. The Applicant shall lengthen the westbound left turn pocket at Lakeville Street/Caulfield Lane to approximately 250 feet, and install a raised median on the westbound approach to physically prohibit illegal left turn movements into and out of adjacent properties, as recommended in the project traffic report, in order to improve capacity and safety at the intersection.	• Include measure as Condition of Approval. APPLIES TO SUBDIVISION IMPROVEMENTS. • Applicant responsible for preparation of improvement design plans, submittal to City and construction of improvement upon City review and approval.	• The Petaluma Public Works & Utilities Department is responsible for review and approval of improvement plans.	As part of the construction of subdivision improvements.	None Required	Subdivision Improvements _____

APPENDIX B

GEOTECHNICAL PEER REVIEW

RGH CONSULTANTS
Experience is the difference

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May 13, 2014

Metropolitan Planning Group
Attention: Olivia Ervin
1303 Jefferson Street
Napa, CA 94559
olivia@mplanninggroup.com

Geotechnical Peer Review
Riverfront Mixed Use Project
Petaluma, California

Project Number: 6778.01.06.1

As requested, this letter presents the results of our geotechnical peer review of the geotechnical documents prepared to date for the Riverfront Mixed Use Project in Petaluma, California. This letter has been prepared in accordance with the Subconsulting Services Agreement between RGH Consultants (RGH) and Metropolitan Planning Group (M-Group), dated April 1, 2014. The scope of RGH's services included reviewing published geologic maps and previous work performed by our personnel in the vicinity of the project, reviewing the geotechnical documents prepared by Miller Pacific Engineering Group for the Riverfront Mixed Use Project, reviewing the geotechnical related portions of the Draft Environmental Impact Report (DEIR), and preparing this letter. The intent of the review was to focus primarily on bay mud settlement issues including the exploration and laboratory testing performed for the project, the settlement analysis results, and the proposed options for reducing settlement impacts to determine if the recommendations set forth to manage settlement of bay mud are based on sound evidence, consistent with standards of geotechnical practice, and would provide satisfactory performance of proposed improvements. We were to evaluate the documents for compliance with code standards, identify any factual errors, and assess consistency of data with conclusions.

The proposed riverfront project covers about 39½ acres of property located just north of US Highway 101 and the Lakeville Blvd. interchange, and is situated along the eastern bank of the Petaluma River. The project includes single family homes, townhomes, apartments, retail and office commercial space, a hotel, an active playfield, and a system of multi-use trails. Subsequent potential projects include a bridge over the Petaluma River and a community boathouse adjacent to the Petaluma River. These projects are not covered by the DEIR, and thus not covered by this review.

Geotechnical engineering documents prepared by Miller Pacific Engineering Group (Miller Pacific) for the riverfront project were provided to us by M-Group for our review. In addition, we were provided an internet link to download the DEIR. A list of the documents reviewed for this peer review is attached. The documents indicate that the subsurface profile generally consists of artificial fill, bay mud, and alluvial soils consisting of sand, silt, and clay with minor intermittent gravels. Bay mud is a soft, compressible soil that is susceptible to settlement under loading. The thickness of the

compressible bay mud layer varies across the site, and the documents indicate that the bay mud is between 15 and 20 feet thick beneath the northern half of the site and thickens to between 35 to 40 feet at the southern end of the site, adjacent to the Petaluma River.

The main document provided for our review is a preliminary geotechnical report prepared by Miller Pacific. This report appears to have been prepared as an EIR style document where potential hazards are identified and discussed with further actions and possible mitigation concepts presented. This report identified three main issues related to the presence of bay mud including consolidation settlement due to new fill placement, lateral spreading or lurching towards the Petaluma River, and the liquefaction potential of saturated sand pockets within bay mud. The report estimates settlement of up to one foot for new fill three feet or less in thickness and up to two feet of settlement for the 10 feet of fill required at the southern edge of the project where Caulfield Lane will be extended. The documents conclude that lateral spreading or lurching can be effectively mitigated by the 100-foot wide setback from the river that is already planned. The documents also conclude that widespread liquefaction related impacts are not anticipated because of the localized nature of the sand pockets. The report clearly states that the results are preliminary and need to be addressed in more detail during design level geotechnical studies. Based on our experience, the impacts identified by Miller Pacific are those that we would expect for a site underlain by bay mud.

The preliminary report provides a discussion regarding possible mitigation measures for the presence of bay mud and the above-described issues related to constructing on property underlain compressible soil. The report describes mitigation measures that include driven piles or drilled piers that gain support below the bay mud, surcharge loading of the fill areas including the use of wick drains, the use of ground improvement such as Rammed Aggregate Piers, and the use of stiffened foundation systems. These options are discussed in detail as they relate to the type of construction (residential versus commercial) and feasibility. These identified measures are common and effective geotechnical methods for mitigating hazards related to bay mud.

It is clear from our review of the documents that they were intended as preliminary assessments of the geotechnical aspects of the property. It is clearly stated throughout the documents, and in particular the preliminary geotechnical report and its update, that more detailed geotechnical studies are required for project design. This is evidenced by the fact that only five locations were explored for the 39½ acre property and limited laboratory testing was performed. In fact, site-specific consolidation tests were not performed on the bay mud at the site indicating that the values used for the settlement analysis were based on Miller Pacific's experience with bay mud in the area from other local projects. Site-specific exploration, laboratory testing, and analysis will lead to more precise results that will likely be different in magnitude than the preliminary conclusions. However, site-specific data is not going to eliminate the presence of bay mud and its impacts; it will better define the hazards for which the project needs to be designed. In addition, the mitigation measures recommended for reducing the impacts of bay mud are reasonable given the extent of the hazard and the proposed construction.

In conclusion, we judge that the level of work completed to date is appropriate for the DEIR stage of the project. The documents have identified hazards, recommended additional work where necessary, and provided concept measures to mitigate the hazards. It is our understanding that this is what is required for a DEIR. The identified impacts and mitigation measures are consistent with standard geotechnical practice for bay mud sites. Additionally, we concur with Miller Pacific in that additional geotechnical work is necessary for a design level study with refined hazard mitigation measures. We do not anticipate that a design level study would require substantial changes to the overall project design.

We trust this provides the information you required at this time. If you have questions or need additional information, please contact Eric Chase.

Very truly yours,
RGH Consultants

Jared J. Pratt
Senior Engineering Geologist

Eric G. Chase
Senior Associate Engineer

EGC:JJP:ec:lw
Electronically submitted

s:\project files\6751-7000\6778\6778.01.06.1 geotechnical peer review - riverside mixed use project\geotechnical peer review letter (draft).doc

LIST OF DOCUMENTS REVIEWED

Report titled "Preliminary Geotechnical Report, Riverfront Residential Development, 500 Hopper Street, Petaluma, California," prepared by Miller Pacific Engineering Group, dated March 23, 2006

Letter titled "Geotechnical Discussion, Portion of Riverfront Subdivision, Petaluma, California," prepared by Miller Pacific Engineering Group, dated July 7, 2009

Letter titled "Geotechnical Update of Preliminary Geotechnical Report, Riverfront Subdivision, Petaluma, California," prepared by Miller Pacific Engineering Group, dated August 25, 2011

Letter titled "Influence of New Foundations on Existing Underground Utilities, Riverfront Subdivision, Petaluma, California," prepared by Miller Pacific Engineering Group, dated January 17, 2013

Letter titled "Geotechnical Consultation, Response to City of Petaluma Comments, Riverfront Mixed Use Project, Petaluma, California," prepared by Miller Pacific Engineering Group, dated December 9, 2013

Section 4.4 titled "Geology and Soils" of the Draft Environmental Impact Report titled "Riverfront Mixed-Use Project, State Clearinghouse #2013062004, City of Petaluma," prepared by Strelow Consulting, dated December 2013

APPENDIX C

SUPPLEMENTAL AIR QUALITY REVIEWS

ILLINGWORTH & RODKIN, INC.
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M E M O

Date: March 21, 2014

To: Stephanie Strelow: steph@strelowconsulting.com
STRELOW CONSULTING
P.O. Box 2896
Santa Cruz, CA 95063

Cc: Olivia Ervin: olivia@mplanninggroup.com

From: James A. Reyff

SUBJECT: Riverfront Project Air Quality Analysis in Petaluma, CA – Additional Modeling in Response to Air Quality Comments

Additional construction air pollutant modeling was conducted to address two comments raised in the comments on the Riverfront Mixed Use Development Air Quality and Greenhouse Gas (GHG) Emissions Analysis made by Adams Broadwell Joseph and Cardoza, dated February 6, 2014. This memo provides these additional analyses. The additional modeling results in a slight increase in average daily construction emissions; however, the emissions would remain well below the significance thresholds. As a result, this modeling does not does not trigger any additional significant impact, require any additional mitigation measures, or otherwise affect the conclusions of the DEIR.

Modeling of Asphalt Areas Comprised of Roadways and Parking Areas and Additional Park Area

In light of Comment 4-8, an additional model run was developed using CalEEMod to ensure that the 13 acres of roadways and parking surfaces are accounted for in the emissions predictions. The DEIR analyzed a total of 25 acres, comprised of the various land uses proposed by the project. This analysis includes site preparation, grading and paving emissions. A CalEEMod model run was developed with default inputs for construction of a 13.2-acre land use type: "Other Asphalt Surfaces" and 1.27 acres of "City Park."

Construction phases included site preparation, grading, and paving. The model default construction equipment selection and equipment usage assumptions were assumed. As with the DEIR, the site preparation, grading and paving periods were doubled. These emissions were assumed to overlay the

APPENDIX C

project emissions reported in the DEIR and not add additional construction days. Table 1 reports the total emissions associated with construction of new roadways and parking areas. *Attachment 1* includes the CalEEMod output for the roadway/parking area and additional park area construction emissions.

Table 1 Project Roadway/Parking Area Construction Emissions (in tons)

	ROG	NOx	PM10 Exhaust	PM2.5 Exhaust
Additional Emissions from construction of 13.2 acres of roadways/parking and 1.27 acre of parks (tons)	**0.33**	**3.53**	**0.18**	**0.16**

Modeling of Water Truck Emissions

The CalEEMod User's Manual was reviewed and it could not be determined that water truck emissions were included in the site preparation and grading phases. Therefore, and analysis of water truck emissions was conducted.

CalEEMod only provides trip emissions for trucks, assuming an average public roadway travel speed. Since water trucks travel at slow speeds (i.e., about 15 miles per hour), these emissions were modeled using the EMFAC2011 model developed by the California Air Resources Board (CARB). Slow travel speeds result in higher emissions. Water tucks are typically considered heavy-duty on-road trucks. Emissions from a water truck were estimated using the EMFAC2011 model, selecting T7 Heavy duty truck, travel speed of 15 miles per hour and aggregate year of 2014. These computations assumed one water truck operating at the site during the site preparation period of 21 days and the grading period of 90 days. The water truck would travel 15 miles per hour for an estimated 6 hours per day (i.e., 90 miles/day). The total emissions from water truck operation during the entire construction period are reported in Table 2. *Attachment 2* to this memo includes the EMFAC2011 emissions modeling of water truck usage.

Table 2 Total Project Construction Emissions

	ROG	NOx	PM10 Exhaust	PM2.5 Exhaust
Emissions from water truck during site grading (tons	0.01	0.15	<0.01	<0.01

Resulting Changes to the EIR

Project Construction Criteria Air Pollutant Emissions

The effects of these additional construction activities would be increased emissions. Table 1 of the Air Quality Technical Report is revised as follows:

Table 1 Total Project Construction Emissions

	ROG	NOx	PM10 Exhaust	PM2.5 Exhaust
Emissions from the Project Analyzed in the DEIR (tons)	8.86	22.94	1.20	1.12
Additional Emissions from construction of 13 acres of roadways and parking areas (tons	0.33	3.53	0.18	0.16
Emissions from water truck during site grading (tons	0.01	0.15	<0.01	<0.01
Total Project Emissions (tons)	9.20	26.62	1.39	1.29
Average Daily Emissions (lbs/day) Based on 1,320 construction days	13.9	40.3	2.1	2.0
BAAQMD Thresholds	*54*	*54*	*82*	*54*

Predicted Off-Site Excess Cancer Risk from Project Construction

A health risk assessment of project emissions was conducted, based on emissions of PM2.5 exhaust that was considered to be comprised entirely of diesel particulate matter, a cancer causing TAC. This assessment predicted a maximum cancer risk for a child of 5.3 chances per million, annual PM2.5 concentration of 0.05 micrograms per cubic meter and a Hazard Index of less than 0.01. These risks and hazards are well below the significance thresholds. Assuming the risks would increase proportionally with the PM2.5 emissions increase due to roadway/parking lot construction and water truck use, the excess cancer risk would increase to about 6.1 chances per million, annual PM2.5 concentrations would increase slightly to almost 0.06 micrograms per cubic meter and the hazard index would remain unchanged (i.e., less than 0.01).

Conclusions

The additional construction emissions modeling contained in this memo show a slight increase in average daily construction emissions; however, the emissions would remain well below the significance thresholds. As a result, this modeling does not does not trigger any additional significant impacts, require any additional mitigation measures, or otherwise affect the conclusions of the DEIR.

Riverfront Roadways and Additional Park Area

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	13.20	Acre	13.20	574,992.00	0
City Park	1.27	Acre	1.27	55,321.20	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Intensity Rate

Land Use - Other asphalt surfaces used to represent roadways

Construction Phase - Demolition removed. Building construction and architectual coating phases removed, since there would be no building construction. Construction period doubled consistent with DEIR

Off-road Equipment -

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	30.00	60.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	10.00	20.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblProjectCharacteristics	OperationalYear	2014	2020

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.3288	3.5276	2.3566	2.8100e-003	0.4506	0.1769	0.6275	0.2098	0.1628	0.3725	0.0000	268.4466	268.4466	0.0772	0.0000	270.0670
Total	**0.3288**	**3.5276**	**2.3566**	**2.8100e-003**	**0.4506**	**0.1769**	**0.6275**	**0.2098**	**0.1628**	**0.3725**	**0.0000**	**268.4466**	**268.4466**	**0.0772**	**0.0000**	**270.0670**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.3288	3.5276	2.3566	2.8100e-003	0.4506	0.1769	0.6275	0.2098	0.1628	0.3725	0.0000	268.4463	268.4463	0.0772	0.0000	270.0667
Total	**0.3288**	**3.5276**	**2.3566**	**2.8100e-003**	**0.4506**	**0.1769**	**0.6275**	**0.2098**	**0.1628**	**0.3725**	**0.0000**	**268.4463**	**268.4463**	**0.0772**	**0.0000**	**270.0667**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.7904	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	1.0800e-003	2.0800e-003	9.7900e-003	2.0000e-005	1.5900e-003	3.0000e-005	1.6200e-003	4.3000e-004	3.0000e-005	4.5000e-004	0.0000	1.6150	1.6150	7.0000e-005	0.0000	1.6163
Waste						0.0000	0.0000		0.0000	0.0000	0.0223	0.0000	0.0223	1.3200e-003	0.0000	0.0500
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.6967	0.6967	7.0000e-005	1.0000e-005	0.7026
Total	**2.7915**	**2.0800e-003**	**9.9200e-003**	**2.0000e-005**	**1.5900e-003**	**3.0000e-005**	**1.6200e-003**	**4.3000e-004**	**3.0000e-005**	**4.5000e-004**	**0.0223**	**2.3119**	**2.3342**	**1.4600e-003**	**1.0000e-005**	**2.3692**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.7904	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	1.0800e-003	2.0800e-003	9.7900e-003	2.0000e-005	1.5900e-003	3.0000e-005	1.6200e-003	4.3000e-004	3.0000e-005	4.5000e-004	0.0000	1.6150	1.6150	7.0000e-005	0.0000	1.6163
Waste						0.0000	0.0000		0.0000	0.0000	0.0223	0.0000	0.0223	1.3200e-003	0.0000	0.0500
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.6967	0.6967	7.0000e-005	1.0000e-005	0.7026
Total	**2.7915**	**2.0800e-003**	**9.9200e-003**	**2.0000e-005**	**1.5900e-003**	**3.0000e-005**	**1.6200e-003**	**4.3000e-004**	**3.0000e-005**	**4.5000e-004**	**0.0223**	**2.3119**	**2.3342**	**1.4600e-003**	**1.0000e-005**	**2.3692**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	2/12/2014	3/11/2014	5	20	
2	Grading	Grading	3/12/2014	6/3/2014	5	60	
3	Paving	Paving	6/4/2014	7/29/2014	5	40	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 150

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	162	0.38
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1807	0.0000	0.1807	0.0993	0.0000	0.0993	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0529	0.5762	0.4296	3.9000e-004		0.0314	0.0314		0.0289	0.0289	0.0000	37.7016	37.7016	0.0111	0.0000	37.9356
Total	**0.0529**	**0.5762**	**0.4296**	**3.9000e-004**	**0.1807**	**0.0314**	**0.2120**	**0.0993**	**0.0289**	**0.1282**	**0.0000**	**37.7016**	**37.7016**	**0.0111**	**0.0000**	**37.9356**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.9000e-004	1.3500e-003	0.0134	2.0000e-005	1.6200e-003	2.0000e-005	1.6400e-003	4.3000e-004	2.0000e-005	4.5000e-004	0.0000	1.5782	1.5782	1.0000e-004	0.0000	1.5804
Total	**9.9000e-004**	**1.3500e-003**	**0.0134**	**2.0000e-005**	**1.6200e-003**	**2.0000e-005**	**1.6400e-003**	**4.3000e-004**	**2.0000e-005**	**4.5000e-004**	**0.0000**	**1.5782**	**1.5782**	**1.0000e-004**	**0.0000**	**1.5804**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1807	0.0000	0.1807	0.0993	0.0000	0.0993	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0529	0.5762	0.4296	3.9000e-004		0.0314	0.0314		0.0289	0.0289	0.0000	37.7016	37.7016	0.0111	0.0000	37.9355
Total	**0.0529**	**0.5762**	**0.4296**	**3.9000e-004**	**0.1807**	**0.0314**	**0.2120**	**0.0993**	**0.0289**	**0.1282**	**0.0000**	**37.7016**	**37.7016**	**0.0111**	**0.0000**	**37.9355**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.9000e-004	1.3500e-003	0.0134	2.0000e-005	1.6200e-003	2.0000e-005	1.6400e-003	4.3000e-004	2.0000e-005	4.5000e-004	0.0000	1.5782	1.5782	1.0000e-004	0.0000	1.5804
Total	**9.9000e-004**	**1.3500e-003**	**0.0134**	**2.0000e-005**	**1.6200e-003**	**2.0000e-005**	**1.6400e-003**	**4.3000e-004**	**2.0000e-005**	**4.5000e-004**	**0.0000**	**1.5782**	**1.5782**	**1.0000e-004**	**0.0000**	**1.5804**

3.3 Grading - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2602	0.0000	0.2602	0.1079	0.0000	0.1079	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2054	2.4216	1.5475	1.8500e-003		0.1164	0.1164		0.1071	0.1071	0.0000	178.3934	178.3934	0.0527	0.0000	179.5004
Total	**0.2054**	**2.4216**	**1.5475**	**1.8500e-003**	**0.2602**	**0.1164**	**0.3766**	**0.1079**	**0.1071**	**0.2150**	**0.0000**	**178.3934**	**178.3934**	**0.0527**	**0.0000**	**179.5004**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3100e-003	4.4900e-003	0.0445	6.0000e-005	5.4100e-003	6.0000e-005	5.4600e-003	1.4400e-003	5.0000e-005	1.4900e-003	0.0000	5.2607	5.2607	3.5000e-004	0.0000	5.2680
Total	**3.3100e-003**	**4.4900e-003**	**0.0445**	**6.0000e-005**	**5.4100e-003**	**6.0000e-005**	**5.4600e-003**	**1.4400e-003**	**5.0000e-005**	**1.4900e-003**	**0.0000**	**5.2607**	**5.2607**	**3.5000e-004**	**0.0000**	**5.2680**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2602	0.0000	0.2602	0.1079	0.0000	0.1079	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2054	2.4216	1.5475	1.8500e-003		0.1164	0.1164		0.1071	0.1071	0.0000	178.3931	178.3931	0.0527	0.0000	179.5002
Total	**0.2054**	**2.4216**	**1.5475**	**1.8500e-003**	**0.2602**	**0.1164**	**0.3766**	**0.1079**	**0.1071**	**0.2150**	**0.0000**	**178.3931**	**178.3931**	**0.0527**	**0.0000**	**179.5002**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3100e-003	4.4900e-003	0.0445	6.0000e-005	5.4100e-003	6.0000e-005	5.4600e-003	1.4400e-003	5.0000e-005	1.4900e-003	0.0000	5.2607	5.2607	3.5000e-004	0.0000	5.2680
Total	**3.3100e-003**	**4.4900e-003**	**0.0445**	**6.0000e-005**	**5.4100e-003**	**6.0000e-005**	**5.4600e-003**	**1.4400e-003**	**5.0000e-005**	**1.4900e-003**	**0.0000**	**5.2607**	**5.2607**	**3.5000e-004**	**0.0000**	**5.2680**

3.4 Paving - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0472	0.5217	0.2993	4.5000e-004		0.0291	0.0291		0.0267	0.0267	0.0000	42.8825	42.8825	0.0127	0.0000	43.1486
Paving	0.0173					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0645**	**0.5217**	**0.2993**	**4.5000e-004**		**0.0291**	**0.0291**		**0.0267**	**0.0267**	**0.0000**	**42.8825**	**42.8825**	**0.0127**	**0.0000**	**43.1486**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6500e-003	2.2400e-003	0.0223	3.0000e-005	2.7000e-003	3.0000e-005	2.7300e-003	7.2000e-004	3.0000e-005	7.5000e-004	0.0000	2.6303	2.6303	1.7000e-004	0.0000	2.6340
Total	**1.6500e-003**	**2.2400e-003**	**0.0223**	**3.0000e-005**	**2.7000e-003**	**3.0000e-005**	**2.7300e-003**	**7.2000e-004**	**3.0000e-005**	**7.5000e-004**	**0.0000**	**2.6303**	**2.6303**	**1.7000e-004**	**0.0000**	**2.6340**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0472	0.5217	0.2993	4.5000e-004		0.0291	0.0291		0.0267	0.0267	0.0000	42.8824	42.8824	0.0127	0.0000	43.1485
Paving	0.0173					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0645**	**0.5217**	**0.2993**	**4.5000e-004**		**0.0291**	**0.0291**		**0.0267**	**0.0267**	**0.0000**	**42.8824**	**42.8824**	**0.0127**	**0.0000**	**43.1485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6500e-003	2.2400e-003	0.0223	3.0000e-005	2.7000e-003	3.0000e-005	2.7300e-003	7.2000e-004	3.0000e-005	7.5000e-004	0.0000	2.6303	2.6303	1.7000e-004	0.0000	2.6340
Total	**1.6500e-003**	**2.2400e-003**	**0.0223**	**3.0000e-005**	**2.7000e-003**	**3.0000e-005**	**2.7300e-003**	**7.2000e-004**	**3.0000e-005**	**7.5000e-004**	**0.0000**	**2.6303**	**2.6303**	**1.7000e-004**	**0.0000**	**2.6340**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0800e-003	2.0800e-003	9.7900e-003	2.0000e-005	1.5900e-003	3.0000e-005	1.6200e-003	4.3000e-004	3.0000e-005	4.5000e-004	0.0000	1.6150	1.6150	7.0000e-005	0.0000	1.6163
Unmitigated	1.0800e-003	2.0800e-003	9.7900e-003	2.0000e-005	1.5900e-003	3.0000e-005	1.6200e-003	4.3000e-004	3.0000e-005	4.5000e-004	0.0000	1.6150	1.6150	7.0000e-005	0.0000	1.6163

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	2.02	2.02	2.02	4,311	4,311

Other Asphalt Surfaces	0.00	0.00	0.00		
Total	2.02	2.02	2.02	4,311	4,311

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.471814	0.077320	0.181313	0.151940	0.061685	0.009120	0.019075	0.010399	0.002651	0.002510	0.008802	0.000509	0.002861

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.7904	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.7000e-004
Unmitigated	2.7904	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.7000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3287					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4617					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.7000e-004

Total	**2.7904**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3287					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4617					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.7000e-004
Total	**2.7904**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.6967	7.0000e-005	1.0000e-005	0.7026
Unmitigated	0.6967	7.0000e-005	1.0000e-005	0.7026

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 1.51318	0.6967	7.0000e-005	1.0000e-005	0.7026
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.6967**	**7.0000e-005**	**1.0000e-005**	**0.7026**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 1.51318	0.6967	7.0000e-005	1.0000e-005	0.7026
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000

Total		**0.6967**	**7.0000e-005**	**1.0000e-005**	**0.7026**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0223	1.3200e-003	0.0000	0.0500
Unmitigated	0.0223	1.3200e-003	0.0000	0.0500

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.11	0.0223	1.3200e-003	0.0000	0.0500
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0223**	**1.3200e-003**	**0.0000**	**0.0500**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.11	0.0223	1.3200e-003	0.0000	0.0500
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0223**	**1.3200e-003**	**0.0000**	**0.0500**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

EMFAC2011 Emission Rates
Region Type: Air Basin
Region: San Francisco Bay Area
Calendar Year: 2014
Season: Annual
Vehicle Classification: EMFAC2007 Categories

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	ROG_RUNEX (gms/mile)	NOX_RUNEX (gms/mile)	CO2_RUNEX (gms/mile)	CO2_RUNEX(Pa (gms/mile)	PM10_RUNEX (gms/mile)	PM2_5_RUNEX (gms/mile)
San Francisco Bay Area	2014	Annual	T7	DSL	Aggregated	15	1.225012347	13.94339123	2736.436832	2695.390279	0.271786236	0.250043337
				Daily emissions (lbs/day):			0.243	2.764	542.465	534.328	0.054	0.050
				Total Emissions (tons):			**0.013**	**0.153**	**30.107**	**29.655**	**0.003**	**0.003**

Grading Period: 111 days (21 days site preperation and 90 days grading)
Daily Travel: 90 miles (based on 15 mph and 6 hours travel)

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March 21, 2014

City of Petaluma
c/o Stephanie Strelow
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Sent Via Email: steph@strelowconsulting.com

SUBJECT: Riverfront Mixed Use Development in Petaluma, CA – Response to Comments on DEIR Air Quality and Greenhouse Gas Emissions Analysis

Dear Stephanie:

The purpose of this letter is to address comments on the Riverfront Mixed Use Development Air Quality and Greenhouse Gas (GHG) Emissions Analysis made by Adams Broadwell Joseph and Cardoza, dated February 6, 2014. Our responses are as follows:

Comment 4-6: The first modification made to the CalEEMod default settings was to assume that mitigation would already be built into the Project, specifically, that construction equipment would be equipped with newer, cleaner engines, when in fact no such mitigation is actually required. The DEIR changed the CalEEMod default settings for all 13 types of diesel construction equipment that will be used on the Project site. Instead of calculating the unmitigated exhaust emissions from equipment that is typically found on a project site, the DEIR assumed that every diesel engine would automatically be mitigated and would have a "Tier 2" engine.

Response 4-6: Incorrect. The DEIR never assumes the use of diesel construction equipment with Tier 2 engines except when such engines are required by a mitigation measure. The DEIR first analyzed regional emissions and emissions affecting sensitive receptors, in both cases using unmitigated exhaust emissions based on the default diesel equipment selected by the CalEEMod (this would be the *Unmitigated Construction Emissions* reported in the CalEEMod output). [Table 4.1-1, page 4.1-9 of the DEIR[1]] No significant impacts were identified for regional emissions or for off-site sensitive receptors. [Impact 4.1-1 on page 4.1-8 through 4.1-9 and Impact 4.1-2b on page 4.1-13 through 4.1-15 of the DEIR] However, a significant impact was identified for on-site sensitive receptors. [Impact 4.1-2b on page 4.1-13 through 4.1-15 of the DEIR] The DEIR next analyzed emissions for on-site sensitive receptors assuming the use of Tier 2 engines, and there was no significant impact. [Mitigation Measure AIR-3 on page 4.1-15 and 4.1-16 of the DEIR] Mitigation Measure AIR-3 was then added to require the use of Tier 2 engines for any work within 200 feet of a residential occupant to avoid any significant impact to on-site sensitive receptors. Note that the

[1] This table reports average daily emissions that were based on the air quality and greenhouse emissions analysis prepared by Illingworth & Rodkin, Inc. on December 10, 2013 (the Technical Report). That report was included in Technical Appendix C-1 to the DEIR. The Technical Report describes the modeling methodology and includes the CalEEMod modeling output files as "Attachment 1: CalEEMod Output for Annual Construction and Operation". Reported emissions are based on "Unmitigated Construction Emissions on p6 of 44 in Attachment 1. Attachment 3 to the Technical Report included CalEEMod model output used for modeling the health risk impacts from construction activity.

mitigation inputs to CalEEMod were modified to select Tier 2 equipment for *Mitigated Construction Emissions*. These emissions were only used to address the effectiveness of Measure AIR-3 on page 4.1-15 and 4.1-16 of the DEIR. All other emissions reported in the DEIR were based on the *Unmitigated Construction Emissions* reported in the CalEEMod output.

Comment 4-7: The DEIR, however, only requires the use of Tier 2 engines under a "worst-case" scenario: if the single family residences are constructed and occupied first, then the remainder of construction must use Tier 2 engines. This mitigation measure is only triggered by an unlikely set of circumstances. Nothing in the DEIR requires the use of Tier 2 engines as a matter of course, and therefore the DEIR's modifications to the CalEEMod default settings were inappropriate. As noted in the CalEEMod User's Guide, "substantial evidence" must be available to support any reduction in engine emissions below the default level, and that evidence is lacking here.

Response 4-7: Mitigation Measure AIR-3 requires the use of Tier 2 engines within 200 feet of any residential occupant in the project, not just the single family homes and regardless of the phasing of the project. [page 4.1-15 and 4.1-16 of the DEIR] In addition and as discussed in Response 4-6, reductions in engine emissions below the default level of the CalEEMod were only assumed in connection with Mitigation Measure AIR-3, which requires the reduction of emissions through the use of Tier 2 engines. [page 4.1-15 and 4.1-16 of the DEIR]

Comment 4-8: The second modification the DEIR made to the CalEEMod default settings was to reduce the Project acreage to only 25 acres. Although it is acceptable to change the model's default settings in a way that more accurately reflects Project construction, such changes must be "supported with substantial evidence required by CEQA." Project construction will disturb 39 acres and will include the construction of 7.4 acres of parks (only 6.2 acres were assumed in the DEIR's CalEEMod model) and 13 acres of roads (the DEIR's CalEEMod model did not include this at all). The DEIR improperly manipulated the CalEEMod model by failing to account for emissions associated with constructing the entire Project.

Response 4-8: In response to this comment, an additional CalEEMod model run was performed with the same assumptions applicable to grading and paving as the CalEEMod model run for the DEIR for a project with 13.2 acres of land use type "Other Asphalt Surfaces" and 1.27 acres of land use type "City Park" which were inadvertently left out of the project modeling. Construction phases for this portion of the project included the default phases of site preparation, grading, and paving. Because development of roadways and the park only involved site preparation, grading and paving phases, building construction and architectural coating phases were not included for this construction activity. As with the CalEEMod model run used in the DEIR, the CalEEMod default construction schedule was doubled from 60 days to 120 days, and the equipment selection and equipment usage assumptions were used without modification. These total emissions are set forth in the table below:

Project Roadway/Park Area Construction Emissions (in tons)

	ROG	NOx	PM10 Exhaust	PM2.5 Exhaust
Additional Emissions from construction of 13 acres of roadways and parks (tons)	0.33	3.53	0.18	0.16

These emissions were then added to the DEIR construction emissions reported in Table 4.1-1, page 4.1-9, with the result being a small increase in daily total project emissions that remain well below applicable BAAQMD thresholds. Revisions to the portion of Table 4.1-1 concerning construction emissions are shown below:

TABLE 4.1-1: Project Air Emissions		
Pollutant	**Daily Total Project Emissions (lbs per day)**	**BAAQMD Threshold** [1]
CONSTRUCTION EMISSIONS		
ROG	~~13.4~~ 13.9	54
NO_x	~~34.8~~ 40.3	54
PM_{10}	~~1.8~~ 2.1	82
PM_{25}	~~1.7~~ 2.0	54
[1] Per BAAQMD's CEQA Guidelines: May 2011		
SOURCE: Illingworth & Rodkin, December 2013		

The memorandum included with this letter as Attachment 1 provides the technical analysis for this response 4-8. Based on the foregoing, the inclusion of 13.2 acres of additional roadway land use and 1.27 acres of additional park land use does not trigger any additional threshold of significance, require any additional mitigation measures, or otherwise affect the conclusions of the DEIR.

Comment 4-9: The third modification that the DEIR made to the CalEEMod default settings was to extend the construction period "out 5 years," which is far beyond the model's assumption for a project of similar size. The CalEEMod model is not based on the total time it may take for a project to be fully constructed, including "down time" when no construction occurs. Instead, the model calculates the actual "workdays" during six phases of construction: demolition, site preparation, grading, building construction, architectural coating (i.e. painting), and paving. The DEIR did not assume a demolition phase because there are no buildings to demolish, and it adhered closely to the default assumptions for site preparation and paving. However, it deviated dramatically from the default assumptions for grading, building construction, and architectural coatings. The DEIR estimated that the grading and building construction phases would take twice as long as assumed in by CalEEMod, and that architectural coatings (painting) would take ten times as long. In total, the DEIR added 775 work days to the presumed construction timeline for these three phases, which is 135% more than the number of days presumed by the CalEEMod model based on a survey of similar projects.

As a result of adding so many more work days, the "average daily emissions" from project construction went dramatically down. A project that is constructed over 575 work days, as predicted by the CalEEMod model, has a much higher daily emissions rate than a project constructed over 1352 work days, as predicted by the DEIR. The City does not have substantial evidence to support such an extreme deviation from the CalEEMod model. The DEIR even states that the Applicant's Project plans "do not specify a phasing order or timeframe" for Project construction. Despite the fact that the Project will be completed "in response to market conditions," and thus there may be periods of non-construction, there is no evidence to support the conclusion that the number of active construction days on the Project site could reasonably occupy every single working day over a five-year period, as assumed in the DEIR.

Response 4-9: The 5-year construction period used in the CalEEMod modeling is reasonable based on the applicant's estimate of the shortest likely time period necessary to construct the project after deducting all downtime. Such estimate is based in part on the applicant's market-driven expectation that the various components of the project (single family homes, town homes, mixed-use building, hotel and office building) will likely be built at different times, which will increase the overall period of construction of the project compared to constructing all five components of the project at the same time. The CalEEMod default schedule was thus properly adjusted to reflect a 5-year construction build-out period. There are no periods of "non-construction" included in the modeling used in the DEIR.

Extending the length of the construction period for the project does not necessarily result in a reduction in daily emissions because the CalEEMod model assumes equipment usage and emissions for each day of the construction period. With more construction days, there are more construction emissions. As a result, any reduction associated with an increase in the construction period would be limited to the CalEEMod's default assumption that the emission rates for construction equipment decrease over time. In addition, the DEIR assumed construction would begin in February 2014, at least one year earlier than is realistic. The emission rates assumed in 2014 are higher than those that would occur in subsequent years.

Comment 4-10: The DEIR includes a separate "partial" emissions analysis for the Project components other than the single-family homes. Instead of doubling the estimated time for building construction, as was done in the full Project emissions analysis, the partial emissions analysis adopts the CalEEMod default time period for this phase. It is inconsistent and arbitrary to use the default number of construction working days when analyzing part of the Project, but not when analyzing the entire Project. There is no justification for presuming that the active building construction phase for the entire Project will take 440 working days longer than predicted by the CalEEMod model.

Response 4-10: The default CalEEMod construction period of 520 days for construction of the portions of the project other than single family homes is a reasonable estimate and was confirmed as reasonable in conversations with the applicant. Such schedule is also consistent with the assumptions in the DEIR for the entire project (1,320 total construction days), keeping in mind that the single family homes are by far the largest single portion of the project and the site preparation and grading for the entire project were assumed to occur prior to the construction of the other phases. The estimates used for the construction period for the whole project and the portion of the project containing only the single family homes was reasonably made based on input from the applicant and reflect a reasonable allocation of construction time between the single family homes and the full project site preparation and grading, on the one hand, and the townhomes, hotel, office building and mixed-use buildings, on the other hand.

See also Response 4-9.

Comment 4-11: It is also absurd to presume that the active period for applying architectural coatings (i.e. paint) will take almost 300 working days longer than the CalEEMod default assumption. Based on the square footage of the buildings to be constructed, CalEEMod assumed it would take 35 working days to paint those buildings. The DEIR, however, assumed that it would take 325 working days. This can only be characterized as an absurd amount of time.

Response 4-11: The CalEEMod default period for architectural coatings was extended for two reasonable reasons. First, consultation with the applicant indicates that applying all interior and exterior architectural coatings, including building paint and road and parking lot striping is unreasonably short for a project of this size with five distinct land uses. Second, additional interior work (e.g., mechanical work, electrical, plumbing, sheet rock, etc…) was added to this phase of work because such work is typically performed in connection with interior painting. As a result, the 325 days estimate for architectural coatings is reasonable.

Comment 4-11: The partial emissions analysis for the Project similarly increased the length of the architectural coatings phase by 10 times the number of days predicted by CalEEMod. In support of this change, the DEIR simply explained that the timeline was extended "to represent activity for interior work that includes painting." This statement does not make sense, because the CalEEMod already assumes that the architectural coatings phase includes interior work such as painting. As described in the CalEEMod User's Guide, the architectural coatings phase "involves the application of coatings to both the interior and exterior of buildings or structures and includes parking lot striping as well as painting of the walls of parking structures." The City lacks substantial evidence for its presumption that the active architectural coatings phase for the Project will take 290 working days longer than predicted by the CalEEMod model.

Response 4-11: See Response 4-11.

Comment 4-12: The fourth flaw in the DEIR's construction-related air quality analysis is that it did not incorporate the emissions associated with water trucks, which will be required on site throughout construction to reduce fugitive dust.

Response 4-12: Incorrect. The CalEEMod model automatically accounts for water truck trips as part of the number of vendor trips that are included in each phase (see CalEEMod User's Guide page 25). The estimate of vendor trips is based on surveys conducted by the Sacramento Metropolitan Air Quality Management District and South Coast Air Quality Management District (see Appendix E of the CalEEMod User's manual). However, in light of this comment and because the CalEEMod does not include any vendor trips in connection with grading, a supplemental analysis was performed with respect to the grading phase of construction only as more fully described in Attachment 1. As shown in Attachment 1, the addition of emissions from water trucks during the grading of the project is extremely small and does not trigger any additional threshold of significance, require any additional mitigation measures, or otherwise affect the conclusions of the DEIR. These additional emissions from water truck usage during Site Preparation and Site Grading phases is included in the table below:

Total Project Construction Emissions

	ROG	NOx	PM10 Exhaust	PM2.5 Exhaust
Emissions from water truck usage during site grading (tons)	0.01	0.15	<0.01	<0.01

Note that revisions to the portion of Table 4.1-1 on page 4.1-9 of the DEIR concerning construction emissions includes these emissions.

Comment 4-13: The DEIR also did not incorporate emissions associated with the off-haul of tens of thousands of cubic yards of fill. These omissions undercut the total amount of exhaust emissions analyzed in the DEIR, resulting in an underestimation of Project impacts.

Response 4-13: The project proposes a balanced site and would not include substantial import or export of fill material. Any off-haul of materials occurring prior to construction of the project will be performed pursuant to an existing stockpile permit.

Comment 4-14: In sum, there are not sufficient reasons for the City to avoid a finding that construction-related air quality impacts from criteria pollutants will be significant. Had the DEIR not gone to such great lengths to alter the CalEEMod default assumptions, it would not have reached the conclusion that daily construction emissions would be one third below the threshold of significance. What is more, because the DEIR concludes that the Project will not exceed the criteria pollutant thresholds, it does not require stringent controls for dust during and after mass.

Response 4-14: The Adams Broadwell letter repeatedly suggests that changes to the CalEEMod default assumptions were done to avoid significant impacts that would occur if the CalEEMod defaults had been used instead. The CalEEMod model default assumptions represent a "baseline" data set that the authors intended to be modified to reflect the facts and circumstances of each unique project. [CalEEMod User's Guide, Version 2013.2, pages 9 and 24-25] As discussed more fully in Responses 4-6 through 4-13 above, each deviation from the CalEEMod defaults was reasonable under the circumstances.

In addition, the DEIR incorporates substantial mitigation measures that include the Basic Construction Mitigation Measures recommended by BAAQMD and also includes additional measures imposed by the City that make up most of the BAAQMD-recommended "Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Thresholds." To ensure that all Basic Construction Mitigation Measures recommended by BAAQMD are included, Mitigation Measure AIR-1 has been revised to include the following requirement that was inadvertently left out of the DEIR:

All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads will be laid as soon as possible after grading, unless seeding or soil binders are used.

Comment 4-15: As discussed above, the BAAQMD requires 13 "additional construction mitigation measures" for projects with significant emissions of criteria air pollutants during construction. Three of these 13 measures have not been fully incorporated into the DEIR:

- "All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe."

Instead of incorporating this measure, the DEIR states that all exposed surfaces "shall be watered two times per day or to a [sic] maintain a minimum soil moisture of 12%." Watering two times per day comes from the BAAQMD's "basic" construction mitigation measures. If the Applicant has the option of watering two times per day (less stringent) or maintaining a verified 12% soil moisture (more stringent) it will inevitably choose the less stringent option. This makes the City's incorporation of a 12% soil moisture requirement essentially useless. Moreover, the DEIR's mitigation measure does not require verification of the soil moisture content by lab samples or moisture probes, as set forth in the BAAQMD measure, thus making the measure impossible to verify and enforce.

It is important that stringent dust control mitigation be put in place for this Project, including the maintenance of adequate soil moisture to prevent unwanted dust from blowing toward neighboring communities, roads, and highways. The entire Project site will be mass graded, and the Project will likely be built in stages, which presents a risk of excess particulate matter being blown into the air from the Project site. The City must adopt and provide for strict enforcement of the 12% moisture content requirement.

- "Wind breaks (e.g. trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50% air porosity."

This measure is not included in the DEIR. For reasons similar to those described above, this measure is key to preventing undue fugitive dust from escaping the Project site. The City must apply and actively enforce this measure.

- "The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e. owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NOx reduction and 45 percent PM reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low- emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available."

This measure is not included in the DEIR. Instead, a measure from the City's General Plan is used, which was adopted before the BAAQMD's CEQA Guidelines. The City's measure simply requires that off-road equipment meet the most recent ARB fleet average, and be equipped with "Best Available Control Technology." This measure neither requires an approved plan for reducing emissions, or provides a particular benchmark for emissions reductions. An approved plan for emissions reductions is crucial, not least because the DEIR improperly assumes significant reductions when modeling the Project's air emissions.

Response 4-15: This comment incorrectly assumes that the project exceeds the BAAQMD thresholds that would require the use of the 13 additional mitigations measures. This is incorrect. The DEIR shows that the project is below such thresholds, and therefore, none of the 13 additional mitigation measures is required. [Table 4.1-1, page 4.1-9 of the DEIR] The City has elected to include some of the 13 additional measures, but such election is at the discretion of the City, based on the feasibility of the additional measures, as none of the 13 additional mitigation measures is required unless the BAAQMD thresholds are exceeded. Accordingly, none of the commenter's discussion as to the inadequacy of each specific additional mitigation measure imposed by election by the City is relevant.

Comment 4-15: The DEIR even fails to incorporate all eight of the BAAQMD's "basic" construction mitigation measures, which apply to all projects and which the DEIR acknowledges are required to reduce potentially significant impacts from fugitive dust to a less-than-significant level. The DEIR only incorporates seven of these eight measures, and omits the following measure:

> • "All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used."

Instead, the DEIR provides an apparently non-applicable requirement that all "paving shall be completed as soon as possible after pipeline replacement work is finished." This is unacceptable. Incorporation and enforcement of the BAAQMD's basic measure is imperative to ensure that wind-borne dust is not a chronic problem as the Project is built out. It is reasonable and feasible to require the Applicant to pave all roads and sidewalks immediately after grading, and to lay building pads promptly, or at least establish a vegetative cover or soil-binding mulch while Project phases are constructed. This measure was inappropriately omitted from the DEIR.

Response 4-15: As noted in Response 4-15, this mitigation measure was inadvertently left out of the DEIR and has now been added. The inadvertent omission of this mitigation measure does not affect the analysis or conclusions of the DEIR.

Comment 4-16: The DEIR improperly concludes that the Project will not contribute significant amounts of greenhouse gas pollution ("GHG") to the atmosphere, and the DEIR proposes absolutely no mitigation requiring sustainability features that would reduce the Project's contributions to GHG pollution. Under the BAAQMD's CEQA Guidelines, GHG emissions that exceed 1,100 million tons per year ("MTY") are considered cumulatively significant. If a project exceeds that threshold it is required to incorporate mitigation measures, unless it can show that the project is extremely efficient and will produce no more than 4.6 MTY per capita, including residents and employees of a project.

The DEIR concludes that the Project's operational emissions will be 4,696 MTY, well above the 1,100 MTY threshold of significance, but that per capita emissions will be 4.13 MTY, just below the efficiency threshold of 4.6 MTY, and therefore the Project does not require any mitigation. For several reasons this conclusion is not supported by substantial evidence.

Response 4-16: This comment incorrectly states the MTY standard as "million tons per year." The correct standard is "metric tons per year." [see Page 4.1-6 of the DEIR] The remainder of Comment 4-16 is responded to in Responses 4-17 through 4-19.

Comment 4-17: Similar to the DEIR's manipulation of the CalEEMod default settings for construction emissions, the DEIR also improperly changed the CalEEMod default settings for operational GHG emissions. First, the DEIR assumed that the Project would not be occupied until 2020, which is two years after even the lengthy construction period presumed in DEIR. The DEIR predicts that the Project may be built in phases, ending in 2018, and that the single family homes and the hotel will likely be constructed and occupied first. It is unreasonable to change the default CalEEMod settings to reflect that the Project will not be operational

until 2020. As the DEIR admits, the sole purpose of using 2020 as the Project occupation date is so that the Project's GHG emissions could be evaluated against "AB32 GHG emission targets" for the electric utility that will serve the Project, PG&E. The DEIR attempts to manipulate the date of Project occupancy so that its emission will look more favorable and it can avoid GHG mitigation. Substantial evidence does not support this conclusion.

Response 4-17: According to the applicant, complete construction and occupation of the project would not occur until 2020 or beyond. The DEIR assumed a credible worst-case construction scenario of five years that was based on the most aggressive construction schedule for the project. However, the construction schedule used in the DEIR emissions modeling did not include any periods where there would not be any construction. Moreover, as of the date of these responses it is clearly unlikely that construction will even *commence* before 2015 given the remaining project review process. Thus it is highly unlikely that the project will be fully constructed, let alone occupied, prior to 2020. Accordingly, the 2020 estimate of initial full occupancy is in fact quite conservative.

Comment 4-18: Another related change is that the DEIR reduces the estimated emissions associated with the Project's electricity consumption. The DEIR reduced PG&E's "CO2 intensity factor" from 641.3 pounds per megawatt of electricity to just 288.8 pounds, a 55% reduction from the CalEEMod default assumption. The DEIR states that the 641.3 pounds used in the CalEEMod model only reflects PG&E's "2008 base emission rate," and that "PG&E's 2020 emission rate, as reported by PG&E using the California Public Utilities Commission's CPUC GHG Calculator," is 288.8 pounds. While it is true that the 641.3 intensity factor is based on PG&E's 2008 reporting year, this is the most accurate, verified, and up-to-date number that has been reported to the BAAQMD by PG&E, and it is the number that is used and recommended in the most recent 2013 CalEEMod program. As described in the CalEEMod User's Guide, this intensity factor is "based on Table G6 of the California Air Resources Board (ARB) Local Government Operation Protocol version 1.1 or the latest public utilities inventory reports," and "is consistent with recommendations in the California Air Pollution Control Officer Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures document."

There is no substantial evidence to support using a 55% reduction in electricity-related GHG emissions. The DEIR states that PG&E "reported" a 2020 emissions rate, but provides no supporting data to support this assertion. The DEIR also mischaracterizes PG&E's CO2 intensity factor as "steadily decreasing," and suggests that the intensity factor is only affected by PG&E's increasing renewable energy portfolio. This is not at all accurate. PG&E's CO2 intensity factor rises and falls from year to year, based primarily on customer demand and the availability of clean hydro-power. For example, 2011 was an extremely wet year, and PG&E reports that it was able to achieve its lowest CO2 intensity factor yet, at 393 pounds. During the dry years of 2007 and 2008, however, PG&E's CO2 intensity factor rose to over 600 pounds.5

The DEIR's significant reduction from the default assumption for PG&E is unsupportable. The GHG Calculator is a model that can be manipulated in any number of ways by the user, to estimate potential future GHG emissions associated with statewide electricity production. The calculator does not provide hard answers, but instead allows users to "run their own scenarios" by varying the parameters associated with statewide future energy efficiency achievements and costs, electricity load, regulatory compliance, the effectiveness of the state's new cap and trade policy, and numerous other parameters. In reality, PG&E's intensity factor rises and falls each year, and even PG&E acknowledges that its data should not be relied upon until "a thorough, third-party verification" is conducted. California is currently facing a severe drought, and hydropower resources have become less reliable. PG&E's current CO2 intensity factor is likely close to or above the 641 pounds used in the CalEEMod model. There is no substantial evidence for deviating from this default intensity factor. The DEIR relies purely on speculation in an attempt to avoid mitigating its significant GHG emissions.

Response: The Air Quality Technical Report, page 6, describes the CO2 intensity factors used in the analysis. The CalEEMod default intensity factor is based on the most up to date information available when

the model was developed. This is the historical intensity factor for 2008. In April 2013, PG&E published historical and future CO2 intensity factors that are based on more up to date emissions information (see Attachment 2). PG&E's third-party-verified GHG inventory submitted to the California Climate Action Registry (2003-2008) and The Climate Registry (2009-2011) show historical emissions of 641 pounds of CO2 per megawatt hour in 2008 and 393 pounds per megawatt hour for the most recent verified inventory in 2011. PG&E also reports their projected emissions, based on requirements to meet AB32 requirements. These emission rates are independently forecasted. [Greenhouse Gas Calculator for the California Electricity Sector, Developed by Energy + Environmental Economics under contract to the California Public Utilities Commission (CPUC) and the California Air Resources Board (CARB), Version 3C, March 2010.] The DEIR used the most recent available PG&E intensity factors, where the CalEEMod default value is based on 2008 historical data that were the most recent historical data available when the original model (i.e., CalEEMod 2011) was developed. The recent PG&E data are the best available data and it is appropriate to use the projected future emissions.

Comment 4-19: The "per capita" energy efficiency of the Project depends heavily on how many people will live and work there. The fewer people who occupy the Project, the less efficient the Project will be. The original Initial Study prepared by the City for the Project relied on generic assumptions about the number of residents and employees on the Project site, using U.S. Census data to estimate the number of residents, and basic square footage assumptions to estimate the number of employees. Presumably in response to Petaluma Residents' comments on the Initial Study, the DEIR now incorporates the estimated number of employees from the Project's Fiscal and Economic Impact Analysis (FEIA). Thus, instead of using generic calculations and estimating 420 employees, as was done in the Initial Study, the DEIR estimates only 348 employees, based on the Project's FEIA.

The DEIR refuses, however, to make a similar adjustment to the estimated number of Project residents, in order to align this estimate with the Project's FEIA. The generic estimate of residents based on U.S. Census data is 718, while the FEIA relied on a specific estimate from the Applicant, based on experience with similar projects in the City, of only 565 residents. It is entirely arbitrary for the DEIR to incorporate the more accurate number of employees from the FEIA, but not the more accurate number of residents. Throughout the DEIR it is evident that the City chose to alter default assumptions about Project impacts, but only when the result would be to avoid a finding of significance and its associated mitigation requirements. Here, the DEIR refuses to alter its default assumptions for the same reason: to avoid a proper finding of significance that would require mitigation. The City should not be so eager to assist the Applicant in avoiding sustainability measures that would benefit the health and well being of all City residents. The failure to make a finding of significance for GHG impacts is not supported by substantial evidence.

Response: The normal protocol for determining the number of workers in a project for air quality purposes is to rely on applicant estimates based on applicant interviews. The FEIA, however, is a professional study of the economic impacts of the project prepared at the direction of the City by a consultant selected by the City. Accordingly, the workforce estimates provided in the FEIA are plainly more reliable than reliance on applicant estimates. The project residential service population was calculated by applying the persons per household rate developed from the U.S. Census. This rate is based on all households in Petaluma using the latest census data (2006-2010) for the City of Petaluma.[2] The FEIA projection was not utilized because it made an overly-conservative estimate in terms of population by only applying the persons per household rate from the Census to detached single-family homes and attached townhomes, while applying a lower rate for apartments. However, the census data is based on all households in Petaluma, including apartments. The U.S. Census Bureau defines a housing unit as "a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters". [see http://quickfacts.census.gov/qfd/meta/long_HSD310212.htm, accessed March 19, 2014], Moreover, a real-world vacancy rate is built in to the Census data, since it simply reflects the population divided by the number

2 U.S. Census Bureau, 2012. Petaluma (city), California. Available on-line: http://quickfacts.census.gov/qfd/states/06/0656784.html. Accessed: March, 14. 2012.

of households (including apartments), whether those households are vacant or not. Thus, the U.S. Census is the more accurate source for determining the number of residential occupants in the project.

* * *

This concludes our responses to comments regarding air quality and GHG emissions from this project. If you have any questions or comments, please feel free to contact me at (707) 794-0400 x24.

Sincerely,

James A. Reyff
Project Scientist

Illingworth & Rodkin

11-175

Cc: Olivia Ervin: olivia@mplanninggroup.com

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June 5, 2014

City of Petaluma
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SUBJECT: Riverfront Mixed Use Development in Petaluma, CA – Response to Comments on DEIR Air Quality Construction Emissions Analysis

Dear Stephanie:

Construction emissions vary substantially over the course of a construction period, especially large projects with various land use types and phases. The DEIR analysis of construction emissions for the Riverfront Project predicted construction period emissions and averaged them over the duration of the construction period. As shown in the Thresholds of Significance table on Page 2-2 of the BAAQMD CEQA Guidelines, project-level construction emissions are recommended to be evaluated using average daily emissions. There could be various methods of averaging construction period emissions. Pages B-13 and B-14 of the *BAAQMD CEQA Air Quality Guidelines* describe the procedure for averaging construction period emissions and clearly state that, "the average daily emissions of each pollutant that would occur throughout the entire construction period should be identified and compared with the District's threshold of significance." In addition, personal correspondence with BAAQMD staff[1] has confirmed the use of this approach for evaluating construction impacts.

Illingworth & Rodkin, Inc. has prepared air quality analyses for numerous projects throughout the Bay Area using this approach. The approach recognizes that the emissions vary throughout a project construction period and cannot be accurately predicted for any specific construction phase, especially a project with a construction period that likely would exceed 5 years.

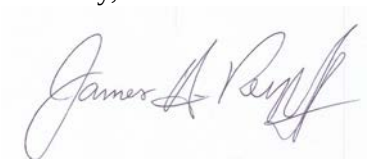
We should point out that the construction period emissions reported are unmitigated. This is conservative, since the DEIR includes Mitigation Measure AIR-2 that would require use of construction equipment that is equipped with Best Available Control Technology for emission reductions of NOx and PM (particulate matter, i.e., $PM_{2.5}$ and PM_{10}) and requires contractors to use equipment that meets CARB's most recent certification standard for off road heavy duty diesel engines. Application of this mitigation measure would likely result in substantial reductions in emissions from those predicted in the DEIR analysis.

[1] Personal correspondence between James Reyff, Illingworth & Rodkin, Inc., and Sigalle Michael, BAAQMD, January 11, 2012.

* * *

This concludes our responses to comments regarding air quality construction emissions from this project. If you have any questions or comments, please feel free to contact me at (707) 794-0400 x24.

Sincerely,



James A. Reyff
Project Scientist

Illingworth & Rodkin

11-175

Cc: Olivia Ervin: olivia@mplanninggroup.com

Greenhouse Gas Emission Factors: Guidance for PG&E Customers

April 2013

In recent years, an increasing number of PG&E customers have started to track the greenhouse gas (GHG) emissions from their business operations, generated within their city, or saved through energy efficiency. This document is intended to help PG&E customers understand the different emission factors they can use to estimate GHG emissions for their own climate action planning or voluntary GHG emissions tracking or reporting. PG&E's latest GHG emission factor for delivered electricity is available online.

Please note: The information in this document is not to be used for mandatory GHG reporting, financial analysis, or regulatory compliance, and does not necessarily reflect the approaches taken by PG&E for its own regulatory compliance purposes.

What is a GHG emission factor?

A GHG emission factor[1] is a measure of the pounds of carbon dioxide (CO_2) emitted per megawatt-hour of electricity or per therm of natural gas.

- **Electricity** generated from fossil fuels such as natural gas or coal emit CO_2, while other sources of electricity such as hydropower, wind, solar, and nuclear power are considered to be carbon-free. The electricity that PG&E delivers to customers comes from a mix of these generation sources. PG&E's emission factor for delivered electricity incorporates the annual energy and associated emissions from each generation source for the given year. Variance in PG&E's mix of electricity sources largely account for changes in PG&E's GHG emission factor from year to year.
- The **natural gas** emission factor represents the amount of GHGs emitted per therm of natural gas combusted. This emission factor does not vary because the composition of PG&E's natural gas does not change significantly over time.

Electricity Emission Factors

If you are estimating the GHG emissions generated by a business, city, county, or related entity over the course of a year, and if 100% of your electricity was purchased from PG&E, you can use the average emission factor for all the PG&E electricity delivered during that specific year.

Historic emissions: Historic average emissions factors take into account all of the sources of electricity that PG&E delivered to customers during a specific year in the past. As a founding member of the California Climate Action Registry (CCAR), PG&E

[1] An emission factor is also known as an emission rate or emission coefficient.

has emission factors that have been third-party verified starting in the year 2003. For factors prior to 2003, please see FAQ #2.

Current/Future emissions: Because of the multiple sources of power used in the course of a year and the rigorous process PG&E follows to have its emissions independently verified by a third party, the emission factor for delivered electricity lags by a year. To estimate GHG emissions in a recent or future year for which an emission factor is not yet available, use the emissions factor forecast for PG&E's electricity in the CPUC GHG Calculator. The calculator is a publicly-available document that provides emission factor forecasts from 2012–2020 which are listed in the table below.

Avoided emissions: When you implement an energy efficiency project or install a renewable generation project (e.g., a solar photovoltaic system), you are reducing your use of electricity from the utility, and therefore are avoiding the associated GHG emissions. Determining the emissions avoided from these projects can be complicated, depending on the season and time of day the electricity was saved.

For simplicity, you can use the relevant annual emission factor to estimate the GHGs avoided from these projects. See FAQ #5 for more information.

PG&E Emissions Factor Summary

Emission Type	Emission Factor			Source
	Year	*Lbs CO_2 /MWh*	*Metric tons CO_2/MWh*	
Historical Emissions	2003	620	0.281	PG&E's third-party-verified GHG inventory submitted to the California Climate Action Registry (CCAR)[2] (2003-2008) or The Climate Registry (TCR) (2009-2011)
	2004	566	0.257	
	2005	489	0.222	
	2006	456	0.207	
	2007	636	0.288	
	2008	641	0.291	
	2009	575	0.261	
	2010	445	0.202	
	2011	393	0.178	
Future Emissions (estimated)	2012[3]	453	0.205	CPUC GHG Calculator, which provides an independent forecast of PG&E's emission factors as part of a model on how the electricity sector
	2013	431	0.196	
	2014	412	0.187	
	2015	391	0.177	
	2016	370	0.168	

[2] The 2003-2008 factors are in the Power/Utility Protocol (PUP) spreadsheet of PG&E's CCAR reports. The 2009-2011factors are in the Additional Optional Information tab of the Electric Power Sector (EPS) Report spreadsheet of PG&E's TCR report.
[3] PG&E's actual 2012 emission factor will be available in January 2014.

	2017	349	0.158	would reduce emissions under AB 32[4]
	2018	328	0.149	
	2019	307	0.139	
	2020	290	0.131	

Natural Gas Emission Factors

Historic, Current, and/or Future: The combustion of natural gas (in your stove, a furnace, or a natural gas power plant) releases CO_2. The emission factor for natural gas represents the amount of GHGs emitted per therm of natural gas combusted. Since the composition of PG&E natural gas does not change significantly over time, this factor does not change from year to year.

Emission Type		Emission Factor		Source
	Year	*Lbs CO_2/therm*	*Metric ton CO_2/therm*	
Historic, Current, or Future	All years	11.7	0.00531	U.S. Energy Information Administration[5]

UPDATES: The emissions factors will be updated annually, so please check with your PG&E account manager or the PG&E website at www.pge.com/environment for the most recent version.

Frequently Asked Questions:

[4] E3, GHG Calculator version 3c, worksheet tab "CO_2 Allocations," cells AH35 - AH44.
[5] U.S. Energy Information Administration, Voluntary Reporting of Greenhouse Gases Program.

1. Q: Why do the emission factors for PG&E electricity vary from year to year?
   A: PG&E's electricity emission factors vary primarily because the amount of available hydroelectricity varies from year to year. During drought years, less hydroelectricity is available and other power sources (usually natural gas generation) are used instead.

   Emission factors also change, but less significantly, based on variables such as change in demand due to weather (hot summers mean more air conditioning demand). Increased demand on a short-term basis is generally met by fossil fuel generation, which raises the average emission factor. PG&E works to mitigate demand by following California's "loading order," which involves reducing electricity demand by increasing energy efficiency and demand response, and meeting new long-term generation needs first with renewable and distributed generation resources, and second with clean fossil-fueled generation. The loading order was adopted in the 2003 Energy Action Plan prepared by the California energy agencies[6].

   Over time, PG&E's emission factor is also decreasing as we make steady progress toward California's target of 33% renewables by the end of 2020.

2. Q: Does PG&E have emission factors from years prior to 2003?
   A: PG&E was among the earliest companies to voluntarily quantify and report its GHG emissions using rigorous, publicly-vetted GHG reporting standards. As a charter member of the California Climate Action Registry which later grew into The Climate Registry, PG&E has voluntarily registered and publicly reported its third-party verified GHG inventory every year since 2003. Prior to 2003, there were no commonly-accepted guidelines to report the GHG emission factors from a utility. If you would like to calculate emissions prior to 2003, you can use the 1990 emission factor in FAQ #3 below.

3. Q: What emission factor should I use to calculate the emissions from electricity use in 1990?
   A: You can use the factor from a study published by Lawrence Berkeley National Laboratory, which cites an emission factor of 0.070 kg C/kWh for PG&E in 1990.[7] This figure translates to approximately 572 lbs CO_2/MWh or 0.259 metric tons CO_2/MWh.[8]

[6] Implementing California's Loading Order for Electricity Resources.
[7] LBNL-49945, Marnay *et al*, Estimating the CO_2 emissions factors for the California Electric Power Sector, August 2002.
[8] Assuming 1 kg CO_2 = 0.27 kg C and 2.2046 lbs/kg.

4. Q:Why do you use an average emission factor to estimate avoided emissions and not a marginal[9] or project-specific emission factor?
   A: For the purposes of climate action planning or voluntary tracking and reporting, using an average emission factor simplifies the emissions calculation process. While some large entities may be required to estimate the amount of GHGs avoided by using emission factors specific to the hours of the day, the days of the year, or the seasons in which the energy use was avoided, the use of an average emission factor is appropriate for most customers.

5. Q: What emission factor should I use if I want to estimate the emissions avoided through participation in PG&E's demand response programs[10]?
   A: For the purposes of climate action planning or voluntary tracking or reporting, an average emission factor is appropriate. If you are participating in a third-party Demand Response program, you may reach out to your program manager for further guidance. Using the average factor is a simplification and may not reflect the approach taken by large entities for regulatory compliance purposes.

6. Q: If I am a direct access electricity customer, what emission factor should I use?
   A: If you are a direct access customer, you should contact your direct access electricity provider for the appropriate emission factor. If the emission factor is unavailable, The Climate Registry's Local Government Operations Protocol and the World Resources Institute's GHG Protocol recommend using the EPA Emissions & Generation Resource Integrated Database (eGRID) annual output emission factors for the WECC California (CAMX) sub-region.

7. Q: Can PG&E customers use the U.S. EPA carbon calculator to calculate the emissions from PG&E electricity?
   A: PG&E does not recommend that customers use this calculator. The EPA calculator uses an average emission factor for electricity generated nationwide. PG&E's emission factor is independently verified and based on the PG&E-specific mix of electricity delivered to PG&E customers. Because of PG&E's higher use of lower- and zero-emission generation sources, PG&E's emission factor is more than 60 percent cleaner than the national average.[11] Using the EPA carbon calculator would dramatically overstate PG&E customers' emissions and any emissions savings associated with energy efficiency projects.

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[9] A marginal emission factor represents the emissions from electricity generated "at the margin", i.e., electricity generated in response to an additional unit of electricity demand. In California, this factor is typically that of a natural gas power plant, because this type of plant is most frequently deployed when electricity demand increases in the state. The California Air Resources Board (ARB) uses a marginal emission factor for California of 944 lbs CO_2e/MWh. *See*: ARB, Mandatory Reporting Requirement Final Regulation, Section 95111(b)(1).

[10] PG&E's demand response programs offer incentives to customers that volunteer and participate by temporarily reducing their electricity use when demand could outpace supply.

[11] PG&E website: http://www.pge.com/myhome/environment/pge/cleanenergy/index.shtml.

8. Q: What is the difference between the emission factors used in the U.S. EPA's Portfolio Manager benchmarking tool and PG&E's emission factors?
   A: The EPA tool uses emission factors from the EPA Emissions & Generation Resource Integrated Database (eGRID), which are derived from utility data for each of the 26 sub-regions of the U.S. power grid. Users are not able to enter a PG&E-specific emission factor into the tool. Instead, based on the zip code of each building entered, Portfolio Manager identifies the appropriate sub-region and emission factor, and provides a graphic comparison of the sub-region's emission factor and electric generation fuel mix to the national factor. PG&E customers are in the WECC[12] California (CAMX) sub-region. Because eGRID's WECC California emission factor has consistently been higher than PG&E's historic emission factors, customers should understand that this tool overestimates emissions from buildings that use PG&E electricity.

   The tool also gives users the choice of selecting a specific power generation facility, which is not generally appropriate for the purposes of climate action planning or voluntary tracking and reporting, since the electricity delivered by PG&E to customers comes from a variety of sources.

9. Q: Does PG&E have emission factors for smaller geographic areas like cities or counties within its service territory?
   A: No, PG&E's emission factor is based on the electricity delivered to all of its customers. Because electricity enters PG&E's electrical transmission and distribution system from multiple sources and gets distributed throughout the system to customers, it is not possible to calculate emission factors for specific geographic areas.

10. Q: What measures can I use to compare a reduction of one metric tonne of CO_2?
    A: Reducing one metric ton (2204.6 lbs) of CO_2 is approximately equivalent to:
    - Taking 0.21 of an average passenger car in California off the road for a year in 2011;[13]
    - Avoiding the use of 112 gallons of gasoline;[14] or
    - Eliminating the GHGs associated with about 3.3 homes in PG&E's service territory for a month.[15]

[12] The Western Energy Coordinating Council (WECC) is a regional organization that promotes reliable electric service by establishing operating criteria and facilitating electric system support between utilities.
[13] California Air Resources Board's EMFAC 2011 model indicates an average passenger car in California in 2011 emitted 4.76 metric tons (5.24 short tons) of CO_2 per car per year.
[14] U.S. EPA website: http://www.epa.gov/cleanenergy/energy-resources/refs.html#gasoline.
[15] In PG&E's service territory in 2011, the average residential customer consumed 0.584 MWh and 38 therms per month. 0.584 MWh/home times 0.178 metric tonnes (MT) CO2/MWh in 2011 is approximately 0.104 MT of CO2 per home each month for electricty. 38 therms/home times 0.00531 MT of CO2 per therm is approximately 0.202 MT of CO2 per month. Combined energy use per house accounts for about 0.306 MT per month. Therefore, reducing 1 MT of CO2 is equivalent to reducing the emissions for about 3.3 homes per month.

11. Q: Why are PG&E's emission factors in CO_2 (carbon dioxide) and not CO_2e (i.e. CO_2 equivalent)?[16]
    A: The electricity emission factors reported via CCAR and TCR are in pounds of CO_2 and not CO_2e because their methodology for calculating emission factors only includes CO_2 and not methane (CH_4) or nitrous oxide (N_2O) from electricity generation. CCAR and TCR do not include CH_4 or N_2O because these emissions are considered to be *de minimis*.

    However, PG&E customers can still estimate the CH_4 and N_2O emissions associated with their electricity use by using the California-specific emission factors provided by The Climate Registry's Local Government Operations Protocol[17]. For natural gas, customers can use the relevant default emission factors for natural gas provided by the same protocol[18].

12. Q: Why don't PG&E's emission factors include the emissions associated with the delivery of electricity or natural gas?
    A: The emissions associated with the delivery of electricity or natural gas are not included in PG&E's emission factors for delivered electricity or natural gas because those emissions are reported separately by PG&E in its own GHG inventory. Standard voluntary reporting practice is to report such emissions, like the emissions associated with transmission and distribution line losses, natural gas compressor stations, and vehicles used to service electricity and natural gas delivery systems, separately from the emissions attributed to the generation or use of the energy itself.

13. Q: Who can I contact at PG&E to ask questions about emission factors?
    A: Email ghgdatarequests@pge.com and a PG&E employee will get back to you shortly.

[16] CO_2e or CO_2 equivalent is a measure used to compare the emissions from various GHGs based upon their global warming potential (GWP). The CO_2e for a gas is derived by multiplying the amount of the gas by the GWP of the gas.
[17] Version 1.1, May 2010. Page 209, Table G.7: California Grid Average Electricity Emission Factors (1990-2007).
[18] Page 205, Table G.3: Default Methane and Nitrous Oxide Emission Factors by Fuel Type and Sector.

APPENDIX D

SUPPLEMENTAL NOISE REVIEW

ILLINGWORTH & RODKIN, INC.
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www.illingworthrodkin.com *illro@illingworthrodkin.com*

M E M O

Date: March 17, 2014
To: Olivia Ervin
City of Petaluma

Email: OERVIN@ci.petaluma.ca.us
From: Richard B. Rodkin, P.E.

SUBJECT: Riverfront Mixed-Use Project DEIR, Petaluma, CA – Responses to Comments on the Noise Study

This memo presents responses to comments on the Noise Study Illingworth & Rodkin, Inc. (I&R) prepared as supporting documentation for the Riverfront Mixed-Use Project DEIR (Strelow, 2013).

Comments and Responses

Noise Measurement Methodology. The discussion of the noise measurements presented in the March 2013 Noise Study and DEIR prompted several comments from the Planning Commission: the measurements were made during mid-day and should have been made during the "peak hour"; the noise measurements are 10 years old; and, the noise measurements should have been made at the "second story" height.

Response to "Peak Hour" comment: In October 2003 I&R performed noise measurements for a continuous 48 hour period overlooking US Highway 101 south of the Petaluma River at a distance of 100 feet from the centerline of the highway (I&R, 2004). This measurement location provided an unobstructed view of the highway. The measurements were made in consecutive 15 minute intervals. The hour by hour variation in the hourly average noise levels (Leq) and the daily weighted average noise levels (Ldn and CNEL) were calculated from these data. The highest hourly average noise levels occurred between 9:00 AM and noon. This is not unusual for a highway that operates over its capacity because during peak traffic periods the traffic slows

down, resulting in lowered noise levels as compared to the shoulder hours when the combination of maximum volume at the design speed result in the maximum noise levels. The 24-hour average CNEL was 1 dBA higher than the hourly average (Leq) during the noisiest hours. There was no highway construction occurring so the hourly traffic distribution was normal for the highway. As described above, the comment regarding "peak hour" measurement has been addressed because a 48-hr, 15-minute interval measurement period was conducted to quantify the "peak hour". This measurement provided an accurate reference noise level.

Response to "Age of Information": Short term noise measurements were made on the Riverfront Project site during the noisiest time period of the day in 2005 during the original noise assessment for the Riverfront Project and updated in 2013. These data were directly correlated to the 2003 measurement during the same time periods to determine the CNEL on the Riverfront Project Site. It should be noted that through this correlation, the 2013 noise exposure increased by 3 dBA CNEL as compared to the 2005 noise exposure, likely the result of the addition of the southbound auxiliary lane and increased traffic on the highway. The baseline data collected in 2003 was subsequently verified in 2005 for the original Noise Assessment (I&R, 2005) and later was found to have increased in 2013 (I&R, 2013). This increase in noise was accounted for in the 2013 noise assessment.

Response to "Height of Measurement": Noise measurements were made at a height of about 5 feet above the existing ground which is a standard height for measurement as it represents the average height of a human's ears. The project proposes two story residential buildings. In the case of adjacent State Hwy 101, the roadway is substantially above the adjacent project grade, and is higher than the future 2nd story windows, such that the edge of the roadway acts as a noise barrier. In this case there is an additional concrete vehicle barrier at the edge of the highway that improves this noise reduction effect. Typically in this geometry noise levels at the second story are no more than 1 to 2 dBA higher than at the first story. A 2 dBA factor was included in the CNEL noise exposure levels presented in the March 2013 Noise Study. Traffic noise modeling using the Federal Highway Administration Traffic Noise Model (FHWA, 2004) was completed to confirm the difference in first and second story noise exposure. Steve Lafranchi and Associates, the Project Engineer, provided the locations and elevations of the future townhome buildings proposed in the north corner of the site nearest to the highway, as well as the location and elevations of highway where it continues to the north over Lakeville Street. I&R requested this additional information because the roadway continues a downward slope as it goes over Lakeville Highway. Traffic data for the highway were obtained from the Caltrans website. Using TNM the second story noise exposure of the most affected building was calculated to be 1.6 dBA higher than the first story exposure. Both floors would be exposed to substantially lower levels as compared to an at grade roadway due to the shielding discussed above. As noted above, the noise exposure levels reported in the 2013 Noise Study (I&R, 2013) and DEIR

included this effect and therefore, as determined in the DEIR, there are no noise impacts relative to height of buildings or measurements.

Traffic and Train Noise Control Measures. Mitigation Measure Noise-1 provided a list of noise attenuation measures that could be incorporated into the design of buildings to reduce noise intrusion. One of these measures was "…small or no windows facing noise emitters…" that caused understandable concern from the Planning Commission. Although this was only one of several alternative measures listed, this clause should not have been included in the mitigation measure because: a) it is not normally feasible due to a number of other considerations including egress, natural light, and ventilation; and, b) there are available construction techniques and improvements (i.e. insulated walls, sound rated windows, etc.) that can achieve acceptable noise levels within a residence. The noise exposure at the location of the proposed Townhomes would fall within the Conditionally Acceptable category of the City of Petaluma General Plan Land Use Compatibility Standards (Figure 10-2). The Conditionally Acceptable category is described as follows: "New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning systems will normally suffice." This is a correct characterization of the noise exposure and noise insulation requirements at the Project site. In practice, operable windows (and of course doors) are installed. What constitutes adequate ventilation depends upon the climate, but always must meet minimum fresh-air supply rates assuming that the occupants have chosen to keep the windows closed to control noise intrusion. The specific requirements for the sound ratings of individual building elements cannot be determined until final design, but as stated in Mitigation Measure Noise 1, the design of the overall building envelope must provide the sound insulation necessary to reduce the noise level inside the unit to 45 dBA CNEL or less as required by the General Plan.

The noise from infrequent railroad train operations does not adversely affect most people using outdoor activity areas in residential areas. However, the noise often disturbs or annoys people inside their homes, and causes sleep interference. The highest noise level associated with a train is the warning horn that must be used as a train approaches and passes through an at-grade crossing, unless Quiet Zone status has been approved. Outdoor to indoor noise reduction of up to 40 to 45 dBA is feasible with proper noise controls. With or without the approval of Quiet Zone status for the grade crossing at Caulfield, the proper incorporation of building sound insulation treatments would achieve both the City of Petaluma maximum interior noise limit of 45 dBA CNEL and adequate control of the maximum noise levels during the passage of the trains. Clearly, the performance requirements for the sound insulation treatments, particularly in the bedrooms, would be much greater if Quiet Zone status is not approved and the trains must sound their warning horns. It should be noted that the adverse effect of train horns would not be

limited to this project; it would affect the entire City and be more profound on existing uses in the proximity of at-grade crossings.

Intra-Project Construction Noise Effects. The Project would be constructed in phases and the Planning Commission expressed concern that occupants of the first phases would be affected by construction noise generated during the subsequent phases. The application of standard controls, and conformance with the requirements set forth in the municipal code are considered to be sufficient to mitigate the short term impact of construction related noise to a less than significant level if no individual sensitive receiver or group of receivers would be exposed to excessive noise for a period of more than one calendar year.

According to the Applicant the grading and construction of infrastructure for the entire site would be completed first, prior to construction and occupation of any uses on the site. These construction activities are typically among the noisiest phases. Once the infrastructure is in place, a specific phasing plan for the build out of the Project has not been developed. According to the Applicant the build out of the single family portion of the Project would also be done in phases, with the specific number of homes built in each phase subject to demand for the housing. It is, therefore, likely that new residents would be exposed to noise when the adjacent block of homes is constructed. However, because the site grading and infrastructure would be in place already, it is presumed that the elevated noise levels would occur for a period of only one year or less. Once a group of homes is constructed it provides acoustical shielding for other previously occupied homes. Therefore, subsequent residents would similarly experience elevated noise levels for a period of less than one year. While it is likely that each subsequent phase of development would result in elevated noise levels for a small group of receivers, no receivers are expected to experience elevated sound levels for an extended period of time.

The DEIR recommends allowable construction hours shorter than the allowable hours set forth in the Petaluma Municipal Code. In this instance, given the expectation that future residents would be in close proximity to construction activities, it is appropriate to limit construction hours as specified in Mitigation Measure Noise-2.

In summary, with the suggested mitigations, the Riverfront project will not result in any significant noise impact.

A marked-up copy of the DEIR Noise Section with our comments is attached. We have indicated where further explanations contained in this memo could be incorporated into the DEIR if appropriate.

References

Federal Highway Administration. 2004. Traffic Noise Model (FHWA TNM) Version 2.5.

Illingworth & Rodkin, Inc. 2004. Lomas Residential Development, Petaluma, California, Environmental Noise Assessment.

Illingworth & Rodkin, Inc. 2005. Riverfront Residential Development, Petaluma, California, Environmental Noise Assessment.

Illingworth & Rodkin, Inc. 2013. Riverfront Development Noise and Vibration Assessment Petaluma, California.

Strelow Consulting. 2013. Draft Environmental Impact Report Riverfront Mixed-Use Project.

NOTES

1. TOPOGRAPHIC INFORMATION IS A BLEND OF TWO AERIAL MAPPINGS FIRST BY DAVID L. CRAMER, PLS., AERIAL MAPPING PREPARED BY TOWILL, INC., DATED APRIL 2000 AND AUGMENTED BY STEVEN J. LAFRANCHI & ASSOCIATES, INC. IN MAY 2009, MAY 2012 AND JUNE 2012. SECOND AERIAL MAPPING PREPARED BY AMERICAN AERIAL MAPPING, INC., DATED SEPTEMBER 2013.
2. BENCHMARK: HORIZONTAL DATUM BASED ON THE CONTROL NETWORK PREPARED BY DAVID L. CRAMER, PLS. VERTICAL DATUM BASED ON SAID SURVEY, PANEL POINT NO. 112, ELEVATION = 9.15', USGS DATUM.
3. BOUNDARY INFORMATION SHOWN IS BASED UPON FIELD TIES AND RECORD INFORMATION. IT IS NOT THE INTENT OF THIS MAP TO PROVIDE A BOUNDARY RESOLUTION FOR THE SUBJECT PROPERTY. SAID RESOLUTION WOULD REQUIRE A RECORD OF SURVEY UNDER STATE LAW. BOUNDARY INFORMATION SHOWN IS FOR PLANNING PURPOSES ONLY.
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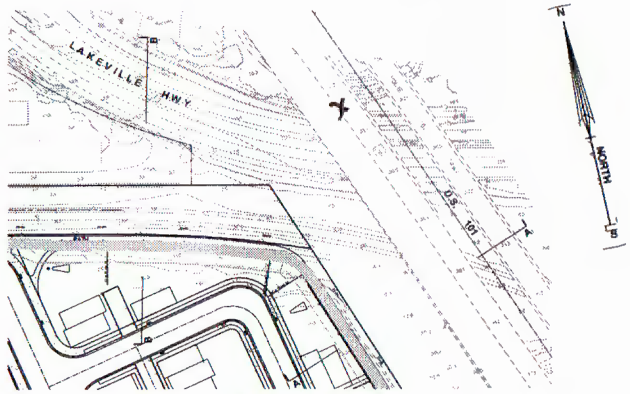
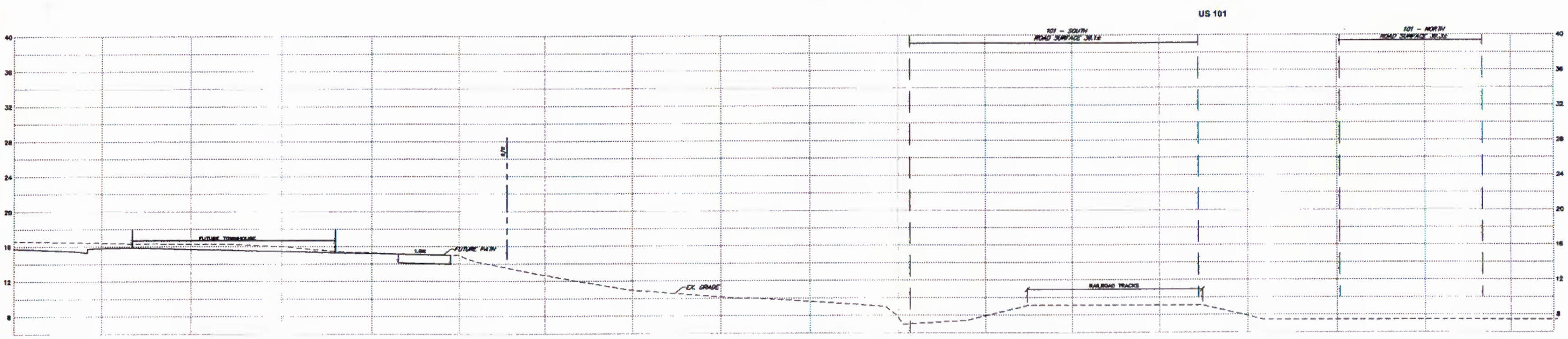
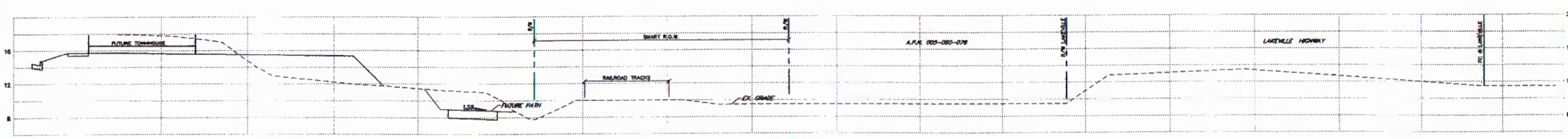


SITE DIAGRAM



SECTION A-A



SECTION B-B

REVISIONS | BY

SECTIONS EXHIBIT

RIVERFRONT DEVELOPMENT
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PETALUMA, CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
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DATE: 2014.02.24
SCALE: AS SHOWN
DESIGN: SJL
DRAWN: ADF
CHECK: SJL
JOB: RIVERFRONT 2010
JOB No: 081356
SHEET
EX-1
OF 1 SHEETS

INPUT: ROADWAYS 13-045

I&R 15 April 2014
MST TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 13-045
RUN: Riverfront

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points										
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
SB 101	36.0	point1	1	-500.0	210.0	29.00				Average	
		point2	2	500.0	210.0	49.00					
NB 101	36.0	point3	3	500.0	265.0	49.00				Average	
		point4	4	-500.0	265.0	29.00					

INPUT: TRAFFIC FOR LAeq1h Percentages 13-045

I&R 15 April 2014
MST TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Percentages
PROJECT/CONTRACT: 13-045
RUN: Riverfront

Roadway	Points												
Name	Name	No.	Segment										
			Total	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			Volume	P	S	P	S	P	S	P	S	P	S
			veh/hr	%	mph	%	mph	%	mph	%	mph	%	mph
SB 101	point1	1	4000	94	65	4	60	2	60	0	0	0	0
	point2	2											
NB 101	point3	3	4000	94	65	4	60	2	60	0	0	0	0
	point4	4											

INPUT: RECEIVERS 13-045

I&R 15 April 2014
MST TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 13-045
RUN: Riverfront

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Receiver1 - 5 ft.	1	1	0.0	0.0	17.00	4.92	0.00	66	10.0	8.0	Y
Receiver2 - 15 ft.	3	1	0.0	0.0	17.00	15.00	0.00	66	10.0	8.0	Y
Receiver3 - 10 ft. above HWY BAR	4	1	0.0	0.0	17.00	35.00	0.00	66	10.0	8.0	Y

INPUT: BARRIERS 13-045

I&R 15 April 2014
MST TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 13-045
RUN: Riverfront

Barrier Name	Type	Height Min	Height Max	If Wall $ per Unit Area	If Berm $ per Unit Vol.	If Berm Top Width	If Berm Run:Rise	Add'tnl $ per Unit Length	Points Name
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft	
K-Rail	W	0.00	99.99	0.00				0.00	point1
									point2

No.	Coordinates (bottom) X	Y	Z	Height at Point	Segment Seg Ht Increment	Perturbs #Up	#Dn	On Struct?	Important Reflections?
	ft	ft	ft	ft	ft				
1	-500.0	180.0	29.00	3.50	0.00	0	0		
2	500.0	180.0	49.00	3.50					

I&R 15 April 2014
MST TNM 2.5

INPUT: TERRAIN LINES
PROJECT/CONTRACT: 13-045
RUN: Riverfront

Terrain Line Name	Points No.	Coordinates (ground) X ft	Y ft	Z ft
Terrain Line1	1	-500.0	160.0	12.00
	2	500.0	160.0	12.00

RESULTS: SOUND LEVELS 13-045

I&R
MST

15 April 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 13-045
RUN: Riverfront
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1 - 5 ft.	1	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
Receiver2 - 15 ft.	3	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Receiver3 - 10 ft. above HWY BAR	4	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX E

SUPPLEMENTAL HAZARDOUS MATERIALS REVIEW

IRIS ENVIRONMENTAL

Via Email

March 6, 2014

City of Petaluma
Community Development Department
Attention: Olivia Ervin
11 English Street
Petaluma, CA 94952-2610

Dear Ms. Ervin:

As requested by Stephanie Strelow of Strelow Consulting, Iris Environmental has reviewed comments on the Draft Environmental Impact Report (DEIR) which was prepared by the City of Petaluma (City) for the Riverfront Mixed Use Project proposed by Basin Street Properties, LLC. These comments were submitted to the City on February 6, 2014 by Adams Broadwell Joseph & Cardozo on behalf of the Petaluma Residents for Responsible Development. Iris Environmental's review was focused specifically on section II C of the comment letter *"The DEIR Fails to Adequately Disclose, Analyze and Mitigate Significant Impacts Regarding Hazardous Materials"*. Responses to these comments are attached.

Sincerely,
IRIS ENVIRONMENTAL

Sandra N. Stevens
Principal

Cc: S. Strelow, Strelow Consulting

C. The DEIR Fails to Adequately Disclose, Analyze and Mitigate Significant Impacts Regarding Hazardous Materials

Comment 4-20: The DEIR's description of potentially hazardous materials on the Project site misleads the reader by depicting the site as essentially free from potentially significant contamination. The DEIR even characterizes the proposed mitigation measures as conservative and not entirely necessary. In reality, the site contains three sources of potentially significant contamination, the DEIR's investigation and disclosure of these environmental conditions is inadequate, and the proposed mitigation is not sufficient to protect worker health and the health of those who will live on or use the Project site.

The Project site has a storied history of industrial use and hazardous materials storage and disposal. First the Pomeroy Corporation (formerly Ben C. Gerwick Company) owned the site for 50 years. Between 1973 and 1980 Pomeroy built a railroad spur that terminated on the Project site, to serve its concrete fabrication yard. Pomeroy used this area around the railroad spur to store hazardous materials. Records from a site visit in 1999 include photographs of old fuel tanks, dozens of large metal drums, and chemical containers with petroleum and unidentified chemicals, some of which were tipped over, partially full, and strewn around an "open field" on the Project site. These photographs look like those from a typical "superfund" site.

Response: The attempt to paint the Project site's environmental conditions as typical of a "Superfund Site", i.e. a grossly contaminated site, is simply untrue and wholly misrepresents the nature of the Project site. The two comments above inappropriately characterize historical site conditions and speculate about supposed threats unsupported by facts. The comments above ignore the sound technical work that has been completed at the Project site to understand local environmental conditions based on science rather than speculation. As presented in the DEIR, Phase I and Phase II Environmental Site Assessments (ESAs) were conducted for the Project site in 2001(Kleinfelder 2001a; 2001b). Additionally, a Phase I Environmental Site Assessment was completed for the proposed project in 2012 (Iris Environmental 2012) and a subsequent Phase I Environmental Site Assessment was prepared in October 2013 by Iris Environmental (Iris Environmental 2013). These Environmental Site Assessments were comprehensive and done according to appropriate industry standards for assessing environmental condition at sites and for identifying environmental concerns that could impact the safe use of a site. The foundation of understanding a site's environmental condition is the Phase I Environmental Site Assessment. The U.S. Environmental Protection Agency (USEPA) and ASTM International set standards for Phase I Environmental Site Assessments. Iris Environmental's Phase I Environmental Site Assessments completed in 2012 and 2013 fulfill the USEPA requirement of All Appropriate Inquiries (AAI) through a defined process of evaluating a property's environmental conditions and assessing the likelihood of contamination. Every Phase I assessment conducted with EPA Brownfields Assessment Grant funds must be conducted in compliance with the All Appropriate

Inquiries Final Rule at 40 CFR Part 312. The All Appropriate Inquiries Final Rule provides that the ASTM E1527-05 and E1527-13 standards are consistent with the requirements of the final rule and may be used to comply with the provisions of the rule (USEPA Brownfields and Land Revitalization Website 2014 http://www.epa.gov/brownfields/aai/).

The Kleinfelder 2001 Phase I ESA, and the Iris Environmental 2012 and 2013 Phase I ESAs all included a check of databases of businesses and properties that handle hazardous materials or hazardous waste. The Project site was not listed on any of the federal and state databases reviewed.

As illustrated in the referenced Phase I Environmental Site Assessment reports, the Project site does not have a "storied history" of industrial use and hazardous materials storage and disposal. To the contrary, the Project site has been unused for most of its history (Iris Environmental 2013). The Project site is formerly a marshland that was filled between 1914 and 1944. The Project site was purchased in the early 1950's by the Ben C. Gerwick Company, which became the Pomeroy Corporation, and remained unused until the early 1980's, other than usage of the northeastern portion of the by the adjacent former Petaluma Wastewater Treatment Plant as a settling pond in the 1960's and 1970's. The comments above imply that that the Project site was used for concrete fabrication. This is not the case. Concrete fabrication was not done at the Project site; those operations were conducted off-site.

The 1999 photographs mentioned in the comments above were actually taken by the reputable environmental firm, Kleinfelder, while they completed a site reconnaissance in 1999 that was then reported their Phase I Environmental Site Assessment issued in 2001. Kleinfelder followed up on their 1999 field observations by appropriately investigating the areas of interest through Phase II subsurface investigations including testing in the rail spur area. After completion of this testing, Kleinfelder's technical conclusion was that contamination was not found in significant concentrations and soil materials do not appear to represent a risk to human health or the environment (page 17, Kleinfelder 2001a). These findings are in stark contrast to the comments characterizing the Project site as a "Superfund Site".

The following discussion presents further detail on the Kleinfelder subsurface investigation.

Kleinfelder conducted a Phase II subsurface investigation (Kleinfelder 2001a) which included excavation of three trenches measuring 10-20 feet in length and 7-12 feet deep, as well as installation of 17 soil borings across the Project site. Some of the sampling locations for the Phase II investigation were selected to evaluate the soils in the portion of the site where debris and waste storage was observed during the 1999 site visit (Borings K-2, K-3, K-4, and Trench T-3). To evaluate the significance of detected concentrations in soil and groundwater and determine whether the levels present may pose a risk to human health and the environment under current or potential future land uses, the analytical results were compared against applicable screening criteria (Iris Environmental 2013). With the exception of arsenic, none of the soil

samples collected from this area had chemical concentrations above the current Environmental Screening Levels (ESLs) developed by the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) (RWQCB 2013b) for residential land use where groundwater is not a current or potential source of drinking water. Although arsenic concentrations are above the ESLs, as concluded in the Kleinfelder 2001 Phase II report, they are similar to concentrations in native soils throughout the Bay Area, and are considered to reflect ambient (background) conditions (Kleinfelder 2001b). This conclusion is further supported by a recent evaluation of background concentrations of arsenic in urbanized flatland soils within the Bay Area, completed at San Francisco State University in coordination with RWQCB staff, which established an upper-limit background concentration of 11 milligrams per kilogram (mg/kg) (Duvergé 2011). The maximum arsenic concentration detected at the Project site is 9 mg/kg.

Conclusions:

1. A review of the Project site history shows that there is not a history of industrial site use; instead most of the Project site has been unused through its history.
2. A review of federal and state environmental regulatory databases does not show a history of hazardous materials usage or disposal on the Project site.
3. Although Pomeroy used a portion of the Project site for storage of materials and debris, soil sampling and analysis in this area showed chemical concentrations below the current ESLs for residential land use, or, in the case of arsenic, below background concentrations.

Comment 4-21: Second, the northern part of the Project site was used by the City in the 1960's and 1970's as settling ponds for its wastewater treatment plant. In the 1990's Pomeroy laid sheets of plastic over a portion of the former settling pond area and covered it with petroleum-contaminated soil from a leaking underground storage tank. The soil and the plastic sheeting are still on the Project site.

Response: The northern portion of the Project site was used by the City in the 1960's and 1970's as settling ponds for its wastewater treatment plant. After the settling ponds were no longer in use, limited amounts of diesel-impacted soils were responsibly and safely stockpiled on plastic sheeting on a portion of the former settling ponds. The diesel-impacted soils were generated during a legal underground storage tank (UST) removal project conducted at the adjacent Pomeroy property and overseen by Sonoma County Department of Health Services. The UST was not located on the Project site. The County issued a closure letter for the adjacent site's UST in 2008 and even complimented the UST owner in the closure letter for their promptness in responding to the County's inquiries (County of Sonoma Department of Health Services 2008). The UST was closed in compliance with subdivisions (a) and (b) of Section 25296.10 and the corrective action regulations adopted pursuant to 25299.3 of the California Health and Safety Code.

As presented in the DEIR, the presence of the settling ponds and the UST-related stockpiled soils were identified as concerns in the Kleinfelder 2001 Phase I (Kleinfelder 2001b). Kleinfelder appropriately conducted subsurface soil investigations (Kleinfelder 2001a) to understand what environmental impacts might have been associated with these operations. Kleinfelder completed excavation of three trenches measuring 10-20 feet in length and 7-12 feet deep, as well as installation of 17 soil borings across the Project site. Sampling locations included both the areas of the former settling ponds and areas where UST-related stockpiled soils were stored from 1995 to 1996. Borings K-6 and Trenches T-1 and T-2 were located to investigate the UST-related soil stockpile area. All chemical concentrations were below the current ESLs for residential land use with the exception of two detections of total petroleum hydrocarbons in the motor oil range (TPH-mo) that exceeded a residential ESL. These TPH-mo detections are discussed further in the response to Comment 4-29.

The assertion in Comment 4-25 that "The soil and the plastic sheeting are still on the Project site" is not accurate or true. Neither the plastic sheeting nor the soil were observed to be present during the October 16, 2013 site visit performed as part of the Iris Environmental 2013 Phase I Environmental Site Assessment.

Conclusions:

1. The northern portion of the Project site was used by the City as settling ponds associated with its nearby wastewater treatment plant and diesel-impacted soils associated with a legal UST removal from an adjacent site were stockpiled on plastic sheeting after the settling ponds were no longer in use. Soil investigations in this area do not show undue impacts from these operations. Soil sampling results show that chemical concentrations, other than two detections of TPH-mo, are below the current conservative and protective ESLs for residential land use.
2. Stockpiled soils generated during a 2008 UST removal from an adjacent site are no longer present on the Project site. They have been removed from the Project site.

Comment 4-22: Third, after the Project site was purchased by the applicant in 2005, soil from at least nine other projects was transported there. Aerial photographs of the Project site between 2005 and 2012 show an ever-increasing portion of the Project site being covered with soil. The DEIR does not disclose how much of the transported soil was contaminated, but it appears that the soil came from multiple contaminated sites nearby.

The only specific information about the transported soils concerns another project constructed by the applicant, the "Theater Square" project, and it is not reassuring. A letter about the Theater Square site describes how unexpected contamination was discovered when soils were disturbed by workers. 6,100 cubic yards of soil from the site were hauled to a "storage area at a property on Hopper Street in Petaluma," the Project

site. 1,000 cubic yards of this soil "had a petroleum hydrocarbon odor" and was classified as hazardous waste. The letter states that the contaminated soils were supposed to be "disposed shortly," but nothing in the DEIR indicates whether the soils were ever removed from the Project site.

Response: Comment 4-26 is correct in noting that soils have historically been moved to the Site from nine off-site areas. This is a standard soil management procedure and by no means suggests or documents an environmental issue or impact. The soil import exercise was clearly identified in the Iris Environmental Phase I Environmental Site Assessment (Iris Environmental 2013). Soils that had been historically moved to the Project site were identified in Table 4 of the 2013 Phase I ESA report[1]. The assertion that imported soils were contaminated is mere speculation unsupported by observation or data.

Sources 1-6 in Table 4: Of the nine off-site local soil borrow areas, six were included in a beneficial redevelopment project in a six-block area in downtown Petaluma. Soils in two of these areas had no contamination, so no investigation or cleanup was necessary (Sources 1 and 2 in Table 4). The RWQCB Geotracker database indicates that the RWQCB oversaw the investigation and cleanup of the remaining four borrow areas within this six-block area (Sources 3 through 6 in Table 4). Contaminated soils at these properties were removed and disposed of at licensed landfills during redevelopment activities. Three of these cases are listed as closed on the Geotracker database (Sources 3, 5 and 6 in Table 4). After closure was granted by the RWQCB, excess clean soils that were subsequently excavated during construction of new buildings on these properties were moved to the Project site (Iris Environmental 2013). The fourth case listed on the Geotracker database includes the Petaluma Theater Square project.[2] Theater Square was identified as Source 4 in Table 4 (Iris Environmental 2013).

Soil managed during the development of Theater Square included a limited volume of soil with slight hydrocarbon impacts (Source 4 in Table 4). Soil removal from the Theater Square site was completed under RWQCB oversight. The 6,100 cubic yards referenced in Comment 4-26 were tested and the results showed the soil was safe for residential use. The test results were shared with the RWQCB in a formal communication dated September 8, 2005[3]. The soil was not a hazardous waste. The soil simply had a hydrocarbon odor. Soil that had a hydrocarbon odor (approximately 1,000 of the total 6,100 cubic yards) was analyzed and disposed of at an off-site landfill. The remainder of the soil was cleared by the RWQCB and was used in an off-site levee reconstruction project. Theater Square soils have been removed from the Project site.

Source 7 in Table 4: Soils with no visible contamination generated during redevelopment of the Redwood Business Center in Petaluma were moved to the Project site.

[1] DEIR Appendix C-5; page 29 of 639
[2] DEIR Appendix C-5; page 15 of 639
[3] DEIR Appendix C-5; page 375 of 639

Source 8 in Table 4: Soils originating from various projects performed for the City of Petaluma within the city limits were moved to the Project site. Surplus soils from these small projects were sampled and analyzed before they were removed to the Project site.

Source 9 in Table 4: Uncontaminated concrete and roadbed material from a project in San Rafael, CA were moved to the Project site.

As of October 2013, approximately 70 percent of the stockpiled soil had been removed from the Project site, and the remaining soil is expected to be removed by the spring of 2014 (Iris Environmental 2013).

As described in the DEIR, if any stockpiled soils remain on the Project site at the time of development they will be sampled in accordance with the Department of Toxic Substances Control (DTSC) Clean Fill Material Information Advisory (DTSC 2001) (Clean Fill Advisory) prior to re-use as fill material on the Project site . The Clean Fill Advisory was developed by DTSC to minimize the possibility of introducing contaminated soil onto a site that requires imported fill material, including construction projects that will result in sensitive land uses such as residential development. Any stockpiled soils that are identified for potential reuse on the Project site will be sampled at a frequency based on the volume of material under consideration as defined by the Clean Fill Advisory. The collected samples will be analyzed for the target compounds presented in the Clean Fill Advisory, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), metals, and asbestos. If the stockpiled soil is shown to contain chemical concentrations above the most recent ESLs developed by the RWQCB for residential land use, it will be removed from the Project site.

Conclusions:

1. Soils temporarily stockpiled at the Project site were from appropriate local borrow areas in a redevelopment area in downtown Petaluma. The soils were from Sources 1 through 6 listed on Table 4. Soils from two of these sites were clean. The RWQCB provided oversight and case closures were obtained for three of these properties prior to the export of soil to the Project site.
2. Theater Square redevelopment project is borrow area 4 on Table 4. The RWQCB oversaw soil management and approved the soil reuse. None of this soil remains at the Project site.
3. None of the soil transported to the Project site from the Theater Square Project was a hazardous waste. The soils were tested and were appropriate for residential site use.
4. Soils from Source 7 on Table 4 had no visible contamination, soils from Source 8 on Table 4 were sampled and analyzed before they were moved to the Project site, and concrete and roadbed materials from Source 9 on Table 4 were uncontaminated.

5. Any stockpiled soils that are to be reused on the Project site will be tested in advance of use according to the DTSC Clean Fill Advisory. Any soils exceeding the ESLs for residential land use will be removed from the Project site.

Comment 4-23: These three potential sources of contamination on the Project site require further investigation and more stringent mitigation, to protect worker and public health. This is particularly important because the Applicant, Basin Street Properties, has a history of encountering unexpected contamination during construction on at least one of its nearby project sites, the Theater Square site.

Response: Potential sources of contamination have been appropriately investigated by investigations dating back to 2001. Details related to past Project site subsurface investigations have been presented in our responses to comments above.

The allegation, *"that Basin Street Properties has a history of encountering unexpected contamination during construction on at least one of its nearby project sites, the Theater Square site"* is unfounded and untrue. On the contrary, Basin Street has a commendable history of understanding its sites prior to development. Case in point, Basin Street commissioned a comprehensive Phase II Environmental Site Assessment of the Theater Square site prior to development. This report was prepared by Iris Environmental and dated October 28, 2004 (Iris Environmental 2004). In that 2004 report, the subject of impacted soils was clearly identified prior to development. The impacted soils were not *"unexpected"* as stated in Comment 4-27. Instead, they were known to exist and they were properly managed under the oversight of the RWQCB. Theater Square was developed safely and appropriately and environmental conditions there were appropriately and well managed. Basin Street acted with foresight and with proper due diligence during its development process of Theater Square.

Comment 4-24: Regarding the first source of potential contamination, which is Pomeroy's former hazardous materials storage site and the area where chemical containers were found strewn about in an adjacent open field, the DEIR relies on 14-year old data from soil samples, including boring K-2 and trench T-3. These samples, however, were not adequately tested in order to dispel the potential for contaminants that exceed human health thresholds. The shallowest soil sample tested from boring K-2 was four feet beneath the surface, and contained a lead concentration of 75 mg/kg, which is just below the residential "ESL", or Environmental Screening Level, of 80 mg/kg. This concentration dissipated rapidly to 15 mg/kg at six feet below the surface. It is reasonable to assume that lead concentrations in soils closer than four feet from the surface will be higher than 75 mg/kg and may exceed the residential ESL for lead. Soil sampled from the top five feet in Trench 3 was not tested for lead, despite its proximity to boring site K-2, and despite the fact that the soil showed "signs of garbage" during sampling.

It is critical that this site be further investigated under the regulatory oversight of an agency that regulates soil hazards and cleanups, such as the San Francisco Bay Regional Water Quality Control Board or Department of Toxic Substances Control. The area with the highest concentration of lead on the site is proposed by the Applicant for the construction of an active park and ball field. Particularly because the public will be more actively exposed to soils in this park area, the City must ensure that potential health threats from lead and other contaminants are fully investigated and mitigated.

Response: Soils at the Project site have been tested for the presence of lead as well as other potential chemicals of concern. No lead test result from anywhere on the Project site exceeded the conservative ESL for residential use, not one. The entire lead data set supports the finding that lead is not found at concentrations of concern at the Project site.

The residential ESLs assume that future users of a site would have full access to the soil for skin contact and for ingestion. Residential ESLs assume that a future resident is on site for 30 years. The residential ESLs are, therefore, protective of an incidental future park user who would be at the site for a much shorter period of time and hence have lower exposure levels.

In general, the Project site has been tested for chemicals of concern in appropriate places. Kleinfelder investigated the area used by Pomeroy for material and debris storage in 2001 (Kleinfelder 2001a). The Pomeroy concrete fabrication operation itself was located off the Project site. Soils in boring locations K-2, K-3, and K-4 were appropriately analyzed for metals, total petroleum hydrocarbons (TPH), semi-volatile organic compounds (SVOCs), and/or polychlorinated biphenyls (PCBs) and samples from Trench-3 were analyzed for California Leaking Underground Fuel Tank (CA LUFT-5) metals, volatile organic compounds (VOCs), pesticides and PCBs, or TPH (including benzene, toluene, ethylbenzene, and xylenes [BTEX]). Concentrations of all analytes at these sampling locations were below the current ESLs for residential land use, with the exception of arsenic. As explained in the response to Comment 4-24, as concluded in the Kleinfelder 2001 Phase II report (Kleinfelder 2001a), the observed arsenic concentrations are similar to concentrations in native soils throughout the Bay Area, and are considered to reflect ambient (background) conditions (Kleinfelder 2001b). This conclusion is further supported by a recent evaluation of background concentrations of arsenic in urbanized flatland soils within the Bay Area, completed at San Francisco State University in coordination with RWQCB staff, which established an upper-limit background concentration of 11 mg/kg (Duvergé 2011).

With respect to the lead concentration of 75 mg/kg detected at 4 feet below ground surface (bgs) at boring location K-2, although shallower soil samples were not collected at this specific location, or in nearby Trench T-3, an analysis of lead concentrations collected throughout the Project site shows no evidence of elevated lead concentrations in Project site soils from the surface to 4 feet bgs. Twenty-three samples were analyzed for lead in this interval. Concentrations ranged from a minimum of 5.5 mg/kg to a maximum of 75 mg/kg. The next highest lead concentration was 34 mg/kg. These data do not suggest that lead concentrations in Project site soils present a risk to human health or the environment. The field observation of signs of "garbage" in a test trench (Trench T-3) does not translate to the presence of lead. The lead results in this trench were below residential ESLs.

Environmental conditions at the Project site have been thoroughly investigated. As discussed in the 2013 Phase I (Iris Environmental 2013), Kleinfelder conducted a Phase I of the Site, in 1999 (Kleinfelder 2001b) and identified several areas of concern that were further investigated in a Phase II investigation. During the Phase II investigation in 2000 (Kleinfelder 2001a), 17 borings and three exploratory trenches were sampled. Samples were collected throughout the Site in areas including the former settling pond area, a storage area in the southwestern portion of the Site, which was in use when the 1999 Phase I was conducted, and in the southern portion of the Site, which was planned for future residential use. Grab soil samples were also collected from the drainage channel.

Boring and grab soil samples from the investigation were analyzed for metals, total petroleum hydrocarbons (TPH), semi-volatile organic compounds (SVOCs), and/or polychlorinated biphenyls (PCBs). Trench soil samples were analyzed for California Leaking Underground Fuel Tank (CA LUFT-5) metals, volatile organic compounds (VOCs), pesticides and PCBs, or TPH (including benzene, toluene, ethylbenzene, and xylenes [BTEX]).

As reported by Kleinfelder in 2001 (Kleinfelder 2001a), there were no detections of SVOCs, PCBs, or pesticides in the collected samples, and only one VOC (carbon disulfide) was detected at a concentration of 0.0089 mg/kg. ESLs have not been promulgated for this compound, but a comparison of the detected concentration with the USEPA Regional Screening Level (RSL) for residential soil (USEPA 2013) as an alternative risk-based criterion shows that the detected concentration is below the RSL of 820 mg/kg.

A total of 39 soil samples, including five trench samples, one grab surface sample, and 33 samples from borings were analyzed for TPH as diesel range hydrocarbons (TPH-d) and TPH as motor oil range hydrocarbons (TPH-mo) in the Kleinfelder Phase II investigation (Kleinfelder 2001a). Of the 33 samples analyzed from borings, three were collected at depths of 1.5 to 2.0 feet below ground surface (bgs), seven were collected at depths of 3.5 to 4.0 feet bgs, 18 were collected at depths of 6.0 to 10.0 feet bgs, and five were collected below 10.0 feet bgs (11.0 to 20.0 feet bgs). While TPH-d and TPH-mo were detected in several soil samples, detected concentrations were below residential ESLs with the exception of two samples collected in Trenches 1 and 2. These detections are discussed further in the response to Comment 4-29 below.

A total of 37 soil samples, including three trench samples, one grab surface sample, and 33 samples from borings were analyzed for metals in the Kleinfelder Phase II investigation (Kleinfelder 2001a). Of the 33 samples analyzed from borings, 11 were collected at depths of 1.5 to 2.0 feet below ground surface (bgs), 11 were collected at depths of 3.5 to 4.0 feet bgs, eight were collected at depths of 5.5 to 10.0 feet bgs, and three were collected below 10.0 feet bgs (at 11.0 feet bgs). All detected concentrations of metals in soil samples were below the residential ESLs with the exception of arsenic, however the detected concentrations are within the range of background concentrations found in Bay Area soils (Duvergé 2011).

Project site soils have been thoroughly investigated as described above. Of the compounds detected during the Kleinfelder Phase II investigation (Kleinfelder 2001a), other than arsenic, all metals concentrations are below their respective ESLs for residential land use (RWQCB 2013b), and the detected arsenic concentrations are consistent with naturally occurring background conditions. Two detections of TPH-mo were above the ESLs for residential land use based on nuisance concerns, such as odor. These detections did not exceed ESLs for residential land use based on protection of human health (RWQCB 2013b) (these detections are further discussed in the response to Comment 4-29 below); all other TPH concentrations are below all ESLs for residential land use. Project site soils have been investigated and concentrations of all but two samples analyzed are below all residential ESLs.

Conclusions:

1. Testing data from the Project site support the conclusion that there are no unacceptable threats to public health and the environment at the Project site, and there is no need for an environmental cleanup at the Project site.
2. Soils in the area used by Pomeroy for storage of materials and debris have been investigated, and other than background concentrations of arsenic, all chemical concentrations are below residential ESLs. Arsenic concentrations are consistent with documented naturally occurring background conditions.
3. No lead detections exceed the residential ESL. The entire lead data set supports the finding that lead is not at concentrations of concern at the Project site.
4. An observation that "signs of garbage" were seen in a test trench does not correlate with the presence of lead. Lead concentrations in this trench were below residential ESLs.
5. Project site soils have been thoroughly investigated, and the analytical results (other than two detections of TPH-mo) are either below the ESLs for residential land use or are consistent with naturally occurring background conditions. The two detections of TPH-mo were only slightly above residential ESL screening levels for nuisance concerns, such as odor; they were not above levels for the protection of human health.

Comment 4-25: Regarding the second source of potential contamination, Pomeroy's fuel-contaminated soil spread on the former treatment pond area, the DEIR acknowledges that the 2001 soils report showed the highest concentrations of petroleum hydrocarbons in this area. The DEIR concludes, however, that these levels of petroleum hydrocarbons "were below residential ESLS." This is incorrect. The residential ESL for petroleum hydrocarbons in shallow soils where groundwater is not a potential source of drinking water is 100 mg/kg. The 2001 soils tests showed petroleum hydrocarbons of 120 mg/kg in Trench 1 and 220 mg/kg in Trench 2, both in the former treatment pond area where Pomeroy is known to have disposed of petroleum-contaminated soils. The DEIR improperly substitutes the petroleum hydrocarbon ESL for "industrial" land use into its table of residential ESLs, but this is in error. The applicable ESL is 100 mg/kg.

Because the soil tested from both of the trenches that were excavated in the former treatment pond area exceeded the residential ESL, there is a clear risk that this entire portion of the Project site exceeds the contamination threshold for public health. The laboratory notes for these soil samples indicate that oil and diesel range compounds were "significant." The DEIR's conclusion that petroleum hydrocarbons on the Project site are not likely to cause a potentially significant impact is not supported by substantial evidence and must be revised.

Response: The 2013 Iris Environmental Phase I ESA is dated October 23, 2013 (Iris Environmental 2013). This Phase I ESA included an evaluation of the analytical data collected by Kleinfelder in their 2001 Phase II ESA (Kleinfelder 2001a) using ESLs for residential land use that were published by the RWQCB on May 23, 2013 (RWQCB 2013a). These ESLs were in effect at the time the Project Notice of Preparation was released (September 13, 2013) and were also in effect at the time the DEIR was issued (December 19, 2013). The ESLs were revised on December 23, 2013 (RWQCB 2013b) subsequent to the preparation and issuance of the DEIR. Therefore, the DEIR correctly presents the ESLs for residential land use that were in place at the time that the DEIR was issued. The DEIR did not incorrectly substitute the ESLs for commercial/industrial land use. Comment 4-29 is in error and misrepresents the sequence of events.

Only one ESL screening level for TPH changed as a result of the December 2013 revisions. The ceiling value for TPH as motor oil (TPH-mo) dropped to 100 milligrams per kilogram (mg/kg) from 500 mg/kg. Ceiling values are not based on human health effects, but are driven by nuisance concerns such as odor. Other TPH ESL values for residential land use, including those for protection of human health, were not revised in the December 2013 ESL revisions, and remain the same as those that were in effect when the DEIR was issued.

As shown in the table below, the maximum TPH-d and TPH-mo concentrations are well below both the human health based ESLs for residential land use and for construction workers. Only two soil samples have TPH-mo concentrations that slightly exceed the nuisance-based residential ESL ceiling value.

Chemical	Maximum detected concentration (mg/kg)[1]	ESL for Residential Land Use (mg/kg); Ceiling Value[2]	ESL for Residential Land Use (mg/kg); Human Health[3]	ESL for Construction Workers (mg/kg)[4]
TPH-d	88	100	240	900
TPH-mo	220	100	10,000	28,000

[1]Source: Phase II Soil and Groundwater Investigation, Pomeroy Site, Petaluma, California (Kleinfelder 2001).

[2]ESL = Environmental Screening Level (Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater (RWQCB, December 2013); Table A-1: Shallow Soil Screening Levels (<3m bgs), Residential Land Use, (groundwater is not a current or potential source of drinking water).

[3]ESL = Environmental Screening Level (Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater (RWQCB, December 2013); Table K-1: Direct Exposure Soil Screening Levels, Residential Exposure Scenario.

[4]ESL = Environmental Screening Level (Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater (RWQCB, December 2013); Table K-3: Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario.

Evaluating the TPH data and drawing conclusions from the entire data set leads to a conclusion that TPH is not present at the Project site at concentrations of concern. Thirty-nine soil samples, including five trench samples, one grab surface sample, and thirty-three samples from borings were analyzed for TPH as diesel range hydrocarbons (TPH-d) and TPH as motor oil range hydrocarbons (TPH-mo) in the Kleinfelder Phase II investigation (Kleinfelder 2001a). TPH-d was not detected in nine of the thirty-nine samples analyzed. Concentrations of TPH-d in the remaining thirty samples ranged from 1.0 mg/kg to 88 mg/kg, with an average concentration of 10.5 mg/kg.

TPH-mo was not detected in twelve of the thirty-nine samples analyzed. Concentrations of TPH-mo in the remaining twenty-seven samples ranged from 6.3 mg/kg to 220 mg/kg, with an average concentration of 32.8 mg/kg.

TPH concentrations at the Project site are well below the ESL values that are protective of human health for both residents and construction workers. These TPH-mo concentrations do not pose a health risk to either future residents or to construction workers and these conclusions are fully supported by existing data.

Comment 4-29 calls out that *the laboratory notes for these soil samples indicate that oil and diesel range compounds were "significant"*. A detailed review of this specific laboratory report shows that what is being termed "significant" is actually related to the laboratory's evaluation of the chromatogram itself. What is meant by "significant" is that the laboratory is simply saying the detection is real. The laboratory in no way is offering a value judgment on the magnitude of hydrocarbon detection. Comment 4-29 misconstrues the meaning of the laboratory data sheet note.

<u>Conclusions:</u>

1. The ESLs for residential land use were properly presented in the DEIR. The DEIR did not incorrectly substitute the ESLs for commercial/industrial land use. The ESLs were revised on December 23, 2013, after the Project Notice of Preparation was released on September 13, 2013, and after the DEIR was issued on December 19, 2013. The ESL for residential land use for TPH-mo based on nuisance concerns, such as odor, was lowered from 500 mg/kg to 100 mg/kg in the revised ESLs. TPH human health based ESLs that are protective of residents and construction workers did not change.

2. Although TPH-mo concentrations in two of thirty nine samples analysed are slightly above residential ELS based on ceiling values for nuisance concerns such as odor, the TPH concentrations detected in Project site soils are well below human health based ESLs, and the TPH data set taken as a whole supports the finding that TPH is not present at the Project site at concentrations of concern.
3. The laboratory note cited in Comment 4-29 is related to the laboratory's evaluation of its chromatograms. The laboratory note is simply stating that the lab believes that its detections of hydrocarbons on the chromatogram are real. Comment 4-29 misconstrues the meaning of the laboratory data sheet note.

Comment 4-26: Regarding the third potential source of contamination the potentially contaminated soils brought to and spread on the Project site from other projects, the DEIR's proposed mitigation for this impact is entirely inadequate. The DEIR requires that "stockpiled soils be reaffirmed / tested prior to use for onsite fill, which shall be done following the Clean Imported Fill Material Information Advisory prepared by DTSC (DTSC 2011) in accordance with the recommendation set forth in the 2013 Iris Environmental Phase I Environmental Site Assessment. This mitigation provides no agency oversight whatsoever, no timeframe for soil testing, no health thresholds against which samples must be compared, and no delineation of the extent and location of stockpiled soils. The DTSC Advisory *recommends,* but does not require, consultation and oversight by DTSC for testing stockpiled soils. Mitigation Measure HAZMAT-1 should be revised to require soils testing prior to the issuance of grading permits for the Project, to require that such testing be conducted under the oversight of a regulatory agency such as DTSC of the Regional Water Quality Control Board, that *all* soils stockpiled or spread on the Project site from other project sites must be subject to this mitigation, and that soil tests must be compared against the applicable residential ESLs.

Response: As of October 2013, approximately 70 percent of stockpiled soils had been removed from the Project site, and the remaining soils are expected to be removed by the spring of 2014 (Iris Environmental 2013). If any stockpiled soils remain on the Project site, they will be sampled in accordance with the DTSC Clean Fill Material Information Advisory (DTSC 2001) prior to re-use as fill material on the Project site. Regulatory agency oversight for testing of import soils is not required, and not necessary provided that the recommendations included in the Clean Fill Advisory are followed. As stated in the response to Comment 4-26, the recommendations in the Clean Fill Advisory for sampling frequency and target analyses will be followed. If the quality of stockpiled soil does not meet applicable RWQCB ESLs in place at the time of testing, that soil will be removed from the Project site.

This proposed mitigation measure will provide an effective means to evaluate and appropriately manage any stockpiled soils that are reused on the Project site, is protective of human health, and is consistent with proper site management procedures.

Conclusions:

1. Stockpiled soils are being removed from the Project site. If any stockpiled soils remain, they will be sampled and tested according to the Clean Fill Advisory.
2. If any chemical concentrations in the stockpiled soils are found to be above the applicable RWQCB ESLs in place at the time of testing, they will be removed from the Project site.
3. This proposed mitigation measure will control undue exposures to hazardous materials potentially contained in stockpiled soils will occur during construction, and will prevent soil reuse at the Project site inappropriate for residential land use.

Comment 4-27: With respect to the second mitigation measure requiring a soil and groundwater management plan "in the event that potentially affected soil or groundwater is encountered during construction", this measure will not protect worker health because it has already been demonstrated that the site contains potentially affected soil and groundwater. A voluntary cleanup agreement with the Regional Water Quality Control Board or DTSC should be required *before* construction begins.

Response: Soil chemical detections are well below construction worker ESLs, demonstrating that Project site soils do not present a health risk to construction workers. Therefore, no voluntary cleanup agreement or cleanup is required or appropriate. The comment above implies that the soil and groundwater management plan will be by required only in the event that potentially affected soil or groundwater is encountered during construction. This is not correct. A soil and groundwater management plan will be prepared in advance of development and will provide a clear framework for response to discovery of any unknown conditions that may be encountered during redevelopment activities at the Project site. Elements of the soil and groundwater management plan include:

- Soil management
    - Define responsibilities for management of discovery of unknown features or site conditions
    - Provide guidelines for identification and analysis of unknown environmental conditions
- Groundwater management
    - Prohibit use of groundwater encountered during construction activities for dust control.
    - Groundwater will only be discharged to surface waters under a permit from applicable agencies. All permit conditions must be satisfied prior to discharge.
- Preparation and implementation of a site-specific Environmental Health and Safety Plan by the general contractor to ensure that appropriate worker health and safety measures are in place during redevelopment activities.

- Elements of the plan must include all practices and procedures necessary to comply with all new and existing Federal, California, and local statutes, ordinances, or regulations regarding health and safety.
- Specific components of the EHASP must include the following;
  - Identification of Site hazards
  - Assignment of specific health and safety responsibilities for site work
  - Establishment of appropriate general work practices
  - Establishment of control zones and decontamination procedures
  - Job hazard analysis / hazard mitigation procedures
  - Air monitoring
  - Required personal protective and related safety equipment
  - Contingency and Emergency information

Conclusions:

1. No voluntary cleanup agreement is required to protect worker health since chemical detections in Project site soils are below the RSLs established for construction workers.
2. A soil and groundwater management plan will be prepared prior to commencement of construction activities, and will be implemented once construction begins. The soil and groundwater management plan will provide a clear framework for dealing with any unknown soil or groundwater conditions that may be encountered.
3. This mitigation measure is protective of worker health and safety.

Comment 4-28: Finally, the testing of groundwater beneath the Project site revealed high levels of toxic metals and petroleum hydrocarbons. The two recent "Phase I Environmental Site Assessments" or "ESAs" prepared for the Project take different approaches in analyzing these results. The 2012 Phase I ESA compared the groundwater contaminants with the applicable residential ESLs for groundwater that will not be used as a drinking water source. It found that concentrations of metals were thousands of times higher than the applicable ESLs, and concentrations of petroleum hydrocarbons were over ten times higher. As explained by the Regional Water Quality Control Board ("RWQCB"), which sets the ESLs, the groundwater ESLs are put in place for the protection of aquatic resources in situations where there may be discharges of groundwater to surface water.

The 2013 Phase I ESA revokes these findings and takes a new approach. It compares the groundwater contaminant levels with "gross contamination" ESLs, which are intended to apply to groundwater that "does not meet drinking water quality requirements under natural conditions and/or [is] situated in strata that lack adequate aquifer characteristics and is not likely to otherwise directly contaminate a source of drinking water." The reason for the change, as explained by the DEIR, is that "[a]quatic habitat goals were excluded from consideration since there are and will be no groundwater discharges to surface water other than under permit."

The DEIR misses the mark. The Project may very well involve discharges of groundwater to the Petaluma River that exceed the applicable ESLs for the protection of aquatic resources. The purpose of CEQA is not to *assume* that activities which may cause significant impact on the environment will be "taken care of" by a permit to be issued by a responsible agency in the future. Instead, CEQA acts to *inform* agency decision makers, including responsible agencies, about potentially significant impacts before a project is approved. Disclosure of such information, and commitments to binding mitigation, are the hallmarks of the CEQA process. The DEIR attempts to sweep the problem of groundwater contamination under the rug, by switching the applicable ESLs in the groundwater analysis and inserting a footnote, buried in an appendix, to indicate that a permit would likely take care of this potentially significant impact. This is insufficient, particularly because the DEIR does not commit the Applicant to obtaining and complying with Waste Discharge Requirements imposed by the RWQCB.

Response: Grab groundwater samples were collected for analysis as part of the Kleinfelder Phase II subsurface investigation (Kleinfelder 2001a). These grab groundwater samples were not filtered and contained significant sediment. The sediment was extracted with the liquid groundwater sample and analyzed in accordance with USEPA analytical protocols. Therefore, the groundwater test results noted by Kleinfelder for metals and TPH represent measurement not only of metals dissolved in the groundwater, but also of metals and organic materials in the entrained sediment which resulted in reported groundwater concentrations appearing to be higher than they actually are. Laboratory analytical note (note i) for metals analyses describe the samples as "liquid sample that contains greater than ~2% sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect [sic] reported metal concentrations." Soils at the Project site do not have unacceptable concentrations of metals or TPH supporting the finding that groundwater beneath the Project site is not unduly impacted from site conditions.

Use of gross contamination ESLs to evaluate groundwater beneath the Project site is appropriate since discharge of groundwater from the Project site to the ground or to surface waters is unlikely. Groundwater will not be used as a drinking water source. Groundwater encountered during redevelopment activities will either be trucked off site for disposal or discharged to the sanitary wastewater system under a permit issued by the City of Petaluma.

Conclusions:

1. Groundwater concentrations reported by Kleinfelder in the 2001 Phase II report for unfiltered grab groundwater samples are likely significantly higher that what actually exists at the Project site in way of dissolved groundwater concentrations.
2. Site soils do not have unacceptable concentrations of metals or TPH supporting the finding that groundwater beneath the site is not unduly impacted by Project site conditions.

3. Groundwater will not be used as a drinking water source, and discharge to surface waters is unlikely.
4. Groundwater encountered during Project site redevelopment activities will be trucked off-site for disposal or discharged to the sanitary wastewater system under a permit issued by the City of Petaluma.

The DEIR does not "miss the mark" and there is no "sweeping the problem under the rug." Instead the DEIR appropriately relies on current science and appropriate regulations and guidance to support its findings and conclusions.

As discussed in detail in the above responses to comments, environmental conditions at the Project site have been thoroughly and appropriately investigated. The environmental investigations have shown that concentrations of chemicals detected on the Project site are below human health based Environmental Screening Levels established by the Regional Water Quality Control Board or are consistent with background concentrations. Only two detections of total petroleum hydrocarbons in the motor oil range are slightly above nuisance-based screening levels. In summary, the entirety of technical investigations and findings indicates that the Project site is fully safe and appropriate for its intended use.

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