



Environment
Health & Safety
Web Solutions

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Mr. Kiyoshi Graves
Urban Planning Studios
4144 ½ Somers Avenue
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5 September 2018

Re: Revised Air Quality Analysis for Onyx 32 Housing Development.

Dear Mr. Graves:

JE Compliance Services (JECS) was retained by Urban Planning Studios to prepare a limited air quality analysis to focus on construction emission calculations for the Onyx 32 Housing Development in Montecito, California. The project will be completed in two developments, Beryl and Forest Park. Each development of the project involves the following phases: retaining walls, cut, grade, and fill roadwork, curb and gutter, paving, infrastructure, public staircases, grading, foundation, home construction, architectural coating, and landscaping. The maximum daily emissions associated with each phase of the development were calculated independently so that phases could be combined in situations where they may overlap. Additionally, the analysis does not include an evaluation of whether the proposed project is in federal conformity nor does it include a federal conformity test in compliance with 40 CFR part 93. JECS has not evaluated whether the proposed project is included in a regional emission analysis or included in any urban airshed model.

Analysis Methodology for Construction Scenario

The California Emissions Estimator Model (CalEEMod) was used to estimate emissions during the construction project. Both South Coast Air Quality Management District (SCAQMD) and California Air Resources Board (CARB) use and suggest the usage of CalEEMod for developing emission estimates for construction projects. CalEEMod utilizes EMFAC 2011 emission factors for emissions of on-road vehicles and CARB off-road emission factors for construction equipment. The following phases were evaluated for each development: retaining walls, cut, grade, and fill roadwork, curb and gutter, paving, infrastructure, public staircases, grading, foundation, home construction, architectural coating, and landscaping.

Indirect emissions from the manufacturing of concrete, manufacturing of steel, and the manufacturing of asphalt were calculated outside of CalEEMod. Project construction is expected to start in 2019 and be completed in 2021. During construction various phases are expected to overlap.

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Retaining Wall Phase

The retaining wall phase of the project will involve construction of retaining walls for the roads and homes during the Beryl and Forest Park developments. Emissions from the retaining wall phase will occur from off-road equipment exhaust, on-road equipment exhaust, worker trips, concrete manufacturing, and steel manufacturing. Maximum daily emissions of off-road equipment exhaust, on-road vehicle exhaust, and worker trips were estimated using CalEEMod. Due to the configuration of CalEEMod, the model generated grading emissions although grading is not conducted during this phase. Erroneous emissions of grading reported by CalEEMod were omitted from the evaluation.

Indirect emissions of carbon dioxide from the manufacturing of concrete were calculated outside CalEEMod using USEPA emission factors.¹ Indirect emissions of carbon dioxide from the manufacturing of steel were calculated outside CalEEMod using International Iron and Steel Institute emission factors.²

The schedule of off-road equipment, on-road equipment, worker trips, quantity of concrete, and quantity of steel is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas emissions from the retaining wall construction phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**. Supplemental calculations for indirect emissions of carbon dioxide from manufacturing of cement and steel are contained in **Attachment 2**.

Cut, Grade, and Fill Roadwork Phase

The site cut, grade, and fill roadwork phase will consist of grading a total of one acre during the Beryl development and 0.33 acres during the Forest Park development. No soil is expected to be imported or exported to the site. Maximum grading per day during the Beryl and Forest Park development will be one and 0.33 acres, respectively. Emissions of grading will occur from fugitive dust due to site preparation and grading, off-road equipment exhaust, on-road equipment exhaust, and worker trips. Maximum daily emissions of fugitive dust, off-road equipment exhaust, and on-road vehicle exhaust were estimated using CalEEMod.

Emissions of PM_{2.5} and PM₁₀ fugitive dust from grading were calculated using CalEEMod. The maximum surface area expected to be graded per day will not exceed one acre during any Beryl development and 0.33 acres during Forest Park development. Mitigation measures applied during grading activities include watering the active areas of the site three times daily (61% reduction in PM emissions).

The schedule of area graded, off-road equipment, on-road equipment, and worker trips is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas

¹<http://www.epa.gov/ttnchie1/conference/ei13/ghg/hanle.pdf>

² "Sustainability Report for the World Steel Industry 2005", International Iron and Steel Institute, May 2006.



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emissions from the cut, grade, and fill phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**.

Curb and Gutter Phase

The curb and gutter phase of the project will involve construction of curbs and gutters for the Beryl and Forest Park developments. Emissions from the curb and gutter phase will occur from off-road equipment exhaust, on-road equipment exhaust, worker trips, concrete manufacturing, and steel manufacturing. Maximum daily emissions of off-road equipment exhaust, on-road vehicle exhaust, and worker trips were estimated using CalEEMod. Due to the configuration of CalEEMod, the model generated grading emissions although grading is not conducted during this phase. Erroneous emissions of grading reported by CalEEMod were omitted from the evaluation.

Indirect emissions of carbon dioxide from the manufacturing of concrete were calculated outside CalEEMod using USEPA emission factors. Indirect emissions of carbon dioxide from the manufacturing of steel were calculated outside CalEEMod using International Iron and Steel Institute emission factors.

The schedule of off-road equipment, on-road equipment, worker trips, quantity of concrete, and quantity of steel is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas emissions from the curb and gutter construction phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**. Supplemental calculations for indirect emissions of carbon dioxide from manufacturing of cement and steel are contained in **Attachment 2**.

Paving Phase

The site paving phase of the project will involve 0.50 acres of road paving over the two developments of construction. During the Beryl development 0.35 acres will be paved and during the Forest Park development 0.15 acres will be paved. Emissions from the site paving phase will occur from off-road equipment exhaust, on-road equipment exhaust, worker trips, and asphalt off-gassing. Maximum daily emissions of off-road equipment exhaust, on-road vehicle exhaust, and worker trips were estimated using CalEEMod.

Indirect emissions of carbon dioxide from the manufacturing of asphalt were calculated outside CalEEMod using USEPA emission factors. The schedule of on-road equipment, worker trips, quantity of asphalt used in site paving, and total area paved was provided by EnviCraft and Urban Planning Studios. The schedule of off-road equipment is based on CalEEMod default. Criteria pollutant and greenhouse gas emissions from the paving phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**. Supplemental calculations for indirect emissions of carbon dioxide from manufacturing of asphalt are contained in **Attachment 2**.

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Infrastructure Phase

The infrastructure phase of the project will involve installation of water and sewer pipelines for the Beryl and Forest Park developments. Emissions from the infrastructure phase will occur from off-road equipment exhaust, on-road equipment exhaust, and worker trips. Maximum daily emissions of off-road equipment exhaust, on-road vehicle exhaust, and worker trips were estimated using CalEEMod. The schedule of off-road equipment, on-road equipment and worker trips is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas emissions from the infrastructure phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**.

Public Staircase Phase

The public staircase phase of the project will involve construction of staircases for the Beryl and Forest Park developments. Emissions from the public staircase phase will occur from off-road equipment exhaust, on-road equipment exhaust, worker trips, concrete manufacturing, and steel manufacturing. Maximum daily emissions of off-road equipment exhaust, on-road vehicle exhaust, and worker trips were estimated using CalEEMod.

Indirect emissions of carbon dioxide from the manufacturing of concrete were calculated outside CalEEMod using USEPA emission factors. Indirect emissions of carbon dioxide from the manufacturing of steel were calculated outside CalEEMod using International Iron and Steel Institute emission factors.

The schedule of off-road equipment, on-road equipment, worker trips, quantity of concrete, and quantity of steel is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas emissions from the public staircase construction phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**. Supplemental calculations for indirect emissions of carbon dioxide from manufacturing of cement and steel are contained in **Attachment 2**.

Site Grading Phase

The site grading phase will consist of grading a total of 1.5 acre during the Beryl development and 0.5 acres during the Forest Park development. During the Beryl and Forest Park developments 13,136 cubic yards and 4,379 cubic yards of soil are expected to be exported, respectively. No soil is expected to be imported the site. Maximum grading per day during the Beryl and Forest Park developments will be 1.5 and 0.5 acres, respectively. Emissions of grading will occur from fugitive dust due to site preparation and grading, off-road equipment exhaust, on-road equipment exhaust, and worker trips. Maximum daily emissions of fugitive dust, off-road equipment exhaust, and on-road vehicle exhaust were estimated using CalEEMod.

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Emissions of PM_{2.5} and PM₁₀ fugitive dust from grading were calculated using CalEEMod. The maximum surface area expected to be graded per day will not exceed 1.5 acre during any Beryl development and 0.5 acres during Forest Park development. Mitigation measures applied during grading activities include watering the active areas of the site three times daily (61% reduction in PM emissions).

The schedule of area graded, off-road equipment, on-road equipment, and worker trips is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas emissions from the grading phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**.

Foundation Phase

The foundation phase of the project will involve construction of foundation for the homes. Emissions from the foundation phase will occur from off-road equipment exhaust, on-road equipment exhaust, worker trips, concrete manufacturing, and steel manufacturing. Maximum daily emissions of off-road equipment exhaust, on-road vehicle exhaust, and worker trips were estimated using CalEEMod.

Indirect emissions of carbon dioxide from the manufacturing of concrete were calculated outside CalEEMod using USEPA emission factors. Indirect emissions of carbon dioxide from the manufacturing of steel were calculated outside CalEEMod using International Iron and Steel Institute emission factors.

The schedule of off-road equipment, on-road equipment, worker trips, quantity of concrete, and quantity of steel is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas emissions from the foundation phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**. Supplemental calculations for indirect emissions of carbon dioxide from manufacturing of cement and steel are contained in **Attachment 2**.

Home Construction Phase

The home construction phase of the project will involve construction of 32 single family homes. Homes will be constructed in two developments. The Beryl development will consist of 23 homes and the Forest Park development will consist of nine homes. Emissions from the construction phase will occur from off-road equipment exhaust, on-road equipment exhaust, and worker trips. Maximum daily emissions of off-road equipment exhaust, on-road vehicle exhaust, and worker trips were estimated using CalEEMod.

The schedule of on-road equipment, and worker trips used in home construction is based on information provided by EnviCraft and Urban Planning Studios. The schedule of off-road equipment is based on CalEEMod default. Criteria pollutant and greenhouse gas emissions from the hotel

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construction phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**.

Landscaping Phase

The landscaping phase of the project will involve garden and landscaping activities. Emissions from the landscaping phase will occur from fugitive dust, off-road equipment, on-road equipment exhaust, and worker trips. Maximum daily emissions of fugitive dust, off-road equipment exhaust, on-road vehicle exhaust, and worker trips were estimated using CalEEMod. The maximum area expected to be disturbed per day will not exceed 0.25 acre.

Emissions of PM2.5 and PM10 fugitive dust from landscaping were calculated outside of CalEEMod. Emissions of fugitive dust from grading activities were estimated using CalEEMod emission factors based on the methodology in Section 11.9 of USEPA AP-42.³

The schedule of area to be disturbed, on-road equipment, and worker trips is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas emissions from the landscaping phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**. Supplemental calculations for emissions of particulate matter from landscaping are contained in **Attachment 2**.

Architectural Coating Phase

The architectural coating phase of the project will consist of applying stucco to the exterior of the homes and paint, sealers, and varnishes to the interior surfaces of the homes. Emissions from architectural coating will occur from on-road equipment exhaust, worker trips, and architectural coating. Maximum daily emissions from on-road equipment exhaust, worker trips, and architectural coatings were estimated using CalEEMod.

Emissions of VOC due to architectural coating were calculated by CalEEMod using a default VOC content provided by the air districts or CARB statewide limits.⁴ CalEEMod uses default architectural coating VOC content and the total surface to be painted to calculate emissions of VOC. Area to be coated is based on square footage of homes to be constructed and CalEEMod defaults.

The schedule of on-road equipment, worker trips, and total surface area to be coated is based on information provided by EnviCraft. Criteria pollutant and greenhouse gas emissions from the architectural coating phase are summarized in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**.

³ AP-42, Section 11.9, Western Coal Mining.

⁴ "Appendix A Calculation Details For CalEEMod" ENVIRON International Corporation, February 2011.

Analysis Methodology for Operational Scenario

Operational emission sources will include vehicle trips, electricity consumption, architectural coating, natural gas consumption, consumer products, landscaping, solid waste, and water usage. Operational emissions from the project were calculated using CalEEMod for operating year 2021

The schedule of vehicle trips, electricity consumption, natural gas consumption, consumer products, landscape equipment, solid waste, and water usage are based on CalEEMOD default values. The total surface to be coated used by CalEEMod to calculate emissions of VOC from architectural coating is based on information provided by EnviCraft and Urban Planning Studios. Criteria pollutant and greenhouse gas emissions from the operational phase of the project are included in **Emissions Evaluation**. Copies of the CalEEMod output files are provided in **Attachment 1**.

Emissions Evaluation

SCAQMD publishes screening levels to determine if a project is regionally significant.⁵ Additionally, SCAQMD provides guidance on determining localized significance thresholds (LSTs) for a project⁶ and guidance for construction scenarios less than five acres in size.⁷ SCAQMD provides mass rate LST look up tables that are a function of the project location, project size, and sensitive receptor distance and provides guidance for determining LST based on exact site size. For purposes of the evaluation, a site size of 4.29 acres with receptor distance of 25 meters was used. LST for the site size was determined using linear regression and mass rate LST look up tables.

Unmitigated construction emissions from each phase of the project are provided in **Table 1** through **Table 28**. Mitigated construction emissions from the project are provided in **Table 29** through **Table 35**. Unmitigated emissions for overlapping construction phases are provided in **Table 36** through **Table 52**. Mitigated emissions for overlapping construction phases are provided in **Table 53** through **Table 69**. Unmitigated and mitigated emissions of criteria pollutants from the construction phases of the project do not exceed regional significance thresholds and LSTs. Overlapping construction phases do not exceed regional significant thresholds or LSTs.

Unmitigated operational emissions from the project are provided in **Table 70**. Unmitigated emissions of criteria pollutants from operational activities do not exceed the regional significance thresholds or LSTs.

SCAQMD has proposed an interim greenhouse gas significance threshold of 3,000 metric tons of carbon dioxide equivalents per year⁸. Construction emissions from a project are to be amortized over a 30- year period and combined with the annual operational emissions. Based on **Table 71** and **Table 72** the annual quantity of carbon dioxide equivalents emitted from the project will not exceed 3,000 metric tons. A summary of the emissions evaluation is contained in **Attachment 3**.

⁵ <http://www.aqmd.gov/ceqa/handbook/signthres.pdf>

⁶ Final Localized Significance Threshold Methodology, SCAQMD, June 2003.

⁷ Sample Construction Scenarios for Projects Less than Five Acres in Size, SCAQMD, February 2005.

⁸ Threshold proposed during board meeting 5 December 2008. <http://www.aqmd.gov/hb/2008/December/081231a.htm>



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Please contact me or Peter with any comments or questions.

Sincerely,



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