

**DEPARTMENT OF FORESTRY AND FIRE PROTECTION**

P.O. Box 944246
SACRAMENTO, CA 94244-2460
(916) 653-7772
Website: www.fire.ca.gov



June 13, 2017

George Sanchez
City of Merced
1776 Grogan Avenue
Merced, CA 95340

8GG16430; City of Merced, "Tree Inventory & Management Plan" Project

This Agreement cannot be considered binding on either party until approved by appropriate authorized CAL FIRE designee. No services should be provided prior to approval, as the State is not obligated to make any payments on any Agreement prior to final approval. FAILURE TO RETURN ALL DOCUMENTS BY DATE BELOW MAY RESULT IN LOSS OF FUNDING.

Please contact Greg Dion at (559) 243-4156 if you have questions concerning services to be performed.

1. ☒ Full grant agreement including terms and conditions, project grant application form, scope of work, budget, GHG emissions reduction methodology, map, and other exhibits enclosed. Print (single sided) and return three (3) sets of agreements with original signatures in blue ink. Please return the agreement to be received by CAL FIRE no later than **June 20, 2017**.

Return all originals and requested documents for further processing to:

Please send the originals via overnight mail service to the following physical address:

**CAL FIRE
Attn: Grants Management Unit/CCI
1300 U Street
Sacramento, CA 95818**

2. ☐ Please initial change(s) made on all copies of the agreement on page(s) as marked.
3. ☐ Enclosed for your record is one fully executed copy of the agreement referenced above. When billing for services performed under this agreement, your invoices must reference the agreement number above and be submitted to the contract manager.

Thank you,

Alice Miller
Grants Analyst
Grants Management Unit

CC: John Melvin
Greg Dion
Stella Chan

Enclosures

State of California
Dept. of Forestry and Fire Protection (CAL FIRE)
Resource Management
GRANT AGREEMENT

APPLICANT: City of Merced
PROJECT TITLE: Tree Inventory & Management Plan
GRANT AGREEMENT: 8GG16430

PROJECT PERFORMANCE PERIOD IS from Upon Approval through March 30, 2020.

Under the terms and conditions of this Grant Agreement, the applicant agrees to complete the project as described in the project description, and the State of California, acting through the Dept. of Forestry & Fire Protection, agrees to fund the project up the total state grant amount indicated.

PROJECT DESCRIPTION: Using tree inventory data to create an Urban Forest plan that builds a strategy for managing the city's trees. The results of the tree inventory will assist further in planting 720 trees in mostly disadvantaged areas, helping aid environmental and public health improvements.

Total State Grant not to exceed \$ 475,000.00 (or project costs, whichever is less)

**The Special and General Provisions attached are made a part of and incorporated into this Grant Agreement.*

***The below signor testifies that they have the authority to be signing this agreement in their capacity as an employee of the eligible entity for this grant.*

City of Merced

STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY
AND FIRE PROTECTION

Applicant

By _____
Signature of Authorized Representative

Title

By _____
Title: **Helge Eng**
Deputy Director, Resource Management

Date

Date

CERTIFICATION OF FUNDING

AMOUNT OF ESTIMATE FUNDING \$ 475,000.00		GRANT AGREEMENT NUMBER 8GG16430		FUND Optional Line Item:	
ADJ. INCREASING ENCUMBRANCE \$ 0.00		APPROPRIATION			
ADJ. DECREASING ENCUMBRANCE \$		FUNCTION			
UNENCUMBERED BALANCE \$ 475,000.00		LINE ITEM ALLOTMENT 3540- -	CHAPTER	STATUTE	FISCAL YEAR
T.B.A. NO.	B.R. NO. FY	INDEX 9520	OBJ. EXPEN D 418	PCA	PROJECT/WORK PHASE VENDOR#

I hereby certify upon my personal knowledge that budgeted funds are available for this encumbrance.

SIGNATURE OF CAL FIRE ACCOUNTING OFFICER

DATE

TERMS AND CONDITIONS OF GRANT AGREEMENT

I. RECITALS

1. This Agreement, is entered into between the State of California, by and through the California Department of Forestry and Fire Protection (CAL FIRE), hereinafter referred to as "STATE" and City of Merced, hereinafter referred to as "GRANTEE".
2. The STATE hereby grants to GRANTEE a sum (hereinafter referred to as "GRANT FUNDS") not to exceed four-hundred seventy-five thousand dollars (\$475,000.00).
3. In addition to the terms and conditions of this Agreement, the STATE and GRANTEE agree that the terms and conditions contained in the documents set forth below are hereby incorporated and made part of this agreement.
 - a. Department of Forestry and Fire Protection Urban and Community Forestry Program California Climate Investments Grant Guidelines 2016/2017
 - b. California Air Resources Board Greenhouse Gas Quantification Methodology for the Department of Forestry and Fire Protection (CAL FIRE) Urban and Community Forestry Program
 - c. The submitted Application, Scope of Work, Budget Detail, GHG Emissions Reduction Methodology and Exhibits
 - d. Addendum for California Climate Investments (CCI) Grant Projects

II. SPECIAL PROVISIONS

1. Recipients of GRANT FUNDS pursuant to California Public Resources Code Section 4799.06-4799.12 shall abide by the provisions in this Agreement. This includes the requirement that work shall not commence prior to the execution of this Agreement by both parties. Any work started prior to the execution of this Agreement will not be eligible for funding under the terms of this Agreement.
2. As precedent to the State's obligation to provide funding, GRANTEE shall provide to the STATE for review and approval a detailed budget, specifications, and project description. Approval by the STATE of such plans and specifications, or any other approvals provided for in this Agreement, shall be for scope and quality of work, and shall not relieve GRANTEE of the obligation to carry out any other obligations required by this Agreement, in accordance with applicable law or any other standards ordinarily applied to such work or activity.

3. All informational products (e.g., data, studies, findings, management plans, manuals, photos, etc.) relating to California's natural environment produced with the use of GRANT FUNDS shall be available for public use.

III. GENERAL PROVISIONS

1. Definitions

- a. The term "Agreement" means grant agreement number 8GG16430.
- b. The term "GRANT FUNDS" means the money provided by the STATE to the GRANTEE in this Agreement.
- c. The term "GRANTEE" means an applicant who has a signed Agreement for the award for GRANT FUNDS.
- d. The term "Other Sources of Funds" means all matching fund sources that are required or used to complete the Project beyond the GRANT FUNDS provided by this Agreement.
- e. The term "STATE" means the State of California, Department of Forestry and Fire Protection (CAL FIRE).
- f. The term "Project" means the development or other activity described in the "Project Scope of Work".
- g. The term "Project Budget Detail" as used herein defines the approved budget plan.
- h. The term "Project Scope of Work" as used herein means the individual scope of work describing in detail the approved tasks.

2. Project Representatives

The project representatives during the term of the agreement will be:

STATE: CAL FIRE	GRANTEE: City of Merced
Section/Unit: Urban and Community Forestry	Section/Unit: N/A
Attention: Greg Dion	Attention: George Sanchez
Mailing Address: 1234 E. Shaw Avenue	Mailing Address: 1776 Grogan Avenue
Fresno, CA 93710-7899	Merced, CA 95340
Phone Number: (559) 243-4156	Phone Number: (209) 385-6989
Email Address: Greg.Dion@fire.ca.gov	Email Address: sanchezg@cityofmerced.org

Changes to the project representatives during the term of the agreement shall be made in writing. Notice shall be sent to the above representative for all notice provisions of this Agreement.

3. Project Execution

- a. Subject to the availability of grant monies, the STATE hereby grants to the GRANTEE a sum of money (GRANT FUNDS) not to exceed the amount stated on Section I. RECITALS, Paragraph 2 in consideration of and on condition that the sum be expended in carrying out the purposes as set forth in the description of the Project in this Agreement and its attachments and under the terms and conditions set forth in this Agreement.
- b. GRANTEE shall assume any obligation to furnish any additional funds that may be necessary to complete the Project. Any amendment to the Project as set forth in the Application on file with the STATE must be submitted to the STATE for approval in writing. No amendment is allowed until written approval is given by the STATE.
- c. GRANTEE shall complete the Project in accordance with the time of Project performance set forth in this Agreement, unless an amendment has been approved and signed by the STATE under the terms and

conditions of this Agreement. Amendments must be requested in advance and will be considered in the event of circumstances beyond the control of the GRANTEE, but in no event less than 90 days from the Agreement expiration date and in no event less than 60 days before the effective date of the amendment. Approval of amendment is at the STATE's discretion.

- d. GRANTEE certifies that the Project Scope of Work complies with all local, State, and federal laws and regulations.
- e. GRANTEE shall comply with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000, et. seq. Title 14, California Code of Regulations, Section 15000 et. seq.) and all other local, State, and federal environmental laws. A copy of the certified CEQA document must be provided to STATE before any GRANT FUNDS are made available for any Project activity that could directly impact the environment (e.g. cutting, piling or burning bush, masticating, dozer work, etc.). CEQA compliance shall be completed within one (1) year from start date of the Agreement. The start date is considered the date the last party signs the Agreement. GRANT FUNDS will be made available in advance of CEQA compliance for project activities that do not have the potential to cause a direct environmental impact (e.g. project planning, locating and marking property or project boundaries, contacting and signing up landowners, etc.).
- f. GRANTEE shall permit periodic site visits by representative(s) of the STATE to ensure program compliance and that work is in accordance with the approved Project Scope of Work, including a final inspection upon Project completion.
- g. GRANTEE, and the agents and employees of GRANTEE, in the performance of this Agreement, shall act in an independent capacity and not as officers, employees, or agents, of the STATE.

4. Project Costs and Payment Documentation

- a. Payment by the STATE shall be made after receipt of an acceptable invoice and approval by a duly authorized representative of the STATE. GRANTEE shall submit an invoice for payment to the CAL FIRE Project Representative of the STATE. A final invoice shall be submitted no later than 30 days after completion, expiration, or termination of this Agreement.
- b. For services satisfactorily rendered, and upon receipt and approval of invoices for payment, the STATE agrees to compensate GRANTEE for actual expenditures incurred in accordance with the rates specified herein,

which is attached hereto, as Attachment 3 – Final Project Budget, and made a part of this Agreement.

- c. GRANTEE shall submit, in arrears, not more frequently than once a month, and no less than quarterly, an invoice to the STATE for costs paid by GRANTEE pursuant to this Agreement. Each invoice shall contain the following information: the Agreement number, the dates or time period during which the invoiced costs were incurred, expenditures for the current invoice and cumulative expenditures to date by major budget category (e.g., salaries, benefits, supplies, etc.), appropriate supporting documentation, project progress reports, and the signature of an authorized representative of GRANTEE as detailed in the Invoice Guidelines of the Procedural Guide for the CAL FIRE Urban and Community Forestry Program California Climate Investments Grant Guidelines 2016/2017.
- d. GRANT FUNDS in this Agreement have a limited period in which they must be expended. All GRANTEE expenditures must occur prior to the end of the Project performance period of this Agreement.
- e. Except as otherwise provided herein, GRANTEE shall expend GRANT FUNDS in the manner described in the Project Budget Detail approved by the STATE. The dollar amount of an item in the Project Budget Detail may be increased or decreased by up to ten percent (10%) of the budget item through reallocation of funds from another item or items, without approval by the STATE; however, GRANTEE shall notify the STATE in writing in project progress reports when any such reallocation is made, and shall identify both the item(s) being increased and those being decreased. Any increase or decrease of an item of more than ten percent (10%) of the budget item must be approved in writing by the STATE before any such increase or decrease is made. A formal approved amendment is required to increase the total amount of GRANT FUNDS.
- f. GRANTEE shall promptly submit any and all records at the time and in the form as the STATE may request.
- g. GRANTEE shall submit each invoice for payment to:

California Department of Forestry & Fire Protection
Attention: Greg Dion
1234 E. Shaw Avenue
Fresno, CA 93710-7899
- h. Notwithstanding any of the provisions stated within this Agreement, the STATE may at its discretion make advance payment to the GRANTEE, if GRANTEE is a Community-based private non-profit agency, upon written

request by the GRANTEE. Advance payment made by the STATE shall be subject to the circumstance and provisions below.

Where hardship circumstances exist for the GRANTEE, the STATE will consider authorizing advance payments. The STATE will consider the following factors in determining whether a hardship situation exists:

- Modest reserves and potential cash flow problems of the GRANTEE including the need for advance funding in order to initiate a project. A justification for advance payment may include items such as the inability to pay for staff, supplies, administration expenses, and to secure contractors for Project work.

The following guidelines will be applied to advance payments:

- Multiple advance payments may be made to a GRANTEE over the life of a project.
- No single advance payment shall exceed 25% of the total grant amount and must be spent on eligible costs within six months of the advance payment request. The balance of unspent advance payment funds not liquidated within the six month spending period will be billed for the return of the advanced funds to the STATE. The amount will be returned to the grant balance.
- A request for advance payment must include the same level of expenditure detail and justification as a regular invoice.
- All work under a previous advance payment must be fully liquidated via an invoice and supporting documentation and completed to the STATE's satisfaction before another advance payment will be made.
- Any advance payment received by a GRANTEE and not used for project eligible costs shall be returned to CAL FIRE.
- Advance payments must be deposited into an interest-bearing account. Any interest earned on advance payment funds must be accounted for and reported as program income used toward offsetting the project cost or returned to the STATE.

5. Budget Contingency Clause

- a. If STATE funding for any fiscal year is reduced or deleted for purposes of the Urban and Community Forestry Program California Climate Investments Grant Program, the STATE shall have the option to either

cancel this Agreement with no liability occurring to the STATE, or if possible and desirable, offer an Agreement amendment to GRANTEE to reflect the reduced amount available for the Project.

6. Project Administration

- a. GRANTEE shall provide the STATE a written report showing total final Project expenditures and matching funds before work on the Project begins. GRANTEE must report to the STATE all sources of other funds for the Project. If this provision is deemed to be violated, the STATE will request an audit of GRANTEE and can delay the disbursement of funds until the matter is resolved.
- b. GRANTEE shall promptly submit written Project reports as the STATE may request throughout the term of this Agreement.
- c. GRANTEE shall submit a final accomplishment report, final invoice with associated supporting documentation, and copies of materials developed using GRANT FUNDS, including but not limited to plans, educational materials, etc. within 30 days of Project completion.

7. Financial Records

- a. GRANTEE shall retain all records described in Section 7(c) below for three (3) years after final payment by the STATE. In the case an audit occurs, all such records shall be retained for one (1) year from the date is audit is completed or the three (3) years, whichever date is later.
- b. GRANTEE shall maintain satisfactory financial accounts, documents, and records for the Project and make them available to the STATE for review during reasonable times. This includes the right to inspect and make copies of any books, records, or reports of GRANTEE pertaining to this Agreement or matters related thereto.
- c. GRANTEE shall keep such records as the STATE shall prescribe, including, but not limited to, records which fully disclose (a) the disposition of the proceeds of state funding assistance, (b) the total cost of the Project in connection with such assistance that is given or used, (c) the amount and nature of that portion of the Project cost supplied by other sources, and (d) any other such records as will facilitate an effective audit. All records shall be made available to the STATE, other State of California agency, or other entity as determined by the State of California for auditing purposes at reasonable times.
- d. GRANTEE shall use any generally accepted accounting system.

8. Project Termination

- a. This Agreement may be terminated by the STATE or GRANTEE upon 30-days written notice to the other party.
- b. If either party terminates the Agreement prior to the completion of the Project, GRANTEE shall take all reasonable measures to prevent further costs to the STATE under the Agreement and the STATE shall be responsible for any reasonable and non-cancelable obligations incurred by GRANTEE in the performance of this Agreement prior to the date of the notice to terminate, but only up to the undisbursed balance of funding authorized in this Agreement.
- c. Failure by GRANTEE to comply with the terms of this Agreement may be cause for suspension of all obligations of the STATE hereunder at the discretion of the STATE.
- d. Failure of GRANTEE to comply with the terms of this Agreement shall not be cause for the suspension of all obligations of the STATE hereunder if in the judgment of the STATE such failure was due to no fault of GRANTEE. At the discretion of the STATE, any amount required to settle at minimum cost any irrevocable obligations properly incurred shall be eligible for reimbursement under this Agreement.
- e. Final payment to GRANTEE may not be made until the STATE determines the Project conforms substantially to this Agreement.

9. Hold Harmless

- a. GRANTEE shall defend, indemnify and hold the STATE, its officers, employees, and agents harmless from and against any and all liability, loss, expense (including reasonable attorney's fees), or claims for injury or damages arising out of the performance of this Agreement but only in proportion to and to the extent such liability, loss, expense, attorney's fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of GRANTEE, its officers, agents, or employees. The duty of GRANTEE to indemnify and hold harmless includes the duty to defend as set forth in Civil Code Section 2778. This Agreement supersedes GRANTEE's right as a public entity to indemnify (see Government Code Section 895.2) and contribution (see Government Code Section 895.6) as set forth in Government Code Section 895.4.
- b. GRANTEE waives any and all rights to any type of express or implied indemnity or right of contribution from the STATE, its officers, agents, or employees for any liability resulting from, growing out of, or in any way connected with or incident to this Agreement.

- c. Nothing in this Agreement is intended to create in the public or in any member of it rights as a third-party beneficiary under this Agreement.

10. Tort Claims

FEDERAL:

The United States shall be liable, to the extent allowed by the Federal Tort Claims Act 28 United States Code 2671-2680, for claims of personal injuries or property damage resulting from the negligent or wrongful act or omission of any employee of the United States while acting within the scope of his or her employment, arising out of this Agreement.

STATE:

The State of California shall be liable, to the extent allowed by law and subject to California Government Code, Title 1, Division 3.6, providing for the filing of tort claims against the State of California, for personal injuries or property damage resulting from the negligent or wrongful act or omission of State of California employees while acting within the scope of his or her employment, arising out of this Agreement.

11. Nondiscrimination

The State of California prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, sex, marital status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. GRANTEE shall not discriminate against any person on any of these bases.

12. Incorporation

The grant guidelines, quantification methodology and the Project Scope of Work, Project Budget Detail and any subsequent amendments or modifications to the Project Scope of Work and Project Budget Detail approved in writing by the STATE are hereby incorporated by reference into this Agreement as though set forth in full in this Agreement.

13. Severability

If any provision of this Agreement or the Project Scope of Work thereof is held invalid, that invalidity shall not affect other provisions or applications of this Agreement which can be given effect without the invalid provision or application, and to this end the provisions of this Agreement are severable.

14. Waiver

No term or provision hereof will be considered waived by either party, and no breach excused by either party, unless such waiver or consent is in writing and signed on behalf of the party against whom the waiver is asserted. No consent by either party to, or waiver of, a breach by either party, whether expressed or implied, will constitute consent to, waiver of, or excuse of any other, different, or subsequent breach by either party.

15. Assignment

This Agreement is not assignable by GRANTEE either in whole or in part.

ADDENDUM – CALIFORNIA CLIMATE INVESTMENTS (CCI) GRANT PROJECTS

I. SPECIAL PROVISIONS

1. Grant funds shall be used on projects with the primary goal of reducing greenhouse gases (GHGs) and furthering the purposes of AB 32 (Chapter 488, Statutes of 2006), California's Global Warming Solutions Act of 2006.
2. Grant funds shall be used on projects limited to specific activities as described in GHG Grants Procedural Guides.
3. Greenhouse gas reduction must be calculated using the ARB Greenhouse Gas Quantification Methodology (https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/calfire_ucf_16-17.pdf).
4. Grantee shall report project and benefits information when requested by the State (e.g., GHG reductions, disadvantaged community benefits, energy/water savings, and other co-benefits).
5. Grantee shall maintain accurate and detailed records documenting project description, project location, and schedule, GGRF dollars allocated, and leveraged funds throughout the duration of the project.
6. Failure of Grantee to meet the agreed upon terms of achieving required GHG reduction may result in project termination and recovery of funds.

II. MONITORING AND REPORTING REQUIREMENTS

All Greenhouse Gas Reduction Fund (GGRF) projects are required to monitor and report on carbon flux. This includes direct emissions, avoided emissions and sequestration. All such emissions should be monitored and reported separately. In addition, the Urban & Community Forestry and Forest Legacy Program Grants have to monitor and report on other metrics. Monitoring should be done at sufficient intervals to allow periodic reporting per the specific requirements of the individual grant program. Carbon flux should be expressed as the difference between the pre-project baseline and the in-progress or completed project at the end of the given monitoring period. This will require the establishment of a pre-project baseline from which direct emissions, avoided emissions and sequestration can be periodically measured throughout the crediting period¹ on the project area. Emissions and sequestration measurements should be expressed as metric tonnes of carbon dioxide equivalent [MTCO₂e]. Net Greenhouse Gas (GHG) benefit of the project will be determined by the sum of the GHG emissions

¹ The crediting period is the time period over which the project accrues GHG benefits.

reductions and sequestration less any GHG emissions resulting from project implementation. All other metrics should be reported in the appropriate units of measure. The reporting requirements should determine the timing and frequency of monitoring actions as described in Table 1.

a. TABLE 1 CCI GRANT REPORTING REQUIREMENTS

Grant Program	What to Report	Reporting Frequency	Report Due
Urban & Community Forestry	1, 3, 6, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20	Quarterly, At Completion	January 1, April 1, July 1, September 1, At Completion with final invoice
Forest Health	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 19, 20	Annually, At Completion	September 1, At Completion with final invoice

b. CCI GRANT REPORTING REQUIREMENTS

1. Increased carbon sequestration through tree growth.
2. Increased carbon sequestration through tree growth and timberland management.
3. GHG emissions resulting from project implementation actions (fuel reduction activities, timber harvesting, sanitation harvesting, site preparation, research activities, etc.)
4. Avoided GHG emissions resulting from reducing hazardous fuel load potential that could lead to large wildfires.
5. Avoided GHG emissions resulting from retaining the forest and avoiding conversion to another use.
6. Avoided GHG emissions resulting from utilization of the removed trees or other vegetation for biomass energy, solid wood products or other products.
7. Avoided GHG emissions resulting from preventing spread of disease to healthy forests by selectively removing pest- or pathogen-infected trees.
8. Avoided GHG emissions resulting from research activities.
9. Estimated net GHG benefit achieved to date.
10. Estimated net GHG benefit for entire project to date [provide total MTCO_{2e} over the project life].

11. Project status [provide one of the following: (a) started during reporting period; or (b) in progress.]
12. Project activities completed [e.g., milestones achieved].
13. Additional project benefits and results [if applicable, provide estimated totals, if available, or qualitative descriptions, of the following: (a) vehicle miles traveled reductions; (b) open space or greenbelt creation or preservation; (c) wildlife habitat preservation; (d) tons of biomass generated from forest easements and delivered to a renewable energy facility; (e) tons of harvested wood generated from forest easements and delivered to a mill; and (f) property acquired to be repurposed as an urban forestry project site.]
14. Number of trees planted and location.
15. Vegetation planted and location.
16. Maintenance activities conducted.
17. Verification that the land is still being managed in accordance with the terms of the forest conservation easement.
18. Verification that the site is still being maintained in accordance with the terms of the grant agreement.
19. At completion, summarize project accomplishments, including benefits to disadvantaged communities.
20. At completion, summarize co-benefits for entire project [if applicable, e.g., vehicle miles traveled reductions; open space creation or preservation; wildlife habitat preservation].
21. Grantee shall provide photos, literature, presentations and other media developed concerning the Project to the Grantor when requested.

III. PROGRAM ACKNOWLEDGEMENT/RECOGNITION

All projects funded both fully and partially by the GGRF must clearly display, identify and label themselves as being part of the “California Climate Investments” program. The acknowledgement must contain the “California Climate Investments” and CAL FIRE logos as well as the following statement:

“Funding for this project provided by the California Department of Forestry and Fire Protection as part of the California Climate Investments Program.”

A draft of the acknowledgement must be approved by the STATE prior to publication.

In addition, all projects funded both fully and partially by GGRF must contain the following statement in public announcements or press releases on said projects:

“The Tree Inventory & Management Plan is part of California Climate Investments, a statewide program that puts billions of cap-and-trade dollars to work reducing greenhouse gas emissions, strengthening the economy and improving public health and the environment—particularly in disadvantaged communities. The cap-and-trade program also creates a financial incentive for industries to invest in clean technologies and develop innovative ways to reduce pollution. California Climate Investment projects include affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, more sustainable agriculture, recycling and much more. At least 35 percent of these investments are made in disadvantaged and low-income communities. For more information, visit [California Climate Investments](#).”



2016/2017 Urban & Community Forestry California Climate Investment Grants

Project Application Form

Fill out the form completely. Please see the submittal instructions at the bottom of the form. The Project Tracking Number requested is listed in the letter of invitation you received.



CAL FIRE Project Tracking Number: 16-GHG-UF-01-MGMT-015

Name of Organization City of Merced

Project Title Tree Inventory & Management Plan

Project Type Management Activities For GHG Reduction

Requested Grant \$ \$475,000.00

Matching \$ \$154,800.00

Total Project \$ \$629,800.00

Primary Source of Technical Advice ISA Certified Arborist

Explanation (if required):

Professional's First Name George

Professional's Last Name Sanchez

1. Applicant information - Eligible applicants include cities, counties, qualifying districts, or nonprofit organizations qualified under section 501(c)(3) of the Internal Revenue Code.

Type of Organization City

1A. Primary Project Contact information

First Name George

Last Name Sanchez

Email sanchezg@cityofmerced.org

Phone Number (209) 385-6989

Address 1 1776 Grogan Avenue

Address 2

City Merced

County Merced

State California

Zip Code 95340

1B. Secondary Project Contact information

First Name Michael

Last Name Miller

Email millerm@cityofmerced.org

Phone Number (209) 385-6800

Address 1 1776 Grogan Avenue

Address 2

City Merced

County Merced

State California

Zip Code 95340

1C. Correspondence Details: List any information needed for project contacts, invoicing, etc.

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2. Partner information - List primary project partners or co-sponsors. Applicants must provide a letter of commitment from each partner organization that affirms their role in the project.

2A. Name of Organization 1 California Urban Forest Council

First Name Nancy

Last Name Hughes

Partner Contact Title Executive Director

Email njhughes@caufc.org

Phone Number (415) 479-8733

Comments Organizing education and outreach for Arbor Day Celelbrations

2B. Name of Organization 2 Tree Partners Foundation

First Name Bryan

Last Name Tassey

Partner Contact Title Professor Merced College

Email bryan.tassey@mccd.edu

Phone Number (209) 358-6531

Comments Help to coordinate student workers and volunteers for E/O at Arbor Day Celebrations

2C. Additional Partners: list additional partner organizations with contact person, email address, and phone number.

San Joaquin Valley Regional Forest Council, John Bushoven - jrbushoven@csufresno.edu
East Merced Resource Conservation District, Jean Okuye - jeanokuye@gmail.com

3. Grant Period: provide the estimated start and end dates of the grant project. This date cannot be after March 30, 2020. Final billing must be received within 30 days after the completion date.

Project Start Date Jul 3, 2017

Project Completion Date Mar 30, 2020

4A. CES 2.0 Disadvantaged Communities (DACs): Fill in the percentages below. In the larger box, describe what ARB criteria (see grant guidelines) are being met to be considered "in" or "providing benefits to" DACs. Reference Appendix L of grant guidelines.

Percentage of project meeting definition of "in" DAC 100

Percentage of project that "provides benefits to" DACs.

100

The City of Merced has many neighborhoods with a high (>90%) environmental burden due to high levels of diesel, hazardous waste and solid waste, as well as neighborhoods in the high population burden (>90%) with residents living below the poverty level, having low levels of education, and experiencing linguistic isolation. A tree inventory and management plan will allow Merced to identify and prioritize urban forest needs and reduce inequities of tree benefits distribution, specifically in the most disadvantaged communities. Please see Supplemental Sheets for more detailed information.

4B. DAC census tracts: In the box below list DAC census tracts for the project that will meet the definition of being "in". Census tracts should be listed using the 10 digit number found for each tract on the map(s) at <http://www.calepa.ca.gov/EnvJustice/GHGInvest/>.

This project will serve the entire City of Merced. Merced is the county seat of Merced County in the San Joaquin Valley of Northern California. The city had a population of 82,486 in 2015 and its 23.32 square miles fall within Census Tracts 6047001005, 6047001302, 6047001401, 6047001301, 6047001502, 6047001601, 6047001602, 6047000902, 6047001003, 6047001901, 6047001200, 6047001700, 6047001501, 6047001503, 6047001004, 6047000901, 6047001402. Additional scoring details and maps of Merced from the CalEnviroScreen 2.0 determinations are provided in the Supplementation Sheets accompanying this application.

5. GHG Methodology: Fill in the GHG calculated amounts below. Describe the assumptions used to quantify GHG reductions using the ARB Quantification Methodology as required in the grant guidelines and found at: <https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm>. You are required to attach UTCC runs for species specified and the ARB calculator output.

5A. Estimated carbon stored (MT CO₂e)

5B. Estimated avoided emissions (MT CO₂e)

5C. Estimated project emissions (MT CO₂e)

5D Net GHG benefit (MT CO₂e). (5A + 5B) - 5C =

Please see the Supplemental Sheets accompanying this application for the screen shots of the UTCC runs for the species specified: ACSA1, FRPE_M, PICH, PLAC.

GHG benefits are calculated for the "Early action tree planting requirement" list of 720 new trees in section 6E.

Calculations are based on tree type model species with these guidelines.

90 Quercus rubra are combined in the BDL Acer sacharinum tree type with the 180 Acer rubrum.

For each tree type, a model tree species was determined based on the appropriate climate zone: Central Valley.

The following assumptions were made:

Trees are within 20ft and 40ft of a building built after 1980. The 720 planting locations are along streets in parking strips behind the curb.

The building was assumed to have window A/C and wall heating units.

All trees are planted on the west side of the building.

The age at planting was determined for each model species and cumulative energy reductions and CO₂ storage over the course of 40 years calculated using the Urban Tree Carbon Calculator.

GHG reductions will be an estimated 6,708 metric tons of CO₂. 4,565 metric tons are stored in total from annual sequestration and 2,290 metric tons from avoided energy production.

Planting and caring for 100,000 trees will produce a total of 146 metric tons of CO₂ over the course of 40 years based on Kendall & McPherson, 2011, and McPherson & Kendall, 2014.

The energy savings from planting these 720 trees equates to 2 therms for heating and 9,005 MW for cooling. In addition, the benefits of these trees will include stormwater capture and reuse, air quality improvement and most especially improvement in the quality of life for this disadvantaged community.

References:

McPherson, E. Gregory, and Alissa Kendall. "A life cycle carbon dioxide inventory of the Million Trees Los Angeles program." The International Journal of Life Cycle Assessment 19.9 (2014): 1653-1665.

Kendall, Alissa, and E. Gregory McPherson. "A life cycle greenhouse gas inventory of a tree production system." The International Journal of Life Cycle Assessment 17.4 (2012): 444-452.

Tree Carbon Calculator. www.fire.ca.gov/resource_mgt/downloads/TREES_WC.zip.

6. Narrative. In the sections below, please follow the prompts and provide all relevant information for the project.

6A. Background. Describe the situation in the project area(s) and problems in the project area(s) that need attention.

Merced has a number of situations, conditions and problems we hope to address with this project. These include but are not limited to:

1. Lack of a tree inventory for all City managed areas and facilities (Parks, Fire Stations, Community Centers, etc.).
2. A lack of guidance for the future that includes budgeting, planning, and making urban forestry a priority during budget changes.
3. An incomplete understanding of the benefits of trees to the community in the context of more than aesthetics, including the funding of urban forestry activities.
4. An incomplete understanding of the culture-based attitudes towards the benefits of trees.
5. A need for a stronger relationship and coordination between the various departments that influence tree decisions.
6. Limited relationships with non-profit groups.
7. A need to identify opportunities to update and improve existing ordinances, standards and specifications related to tree management.
8. Inadequate levels of community education and outreach.
9. Inadequate planning for addressing potential pest threats to the existing Urban Forest.
10. Inadequate planning to address region-wide environmental changes.
11. Limited advocacy for the Urban Forest by our local elected officials.
12. Lack of a shared vision among the stakeholders within the Urban Forest.

The City of Merced identified the declining quality of the existing urban forest and attempted to improve and enhance the tree population 'one tree at a time' by addressing individual citizen complaints. The City is segmented into 80 quarter-mile pruning grids. The current pruning cycle is approximately 8 years with current funding. This does not include removal and replacement of dead or dying trees. Pruning needs are re-assessed and re-prioritized each year.

This current approach to correcting the City-wide problems in the urban forest does not provide a uniform, efficient or cost effective method to manage the continuing decline of our trees. To properly manage its urban forest the City realizes it must understand the specific nature and characteristics of its trees by completing a comprehensive tree inventory and developing a plan to effectively and responsibly manage our city trees.

6B. Project Objectives - What are the objectives of the proposed project? How do they address the situations and problems identified in the background section?

The primary overarching objectives for this grant are to improve the health of the urban forest thereby improving the quality of life for the residents of Merced by providing them with the benefits a healthy urban forest contributes to a better way of life through carbon sequestration, air quality and other environmental improvements, aesthetics, and health benefits. These objectives align with the goals of the grant to deliver tree benefits to the most disadvantaged communities in California which are here in the heart of Merced.

The City recognizes trees as an important tool to improve environmental quality and address environmental justice issues. Focused tree planting in communities with substantial pollution and where residents are impacted by socioeconomic disparities can help curb both of these challenges. Maps from CalEnviroScreen 2.0 show a widespread pollution and socioeconomic burden on the residents of the City of Merced. Recognizing this burden, the City wishes to use these grant funds to embrace several emerging opportunities:

1. A vision for a healthier, more sustainable urban forestry program can be articulated with a comprehensive urban forest management plan based on the information a City-wide tree inventory will provide.
2. Tree benefits can be quantified and more clearly communicated with internal and external stakeholders.
3. Within culturally-diverse neighborhoods, messaging and marketing of the value of trees should be tailored to match unique community values of residents from different cultural backgrounds.
4. Communication among departments that manage trees can be strengthened.
5. Partnerships with local nonprofit resources can be developed, renewed or re-imagined.
6. Developing a stronger sense of "place" for all of the people who work, live and play in the City of Merced.

Funds are requested to complete a tree inventory so managers have a clear understanding of the current tree numbers, locations, species distribution, age distribution, and condition. In addition, the tree inventory will show our City staff where gaps occur in canopy cover and benefits received from the current urban forest.

The tree inventory data will be used to create an Urban Forest Management Plan. The City of Merced will use the inventory data to build a strategy for managing the city's street and public trees. The plan will assess the current state of the urban forest and identify the most strategic opportunities to protect and enhance the city's tree resource. The tree inventory data will also be used to educate the citizens of the City of Merced on the benefits of their urban canopy and help them to take an active stewardship role in the care and enhancement of the urban forest.

6C. Scope of Work - Describe the approach to be used, the design (methods), and implementation of the project. Include who will be involved with specific tasks and justify why the approach, methods and implementation is the most effective way to accomplish the objectives. Include a description of project sign contents and their locations. *(continued on next page)*

Step One : Tree Inventory - Up to one year to complete RFP, Contract Award and Inventory.

Tree inventory data collection and analyses required by this first step can be most efficiently accomplished utilizing an outside consulting firm. Once the grant funding is assured, City staff will post a Request for Proposal (RFP) for Tree Inventory Data Collection Services and Tree Inventory Software. The tree inventory collection will include all of the data fields required by the CalFire Grant listed in Appendix J of the CalFire Grant Guidelines. Writing, issuing and awarding this contract is expected to take up to four months.

Work to collect and develop tree inventory data, mapping and analysis, as well as training for City staff on software and data collection are expected to commence within a few weeks of the award of the contract for services. Tree inventory data will be used to produce a report that summarizes the current structure of the urban forest. Furthermore, the inventory data can be analyzed with the i-Tree Streets model to determine the functional performance of Merced's street trees. The results will be used to influence future planting palettes, identify vacant sites, and forecast maintenance and tree removal with an eye towards preserving mature trees in the landscape. The tree inventory will enable the production of a map of available planting sites. Those sites will be combined with existing socioeconomic data layers and pollution indices. This will identify where there might be a confluence of low tree canopy, high pollution, and economically disadvantaged residents. Planting in those areas provides the largest overall impact and will be prioritized. This process of data collection and analysis, and staff training is expected to require up to eight months.

Step Two : Development of a Management Plan - Up to 18 months to complete RFP, Contract Award and Plan

The City staff will write, and post an RFP for an outside consulting firm to provide the services needed to develop an Urban Forest Management Plan (UFMP). Services will include an analysis of the current state of the urban forest, it's management, and stakeholder views. During the development of the UFMP the City will conduct a review of the tree ordinance, policies and procedures that currently guide management of the City's trees, interactions between city department managing trees (Planning, Public Works, Parks, Development, etc.), and tree maintenance practices. This solicitation will occur simultaneously with the RFP for inventory services or shortly thereafter. The process of writing, posting, and awarding the work may take up to four months.

An in-depth review of all documents and written and unwritten policies and procedures that relate to urban forest management will be conducted. Through the research, issues may be uncovered that include both opportunities and challenges within the urban forest. Issues such as inconsistencies in tree management, conflicts with stakeholder groups, awareness and understanding of the urban forest by elected officials are common findings. These challenges and subsequent analysis can lead to recommendations that provide for growth in internal efficiencies, cost reductions, and limiting liability. Recommendations to overcome the challenges will support and promote better communication and coordination among city departments that work within and adjacent to the urban forest (trees), decision-makers, and the community. The research and analysis will commence within a few weeks of award of the contract for services and may take up to four months but can occur concurrently with the stakeholder outreach described below.

The City plans to use internal and external stakeholder interaction (meetings, workshops, surveys, presentations) to understand the current "state of the urban forest" as well as "wants and needs" by those stakeholders. This fact finding will help inform the plan and support change in ordinances, planning and design, and function that pertains to the urban forest. In addition, stakeholder interviews coupled with review of operational functions, should result in a complete review of city-wide departmental collaboration and effectiveness. The initial process can begin before the tree inventory and analysis is complete. Gathering feedback from stakeholders before the inventory data are available will allow the City to develop a baseline for the opinions of stakeholders before more active education and outreach is conducted to garner stakeholder buy-in and approval. This initial outreach step of the UFMP will commence within a few weeks of award of the contract for services and concurrently with research and analysis of City documents, procedures and policies.

Once the inventory and tree data analysis are complete, the data will be analyzed to determine strengths, gaps, and challenges. We will want to incorporate community culture to include in the plan. Community meetings will be conducted to inform and gather input, and to show results and create buy-in from the public. We hope to create an abundance of opportunity for public input. When conducting the meetings we will reveal the results and analysis of the tree inventory, discuss the value and benefits the urban forest provides in economic, environmental, and social terms, help the residents understand what might be missing in our urban forest, and guide community members to understand what the role of the stakeholders is in growing the forest.

This UFMP project will be used to help bring the community together and forge new partnerships. To move towards a more effective urban forest management program, the City must develop stakeholder partners to protect and properly manage its forest. Residents lacking knowledge and appreciation for trees are quick to consider a tree a nuisance and call for its removal or remove it themselves without an understanding of the benefits they are losing. A robust outreach program to grow the public's awareness of the many benefits of trees and proper ways to trim trees would increase the public's understanding of the value properly maintained trees provide to each household and the community.

6C. Scope of Work - Continued from previous page

This is a new vision and process for the City of Merced. The result we hope for from this effort is stakeholder support and a unified vision for Merced's urban forest. To insure the desired outcome we plan to develop a strong partnership with local urban forest advocates and recruit local residents to become advocates for the UFMP. The final piece in the Scope of Work for this grant project is the Community Engagement Program we plan to create.

Step Three: Robust Outreach and Education Program - Approximately 24 months and to continue after grant cycle with City funding
The City of Merced has reached out to several local partners who are willing to share resources for this grant project in the form of guidance, outreach and education, and community volunteers. The California Urban Forest Council (CaUFC) along with City staff will take the lead on organizing the two planned education and outreach events (Arbor Day Celebrations) along with a local staff person to help with distribution of educational materials at these events and in our libraries, schools and community centers, and organizing volunteers from Tree Partners Foundation, Merced College, East Merced Resource Conservation District, and the local community.

The City of Merced staff with the California Urban Forests Council and partners will work to increase awareness and community involvement in creating and managing a healthy community tree canopy in the City of Merced through the Invest From the Ground Up program. A local CaUFC staff person will be hired to implement the community engagement plan for the duration of the grant period. Through two planned Arbor Day events, we will be able to reach new individuals and organizations interested in community tree, public health and environmental issues. In the months prior to the events we will identify local partners to assist in building coalitions from elected officials to community members with the intent of sharing educational materials and opportunities and engender ownership in the expansion of a healthy neighborhood forest.

Outreach through media, press releases and the like will be made to reach the public regarding the City of Merced's efforts and the Arbor Day events along with the vital importance of a healthy community forest. The materials will also explain how to maximize the benefits of trees planted through proper care & maintenance. A collaboration of CaUFC with the City and local partners will meet specific local project objectives such as neighborhood outreach and potential trainings, and the event planning and implementation. The tree-planting events help raise awareness as well as mobilize & activate community partners in the planting & care of the urban forest.

Various educational materials will be developed for use in advance of the events to create interest and awareness along with opportunities at the Arbor Day events. These materials include flyers in English and Spanish addressing homeowners and business owners regarding the benefits of trees; tree care brochures; door-hangers; banners, and a new bilingual flyer crafted specifically for the Merced effort and events. Some of these materials will be produced in two separate batches based on the two separate events to keep things relevant. All products developed for this grant (banners, flyers, advertisements, etc.) will bear the logo of both CalFire and California Climate Investments along with acknowledgment of these contributors. All printed materials will be sourced from Greenprinter who uses recycled paper and eco-friendly inks.

Step Four: Early Action Tree Planting - to be planted before March 30, 2020 and on-going

The early action tree planting of 720 street trees will be guided by the results of the tree inventory. Tree species selected may change based on the findings of the inventory in regard to tree species diversity. Tree locations will be based on where the greatest needs are indicated by the tree inventory. The goal of the tree planting will be to provide an equitable distribution of assets to the most needy areas of the community.

All newly planted trees will be included in the tree inventory to facilitate tracking of GHG reporting for the grant. The bulk of the tree planting work will be completed by City staff. The City will also purchase all of the trees and supplies using City general funds. Trees will be purchased from a local supplier and when the opportunity arises the City will purchase trees from Merced College's Horticulture Program. The City hopes to develop a contract-grow partnership with Merced College to help augment the availability of tree species planted in Merced's urban forest.

6D. Project Timeline - Provide a project timeline. Do not list specific dates or months due to uncertainty in when projects may begin. Plan on projects ending no later than March 30, 2020.

Assumes a minimum 30-month grant period: Please see Timeline graph in the Supplemental Sheets

Month 1: Solicitation for Tree Inventory and Software Services - 4 months; Solicitation for Management Plan Services - 4 months

Month 1: Planning begins for Community Engagement Program - approximately 5 month

Month 5: Tree Inventory Data Collection, Software Training for City Staff - 6 - 8 months

Month 5: Begin Management Plan Development (Research and document review, Stakeholder Interviews) - 4 months

Month 6: Arbor Day Celebration Planning and Implementation - 3 months

Month 6: Implementation of Community Engagement Plan - distribution of educational materials, workshops, etc - ongoing

Month 9: Community Meetings for Management Plan - 2 months

Month 9: Early Action Tree Plantings begin - ongoing

Month 19: Arbor Day Celebration Planning and Implementation - 3 months

6E. Tree Information (if applicable) - Provide the following information about any trees or plants to be planted as part of the grant project. Include information even if the trees or plants are not to be funded by CAL FIRE.

Species List - Provide a list of the tree and plant species for this grant project . Include common name, Genus, and species. Include the approximate number of each species to be used. List minimum planting stock size for each species.

Please see the Table provided in Supplemental Sheets

TOTAL TREES TO BE PLANTED = 720. Species may change based on results of tree inventory. All trees to be planted are located in curbside planters along streets.

180 - 15 Gals. Red Maples (*Acer rubrum*); 180 - 15 Gals. Chinese Pistache (*Pistacia chinensis*); 180 - 15 Gals. Autumn Purple Ash (*Fraxinus americana*); 90 - 15 Gals. Red Oak (*Quercus rubra*); 90 - 15 Gals. Sycamore (*Platanus acerifolia* 'Columbia')

Ginkgo biloba, medium size Crape Myrtles, Tulip trees (*Liriodendron tulipifera*), Flowering Pear trees (*Pyrus calleryana*) and Zelkova serrata mixed in with the trees above as requested by property owner or to accommodate planting site conditions.

Total Project Trees:

Total CAL FIRE Funded:

6F. Other deliverables. List all other project deliverables and quantities to be funded by CAL FIRE, as well as overall project totals.

Printed Management Plan with CalFire and CCI logos and acknowledgments.

Completed Tree Inventory/Software

Tree care brochures 1,000 @ \$.40 each

Invest From the Ground Up (Business) - 2-sided English/Spanish 500

Invest From the Ground Up (Residents)- 2-sided English/Spanish 500

Outdoor banners 2

Doorhangers 1000

Buttons - 1.5" 2,000

New Merced Focused Event Flyers- 2-sided English/Spanish 2,000

7. Budget Information

7A. Budget Detail - Provide a specific budget for work to be done. The budget should be based on bid quotes and/or estimates from vendors or on actual costs that will be incurred. The line items listed should be specific enough to adequately describe project expenses. Use the Excel format CAL FIRE has provided for your budget, and follow the guidance in the Procedural Guide. You should note that applicants, if successful in being awarded a grant, will have to follow this budget and will only have the opportunity for minor budget adjustments. The total amount of the project can not be changed later.

7B. Vendor List - List the vendors that have provided you quotes or estimates for this project.

Davey Resource Group - Urban Forest Inventory and Consulting Services & Software Pricing
Boething Treeland - 15-gallon size trees prices
Horizon Irrigation - stakes, ties, mulch
Merced College - 15-gallon size trees
Greenprinter - brochures, flyers, banners, doorhangers
In-house Audit - equipment use costs, staff salaries and benefits

7C. Explanation of Budget and Costs - Describe the basis for the budget amounts listed above. Applicants will be expected to adhere to this budget (*Continued on next page*).

All of the budgeted items are detailed in the Budget document in the Supplemental Sheets. Estimates for all supplies and contract services are based on vendor quotes or current supplier pricing. Tree planting estimates are based on experience within the City staff.

Amount requested: \$475,000

Contractual: This budget amount includes a complete inventory of the public trees (approximately 85,000 street and park trees), tree ordinance and tree policy and contract review and creation of an Urban Forest Management Plan for the City of Merced (includes stakeholder outreach and community meetings). This will include published soft and hard copies of the Urban Forest Management Plan and distribution to community centers, city facilities and libraries. The costs also include the software and equipment required to keep the tree inventory up-to-date, and the staff training for equipment and software.

Education and Outreach: Funding is requested for assistance from the California Urban Forests Council to develop an Invest from the Ground Up model for the City of Merced. Funds will offset the administrative and hard costs (printing, facility rental, etc.) for the partnering non-profit organizations to provide outreach/education to the community, and organizing volunteers for community tree plantings. CaUFC plans to hire a local staff person to manage the day-to-day activities involved in volunteer coordination, event planning and implementation. Collateral from this effort will include brochures, flyers, doorhangers, banners, and other printer educational materials.

Matched Funds: \$154,800 The current budget shows a 39% match.

Personnel: The city Information Technology Department (ITD) is committed to providing staff time for tree inventory data integration into the City GIS system, development of tree report computer applications, and software training to PW staff for inventory use. The City Department of Public Works (PW) staff time will be used for inventory data analysis and review of all ordinances, documents, procedures and policies that relate to the management of the Community Forest. PW staff time is included to perform field verification of inventory, mapping or other issues identified during the community outreach, analysis or review portions of the plan development. Staff time is included for working with the community for the development of the Urban Forest Management Plan and planting/maintenance of 720 trees throughout the City as part of the early action planting requirement. City personnel will be used to install the 720 trees. Staff time is committed for publishing and distribution of the final Urban Forest Management Plan.

Supplies: PW will purchase trees and supplies required to plant and maintain 720 trees for this grant project. All city departments are committed to the supplies required for publishing of the final Urban Forest Management Plan, providing transportation for staff to attend community outreach events, coordination meetings and field verifications. Indirect: The city is committed to providing facilities and electronic devices for communicating (e.g., emails, websites, social media, etc.) recaps and updates for the public.

Equipment: This budget item covers the vehicles & equipment required to plant 720 trees, provide for communication and other necessary field devices. The city will provide vehicles for transportation of staff to attend community outreach events, coordination meetings and field verifications.

7D. Matching Funds - List other non-GGRF funding sources, that will meet grant matching requirements.

Source 1	City of Merced	Amount	\$309,642.00
Description	Staff, Supplies, Equipment, Travel (details listed in budget document)		
Source 2		Amount	
Description			
Source 3		Amount	
Description			
Source 4		Amount	
Description			
Matching funds comments			

8. Project Co-Benefits - What co-benefits will the project have? Check the boxes below for the applicable co-benefits, then describe and/or quantify them. Describe how the project will achieve the co-benefits.

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Stormwater reduction | <input checked="" type="checkbox"/> Improved public health | <input type="checkbox"/> Jobs created |
| <input checked="" type="checkbox"/> Improved water quality | <input type="checkbox"/> Enhanced active transportation | <input type="checkbox"/> Job training conducted |
| <input checked="" type="checkbox"/> Improved air quality | <input type="checkbox"/> Reduced vehicle miles travelled | <input checked="" type="checkbox"/> Community outreach conducted |
| <input checked="" type="checkbox"/> Energy savings | <input type="checkbox"/> Vacant lot(s) acquired | <input checked="" type="checkbox"/> Education tools/media produced |
| <input type="checkbox"/> Biomass diverted from landfill | <input checked="" type="checkbox"/> Improved urban forest management | <input type="checkbox"/> Other co-benefits |

The majority of the 720 trees planted will be located in street tree planting sites. The close proximity of the street trees to the homes in Merced will provide shade and cooling co-benefits. The climate in Merced can often lead to triple digit temperatures during the summer months. The shade from the trees allows for a more comfortable environment for the residents of this city, especially the elderly, the very young and the infirm.

According to the American Lung Association, the Modesto/Merced area is the 4th most polluted (by short- and long-term particle matter pollution or PM2.5) city/area in the United States. As roadside street tree plantings, these planting will provide a co-benefit by capturing pollutants and improving air quality.

Rainfall interception is a co-benefit that includes stormwater capture, reducing the velocity of stormwater and potential erosion, and rainwater storage in the crown. Groundwater recharge is made more possible by allowing the water to slowly penetrate into the soil.

The co-benefits of trees to neighborhoods with tree-lined streets include improved mental and physical health, reduced crime and increased property value. These benefits are vital to a city where foreclosure rates and suicide rates are among the highest in California.

This project will provide the City of Merced the opportunity to develop a new culture in regard to the way its citizens view trees. The education and outreach that will be completed as a part of this grant will open many opportunities to partner with the community, the community organizations, schools and youth. The co-benefit of this project is building a sense of community and a sense of place for the community.

8. Project Co-Benefits - continued from previous page.

Possibly the most valuable co-benefit of this grant project is the opportunity to develop the help and support from the community and local organizations. A new administration is developing in the City of Merced. This grant opportunity provides the resources and advocates to promote urban forestry and to educate the newly elected and newly hired City staff. This collaborative effort will help to open doors and new windows of opportunity to accomplish all the goals set by the urban forest management plan.

The City of Merced has not had a complete tree inventory. As such, the ability for long term planning and care of the urban forest has suffered. With the completion of the tree inventory, the tree managers in the City of Merced will have tools available to make better, more cost-effective tree management decisions that benefit the entire community. The analysis of the tree inventory data and the creation of an Urban Forest Management Plan will allow City leaders the opportunity to better understand the irreplaceable value of the urban forest and help justify a larger investment into the ongoing care and management of this valuable community asset.

In general, the many co-benefits of this grant project will result in substantially improved care and planning around the urban forest and as a result will improve the quality of the environment and the quality of life for the citizens of Merced.

9. Certifications & Forms- The following certifications must be filled out and signed by the appropriate person.

9A. Certification of Party Responsible For Maintenance

I, Appropriate representative KEN ELWIN, P.E., PUBLIC WORKS DIRECTOR

certify that the Appropriate agency CITY OF MERCED

will provide or be responsible for 100% of the maintenance for a minimum of 3 years after the end of the grant period in accordance with ANSI A-300 tree care standards, the accompanying ISA Best Management Practices and the standards outlined in the grant agreement and/or grant attachments with the California Department of Forestry and Fire Protection.

Signature Ken Elwin

Date 4/19/17

Title PUBLIC WORKS DIRECTOR

Phone Number 209 385 6800

9B. Statement of Compliance With All Applicable Laws (all projects must fill out and sign)

I, Appropriate representative KEN ELWIN, P.E., PUBLIC WORKS DIRECTOR

certify that the Appropriate agency CITY OF MERCED

will abide by all applicable federal, state, and local laws, ordinances, regulations and policies in carrying out this State bond-funded project. Failure to do so will lead to cancellation of the grant award.

Signature Ken Elwin

Date 4/19/17

Title PUBLIC WORKS DIRECTOR

Phone Number 209-385 6800

9C. Recycling Certification (all projects must fill out and sign) - This certification applies to all state contracts and, to the extent feasible, all federally funded contracts.

Contractor certifies under penalty of perjury that percent of the minimum, if not exact, percentage of recycled content, both post consumer waste and secondary waste as defined in the Public Contract Code, Sections 12616 and 12200, in materials, goods, or supplies offered or products used in performance of this Agreement, regardless of whether the product meets the required recycled product percentages defined in the Public Contract Code, Sections 12161 and 12200. Contractor may certify that the product contains zero recycled content. (PCC 10233, 10308.5, 10354)

Signature 

Date 4/19/17

Title PUBLIC WORKS DIRECTOR

Phone Number 209 385 6800

9D. Checklist of Necessary Forms To Be Completed. Some may not be applicable to your project.

- | | |
|---|---|
| <input checked="" type="checkbox"/> CAL FIRE Urban Forestry Program Environmental Checklist | <input checked="" type="checkbox"/> State of California Non-Discrimination Compliance (Std. 19) |
| <input checked="" type="checkbox"/> Proof of CalEnviroScreen 2.0 community designation. | <input checked="" type="checkbox"/> State of California Drug-Free Workplace Certification (Std. 21) |
| <input checked="" type="checkbox"/> Governing Body Resolution (must follow sample format) | <input checked="" type="checkbox"/> State of California Payee Data Record (Std. 204) |
| <input checked="" type="checkbox"/> Representative project area maps with DAC information. | <input checked="" type="checkbox"/> Signed letters of participation from listed partners. |
| <input type="checkbox"/> Project sign schematic (including CAL FIRE and CCI logos) | <input checked="" type="checkbox"/> Urban and Community Forestry Project Budget |
| <input type="checkbox"/> 5-10 representative site photos | <input checked="" type="checkbox"/> UTCC runs for assumptions used, ARB Calculator filled in. |

☒ Other:

List other attachments:

Timeline for grant project.

SIGNATURE: The authorized primary project contact for the applying organization must sign below. This must be the person, or person holding the position, that is mentioned in the required governing body resolution, and the same person or position signing all of the other required forms. The signature indicates that, to the best of the signer's knowledge, all of the information provided in this application and all attached required forms and documents is accurate and correct. The signer additionally acknowledges that they have read and understand the grant program RFP and the Procedural Guide common to all of the CAL FIRE Urban & Community Forestry grant programs.

Signature 

Printed Name KEN ELWIN

Title PUBLIC WORKS DIRECTOR Date 4/19/17

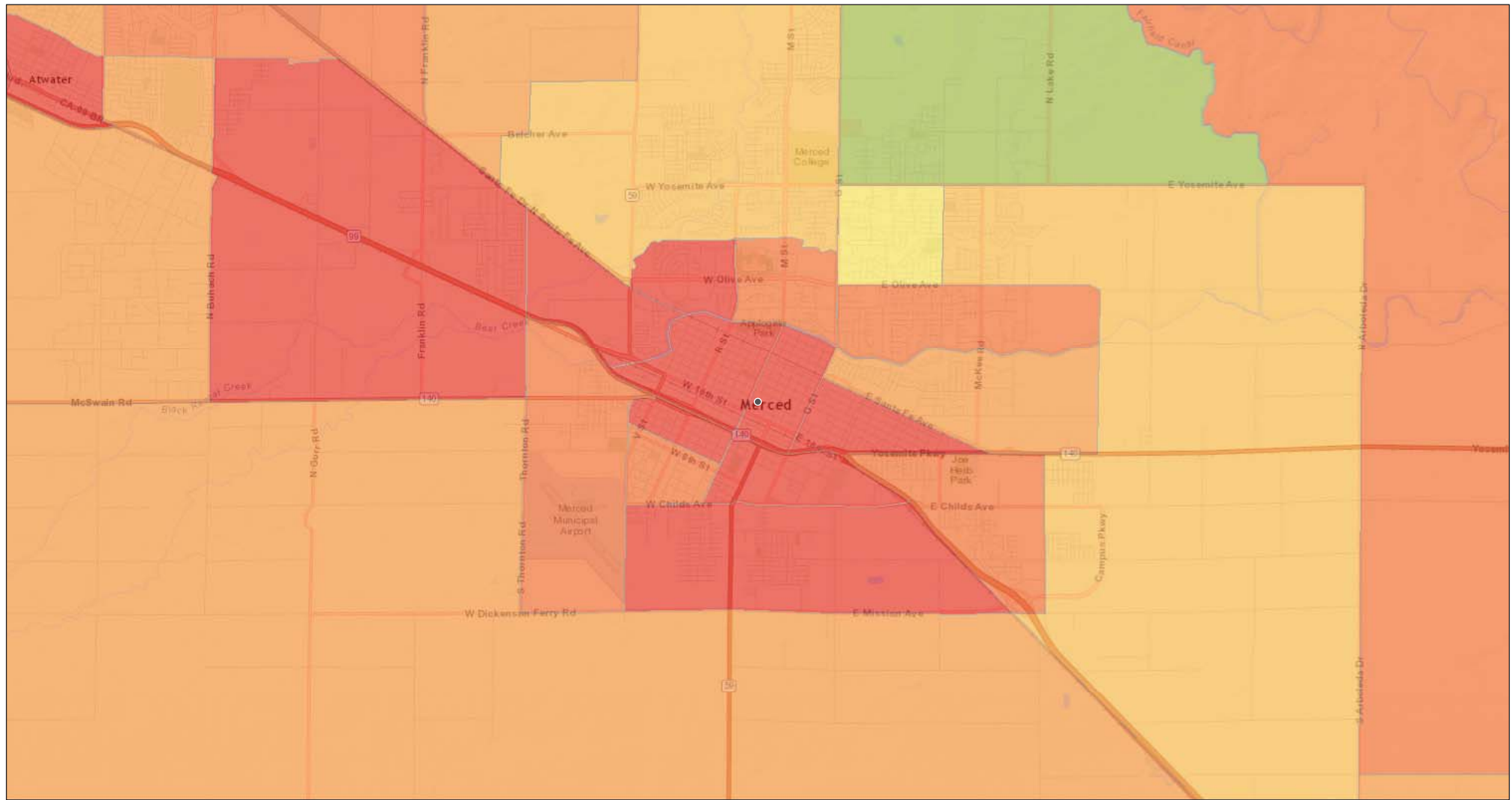
Please fill out this form completely. Be sure to save a copy of this form for your records. Submit one (1) electronic copy in the fillable PDF format with all supporting materials to CALFIRE.Grants@fire.ca.gov. Please use "U&CF GGRF Project Application" in the E-mail subject line and include yourself as a cc. Your CC will be proof of your submittal. In addition, submit one (1) hard copy with signatures and all supporting materials to : California Department of Forestry and Fire Protection, Attention: Grants Management Unit/Urban and Community Forestry Greenhouse Gas Reduction Fund Grant, P.O. Box 944246, Sacramento, CA 94244-2460. Both hard copy and electronic copy must be postmarked no later than the due date in the invitation letter you received. If you would like to mail the hard copy via expedited/overnight mail, please E-mail CALFIRE.Grants@fire.ca.gov for the physical mailing address.

CAL FIRE Urban & Community Forestry Program GHG Reduction Grants

CAL ENVIROSCREEN 2.0 CENSUS TRACT LISTINGS FOR THE CITY OF MERCED

Census Tract	CalEnviroScreen 2.0 Score	CalEnviroScreen 2.0 Percentile Range	Pollution Burden Perentile	Population Characteristics Percentile	Total Population	ZIP code census tract falls within	Nearby City (to help approximate location only)
6047001005	63.31	96-100% (highest scores)	97	92	2406	95348	Merced
6047001302	58.25	96-100% (highest scores)	82	99	3264	95340	Merced
6047001401	55.23	96-100% (highest scores)	87	94	3953	95340	Merced
6047001301	53.82	96-100% (highest scores)	92	86	3213	95340	Merced
6047001502	50.58	91-95%	85	87	2822	95341	Merced
6047001601	49.96	91-95%	90	81	4498	95341	Merced
6047001602	49.23	91-95%	86	84	7243	95341	Merced
6047000902	49.18	91-95%	93	76	8419	95341	Merced
6047001003	47.96	91-95%	69	95	4061	95348	Merced
6047001901	44.47	86-90%	59	95	5739	95340	Merced
6047001200	44.05	86-90%	79	79	5023	95340	Merced
6047001700	43.15	81-85%	82	74	6335	95341	Merced
6047001501	42.70	81-85%	89	66	2693	95341	Merced
6047001503	41.99	81-85%	62	88	4438	95341	Merced
6047001004	41.00	81-85%	65	84	3968	95348	Merced
6047000901	39.58	76-80%	91	57	3970	95341	Merced
6047001402	38.64	76-80%	72	72	4277	95340	Merced

City of Merced Disadvantaged Communities



April 11, 2017

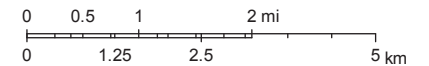
CalEnviroScreen 2.0 results

Highest Scores (91 - 100%)

- 11 - 20%
- 51 - 60%
- 61 - 70%
- 71 - 80%
- 81 - 90%

MERCED 16-GHG-UF-01-MGMT-015

1:72,224



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

CALENVIROSCREEN 2.0 POLLUTION CENSUS TRACTS FOR THE CITY OF MERCED

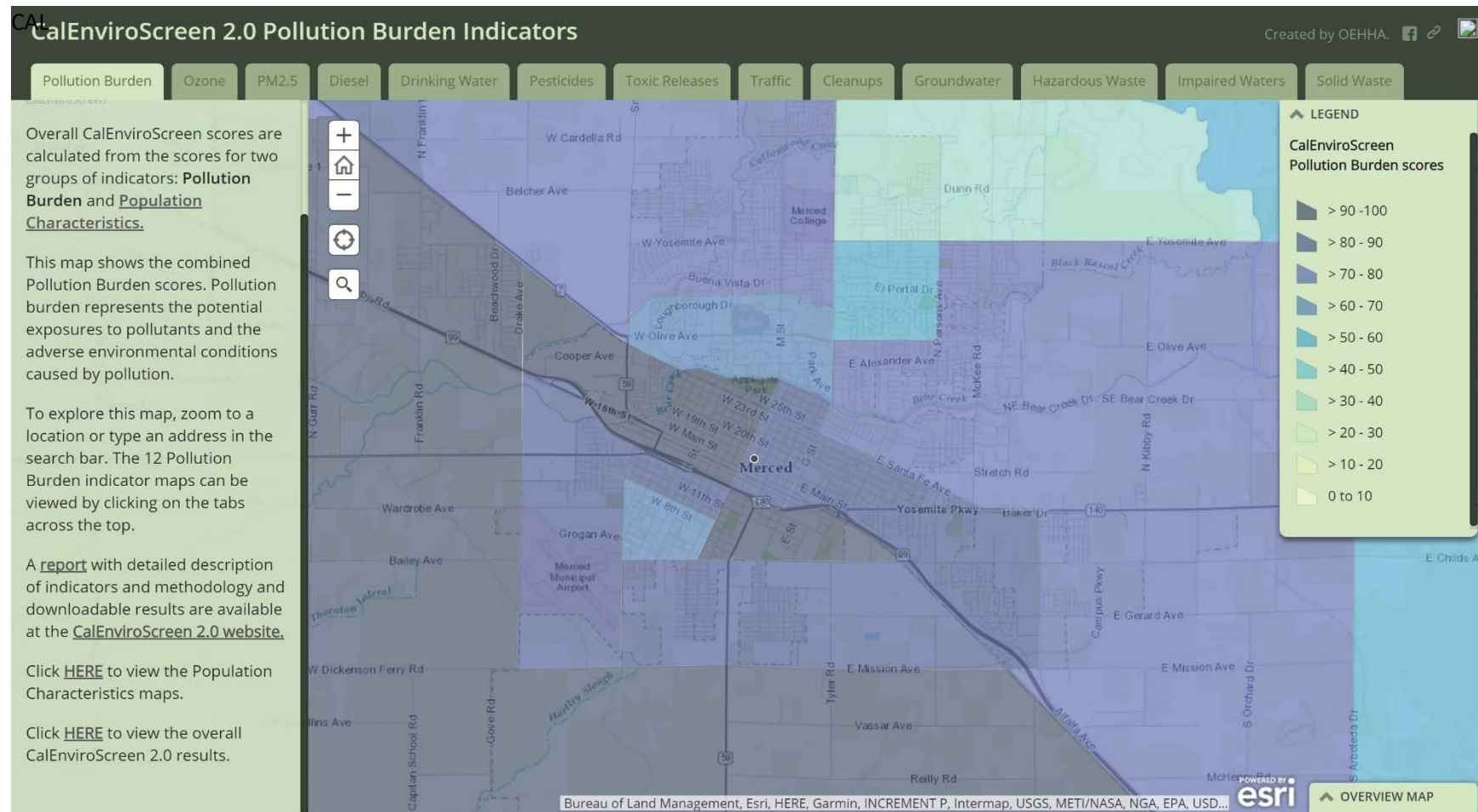
MERCED 16-GHG-UF-01-MGMT-015

Census Tract	CalEnv 2.0 Score	CalEnv 2.0 Pctl Range	Ozone Pctl	PM2.5 Pctl	Diesel PM Pctl	Drinking Water Pctl	Pesticide Pctl	Tox. Release Pctl	Traffic Pctl	Cleanup Sites Pctl	Ground water Threats Pctl	Haz. Waste Pctl	Imp. Water Pctl	Solid Waste Pctl	Pollution Burden Pctl
6047001005	63.31	96-100% (highest scores)	73.04	65.47	85.76	68.12	76.94	52.97	88.90	44.76	71.36	78.97	29.43	0	97.14
6047001302	58.25	96-100% (highest scores)	74.01	65.82	94.14	0.00	60.71295	37.93	46.26	62.50	97.22	44.99	29.43	23.19	81.93
6047001401	55.23	96-100% (highest scores)	74.43	65.96	92.11	25.01	51.88	32.91	86.86	19.71	86.67	8.91	29.43	58.45	86.58
6047001301	53.82	96-100% (highest scores)	73.57	65.81	93.39	44.57	65.76	43.16	46.26	74.25	96.21	62.07	29.43	0	91.82
6047001502	50.58	91-95%	73.44	65.92	92.29	0.00	65.20005	59.26	46.26	72.89	88.58	50.42	29.43	0	85.10
6047001601	49.96	91-95%	74.11	66.08	70.83	0.00	57.13573	46.85	86.18	72.16	91.89	50.42	29.43	58.45	90.18
6047001602	49.23	91-95%	73.92	66.30	61.55	74.59	47.44	18.96	89.30	32.78	84.19	49.14	0	23.19	85.79
6047000902	49.18	91-95%	72.16	65.16	65.74	88.24	55.88	40.61	92.20	68.82	66.38	0	29.43	12.75	92.58
6047001003	47.96	91-95%	73.42	65.40	93.07	0.00	60.88745	42.25	46.26	26.89	27.63	63.13	29.43	0	69.28
6047001901	44.47	86-90%	71.97	61.86	6.30	73.03	17.72	1.60	83.95	17.28	55.59	0	55.50	75.96	59.24
6047001200	44.05	86-90%	74.51	65.38	66.14	88.01	35.83	11.77	88.36	0	79.47	23.25	29.43	0	79.33
6047001700	43.15	81-85%	75.10	66.21	58.04	72.90	37.39	29.80	87.30	0	60.30	39.19	29.43	37.88	82.48
6047001501	42.70	81-85%	72.77	65.97	58.06	71.17	64.19	34.85	81.00	44.76	58.79	63.81	29.43	0	89.31
6047001503	41.99	81-85%	73.29	66.01	63.84	25.91	62.97	7.81	46.26	43.07	67.81	29.03	29.43	0	62.34
6047001004	41.00	81-85%	73.85	65.41	94.14	0.00	56.23831	44.53	46.26	0	85.88	0	29.43	0	64.60
6047000901	39.58	76-80%	68.16	64.77	12.36	92.29	26.57	14.63	95.42	64.78	94.45	14.29	92.82	99.41	90.89
6047001402	38.64	76-80%	74.76	65.80	52.50	85.59	36.76	7.27	88.07	0	81.84	0	29.43	0	72.40

CITY OF MERCED POPULATION STATISTICS FROM CALENVIROSCREEN 2.0

MERCED 16-GHG-UF-01-MGMT-015

Census Tract	Total Pop.	CalEnviro 2.0 Score	CalEnviroScreen 2.0 Percentile Range	Age	Age Pctl	Asthma Pctl	Low Birth Weight Pctl	Education Pctl	Linguistic Isolation Pctl	Poverty Pctl	Unempl oymment Pctl	Pop. Char. Score	Pop. Char. Pctl
6047001005	2406	63.31	96-100% (highest scores)	26.8	70.9	85.1	71.3	83.0	63.2	90.3	72.3	8.0	92.1
6047001302	3264	58.25	96-100% (highest scores)	27.2	74.1	98.9	88.6	80.2	66.6	98.6	98.8	9.0	99.0
6047001401	3953	55.23	96-100% (highest scores)	26.0	63.9	99.1	65.4	76.2	55.3	93.7	95.8	8.2	93.7
6047001301	3213	53.82	96-100% (highest scores)	28.3	80.9	98.9	88.4	67.9	41.8	66.8	59.5	7.5	86.4
6047001502	2822	50.58	91-95%	27.5	76.3	0.0	55.4	97.8	84.4	98.4	98.3	7.6	87.4
6047001601	4498	49.96	91-95%	27.4	75.4	0.0	11.1	99.6	99.3	99.5	92.4	7.1	80.6
6047001602	7243	49.23	91-95%	26.8	70.9	0.0	76.8	91.7	75.2	95.9	83.0	7.3	84.0
6047000902	8419	49.18	91-95%	26.3	66.8	80.6	42.6	74.5	54.2	61.2	76.5	6.8	76.0
6047001003	4061	47.96	91-95%	27.6	76.9	84.4	80.8	72.4	43.5	99.0	99.6	8.3	94.8
6047001901	5739	44.47	86-90%	27.2	74.1	92.0	30.4	95.9	89.7	86.2	92.4	8.3	95.2
6047001200	5023	44.05	86-90%	31.3	92.0	99.1	98.7	49.6	26.2	51.5	51.7	7.0	78.7
6047001700	6335	43.15	81-85%	29.7	87.4	2.2	39.5	74.4	67.6	88.2	87.1	6.6	73.8
6047001501	2693	42.70	81-85%	25.2	54.9	6.7	57.2	80.5	37.9	83.9	91.4	6.1	66.1
6047001503	4438	41.99	81-85%	30.0	88.4	0.0	55.3	97.3	91.0	99.3	83.3	7.6	88.2
6047001004	3968	41.00	81-85%	31.7	93.0	88.3	60.9	66.0	52.7	83.7	49.4	7.3	84.2
6047000901	3970	39.58	76-80%	22.6	26.2	21.6	29.4	80.6	80.7	74.8	61.8	5.6	57.1
6047001402	4277	38.64	76-80%	27.2	74.1	99.1	23.7	64.3	42.7	73.5	60.0	6.5	71.8



Greenhouse Gas Reduction Fund - Urban and Community Forestry Program
Budget Proposal

CITY OF MERCED

MERCED 16-GHG-UF-01-MGMT-015

CAL FIRE Grant					
Budget Item	Description	Cost Basis	Share	Grantee Match	Total
A. Salaries and Wages				44,970.00	44,970.00
	Urban Forestry Supervisor	125 hours x \$30/hour		3750.00	3,750.00
	Tree Trimmer	300 hours x \$27/hour		8100.00	8,100.00
	Park Worker 2	720 hours x \$23/hour		16560.00	16,560.00
	Park Worker 2	720 hours x \$23/hour		16560.00	16,560.00
B. Employee Benefits				19,625.00	19,625.00
	PW Supervisor - Parks & Trees	125 hours x \$13/hour		1,625.00	1,625.00
	Tree Trimmer	300 hrs x \$12/hr		3,600.00	3,600.00
	Park Worker 2	720 hrs x \$10/hr		7,200.00	7,200.00
	Park Worker 2	720 hours x \$10/hour		7,200.00	7,200.00
C. Contractual			447,750.00		447,750.00
	Tree Inventory	Quote from vendor	340,000.00		340,000.00
	Inventory Software	Quote from vendor	7,750.00		7,750.00
	Staff Software Training	Quote from vendor	5,000.00		5,000.00
	Management Plan	Quote from vendor	95,000.00		95,000.00
D. Travel			-	806.40	806.40
	Mileage	1440 miles x \$0.56/mile		806.40	806.40
					-
					-
					-
E. Supplies			2,250.00	82,192.80	84,442.80
	Trees	720 #15 trees @ \$95/tree		68,400.00	68,400.00
	Tree Stakes	1,440 @ \$3.70/tree		5,328.00	5,328.00
	Tree Ties	1,440 @ \$0.67/tree		964.80	964.80
	Mulch	500 Yds. @ \$15/Yd.		7,500.00	7,500.00
	Tablets for Inventory	3 @ \$750 each	2,250.00		2,250.00
F. Equipment			-	162,048.00	162,048.00
	Dump Truck	1600 hours @ \$33.00/hr		52,800.00	52,800.00
	Backhoe	1600 hours @ \$46.78/hr		74,848.00	74,848.00
	Half-ton Pick Up	1600 hours @ \$14.50/hr		23,200.00	
	Trailer	1600 hours @ \$7.00/hr		11,200.00	
G. Outreach/Education			25,000.00		25,000.00
	Tree care brochures	1,000 @ \$.40 each	\$400.00		400.00
	Invest From the Ground Up (Business) - 2-sided English/Spanish	500 @ \$.43 each	\$215.00		215.00
	Invest From the Ground Up (Residents)- 2-sided English/Spanish	500 @ \$.43 each	\$215.00		215.00
	Outdoor banners	2 @ \$112.50	225.00		225.00
	Doorhangers	1000 @ \$.60	\$600.00		600.00
	Buttons - 1.5"	2,000 @ \$.32	\$640.00		640.00
	New Merced Focused Event				
	Flyers- 2-sided English/Spanish	2,000 @ \$.33 each	\$660.00		660.00
		Local staff person to be hired to implement Community			
	California Urban Forests Council planning & organizing two Arbor	Engagement plan in addition to admin services from			
	Day events	CaUFC and other partners.	\$22,045.00		22,045.00
H. Other			-	-	-
					-
					-
					-
TOTAL DIRECT COSTS			475,000.00	309,642.20	784,642.20
INDIRECT COSTS			0%	-	-
TOTAL PROJECT COSTS			475,000.00	309,642.20	784,642.20
LESS Program Income			-	-	-
TOTAL GRANT PROPOSED COSTS			475,000.00	309,642.20	784,642.20
			61%	39%	100%

Table E-5 Merced 16-GHG-UF-01-MGMT-015

[illegible]

Table E8/11. Merced 16-GHG-UF-01-MGMT-015

Summary of Carbon Calculator Results (annual)

Tree ID	Species code	Energy reductions		Emission reductions (CO2 equivalents)			CO2 Sequestration	Total CO2 Stored	Above ground biomass (dry weight)
		Cooling (kWh/tree)	Heating (MBtu/tree)	Cooling (kg/tree)	Heating (kg/tree)	Cooling + Heating (kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)
1	ACSA1						446.6	9853.1	4188.2
2	FRPE_M						14.7	1280.1	544.1
3	PICH						37.3	1183.7	503.2
4	PLAC						44.0	1946.3	827.3
Total		0	0.000	0	0	0	543	14,263	6,063

MERCED 16-GHG-UF-01-MGMT-015



CUFR Tree Carbon Calculator

Developed by the Center for Urban Forest Research
Pacific Southwest Research Station
US Forest Service

In partnership with the California Department of
Forestry and Fire Protection



Figure 1

Project Data entry

Data name	Data entry	Units	Description
Flag1	0		Tree age selected
Flag2	1		Shade & climate selected
Climate Zone	4 (Central Valley)		Central Valley
Electricity CO2 emissions factor\$	395	(kg/MWh)	
Electricity CH4 emissions factor\$	0.0030	(kg/MWh)	
Electricity N2O emissions factor\$	0.0017	(kg/MWh)	

\$required for energy project

Help Commands

Figures 6 & 9

Tree and Building Data entry

Enter Tree data below one tree at a time, then record results

Data name	Data entry	Units	Description
Species code and scientific name	ACSA1 (Acer saccharinum)		silver maple
Age (years)	43	Age (years)	31.9 in DBH & 69.2 ft high
Tree azimuth	7		W
Tree distance class	2		Near
Building vintage	2		1950-80
air conditioning equip.	1		Central air/heat pump
Heating equip.	1		natural gas
Heating emissions factor- CO2\$	53.1	(kg/MBtu)	
Heating emissions factor CH4\$	0.0059	(kg/MBtu)	
Heating emissions factor N2O\$	0.0001	(kg/MBtu)	

Figures 7-10

Carbon Calculator Results (annual)

Energy reductions		Emission reductions (CO ₂ equivalents)			CO ₂ Sequestration	Total CO ₂ Stored	Above ground biomass
Cooling kWh/tree	Heating MBtu/tree	Cooling (kg/tree)	Heating (kg/tree)	Cooling + Heating (kg/tree)	(A value of 0.0 indicates no tree growth) (kg/tree)	(kg/tree)	(dry weight) (kg/tree)
837.95	0.252	331.5	13.4	344.9	446.6	9853.1	4188.2
kWh/tree	GJ/tree	lb/tree	lb/tree	lb/tree	(lb/tree/year)	(lb/tree)	(lb/tree)
837.95	0.266	730.8	29.6	760.4	984.6	21,722.4	9,233.5

MERCED 16-GHG-UF-01-MGMT-015



CUFR Tree Carbon Calculator

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Figure 1

Project Data entry

Data name	Data entry	Units	Description
Flag1	0		Tree age selected
Flag2	1		Shade & climate selected
Climate Zone	4 (Central Valley)		Central Valley
Electricity CO2 emissions factor\$	395	(kg/MWh)	
Electricity CH4 emissions factor\$	0.0030	(kg/MWh)	
Electricity N2O emissions factor\$	0.0017	(kg/MWh)	

\$required for energy project

Help Commands

Figures 6 & 9

Tree and Building Data entry

Enter Tree data below one tree at a time, then record results

Data name	Data entry	Units	Description
Species code and scientific name	PICH (Pistacia chinensis)		chinese pistache
Age (years)	43	Age (years)	15.7 in DBH & 41.3 ft high
Tree azimuth	7		W
Tree distance class	2		Near
Building vintage	2		1950-80
air conditioning equip.	1		Central air/heat pump
Heating equip.	1		natural gas
Heating emissions factor- CO2\$	53.1	(kg/MBtu)	
Heating emissions factor CH4\$	0.0059	(kg/MBtu)	
Heating emissions factor N2O\$	0.0001	(kg/MBtu)	

Figures 7-10

Carbon Calculator Results (annual)

Energy reductions		Emission reductions (CO ₂ equivalents)			CO ₂ Sequestration	Total CO ₂ Stored	Above ground biomass
Cooling kWh/tree	Heating MBtu/tree	Cooling (kg/tree)	Heating (kg/tree)	Cooling + Heating (kg/tree)	(A value of 0.0 indicates no tree growth) (kg/tree)	(kg/tree)	(dry weight) (kg/tree)
554.39	0.221	219.3	11.8	231.1	37.3	1183.7	503.2
kWh/tree	GJ/tree	lb/tree	lb/tree	lb/tree	(lb/tree/year)	(lb/tree)	(lb/tree)
554.39	0.233	483.5	25.9	509.4	82.3	2,609.7	1,109.3

MERCED 16-GHG-UF-01-MGMT-015



CUFR Tree Carbon Calculator

Developed by the Center for Urban Forest Research
Pacific Southwest Research Station
US Forest Service

In partnership with the California Department of
Forestry and Fire Protection



Figure 1

Project Data entry

Data name	Data entry	Units	Description
Flag1	0		Tree age selected
Flag2	1		Shade & climate selected
Climate Zone	4 (Central Valley)		Central Valley
Electricity CO2 emissions factor§	395	(kg/MWh)	
Electricity CH4 emissions factor§	0.0030	(kg/MWh)	
Electricity N2O emissions factor§	0.0017	(kg/MWh)	
§required for energy project			

Help Commands

Figures 6 & 9

Tree and Building Data entry

Enter Tree data below one tree at a time, then record results

Data name	Data entry	Units	Description
Species code and scientific name	PLAC (Platanus hybrida)		london planetree
Age (years)	43	Age (years)	19.0 in DBH & 50.5 ft high
Tree azimuth	7		W
Tree distance class	2		Near
Building vintage	3		post-1980
air conditioning equip.	1		Central air/heat pump
Heating equip.	1		natural gas
Heating emissions factor- CO2§	53.1	(kg/MBtu)	
Heating emissions factor CH4§	0.0059	(kg/MBtu)	
Heating emissions factor N2O§	0.0001	(kg/MBtu)	

Figures 7-10

Carbon Calculator Results (annual)

Energy reductions		Emission reductions (CO2 equivalents)			CO2 Sequestration	Total CO2 Stored	Above ground biomass
Cooling kWh/tree	Heating MBtu/tree	Cooling (kg/tree)	Heating (kg/tree)	Cooling + Heating (kg/tree)	(A value of 0.0 indicates no tree growth) (kg/tree)	(kg/tree)	(dry weight) (kg/tree)
424.92	0.026	168.1	1.4	169.4	44.0	1946.3	827.3
kWh/tree	GJ/tree	lb/tree	lb/tree	lb/tree	(lb/tree/year)	(lb/tree)	(lb/tree)
424.92	0.027	370.6	3.0	373.6	96.9	4,290.9	1,823.9

MERCED 16-GHG-UF-01-MGMT-015



CUFR Tree Carbon Calculator

Developed by the Center for Urban Forest Research
Pacific Southwest Research Station
US Forest Service

In partnership with the California Department of
Forestry and Fire Protection



Figure 1

Project Data entry

Data name	Data entry	Units	Description
Flag1	0		Tree age selected
Flag2	1		Shade & climate selected
Climate Zone	4 (Central Valley)		Central Valley
Electricity CO2 emissions factor\$	395	(kg/MWh)	
Electricity CH4 emissions factor\$	0.0030	(kg/MWh)	
Electricity N2O emissions factor\$	0.0017	(kg/MWh)	

\$required for energy project

Help Commands

Figures 6 & 9

Tree and Building Data entry

Enter Tree data below one tree at a time, then record results

Data name	Data entry	Units	Description
Species code and scientific name	FRPE (Fraxinus pennsylvanica)		green ash
Age (years)	43	Age (years)	12.3 in DBH & 31.4 ft high
Tree azimuth	7		W
Tree distance class	2		Near
Building vintage	2		1950-80
air conditioning equip.	1		Central air/heat pump
Heating equip.	1		natural gas
Heating emissions factor- CO2\$	53.1	(kg/MBtu)	
Heating emissions factor CH4\$	0.0059	(kg/MBtu)	
Heating emissions factor N2O\$	0.0001	(kg/MBtu)	

Figures 7-10

Carbon Calculator Results (annual)

Energy reductions		Emission reductions (CO ₂ equivalents)			CO ₂ Sequestration	Total CO ₂ Stored	Above ground biomass
Cooling kWh/tree	Heating MBtu/tree	Cooling (kg/tree)	Heating (kg/tree)	Cooling + Heating (kg/tree)	(A value of 0.0 indicates no tree growth) (kg/tree)	(kg/tree)	(dry weight) (kg/tree)
354.90	0.204	140.4	10.9	151.3	14.7	1280.1	544.1
kWh/tree	GJ/tree	lb/tree	lb/tree	lb/tree	(lb/tree/year)	(lb/tree)	(lb/tree)
354.90	0.215	309.5	23.9	333.5	32.5	2,822.0	1,199.6



**California Air Resources Board and
California Department of Forestry & Fire Protection**

**Greenhouse Gas Calculator Tool
Urban and Community Forestry Program
Greenhouse Gas Reduction Fund
Fiscal Year 2016-2017**

Version 2 - December 8, 2016



Project Name:	City of Merced
Grant ID, if applicable:	16-GHG-UF-01-MGMT-015

GHG Summary Worksheet

GHG Benefit of Carbon Stored in Live Project Trees Estimated Using the CTCC (MT CO ₂ e)	3,181
GHG Benefit of Carbon Stored in Live Project Trees Estimated Using i-Tree Streets (MT CO ₂ e)	0
GHG Benefit from Energy Savings Estimated Using the CTCC (MT CO ₂ e)	2,649
GHG Benefit from Energy Savings Estimated Using i-Tree Streets (MT CO ₂ e)	0
GHG Benefit of Carbon Stored in Wood Products (MT CO ₂ e)	0
GHG Benefit from Utilizing Biomass for Energy Generation (MT CO ₂ e)	0
GHG Benefit from Preventing the Landfilling of Biomass (MT CO ₂ e)	0
GHG Emissions from Project Implementation (MT CO ₂ e)	291

Net GHG Benefit (MT CO ₂ e)	5,538
UCF GGRF Funds Requested (\$)	475000
Total GGRF Funds Requested (\$)	475000
Net GHG Benefit/UCF GGRF Funds Requested (MT CO ₂ e/\$)	0.011658274
Net GHG Benefit/Total GGRF Funds Requested (MT CO ₂ e/\$)	0.011658274

City of Merced 720 Tree Planting UTCC GHG Calculation Summary

MERCED 16-GHG-UF-01-MGMT-015

		# trees	planting age	Total CO2 reduced per tree over 40 years (kg)		Total CO2 reduced over 40 years (t)	Total CO2 stored over 40 years (t)
Model species							
BDL	Acer saccharinum	270	3	6,230.5	9,406.5	1,682.2	2,539.8
BDL	Fraxinus pennsylvanica	180	1	3,499.1	9,235.0	629.8	1,662.3
BDL	Platanus hybrida	90	1	22.1	1,813.6	2.0	163.2
BDM	Chinese pistache	180	2	-135.6	1,109.2	-24.4	199.7
Total		720				2,289.7	4,564.9

		# trees	planting age	Total kWh reduced per tree over 40 years		Total MWh reduced per tree over 40 years
Model species						
BDL	Acer saccharinum	270	3	16,364.2		4,418.3
BDL	Frax. pennsylvanica	180	1	8,654.1		1,557.7
BDL	Platanus hybrida	90	1	11,619.2		1,045.7
BDL	Pistacia chinensis	180	2	11,017.2		1,983.1
Total		720				9,004.9

		# trees	planting age	Total MBtu reduced per tree over 40 years		Total therms reduced per tree over 40 years
Model species						
BDL	Acer saccharinum	270	3	-4.6		-1.9
BDL	Frax. Pennsylvanica	180	1	1.4		3.2
BDL	Platanus hybrida	90	1	0.4		1.3
BDM	Pistacia chinensis	180	2	-2.6		-0.8
Total		720				1.9

CITY OF MERCED CALFIRE GRANT INVENTORY GHG PRODUCTION CALCULATIONS

MERCED 16-GHG-UF-01-MGMT-015

GHG source	# trees	CO ₂ produced per tree (kg)	total CO ₂ created (kg)	total CO ₂ produced by inventory (t)
UFMP realization (tree production)	720	4.6	3312	3.3
UFMP realization (tree planting and care over 40 years)	720	198.8	143136	143.1
Total GHG produced				146.45

City's Tree Data Assumptions:

about 65 miles of travel per day

about 160 trees inventoried per day

about 30000 trees to be inventoried

} about 2 gal gasoline/day = 17.77 g CO₂/day

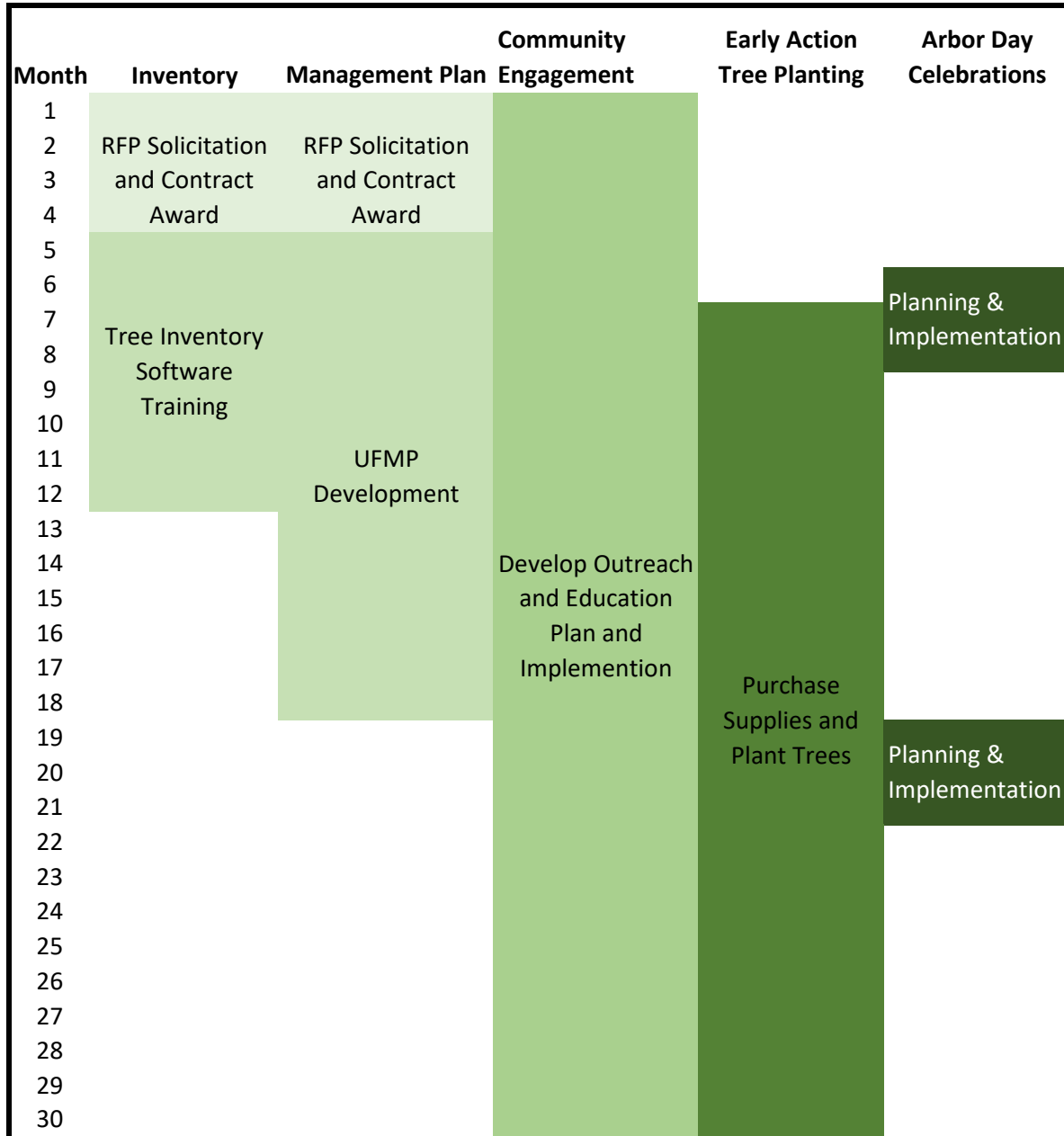
Line 3: CO₂ estimate includes all GHG

Line 4: CO₂ estimate includes all GHG

CO₂ created estimated over 40 years

MERCED 16-GHG-UF-01-MGMT-015

CITY OF MERCED CALFIRE PROJECT TIMELINE



Assumes a minimum of 30 months for grant period.

CITY OF MERCED EARLY ACTION TREE PLANTING SPECIES AND PLANTING SIZE
TOTAL TREES TO BE PLANTED = 720

Common Name	Botanical Name	Minimum Size	Quantity
Red Maple	<i>Acer rubrum</i>	15 gallon	180
Chinese Pistache	<i>Pistacia chinensis</i>	15 gallon	180
Autumn Purple Ash	<i>Fraxinus Americana</i>	15 gallon	180
Red Oak	<i>Quercus rubra</i>	15 gallon	90
Columbia Sycamore	<i>Platanus acerifolia</i>	15 gallon	90
Maidenhair Tree	<i>Ginkgo biloba</i>	15 gallon	*
Japanese zelkova	<i>Zelkova serrata</i>	15 gallon	*
Crape myrtle	<i>Lagerstroemia</i> spp.	15 gallon	*
Tulip tree	<i>Liriodendron tulipifera</i>	15 gallon	*
Flowering Pear	<i>Pyrus calleryana</i>	15 gallon	*

* These tree species will be mixed into the plantings to accommodate property owner requests and site planting restrictions.