THE CITY OF SAN DIEGO

PLANNING DEPARTMENT
Date of Notice: November 20, 2015
PUBLIC NOTICE OF A
DRAFT PROGRAM ENVIRONMENTAL IMPACT REPORT (PEIR)
I.O. No.: 21003516

The City of San Diego Planning Department has prepared a draft PEIR for the following project and is inviting your comments regarding the adequacy of the document. The draft PEIR and ordinance have been placed on the City of San Diego Planning Department website under the heading "Draft CEQA Documents" and can be accessed using the following link:

http://www.sandiego.gov/planning/programs/ceqa/index.shtml

The DEIR public notice has also been placed on the City Clerk website at:
http://www.sandiego.gov/city-clerk/officialdocs/notices/index.shtml

Your comments must be received by Tuesday, January 19, 2016 to be included in the final document considered by the decision-making authorities. Please send your written comments to the following address**: Susan Morrison, Environmental Planner, City of San Diego - Planning Department, 1010 Second Avenue, MS 614C, San Diego, CA 92101 or e-mail your comments to PlanningCEQA@sandiego.gov with the Project Name (CITY OF SAN DIEGO SINGLE-USE CARRYOUT BAG REDUCTION ORDINANCE) and Project Number (412659) in the subject line.**

General Project Information:
- Project Name: **CITY OF SAN DIEGO SINGLE-USE CARRYOUT BAG REDUCTION ORDINANCE**
- Project No. 412659/SCH No. 2015051034
- Community Plan Areas: Citywide
- Council Districts: All Council Districts

Applicant: CITY OF SAN DIEGO, ENVIRONMENTAL SERVICES DEPARTMENT

Subject: **CITY COUNCIL APPROVAL for the Adoption and Implementation of an ordinance restricting the use of plastic and paper single-use carryout bags, and promoting the use of reusable bags. This proposed ordinance would amend Chapter 6, Article 6 of the San Diego Municipal Code, adding new Division 8, Sections 66.0801, 66.0802, 66.0803, 66.0804, 66.0805, 66.0806, 66.0807, and 66.0808.**

The City of San Diego (City) is proposing to reduce the adverse environmental impacts associated with single-use plastic carryout bags, including plastic bag litter. The City proposes to adopt and implement the Single-Use Carryout Bag Reduction Ordinance (project or ordinance) to regulate the use of single-use plastic carryout bags and promote the use of reusable bags within the City. The ordinance would: prohibit stores subject to the ordinance from distributing plastic single-use carryout bags and non-recyclable paper single-use carryout bags at the point of sale to customers, require stores subject to the ordinance to only provide recyclable paper single-use carryout bags or reusable bags at the point of sale to customers, and require stores subject to the ordinance to collect a charge at the point of sale of $0.10 for each recyclable paper single-use carryout bag provided to a customer and a minimum charge of $0.10 for each reusable carryout bag provided to a customer. More specifically, the ordinance would:

1. Prohibit the distribution of plastic single-use carryout bags and paper single-use carryout bags that do not qualify as "recyclable paper single-use carryout bags" to point-of-sale customers at stores subject to the ordinance.

2. Require stores subject to this ordinance to collect a $0.10 charge for each recyclable paper single-use carryout bag provided to point-of-sale customers.

   Participants in the Women, Infant and Children (WIC) or Supplemental Food Programs would be exempt from this requirement. (The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides federal grants to states for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk.)

3. Apply to the following:

   a. Full-line retail stores with two million dollars or more in gross annual sales that offer for sale perishable items in addition to a line of dry groceries, canned goods, or non-food items (Category A stores).
   b. Stores of at least 10,000 square feet of retail space that generate sales or use tax pursuant to the Bradley-Burns Uniform Local Sales and Use Tax Law and that have a pharmacy licensed pursuant to the Pharmacy Law (Category B stores).
   c. Supermarkets, grocery stores, drug stores, convenience food stores, food marts, pharmacies, or other entities engaged in the retail sale of goods that include milk, bread, soda, and snack foods, including those retail establishments with a Type 20 or 21 license issued by the California Department of Alcoholic Beverage Control (Category C stores).

4. <u>Not</u> regulate:

   a. "Product bags" - these include plastic or paper bags without handles, that are provided to a customer to carry meat, produce, or other food items to the point of sale, or to protect food or merchandise from being damaged or contaminated by other food or merchandise when items are placed together in a reusable bag or a recyclable paper single-use carryout bag at the point of sale.
   b. Restaurants.
   c. Non-profit stores that sell used goods.

5. Require stores subject to the ordinance to provide or make available to customers only recyclable paper single-use carryout bags or reusable bags for carrying away goods or materials from the point of sale.

6. Require stores subject to the ordinance to charge at least $0.10 per reusable bag at the point of sale to customers.

7. Allow stores subject to the ordinance to provide reusable bags for free to customers during an infrequent and limited time promotion that cannot exceed a total of 90 calendar days within any consecutive 12-month period.

8. Require stores subject to the ordinance to keep complete and accurate records of the number of recyclable paper single-use carryout bags provided each calendar month, both at a cost and for free to customers, and the total amount of monies collected each calendar month for the sale of recyclable paper single-use carryout bags to customers.

9. Not require periodic reporting, although the City may request data.

10. Phase implementation to allow for the transitional use of remaining single-use plastic and non-recyclable paper carryout bag inventories.

The ordinance would not prohibit a store from providing "product bags" to protect or contain meat or prepared food; or for bagging fruits, vegetables, and other fresh produce; or for other goods that must be protected from moisture, damage or cross-contamination, and which are typically placed inside a single-use carryout bag at the point of sale. Restaurant, City farmers market vendor, pharmacy, clothing, and dry cleaner bags would be exempt from the ordinance. A grace period of six months for large retailers (Category A and B stores) and one year for small retailers (Category C stores) would be provided to allow retailers to phase out stocks of plastic single-use carryout bags and paper bags that do not qualify as "recycled paper single-use carryout bags". Upon completion of the applicable grace period, retailers would have to charge $0.10 per recyclable paper single-use carryout bag, which would be retained by the retailer. The City's Environmental Services Department (ESD) has conducted a public education program for several years, and would continue these activities through the grace period.

Recommended Finding: The draft PEIR concludes that the project would result in less than significant or beneficial effects with regard to **Air Quality, Hydrology/Water Quality**, and **Energy**. All other impacts analyzed in this EIR were found to be less than significant.

Availability in Alternative Format: To request this Notice, the draft PEIR and/or supporting documents in alternative format, call the Planning Department at 619-235-5200 or (800) 735-2929 (TEXT TELEPHONE).

Additional Information: For environmental review information, contact Susan Morrison at (619) 533-6492. The draft PEIR and supporting documents may be reviewed, or purchased for the cost of reproduction, at the Planning Department at 1222 First Avenue, Fifth Floor. If you are interested in obtaining additional copies of the Compact Disk (CD) or a hard-copy of the draft PEIR, they can be purchased for an additional cost. For information regarding the draft PEIR process or public meetings/hearings on this project, contact Jennifer Ott-Rol, Project Manager at (858) 573-1285 or via email: jott@sandiego.gov.

This notice was published in the SAN DIEGO DAILY TRANSCRIPT and distributed on **November 20, 2015**

Martha Blake
Interim Deputy Director
Planning Department

City of San Diego
PLANNING DEPARTMENT
Environmental & Resource Analysis Division
619-235-5200

DRAFT
ENVIRONMENTAL IMPACT REPORT

Project No. 412659
SCH No. 2015051034

SUBJECT: **CITY OF SAN DIEGO SINGLE-USE CARRYOUT BAG REDUCTION ORDINANCE. CITY COUNCIL APPROVAL for the Adoption and Implementation of an ordinance restricting the use of plastic and paper single-use carryout bags, and promoting the use of reusable bags. This proposed ordinance would amend Chapter 6, Article 6 of the San Diego Municipal Code, adding new Division 8, Sections 66.0801, 66.0802, 66.0803, 66.0804, 66.0805, 66.0806, 66.0807, and 66.0808.**

APPLICANT: **CITY OF SAN DIEGO, ENVIRONMENTAL SERVICES DEPARTMENT**

PROJECT DESCRIPTION

The City of San Diego (City) is proposing to reduce the adverse environmental impacts associated with single-use plastic carryout bags, including plastic bag litter. The City proposes to adopt and implement the Single-Use Carryout Bag Reduction Ordinance (project or ordinance) to regulate the use of single-use plastic carryout bags and promote the use of reusable bags within the City. The ordinance would: prohibit stores subject to the ordinance from distributing plastic single-use carryout bags and non-recyclable paper single-use carryout bags at the point of sale to customers, require stores subject to the ordinance to only provide recyclable paper single-use carryout bags or reusable bags at the point of sale to customers, and require stores subject to the ordinance to collect a charge at the point of sale of $0.10 for each recyclable paper single-use carryout bag provided to a customer and a minimum charge of $0.10 for each reusable carryout bag provided to a customer. More specifically, the ordinance would:

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2. Require stores subject to this ordinance to collect a $0.10 charge for each recyclable paper single-use carryout bag provided to point-of-sale customers.

   Participants in the Women, Infant and Children (WIC) or Supplemental Food Programs would be exempt from this requirement. (The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides federal grants to states for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk.)

3. Apply to the following:

    a. Full-line retail stores with two million dollars or more in gross annual sales that offer for sale perishable items in addition to a line of dry groceries, canned goods, or non-food items (Category A stores).
    b. Stores of at least 10,000 square feet of retail space that generate sales or use tax pursuant to the Bradley-Burns Uniform Local Sales and Use Tax Law and that have a pharmacy licensed pursuant to the Pharmacy Law (Category B stores).
    c. Supermarkets, grocery stores, drug stores, convenience food stores, food marts, pharmacies, or other entities engaged in the retail sale of goods that include milk, bread, soda, and snack foods, including those retail establishments with a Type 20 or 21 license issued by the California Department of Alcoholic Beverage Control (Category C stores).

4. Not regulate:

    a. "Product bags" - these include plastic or paper bags without handles, that are provided to a customer to carry meat, produce, or other food items to the point of sale, or to protect food or merchandise from being damaged or contaminated by other food or merchandise when items are placed together in a reusable bag or a recyclable paper single-use carryout bag at the point of sale.
    b. Restaurants.
    c. Non-profit stores that sell used goods.

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7. Allow stores subject to the ordinance to provide reusable bags for free to customers during an infrequent and limited time promotion that cannot exceed a total of 90 calendar days within any consecutive 12-month period.

8. Require stores subject to the ordinance to keep complete and accurate records of the number of recyclable paper single-use carryout bags provided each calendar month, both at a cost and for free to customers, and the total amount of monies collected each calendar month for the sale of recyclable paper single-use carryout bags to customers.

9. Not require periodic reporting, although the City may request data.

10. Phase implementation to allow for the transitional use of remaining single-use plastic and non-recyclable paper carryout bag inventories.

The ordinance would not prohibit a store from providing "product bags" to protect or contain meat or prepared food; or for bagging fruits, vegetables, and other fresh produce; or for other goods that must be protected from moisture, damage or cross-contamination, and which are typically placed

inside a single-use carryout bag at the point of sale. Restaurant, City farmers market vendor, pharmacy, clothing, and dry cleaner bags would be exempt from the ordinance. A grace period of six months for large retailers (Category A and B stores) and one year for small retailers (Category C stores) would be provided to allow retailers to phase out stocks of plastic single-use carryout bags and paper bags that do not qualify as "recycled paper single-use carryout bags". Upon completion of the applicable grace period, retailers would have to charge $0.10 per recyclable paper single-use carryout bag, which would be retained by the retailer. The City's Environmental Services Department (ESD) has conducted a public education program for several years, and would continue these activities through the grace period.

BACKGROUND

In California, nearly 20 billion (20,000,000,000) single-use plastic carryout bags are used annually, and most end up as litter or in landfills. Based on a City of San Diego (City) population of approximately 1,326,238 persons in January 2013 and a statewide estimate of approximately 531 plastic single-use carryout bags used per person per year, retail customers in the City currently use an estimated 700,000,000 plastic single-use carryout bags per year. These millions of single-use plastic bags impact local communities and the environment, especially when littered. Less than five (5) percent of used single-use plastic carryout bags are returned for recycling. The City spends millions of dollars each year on prevention, cleanup, and other activities to reduce litter.

For decades, the City has proactively addressed waste reduction and litter control, with planning including the City Council approved "Recycling and Waste Reduction Plan" in 1988, the "Source Reduction and Recycling Element" in 1992, updated in 1994 and annually thereafter, and, in July 2015, as the City of San Diego City Council unanimously approved a "Zero Waste Plan," which includes plastic bag reduction as one of its components.

In 2014, the California legislature passed, and Governor Brown signed, Senate Bill SB 270, which imposed statewide regulations on retailer provision of plastic single-use carryout bags. SB 270 preempts any local ordinance adopted on or after September 1, 2014 that is related to single-use carryout bag reduction. However, on February 24, 2015 California Secretary of State Alex Padilla certified a referendum for the November 8, 2016, General Election ballot to repeal the requirements of SB 270. Thus, if the ordinance is approved by the City of San Diego City Council and the referendum fails in November 2016, the City's ordinance, if approved, would be preempted by state law and retail stores within the City would be regulated under SB 270. If the referendum succeeds in overturning SB 270, then the City's ordinance, if approved, would regulate single-use carryout bags in the City.

The intent of the ordinance is to significantly reduce the amount of litter in the City attributable to single-use carryout bags and their associated adverse environmental impacts. The City's objectives for the Single-Use Carryout Bag Reduction Ordinance include:

- Reducing the millions of plastic single-use carryout bags currently used in the City;
- Reducing the adverse environmental impacts associated with plastic single-use carryout bags, including impacts to air quality, biological resources (including marine environments), water quality, and solid waste;
- Deterring the use of paper single-use carryout bags by retail customers in the City;
- Promoting a shift toward the use of reusable carryout bags; and

- Reducing litter and the associated adverse impacts to storm water facilities, aesthetics, and the environment.

The ordinance would apply throughout the City, which encompasses approximately 372 square miles, from Rancho Bernardo in the northern part of the City to the Pacific Ocean on the west, east to the communities of Encanto, Navajo, and City Heights, and south to Otay Mesa and the International Border. Adjoining jurisdictions include unincorporated San Diego County, and the cities of Solana Beach, Del Mar, Escondido, Poway, La Mesa, El Cajon, Santee, Lemon Grove, Coronado, National City, Chula Vista, and Imperial Beach.

CONCLUSIONS:

Based on the analysis conducted for the project described in the subject block above, the City has prepared the following Environmental Impact Report (EIR) in accordance with the California Environmental Quality Act (CEQA) to inform public agency decision-makers and the public of the significant environmental effects that could result if the project is approved and implemented, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project (State CEQA Guidelines Section 15121). As further described in the attached EIR, the City has determined that the project would result in less than significant or beneficial effects with regard to **Air Quality, Hydrology/Water Quality**, and **Energy**. All other impacts analyzed in this EIR were found to be less than significant. No mitigation measures are required (Chapter 3) to reduce program-level impacts to below a level of significance.

The attached Environmental Impact Report documents the reasons to support the above Determination.

MITIGATION, MONITORING AND REPORTING PROGRAM:

No significant impacts would result from adoption and implementation of the ordinance; therefore, no mitigation measures are required.

RECOMMENDED ALTERNATIVES FOR REDUCING SIGNIFICANT UNMITIGATED IMPACTS

Based on the requirement that alternatives reduce significant impacts associated with the proposed project, the EIR considers the following Project Alternatives which are further detailed in the Executive Summary and Chapter 4 of the EIR:

1. No Project
2. Apply the Single-Use Carryout Bag Reduction Ordinance to All Retail Vendors Alternative
3. Apply the Single-Use Carryout Bag Reduction Ordinance to Only Large ("Big-Box") Retail Vendors Alternative
4. Apply the Single-Use Carryout Bag Reduction Ordinance, but Impose a Higher Fee on Recyclable Paper Single-Use Carryout Bags Alternative

The EIR identified Alternative 4, Apply the Single-Use Carryout Bag Reduction Ordinance, but Impose a Higher Fee on Recyclable Paper Single-Use Carryout Bags as the environmentally superior alternative which was based on a comparison of the alternatives' overall environmental impacts. Alternative 4 would achieve the objective of promoting a shift to reusable bags more rapidly and to a greater extent

than under the project. However, no jurisdiction has implemented this option or provided data on the effectiveness; therefore, the effect of increasing the fee on recyclable paper single-use carryout bags can only be very broadly estimated. Of the remaining alternatives, Alternatives 2 and 3 have very similar levels of impact to the project.

PUBLIC REVIEW DISTRIBUTION:

Individuals, organizations, and agencies that received a copy or notice of the Draft EIR and were invited to comment on its accuracy and sufficiency is provided below. Copies of the Final EIR may be reviewed in the office of the Planning Department, or purchased for the cost of reproduction.

RESULTS OF PUBLIC REVIEW:

( ) No comments were received during the public input period.

( ) Comments were received but did not address the accuracy or completeness of the Draft Environmental Impact Report (EIR). No response is necessary and the letters are attached at the end of the EIR.

( ) Comments addressing the accuracy or completeness of the Draft Environmental Impact Report (EIR) were received during the public input period. The letters and responses are located immediately after the EIR Distribution List.

Martha Blake, Interim Deputy Director
Planning Department

November 19, 2015
Date of Draft Report

Date of Final Report

Analyst: Susan Morrison

DISTRIBUTION OF DRAFT ENVIRONMENTAL IMPACT REPORT:

Copies of the Draft EIR were distributed to the following individuals, organizations, and agencies:

United States Government
Federal Aviation Administration (1)
Naval Facilities Engineering Command, SW Division, Environmental Planning (12)
MCAS Miramar (13)
Marine Corps Recruit Depot Facilities Div. (14)
Environmental Protection Agency (19)
U. S. Fish and Wildlife Service (23)
USDA Natural Resources Conservation Services (25)
Army Corps of Engineers (26)

State of California
Caltrans District 11 (31)
Department of Fish and Wildlife (32)
Cal Recycle (35)
California Environmental Protection Agency (37A)
Department of Toxic Substance Control (39)
Natural Resources Agency (43)
Regional Water Quality Control Board, Region 9 (44)
Department of Water Resources (45)
State Clearinghouse (46A)
California Coastal Commission (47)
California Air Resources Board (49)
State Coastal Conservancy (54)
State Water Resources Control Board Division of Clean Water Programs (55)
Native American Heritage Commission (56)
California Energy Commission (59)
California Dept. of Conservation (60)

San Diego County
Agriculture Department (64)
Air Pollution Control Board (65)
Planning and Land Use (68)
Parks Department (69)
Public Works (72)
County Water Authority (73)
Department of Environmental Health (76)

City of San Diego
Office of the Mayor (91)
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Stacey LoMedico
David Graham
Ron Villa
Mike Hansen
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Councilmember Zapf, District 2

Councilmember Gloria, District 3
Councilmember Cole, District 4
Councilmember Kersey, District 5
Councilmember Cate, District 6
Councilmember Sherman, District 7
Councilmember Alvarez, District 8
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Office of the City Attorney
Shannon Thomas
Amanda Guy

Environmental Services Department (Applicant)
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Russ Gibbon
Jim Davies

Park and Recreation Department
Herman Parker, Director
Andrew Field
Chris Zirkle

Transportation & Storm Water Department
Kris McFadden, Director
Andrew Kleis
Ruth Kolb

City Government
Civic San Diego (242)
San Diego Housing Commission (88)

City Advisory Boards or Committees
Mission Bay Park Committee (318A)
Airports Advisory Committee (MS 14)
Park and Recreation Board (83)
Community Forest Advisory Board (90)
Small Business Advisory Board (MS 904)
Historical Resources Board (87)
Wetland Advisory Board (91A)
La Jolla Shores PDO Advisory Board (279)
Sustainable Energy Advisory Board

Libraries
Central Library, Government Documents (81 & 81A)
Balboa Branch Library (81B)
Beckwourth Branch Library (81C)
Benjamin Branch Library (81D)
Carmel Mountain Ranch Branch Library (81E)
Carmel Valley Branch Library (81F)
City Heights/Weingart Branch Library (81G)
Clairemont Branch Library (81H)
College-Rolando Branch Library (81I)
Kensington-Normal Heights Branch Library (81K)
La Jolla/Riford Branch Library (81L)
Linda Vista Branch Library (81M)
Logan Heights Branch Library (81N)

Malcolm X Library & Performing Arts Center (81O)
Mira Mesa Branch Library (81P)
Mission Hills Branch Library (81Q)
Mission Valley Branch Library (81R)
North Clairemont Branch Library (81S)
North Park Branch Library (81T)
Oak Park Branch Library (81U)
Ocean Beach Branch Library (81V)
Otay Mesa-Nestor Branch Library (81W)
Pacific Beach/Taylor Branch Library (81X)
Paradise Hills Branch Library (81Y)
Point Loma/Hervey Branch Library (81Z)
Rancho Bernardo Branch Library (81AA)
Rancho Peñasquitos Branch Library (81BB)
READ San Diego (81CC)
San Carlos Branch Library (81DD)
San Ysidro Branch Library (81EE)
Scripps Miramar Ranch Branch Library (81FF)
Serra Mesa Branch Library (81GG)
Skyline Hills Branch Library (81HH)
Tierrasanta Branch Library (81II)
University Community Branch Library (81JJ)
North University Branch Library (81JJJ)
University Heights Branch Library (81KK)

Other City Governments
City of Chula Vista (94)
City of El Cajon (97)
City of Escondido (98)
City of Imperial Beach (99)
City of National City (102)
City of Poway (103)
City of Santee (104)
San Diego Association of Governments (108)
San Diego Unified Port District (109)
San Diego County Regional Airport Authority (110)
Metropolitan Transit System (112/115)
San Diego Gas & Electric (114)
San Dieguito River Park JPA (116)

School Districts
Chula Vista School District (118)
Grossmont Union High School District (120)
La Mesa-Spring Valley School District (121)
National City School District (123)
Poway Unified School District (124)
San Diego Unified School District (125)
San Ysidro School District (127)
Santee School District (128)
South Bay Unified School District (130)
San Diego Community College District (133)

UCSD (134)

Community Planning Groups or Committees
Community Planners Committee (194)
Balboa Park Committee (226, MS 35)
Black Mountain Ranch –Subarea I (226C)
Otay Mesa - Nestor Planning Committee (228)
Otay Mesa Planning Committee (235)
Clairemont Mesa Planning Committee (248)
Greater Golden Hill Planning Committee (259)
Serra Mesa Planning Group (263A)
Kearny Mesa Community Planning Group (265)
Linda Vista Community Planning Committee (267)
La Jolla Community Planning Association (275)
City Heights Area Planning Committee (287)
Kensington-Talmadge Planning Committee (290)
Normal Heights Community Planning Committee (291)
Eastern Area Planning Committee (302)
Midway/Pacific Highway Community Planning Group (307)
Mira Mesa Community Planning Group (310)
Mission Beach Precise Planning Board (325)
Mission Valley Unified Planning Organization (331)
Navajo Community Planners Inc. (336)
Carmel Valley Community Planning Board (350)
Del Mar Mesa Community Planning Board (361)
North Park Planning Committee (363)
Ocean Beach Planning Board (367)
Old Town Community Planning Committee (368)
Pacific Beach Community Planning Committee (375)
Pacific Highlands Ranch – Subarea III (377A)
Rancho Peñasquitos Planning Board (380)
Peninsula Community Planning Board (390)
Rancho Bernardo Community Planning Board (400)
Sabre Springs Community Planning Group (406B)
San Pasqual - Lake Hodges Planning Group (426)
San Ysidro Planning and Development Group (433)
Scripps Ranch Community Planning Group (437)
Miramar Ranch North Planning Committee (439)
Skyline - Paradise Hills Planning Committee (443)
Torrey Hills Community Planning Board (444A)
Southeastern San Diego Planning Committee (449)
Encanto Neighborhoods Community Planning Group (449A)
College Area Community Planning Board (456)
Tierrasanta Community Council (462)
Torrey Highlands – Subarea IV (467)
Torrey Pines Community Planning Board (469)
University City Community Planning Group (480)
Uptown Planners (498)

Community Councils
Town Council Presidents Association (197)
Barrio Station, Inc. (241)
Downtown Community Council (243)
Harborview Community Council (245)

Clairemont Town Council (257)
Serra Mesa Community Council (264)
La Jolla Town Council (273)
Rolando Community Council (288)
Oak Park Community Council (298)
Darnell Community Council (306)
Mission Beach Town Council (326)
Mission Valley Community Council (328 C)
San Carlos Area Council (338)
Carmel Mountain Ranch Community Council (344)
Ocean Beach Town Council, Inc. (367 A)
Pacific Beach Town Council (374)
Rancho Penasquitos Town Council (383)
Rancho Bernardo Community Council, Inc. (398)
San Dieguito Planning Group (412)
United Border Community Town Council (434)
Tierrasanta Community Council (462)
Murphy Canyon Community Council (463)

Other Agencies, Organizations and Individuals
San Diego Chamber of Commerce (157)
Building Industry Association (158)
San Diego River Park Foundation (163)
San Diego River Coalition (164)
Sierra Club (165)
San Diego Canyonlands (165A)
San Diego Natural History Museum (166)
San Diego Audubon Society (167)
Jim Peugh (167A)
San Diego River Conservancy (168)
Environmental Health Coalition (169)
California Native Plant Society (170)
San Diego Coast & Baykeeper (173)
Citizens Coordinate for Century 3 (179)
Endangered Habitats League (182 & 182A)
San Diego Tracking Team (187)
League of Women Voters (192)
National City Chamber of Commerce (200)
Carmen Lucas (206)
South Coastal Information Center (210)
San Diego Historical Society (211)
San Diego Archaeological Center (212)
Save Our Heritage Organization (214)
Ron Chrisman (215)
Clint Linton (215B)
Frank Brown - Inter-Tribal Cultural Resource Council (216)
Campo Band of Mission Indians (217)
San Diego County Archaeological Society Inc. (218)
Kuumeyaay Cultural Heritage Preservation (223)
Kuumeyaay Cultural Repatriation Committee (225)
Native American Distribution
- Barona Group of Capitan Grande Band of Mission Indians (225A)
- Campo Band of Mission Indians (225B)
- Ewiiaapaayp Band of Mission Indians (225C)

Inaja Band of Mission Indians (225D)
Jamul Indian Village (225E)
La Posta Band of Mission Indians (225F)
Manzanita Band of Mission Indians (225G)
Sycuan Band of Mission Indians (225H)
Viejas Group of Capitan Grande Band of Mission Indians (225I)
Mesa Grande Band of Mission Indians (225J)
San Pasqual Band of Mission Indians (225K)
Ipai Nation of Santa Ysabel (225L)
La Jolla Band of Mission Indians (225M)
Pala Band of Mission Indians (225N)
Pauma Band of Mission Indians (225O)
Pechanga Band of Mission Indians (225P)
Rincon Band of Luiseno Indians (225Q)
San Luis Rey Band of Luiseno Indians (225R)
Los Coyotes Band of Mission Indians (225S)
Otay Valley Regional Park CAC – John Willett (227)
Tijuana River National Estuarine Reserve (229)
Chuck Tanner – County San Diego OVRP Rep (232)
Downtown San Diego Partnership (237)
Deron Bear – Marion Bear Natural Park Recreation Council (253)
Tecolote Canyon Citizens Advisory Committee (254)
Friends of Tecolote Canyon (255)
Tecolote Canyon Rim Owner's Protection Association (256)
Friends of Switzer Canyon (260)
Marion Bear Natural Park Recreation Council (266A/267A)
UCSD Natural Reserve System (284)
John Stump (304)
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D R A F T
E N V I R O N M E N T A L I M P A C T R E P O R T

CITY OF SAN DIEGO
SINGLE-USE CARRYOUT BAG REDUCTION ORDINANCE

PROJECT NO: 347344

Prepared for:

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LIST OF ACRONYMS AND ABBREVIATIONS

˚F	degrees Fahrenheit
AAC	All American Canal
AB	Assembly Bill
AF	acre-feet
AFY	acre-feet per year
APS	Alternative Planning Strategy
ASBS	Areas of Special Biological Significance
AWTP	Alvarado Water Treatment Plant
AWWA	American Water Works Association
BID	Business Improvement District
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalARP	California Accidental Release Prevention
CalEPA	California Environmental Protection Agency
CalOSHA	California Division of Occupational Safety and Health
CalRecycle	California Department of Resources Recycling and Recovery
CAP	Climate Action Plan
CARB	California Air Resources Board
CAT	Climate Action Team
CC	Coachella Canal
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CHP	California Highway Patrol
City	City of San Diego (governing body)
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRA	Colorado River Aqueduct
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CZMA	Coastal Zone Management Act

DEH	Department of Environmental Health
DTSC	Department of Toxic Substance Control
DOGGR	Division of Oil, Gas, and Geothermal Resources
EESTF	Environmental and Economic Sustainability Task Force
ESEPD	Energy Sustainability and Environmental Protection Division
EIR	Environmental Impact Report
EO	Executive Order
EPIC	Environmental and Plastics Industry Council
ESD	City of San Diego Environmental Services Department
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GWP	global warming potential
HAP	Hazardous Air Pollutant
HDPE	High Density Polyethylene
HMIS	Hazardous Material Identification System
HMMP	Hazardous Materials Management Program
HU	Hydrologic Unit
IID	Imperial Irrigation District
IIPP	Injury and Illness Prevention Program
IPCC	Intergovernmental Panel on Climate Change
JRMP	Jurisdictional Runoff Management Plan
LCA	Life Cycle Assessment
LCFS	low carbon fuel standard
LDPE	low-density polyethylene
LEA	Local Enforcement Agency
LPG	liquid petroleum gas
MAF	million acre-feet
MBC	Metro Biosolids Center
MEA	Master Environmental Assessment
mgd	million gallons per day
mg/year	million gallons per year
MJ	mega joule (1 mega joule = 737 562.148 foot-pounds)
MMT	million metric tons
MRZ	Mineral Resource Zone
MS4	Municipal Separate Storm Sewer System
MHPA	Multi Habitat Planning Area
MST	Major Source Thresholds

MWTP	Miramar Water Treatment Plant
mya	million years ago
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NCWRP	North City Water Reclamation Plant
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHTSA	National Highway Traffic Safety Administration
NO	nitric oxide
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OSHA	Occupational Safety and Health Administration
OWTP	Otay Water Treatment Plant
PE	polyethylene
PE	polyethylene terephthalate
PFC	perfluorocarbon
PLOO	Point Loma Ocean Outfall
PLWTP	Point Loma Water Treatment Plant
PM	particulate matter
PM_{10}	PM equal to or less than 10 micrometers in diameter
$PM_{2.5}$	PM equal to or less than 2.5 micrometers in diameter
PP	Polypropylene
PRC	Public Resources Code
PUD	Public Utilities Department
RAQS	Regional Air Quality Strategy
RCRA	Resource Conservation and Recovery Act
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SBOO	South Bay Ocean Outfall
SBWRP	South Bay Water Reclamation Plant
SCS	Sustainable Communities Strategy
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDCWA	San Diego County Water Authority

SF_6	sulfur hexafluoride
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SPCC	spill prevention and control counter measures
SUSMP	Countywide Model Standard Urban Runoff Stormwater Management Plan
SWRCB	State Water Resources Control Board
SWP	State Water Project
TAC	toxic air contaminant
TMDL	Total Maximum Daily Load
TWP	Technical White Paper
UFC	Uniform Fire Code
UST	Underground Storage Tanks
U.S.	United States
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
VOCs	Volatile organic compounds
WARM	USEPA's Waste Reduction Model
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children
WQIP	Water Quality Improvement Plan
WURMP	Watershed Urban Runoff Management Plan

EXECUTIVE SUMMARY

THE PROJECT

The City of San Diego (City) is proposing to reduce the adverse environmental impacts associated with single-use plastic carryout bags, including plastic bag litter. The City proposes to adopt and implement the Single-Use Carryout Bag Reduction Ordinance (project or ordinance) to regulate the use of single-use plastic carryout bags and promote the use of reusable bags within the City.

In California, nearly 20 billion (20,000,000,000) single-use plastic carryout bags are used annually, and most end up as litter or in landfills.[1] Based on a City of San Diego (City) population of approximately 1,326,238 persons in January 2013[2] and a statewide estimate of approximately 531 plastic single-use carryout bags used per person per year,[3] retail customers in the City currently use an estimated 700,000,000 plastic single-use carryout bags per year. These millions of single-use plastic bags impact local communities and the environment, especially when littered. Less than five (5) percent of used single-use plastic carryout bags are returned for recycling.[4] The City spends millions of dollars each year on prevention, cleanup, and other activities to reduce litter.[5]

The City of San Diego is proposing to reduce the adverse environmental impacts associated with single-use plastic carryout bags by adopting and implementing an ordinance to regulate the use of single-use plastic carryout bags, and by promoting the use of reusable bags within the City. The ordinance would:

1. Prohibit stores subject to the ordinance from distributing plastic single-use carryout bags and non-recyclable paper single-use carryout bags at the point of sale to customers, and
2. Require stores subject to the ordinance to only provide recyclable paper single-use carryout bags or reusable bags at the point of sale to customers, and
3. Require stores subject to the ordinance to collect a charge at the point of sale of $0.10 for each recyclable paper single-use carryout bag provided to a customer and a minimum charge of $0.10 for each reusable carryout bag provided to a customer.

A grace period of six months for large retailers (Category A and B stores, as defined in the ordinance) and one year for small retailers (Category C stores, as defined in the ordinance) would be provided to allow retailers to phase out their stocks of plastic single-use carryout bags and paper bags that do not qualify as "recyclable paper single-use carryout bags". Upon completion of the grace period, regulated stores would be required to charge $0.10 per recyclable paper single-use carryout bag and at least $0.10 for reusable bags, which would be retained by the store. During the grace period, regulated stores could continue to provide plastic and paper bags that do not qualify as "recyclable paper single-use carryout bags". During the grace period, the retailers would also not be required to provide paper carryout bags to customers.

[1] Master Environmental Assessment on Single-Use and Reusable Bags, Green Cities California, March 2010.
[2] From Population Estimates for Cities, Counties, and the State. http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/view.php
[3] Master Environmental Assessment on Single Use and Reusable Bags, Green Cities California, March 2010.
[4] CalRecycle http://www.calrecycle.ca.gov/Plastics/AtStore/AnnualRate/2009Rate.htm
[5] City of San Diego estimate, http://www.sandiego.gov/fm/annual/pdf/fy13/vol2/v2esd.pdf

The City's Environmental Services Department (ESD) has conducted a public education program for several years, and would continue these activities through the grace period. Program activities include:

- disseminating information to the public, providing information to the City's Community Town Councils and Planning Groups, and
- promoting the use of reusable bags at major events throughout the City.

The ordinance would apply to retail stores in the City, including large retailers (full-line retail stores with two million dollars or more in gross annual sales that offer for sale perishable items in addition to a line of dry groceries, canned goods, or non-food items [Category A stores], and stores of at least 10,000 square feet of retail space that generate sales or use tax pursuant to the Bradley-Burns Uniform Local Sales and Use Tax Law and that has a pharmacy licensed pursuant to the Pharmacy Law [Category B stores]) and small retailers (drug stores, convenience food stores, food marts, pharmacies, or other entities engaged in the retail sale of goods that include milk, bread, soda, and snack foods, including those retail establishments with a Type 20 or 21 license issued by the California Department of Alcoholic Beverage Control [Category C stores]). The ordinance would not apply to other types of retail stores, such as clothing stores and stores that sell durable goods that do not typically distribute large volumes of single-use plastic bags to customers. Also, the regulated retailers would be required to provide at the point of sale, free of charge, recyclable paper single-use carryout bags or reusable bags to customers participating in the California Special Supplemental Food Program for Women, Infants and Children or in the Supplemental Food Program.

The ordinance would <u>not</u> prohibit:

- Regulated stores from providing plastic or paper bags without handles to a customer to carry meat, produce, or other food items to the point of sale, or to protect food or merchandise from being damaged or contaminated by other food or merchandise when items are placed together in a reusable bag or a recyclable paper single-use carryout bag at the point of sale.
- Regulated stores from providing pharmacy bags for prescription drugs.
- The provision of dry cleaning plastic bags.
- The provision of bags from restaurants and vendors at City farmers markets.

The ordinance would provide the City the authority to perform audits and enforce the ordinance. The City would use existing code compliance personnel to implement enforcement proceedings.

PROJECT OBJECTIVES

The City's objectives for the Single-Use Carryout Bag Reduction Ordinance include:

- Reducing the millions of plastic single-use carryout bags currently used in the City each year;
- Reducing the adverse environmental impacts associated with plastic single-use carryout bags, including impacts to air quality, water quality, and solid waste;
- Deterring the use of paper single-use carryout bags by retail customers in the City;

- Promoting a shift toward the use of reusable carryout bags; and
- Reducing litter and the associated adverse impacts to storm water facilities, aesthetics, and the environment.

PROJECT LOCATION AND SURROUNDING USES

The ordinance would apply throughout the City, which encompasses approximately 372 square miles, from Rancho Bernardo in the northern part of the City to the Pacific Ocean on the west and to the International Border on the south. Adjoining jurisdictions include unincorporated San Diego County, and the cities of Solana Beach, Del Mar, Escondido, Poway, La Mesa, El Cajon, Santee, Lemon Grove, Coronado, National City, Chula Vista, and Imperial Beach.

ENVIRONMENTAL IMPACTS

This Environmental Impact Report (EIR) has been prepared to analyze the potentially significant environmental impacts associated with the Single-Use Carryout Bag Reduction ordinance project. The analysis contained in this EIR indicates that the ordinance would result in the possibility for less than significant impacts in addition to beneficial effects with regard to air quality, water quality, and energy. All other impacts analyzed in this EIR were found to be less than significant. Table S-1 summarizes the environmental impacts associated with the adoption and implementation of the ordinance.

Table S-1
Summary of Potential Environmental Impacts

	Environmental Impact	Mitigation Measures	Level of Impact after Mitigation
Air Quality	The ordinance would reduce emissions that contribute to ground-level ozone by at least 45% and atmospheric acidification by 36%. Under the "worst case" scenario where all recyclable paper single-use carryout bags and reusable bags are delivered to retail stores in separate truck loads, the implementation of the ordinance has a potential to add approximately 1.64 truck trips per day. However, the bags are typically delivered to supermarkets and retail stores as part of larger mixed loads of groceries and merchandise. Therefore, there may not be an actual net increase in truck traffic from the change in bag use, particularly since recyclable paper single-use carryout bags and reusable bags could be included in regular mixed load deliveries to the grocery stores, supermarkets, and other retail stores.	Impact would be insignificant or beneficial; no mitigation is required.	Impact would be insignificant or beneficial; no mitigation is required.
Greenhouse Gas Emissions	Some reports estimate a beneficial effect, but for this analysis it is anticipated that as a result of the ordinance, within one year, greenhouse gas (GHG) emissions increases associated with the manufacturing, transportation and disposal of carryout bags used in the City would be approximately 8,498 metric tons of carbon dioxide (CO_2) per	Impact would be less than significant and no mitigation is required.	Impact would be less than significant and no mitigation is required.

	Environmental Impact	Mitigation Measures	Level of Impact after Mitigation
	year. This represents an increase of approximately 0.006 CO_2 metric tons per capita, which would be far less than the City's threshold of 4.46 metric tons of CO_2 per capita and the State target emission rate of 9.6 metric tons of CO_2 per capita.		
Forest and Agricultural Resources	Under a worst case scenario, the ordinance may result in increase in the use of paper single-use carryout bags, which are manufactured from wood pulp and recycled materials. Overall, trees cut down for virgin material to manufacture paper single-use carryout bags are those trees that are commercially grown for paper manufacturing. Therefore, there would be no increase in cutting of old-growth forest. In addition, the ordinance requires recyclable paper single-use carryout bags to have no less than 40% recycled content (and currently, there are paper bags on the market that contain 100% recycled content), which would reduce the loss of trees as a result of any fluctuations in demand for paper single-use carryout bags in the City.	No significant impact would occur and no mitigation is required.	No significant impact would occur and no mitigation is required.
Hazards and Hazardous Materials	None of the commonly used carryout bags possess any of the four characteristics of hazardous wastes (ignitability, corrosivity, reactivity, or toxicity) and do not appear on special U.S. Environmental Protection Agency lists.[6] The ordinance would not involve the routine transport, use, or disposal of hazardous materials as defined by the Hazardous Materials Transportation Uniform Safety Act.[7] The usual practice of placing produce and meat into plastic bags to prevent contamination would continue if the ordinance is adopted, although there is a potential for bacterial continuation in reusable bags. Additional studies show that bacteria are present in kitchens in the US.[8] However, even if bacteria occur in reusable bags, studies suggest that no illness would result.	No significant impact would occur and no mitigation is required.	No significant impact would occur and no mitigation is required.
Hydrology and Water Quality	Surface Waters: The implementation of the ordinance would reduce the amount of litter that could enter storm drains, local waterways, and the Pacific Ocean by reducing plastic single-use carryout bag litter, thus improving water quality. Although there is no local manufacturing of carryout bags, impacts due to potential increases in eutrophication due to manufacturing would be less than significant in a worst-case scenario. Groundwater: The ordinance does not involve any construction of new structures, such as manufacturing	Impact would be beneficial; no mitigation is required. Impact would be less than significant and no mitigation is required.	Impact would be beneficial; no mitigation is required. Impact would be less than significant and no mitigation is required.

[6] City of Los Angeles FEIR citing Code of Federal Regulations, Title 40, Chapter 1, Part 261: "Identification and Listing of Hazardous Waste."
[7] City of Los Angeles FEIR citing Code of Federal Regulations, Title 40, Chapter 1, Parts 106–180.
[8] City of Los Angeles FEIR citing San Jose DEIR citing Josephson, K.L., Rubino, J.R., Pepper, I.L. "Characterization and quantification of bacterial pathogens and indicator organisms in household kitchens with and without the use of a disinfectant cleaner." *Journal of Applied Microbiology*, Vol. 83 No.6, pp.737-50. 1997.

	Environmental Impact	Mitigation Measures	Level of Impact after Mitigation
	facilities, that could result in an increase in impervious surfaces that would potentially reduce ground-water levels. There are no known reusable bag manufacturing facilities in San Diego, and future facilities manufacturing reusable bags, if any, would use water supplied by the San Diego County Water Authority (SDCWA) from its portfolio of water sources and be subject to the SDCWA's water allocations, as applicable.		
Utilities and Service Systems	*Water:* Reusable bags do not require special washing care and would likely be washed on a regular basis along with a household's regular laundry load.[9] Since few if any families have (or are likely to ever have) a large supply of reusable shopping bags that would require laundering all at once, it is anticipated that the reusable bags would be washed in regular laundry loads as needed. This would not result in increased water use, as the wash loads would occur with or without the bags and such bags are not washed often (typically once a month). Additionally, most of the new reusable bags distributed by retailers and others are made from plastics that can be easily cleaned with a damp sponge. Nonetheless, in order to consider the most conservative, albeit unlikely, scenario, even if every reusable bag is washed once per year, the potential increase in water demand due to implementation of the ordinance is within the capacity of San Diego's water supply.	Impact would be less than significant and no mitigation is required.	Impact would be less than significant and no mitigation is required.
	Manufacturing processes for paper single-use carryout bags require more water than manufacturing processes for plastic single-use carryout bags, and the project could potentially, under a worst case scenario, increase the number of paper single-use carryout bags used. Some paper single-use carryout bag manufacturing facilities use "closed loop" water recycling, but not all. If retailers choose a supplier from the State of California, and if that manufacturer increases its water consumption as a result of increased demand, that could result in increased water consumption within the state, a critical issue, especially during drought periods. All manufacturers would be required to comply with local water planning and conservation requirements, and any new facilities would be subject to review under CEQA. Suppliers may include out of state facilities. The source of the bags is speculative, and the nature of the impacts, if any, cannot be determined.	Impact would be less than significant and no mitigation is required.	Impact would be less than significant and no mitigation is required.
	Wastewater: The additional wastewater generation under this scenario would not exceed the remaining capacity of the treatment plants serving the City as there is adequate capacity to treat the additional wastewater, and no new	Impact would be less than significant and no mitigation is required.	Impact would be less than significant and no mitigation is required.

[9] Master Environmental Assessment on Single Use and Reusable Bags, Green Cities California, March 2010.

	Environmental Impact	Mitigation Measures	Level of Impact after Mitigation
	facilities would be necessary. *Solid Waste:* A worst case scenario analysis of the solid waste impacts of carryout bag use indicates up to an additional 1,490 tons of solid waste may be generated due to the ordinance, which amounts to less than .002% of the capacity of Miramar Landfill.	Impact would be less than significant; no mitigation is required.	Impact would be less than significant; no mitigation is required.
Mineral Resources	The ordinance would not result in impacts to mineral resources in relation to the loss of availability of a known mineral resource recovery site. There are three areas within the City with mineral resources (sand and gravel) of statewide or regional importance; however, the regulation of single-use carryout bags at retail stores would not affect these locally-important sand and gravel mineral resources.	There would be no impact to mineral resources recovery sites.	There would be no impact to mineral resources recovery sites; no mitigation is required.
Energy	Recyclable paper single-use carryout bag use may increase with the ordinance, and paper bags have a higher energy consumption rate than plastic bags. However, with the overall reduction in use of all types of bags, the expected energy consumption from the project is expected to decrease. No local increased demand for energy is expected.	Impact would be beneficial and no mitigation is required.	Impact would be beneficial and no mitigation is required.
	Reusable non-woven plastic polypropylene bags are produced using a by-product of gas or oil refining. While there are no known reusable bag manufacturing facilities in San Diego, the manufacture of these bags for use within the City would involve petroleum and/or natural gas. However, any potential use of petroleum in the manufacturing process of reusable bags is anticipated to be offset by the reduction of natural gas/petroleum used in single-use plastic bag manufacture.	Impact would be less than significant and no mitigation is required	Impact would be less than significant and no mitigation is required.
	Under the "worst case" scenario where all recyclable paper single-use carryout bags and reusable bags are delivered to retail stores in separate truck loads, the implementation of the ordinance has a potential to add approximately 1.64 truck trips per day which would result in use of an additional 1,993 gallons of diesel fuel per year. However, the bags are typically delivered to supermarkets and retail stores as part of larger mixed loads of groceries and merchandise. Therefore, there may not be an actual net increase in truck traffic from the change in bag use.	Impact would be less than significant and no mitigation is required	Impact would be less than significant and no mitigation is required.

ALTERNATIVES TO THE PROJECT

The analysis in this Draft EIR indicates that the ordinance project would result in less than significant or beneficial effects with regard to air quality, water quality, and energy. The project was found to result in either a less than significant impact or no impact on other environmental factors analyzed in the EIR.

Therefore, the discussion of the alternatives to the project focuses on whether the alternatives could achieve the project objectives to a greater or lesser extent.

The alternatives considered and compared to the project in the EIR include:

Alternative 1: "No Project" alternative

Alternative 2: Apply the Single-Use Carryout Bag Reduction Ordinance to All Retail Vendors

Alternative 3: Apply the Single-Use Carryout Bag Reduction Ordinance to Only Large ("Big-Box") Retail Vendors

Alternative 4: Apply the Single-Use Carryout Bag Reduction Ordinance, but Impose a Higher Fee on Recyclable Paper Single-Use Carryout Bags

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Alternative 1, the "No Project" would not achieve any of the project objectives.

Alternative 2, Apply the Single-Use Carryout Bag Reduction Ordinance to All Retail Vendors is not environmentally superior to the project, and would achieve all project objectives.

Alternative 3, Apply the Single-Use Carryout Bag Reduction Ordinance to Only Large ("Big-Box") Retail Vendors is not environmentally superior to the project. In the long term, Alternative 3 would only partially achieve the objectives of the ordinance due to the fewer number of vendors covered by the ordinance and the larger number of single-use carryout bags that would still be used within the City.

Alternative 4, Apply the Single-Use Carryout Bag Reduction Ordinance, but Impose a Higher Fee on Recyclable Paper Single-Use Carryout Bags, is considered environmentally superior to the project because it would result in greater beneficial environmental effects and achievement of all of project objectives, and would reduce or eliminate most impacts associated with the project.

AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

The Notice of Preparation (NOP) process raised the potential for the project to result in an increase in water consumption because of the potential for increased consumption of paper bags. Paper bags require more water in their manufacturing process than plastic bags. The analysis in this EIR includes a consideration of potential impacts associated with water used during bag manufacturing. Because no manufacturing facilities are located in the project area, and it is not known what specific facilities are, or would be, the source of bags, the exact nature of the impacts is speculative, and may not occur within California. However, the potential for this impact is considered in general terms in the Utilities/Public Service Systems section.

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SECTION 1 INTRODUCTION

1.1 PURPOSE OF THE EIR

This Environmental Impact Report (EIR) has been prepared to evaluate the environmental effects of the adoption and implementation of the City of San Diego Single-Use Carryout Bag Reduction Ordinance (project or ordinance) regulating single-use carryout bags and instituting a charge for recyclable paper single-use carryout bags and reusable bags at specified retail stores in the City. The ordinance constitutes a project for the purposes of the California Environmental Quality Act (CEQA) and the State CEQA Guidelines.

According to section 15121(a) of the Guidelines for Implementation of the California Environmental Quality Act, an "EIR is an informational document that will inform public agencies, decision makers, and the public generally of the significant environmental effects of a project on the environment, identify possible ways to minimize the significant effects, and describe alternatives to the project."

This EIR is an informational document to be used by decision makers, public agencies, and the general public. It is not a policy document of the City. The EIR will be used by the City in assessing the impacts of the project prior to taking action on the project.

1.2 LEGAL REQUIREMENTS AND ENVIRONMENTAL PROCESS

This EIR has been prepared in accordance with the CEQA (Public Resources Code, Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 et seq.). The City is the lead agency for this EIR, as defined in Section 21067 of CEQA.

1.2.1 Notice of Preparation

Pursuant to CEQA and the CEQA Guidelines, A Notice of Preparation (NOP) for this EIR was issued by the City on May 15, 2015 in accordance with the requirements of the CEQA Guidelines, Sections 15082(a) and 15375. The NOP indicated that an EIR was being prepared and invited comments on the project from the public and public agencies. The NOP and the comment letters received in response to the NOP are included in Appendix A of this Draft EIR.

1.2.2 Intended Uses of the EIR

This Draft EIR will be used by the City to provide information necessary for environmental review of discretionary actions and approvals for the ordinance. These actions include:

Lead Agency

City of San Diego

- Certification of Final Environmental Impact Report
- Adoption of the City of San Diego Single-Use Carryout Bag Reduction Ordinance

Other Public Agencies

No approval from any other public agency is required

SECTION 2 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

As shown in Table 2-1, many jurisdictions have imposed similar ordinances. The exact number of businesses affected was not identified in advance of imposition of these ordinances in larger jurisdictions. Based on a preliminary review of businesses registered in San Diego and staff knowledge, it is anticipated that more than a thousand businesses would be affected by the City's ordinance.[10] The ordinance's expected effect on consumer behavior is shown in Table 2-2.

2.2 PROJECT BACKGROUND

2.2.1 Importance of Source Reduction

One of the more challenging aspects of solid waste management is determining which approach to managing waste has the least impacts on the environment. The California Public Resources Code (PRC), Section 41780 et seq. specifies that "source reduction," also known as waste prevention, is the most preferable approach to solid waste management, because recycling, which is typically preferable to disposal in landfills, is often associated with greenhouse gas production from transportation and remanufacture. Using the United States Environmental Protection Agency's (USEPA) Waste Reduction Model (WARM) to track greenhouse gases associated with different management strategies shows that source reduction results in fewer impacts than any other approach.[11] Both source reduction and recycling are considered "diversion" from landfills, and both help reduce impacts associated with products made from "virgin" (un-recycled) materials.

Paper bags can be recycled or composted. Depending on the constituent materials, plastic bags can be recycled; however, recycling has a market-driven component. Most items entering landfills today are technically recyclable. The problem is separating them out and finding a market for them. Most bags can be incinerated in appropriate facilities for waste-to-energy conversion, where such facilities exist. If disposed of improperly, however, plastic bags can create unsightly litter and harm some types of wildlife.

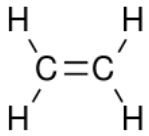
California has established a state goal, found in PRC section 41780 et seq., of diverting 75 percent of the material being disposed of in landfills by 2020. However, based on AB939 reporting to the state, local governments are not evaluated on whether they recycle more, but rather on whether they dispose of less. Therefore, reducing waste is the overall goal.

2.2.2 Types of Plastic

Bags can be made with a variety of plastic films. "Plastic" most commonly refers to polyethylene (PE), which is composed of sets of two carbon and four hydrogen atoms, with two more hydrogen atoms completing the molecule. This is denoted as $(C_2H_4)_nH_2$.

[10] Ott, Jennifer, 2015, pers com.
[11] http://www.epa.gov/wastes/conserve/tools/warm/

The first industrially practical PE was discovered in 1933 by Eric Fawcett and Reginald Gibson, in Northwich, England. During World War II, further research was done and in 1944 Bakelite Corporation at Sabine, Texas and Du Pont at Charleston, West Virginia, began large scale production. High-density polyethylene (HDPE) is the type of molecule making up the most common disposable plastic single-use carryout store bags. Reusable carryout bags are usually made of low-density polyethylene (LDPE). At a molecular level, LDPE has a high degree of short and long chain branching, which means that the chains do not pack as well, making them lower density.



Ethylene (ethene)

2.2.3 Types of Carryout Bags

Plastic Single-Use Carryout Bags. Plastic single-use carryout bags are made of thin, flexible, plastic film, nonwoven fabric, or plastic textile, often HDPE.[12] Plastic bags are used for containing and transporting goods such as foods, produce, powders, ice, magazines, chemicals, and waste. Most plastic bags are heat sealed together. Some bags have gussets to allow a higher volume of contents. Handles are cut into or added onto some.

Reusable Bags. Reusable bags can be made from many materials, such as cotton, nylon, and plastic. Plastic LDPE is the most common type of reusable bag.[13] Typically, a reusable bag must be able to carry a significant weight, over a short distance, and must do so repeatedly without tearing. Other types of reusable bags are estimated to have comparable emissions when compared with LDPE[14] on a per unit basis. For purposes of the ordinance, a reusable bag must be able to carry 22 pounds 125 times over a distance of at least 175 feet.

Paper Single-Use Carryout Bags. In addition to plastic single-use carryout bags, some retailers provide paper single-use carryout bags. Some paper making processes use chemicals, such as sulfites, to dissolve lignin, leaving long cellulose fibers; others use mechanical processes to press fibers into paper. (Chemical pulping is not needed to make paper made from cotton, which is already 90 percent cellulose.) Paper bag manufacture typically uses the "Kraft" process, which does not require sulfites or other acids.[15] The Kraft process includes an exothermic (heat generating) reaction that is sometimes used to generate electricity. The Kraft process can be designed to recover and reuse all inorganic chemical reagents, and can incorporate up to 100 percent post-consumer recycled feedstock. A disadvantage of Kraft paper recycling is that it has a relatively large energy demand.[16]

[12] Wikipedia https://en.wikipedia.org/wiki/Hdpe.
[13] Wikipedia https://en.wikipedia.org/wiki/Low-density_polyethylene .
[14] Master Environmental Assessment on Single Use and Reusable Bags, Green Cities California, March 2010.
[15] Wikipedia https://en.wikipedia.org/wiki/Kraft_paper.
[16] Wikipedia https://en.wikipedia.org/wiki/Kraft_paper.

2.2.4 Current Single-Use Carryout Bag Issues

As previously stated, the City spends millions of dollars each year on prevention, cleanup, and other activities to reduce litter.[17] For example, the City provides litter bins and bin collection on public streets in commercial areas with retailers that provide large quantities of single-use items to their customers. The City also has a Code Compliance section that gives citations for illegal dumping and littering. The City provides community clean ups in all City Council Districts, and provides public education about waste reduction at community meetings and events. The goal of the education program is to reduce the amount of waste generated in the first place, recycle the waste that does get generated, and to prevent litter before it enters the environment.

Consistent with state law and environmental priorities, the most environmentally beneficial way of reducing waste is not to generate it. Examples of "source reduction" include using reusable coffee cups instead of disposable or recyclable cups, printing documents two-sided instead of one sided, and buying products with less packaging. While recycling keeps materials from being wasted in landfills, some recycling processes are associated with long trip distances and polluting remanufacturing processes. While recycling is preferable to use of virgin materials, source reduction is preferable to recycling.

2.2.5 Other Efforts To Reduce Plastic Single-Use Carryout Bag Impacts

Many California communities regulate the use of plastic single-use carryout bags within their jurisdictions. There are 110 adopted ordinances in California covering 139 cities and counties precluding plastic single-use carryout bags. One city, Huntington Beach, passed and then repealed an ordinance restricting plastic single-use carryout bags, with the repeal being cited as a "consumer choice" issue. California jurisdictions that regulate plastic single-use carryout bags are listed in Table 2-1.

Table 2-1
Carry-out Bag Ordinances in California

Enactment Date	Jurisdiction	CEQA Document	Details
January 2011	Marin County	Exemption	• $0.10 for paper • Covers grocery, drug, convenience stores
March 2014	San Rafael		
March 2014	Novato		
March 2014	Sausalito		
May 2014	Larkspur		
June 2014	Belvedere		
June 2014	San Anselmo		
June 2014	Martinez		
September 2014	Ross		
April 2011	Santa Clara County	Negative Declaration	• $0.15 for paper • Covers all retail except nonprofit
October/2012 (Amended September 2011 to add restaurants)	Santa Cruz County	Mitigated Negative Declaration	• Increased from $0.10 for paper to $0.25 for paper after the first year of initial operative date • Covers all retail • No fee would be charged for the distribution of single-use paper bags at restaurants
May 2012	Watsonville		
July 2012	Santa Cruz City		

[17] City of San Diego estimate, http://www.sandiego.gov/fm/annual/pdf/fy13/vol2/v2esd.pdf

Enactment Date	Jurisdiction	CEQA Document	Details
December 2011	Los Angeles County	Environmental Impact Report	• $0.10 for paper • Covers grocery, drug, convenience stores
February 2011	Calabasas		
May 2011	Long Beach		
November 2011	Pasadena		
January 2013	Glendale		
May 2013	Culver City		
August 2012	West Hollywood		
May 2014	South Pasadena		
January 2012	San Luis Obispo County	Exemption	• $0.10 for paper • Covers grocery, drug, convenience stores in unincorporated county and incorporated cities
	Arroyo Grande		
	Atascadero		
	Grover Beach		
	Morro Bay		
	Paso Robles		
	Pismo Beach		
	San Luis Obispo		
January 2012	Alameda County	Environmental Impact Report	• $0.10 for paper/reusable • Covers grocery, drug, convenience stores in unincorporated county and incorporate cities
	Alameda		
	Albany		
	Berkeley		
	Dublin		
	Emeryville		
	Fremont		
	Hayward		
	Livermore		
	Newark		
	Oakland		
	Piedmont		
	Pleasanton		
	San Leandro		
	Union City		
June 2012	Mendocino County	Environmental Impact Report	• $0.10 for paper • Covers all retail and restaurant
November 2012	San Mateo County	Environmental Impact Report	• $0.10 for paper • Covers all retail
November 2012	Belmont		
November 2012	South San Francisco		
December 2012	Pacific		
January 2013	Daly City		
January 2013	Portola Valley		
January 2013	San Bruno		
January 2013	Foster City		
January 2013	Colma		
January 2013	Menlo Park		
March 2013	Half Moon Bay		
March 2013	San Carlos		
March 2013	Redwood City		
March 2013	Brisbane		
March 2013	Burlingame		
April 2013	East Palo Alto		
May 2013	San Mateo City		
	Includes 5 cities outside Santa Clara County:		
December 2012	Mountain View		
March 2013	Los Altos		
March 2013	Cupertino		
July 2013	Campbell		
September 2013	Los Gatos		

Enactment Date	Jurisdiction	CEQA Document	Details
February 2014	Sonoma County	Environmental Impact Report (EIR)	• $0.10 for paper • Covers all retail
	Cloverdale		
	Cotati		
	Healdsburg		
	Petaluma		
	Rohnert Park		
	Sebastopol		
	Sonoma City		
	Windsor		
	Santa Rosa		
August 2014	Monterey County	Exemption	• $0.10 for paper • Covers all retail
August 2007	Fairfax	N/A – Voter Initiative	• Covers all retail
May 2008	Malibu	Exemption	• Covers all retail and restaurants
July 2008	Manhattan Beach	Negative Declaration	• Covers all retail and restaurants
February 2011	Santa Monica	Environmental Impact Report	• $0.10 for paper • Covers all retail
December 2011	Sunnyvale	Environmental Impact Report	• $0.10 for paper • Covers all retail except nonprofit stores
December 2011	Monterey City	Negative Declaration	• $0.25 for paper • Covers all retail except nonprofit stores
December 2012	Laguna Beach	Negative Declaration	• $0.10 for paper • Covers all retail and farmer's markets
December 2012	Millbrae	Negative Declaration	• $0.10 for paper • Covers all retail except nonprofit and drycleaners
December 2012	San Francisco	Exemption (update from earlier 2007 ordinance)	• $0.10 for paper/reusable • Covers all retail and restaurants, allows compostable bags
March 2012	Dana Point	Negative Declaration	• Voluntary charge for paper • Covers all retail
March 2012	Carpentaria	Exemption	• Paper not allowed for large stores • Covers all retail
April 2012	Ojai	Negative Declaration	• $0.10 for paper • Covers all retail
May 2012	Ukiah	Environmental Impact Report	• $0.10 for paper • Covers all retail
May 2012	Solana Beach	Negative Declaration	• $0.10 for paper • Covers all retail
May 2012	Fort Bragg	Environmental Impact Report	• $0.10 for paper • Covers all retail
July 2012	Carmel	Negative Declaration	• Covers all retail except non-profit
January 2013	Capitola	Negative Declaration	• $0.25 for paper • Covers all retail
June 2013	City of Los Angeles	Environmental Impact Report	• $0.10 for paper • Covers grocery, drug, convenience stores
July 2013	Richmond	Environmental Impact Report	• $0.05 to 0.10 for paper/reusable • Covers all retail
August 2013	San Jose	Environmental Impact Report	• $0.10 for paper • Covers all retail except nonprofit
September 2013	El Cerrito	Environmental Impact Report	• $0.05 - 0.10 for paper • Covers all retails
October 2013	Morgan Hill	Exemption	• $0.10 for paper/reusable • Covers all retail
October 2013	San Pablo	Environmental Impact Report	• $0.05-0.10 for paper/reusable • Covers all retail
October 2013	Santa Barbara	Environmental Impact Report	• $0.10 for paper/reusable • Covers grocery, drug, convenience stores
October 2012	South Lake Tahoe	Exemption	• Covers all retail and restaurants

Enactment Date	Jurisdiction	CEQA Document	Details
October 2012	Mill Valley	Exemption	• $0.05 for paper/reusable • Covers grocery, drug, convenience stores
October 2012	Pittsburg	Negative Declaration	• $0.10 or more for paper/reusable • Covers all retail
November 2013	Davis	Exemption	• $0.10 for paper • Covers all retail and restaurants
November 2013	Truckee	Exemption	• $0.10 for paper/reusable • Covers all retail
December 2013	Arcata	Negative Declaration	• $0.10 for paper • Covers all retail
February 2014	Santa Rosa	Environmental Impact Report	• $0.10 for paper • Covers all retail
March 2014	Walnut Creek	Exemption	• $0.10 for paper • Covers all retail, restaurant, nonprofits
March 2012	Desert Hot Springs	Exemption	• $0.10 for paper • Covers all retail
April 2014	Palm Springs	Exemption	• $0.10 for paper • Covers all retail
May 2014	Palm Desert	Exemption	• $0.10 for paper • Covers all retail
May 2014	Indio	Exemption	• $0.10 for paper • Covers all retail
May 2014	Chico	Exemption	• $0.10 for paper • Covers grocery, drug, convenience stores
June 2014	Nevada City	Exemption	• $0.10 for paper • Covers all retail
July, 2014	Monrovia	Exemption	• $0.10 for paper • Covers grocery, drug, convenience stores
July 2014	Gonzales	Exemption	• $0.25 for paper • Covers all retail and restaurants
August 2014	Calistoga	Exemption	• $0.10 for paper • Covers all retail and restaurants
August 2014	Pleasant Hill	Exemption	• $0.10 -0.025 for paper • Covers all retail and restaurants
August 2014	City of Napa	Exemption	• $0.10 for paper • Covers all retail
August 2014	Greenfield	Exemption	• $0.25 for paper and reusable • Covers all retail and restaurants
August 2014	Marina	Exemption	• $0.10 for paper and reusable • Covers all retail
August 2014	Pacific Grove	Exemption	• $0.10 for paper • Covers all retail
August 2014	Seaside	Exemption	• $0.10 for paper • Covers all retail
August 2014	Salinas	Exemption	• $0.10 for paper • Covers all retail
August 2014	St. Helena	Exemption	• $0.10 for paper • Covers all retail
September 2014	Tiburon	Exemption	• $0.10 for paper • Covers grocery, drug, and convenience
September 2014	Hercules	Environmental Impact Report	• $0.05-0.10 for paper and reusable • Covers all retail
September 2014	King City	Exemption	• $0.10 for paper • Covers all retail
September 2014	Encinitas	Exemption	• $0.10 for paper • Covers all retail and farmer's market

Enactment Date	Jurisdiction	CEQA Document	Details
September 2014	Santa Clara City	Negative Declaration	• $0.10 for paper • Covers all retail
October 2014	Soledad	Exemption	• $0.10 for paper • Covers all retail and farmer's market
October 2014	Pico Rivera	Exemption	• $0.10 for paper • Covers all grocery, drug, and convenience
December 2014	Lafayette	Exemption	• $0.10 for paper at grocery, drug and convenience • Covers all retail and restaurants
December 2014	Danville	Exemption	• Covers all retail and convenience
January 2015	Grass Valley	Exemption	• Covers all retail
March 2015	Sacramento	Environmental Impact Report	• $0.10 for paper • Covers grocery, drug and convenience
June 2015	Cathedral City	Exemption	• All retail except eating establishments and nonprofit
July 2015	Santa Barbara County	Environmental Impact Report	• Grocery, drug, convenience/liquor
July 2015	Hermosa Beach	Exemption	• All retail
August 2015	American Canyon	Exemption	• All retail except eating establishments

Source: http://www.cawrecycles.org/list-of-local-bag-bans

2.3 PROJECT OBJECTIVES

The City's objectives for the Single-Use Carryout Bag Reduction Ordinance include:

- Reducing the millions of plastic single-use carryout bags currently used in the City;
- Reducing the adverse environmental impacts associated with plastic single-use carryout bags, including impacts to air quality, biological resources (including marine environments), water quality, and solid waste;
- Deterring the use of paper single-use carryout bags by retail customers in the City;
- Promoting a shift toward the use of reusable carryout bags; and
- Reducing litter and the associated adverse impacts to storm water facilities, aesthetics, and the environment.

2.4 PROJECT HISTORY

In 2014, the California legislature passed, and Governor Brown signed, Senate Bill SB 270, which imposed statewide regulations on retailer provision of plastic single-use carryout bags. SB 270 preempts any local ordinance adopted on or after September 1, 2014 that is related to single-use carryout bag reduction. However, on February 24, 2015 California Secretary of State Alex Padilla certified a referendum for the November 8, 2016, General Election ballot to repeal the requirements of SB 270. Thus, if the ordinance is approved by the City of San Diego City Council and the referendum fails in November 2016, the City's ordinance, if approved, would be preempted by state law and retail stores within the City would be regulated under SB 270. If the referendum succeeds in overturning SB 270, then the City's ordinance, if approved, would regulate single-use carryout bags in the City.

Nationally, the cities of Washington, D.C.; Telluride, Colorado; Austin, Texas; Portland, Oregon; and the entire state of Hawaii have regulated plastic single-use carryout bags. World-wide, plastic single-use carryout bags have been precluded in Mexico City, and by jurisdictions in England, Australia, India, Bangladesh, and Rwanda, among others, while other countries have instituted fees on plastic single-use carryout bags, including Ireland, Italy, Belgium and Switzerland.

For decades, the City has proactively addressed waste reduction and litter control, with planning including the City Council approved "Recycling and Waste Reduction Plan" in 1988, the "Source Reduction and Recycling Element" in 1992, updated in 1994 and annually thereafter, and, in July 2015, as the City of San Diego City Council unanimously approved a "Zero Waste Plan," which includes plastic bag reduction as one of its components.

2.5 OUTREACH

During development of the ordinance, ESD met with a number of stakeholder groups to gather input:

- September 24, 2013 – Community Planners Committee
- September 26, 2013 – Business Improvement District (BID) Council
- September 27, 2013 – Stakeholder meeting hosted by Interim Mayor Todd Gloria's Office
- October 3, 2013 – Solid Waste Technical Advisory Committee
- October 4, 2013 – San Diego Regional Chamber of Commerce, Legislative and Small Business Advocacy Committee

ESD has distributed more than 40,000 reusable bags in the community since 2014. SeaWorld San Diego donated 25,000 reusable bags of which 10,000 were distributed through the San Diego Food Bank, 10,000 through San Diego Title One schools, 3,000 through the San Diego Public Library Summer Reading Program, and 2,000 to local children's environmental events.

In the spring of 2014, the City purchased over 15,000 high quality reusable bags from Green Vets LA. These bags were made locally by at-risk veterans with reclaimed fabric. The bags were distributed at events, especially in lower income neighborhoods, including:

June 26, 2014 – Rise Above Plastics Day sponsored by the Surfrider Foundation

July 2014 – 1,000 bags distributed through the Summer Lunch Program

July and August 2014 – Nine give-away events at local libraries

July and August 2014 – Give-aways at the City Heights and Linda Vista Farmer's Markets

July – December 2014 - Seven give-away events at grocery stores

July 2014 – June 2015 – Reusable bags distributed at more than 25 community fairs, food distribution events, school events, and presentations

Additionally, the City hosted three press events addressing this topic between January and May of 2014.

2.6 THE PROJECT

As stated in the project objectives, to encourage source reduction and reduce the adverse environmental impacts associated with plastic single-use carryout bags, including plastic bag litter, the City is proposing to adopt and implement an ordinance to regulate the use of "single-use carryout bags" and promote the use of "reusable bags" within the City.

A "reusable bag" is defined as a bag with handles that meets all of the following criteria:

- Has a minimum useful life of 125 uses, which means the capability of carrying a minimum of 22 pounds, at least 125 times, over a distance of at least 175 feet;
- Has a minimum volume of 15 liters;
- Is machine washable or is made from a material that can be cleaned or disinfected with common household cleaners;
- Does not contain lead, cadmium, hexavalent chromium, or mercury in toxic amounts, as defined by the ordinance;
- Has printed on the bag, or on a tag that is permanently affixed to the bag: the name of the manufacturer, the location (country) where the bag was manufactured, a statement that the bag does not contain lead, cadmium, hexavalent chromium, or mercury in toxic amounts as defined in the ordinance, the percentage of post-consumer recycled material used, if any, and bag care and washing instructions;
- If made predominantly of plastic derived from petroleum, natural gas, or a biologically-based source, such as corn or other plant sources, is a minimum of at least 2.25 millimeters thick; and
- If made predominantly of plastic derived from petroleum or natural gas, is made from at least twenty percent (20%) "post-consumer recycled material".

A "plastic single-use carryout bag" means any bag that is provided to a customer at the point of sale that is made of plastic derived from either petroleum, natural gas, or a biologically-based source, such as corn or other plant sources, whether or not such bag is compostable and/or biodegradable. "Plastic single-use carryout bags" do not include "reusable bags" or "product bags".

A "paper single-use carryout bag" means any bag made of paper materials that is provided to a customer at the point of sale. Paper materials include virgin, recycled, or recyclable paper materials. "Paper single-use carryout bag" does not include "reusable bags" or "product bags".

A "recyclable paper single-use carryout bag" means a bag that: (1) is one hundred percent (100%) "recyclable" and contains a minimum of forty percent (40%) "post-consumer recycled material"; and (2) has the following information printed on the bag: (a) name of bag manufacturer; (b) the country of bag manufacture; and (c) the percentage of "post-consumer recycled materials" used to make the bag.

"Recyclable" means a material which can be processed into a form suitable for reuse through reprocessing or remanufactured consistent with the requirements of AB 939.

"Post-consumer recycled material" means "recyclable" material that would otherwise be destined for disposal, having completed its intended end use and product life cycle. The term "post-consumer recycled material" does not include materials and by-products generation from, and commonly reused within, an original manufacturing and fabrication process.

The Single-Use Carryout Bag Reduction Ordinance would:

1. Prohibit the distribution of plastic single-use carryout bags and paper single-use carryout bags that do not qualify as "recyclable paper single-use carryout bags" to point-of-sale customers at stores subject to the ordinance.
2. Require stores subject to this ordinance to collect a $0.10 charge for each recyclable paper single-use carryout bag provided to point-of-sale customers.
    - Participants in the Women, Infant and Children (WIC) or Supplemental Food Programs would be exempt from this requirement. (The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides federal grants to states for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk.)
3. Apply to the following:
    a. Full-line retail stores with two million dollars or more in gross annual sales that offer for sale perishable items in addition to a line of dry groceries, canned goods, or non-food items (Category A stores).
    b. Stores of at least 10,000 square feet of retail space that generate sales or use tax pursuant to the Bradley-Burns Uniform Local Sales and Use Tax Law and that have a pharmacy licensed pursuant to the Pharmacy Law (Category B stores).
    c. Supermarkets, grocery stores, drug stores, convenience food stores, food marts, pharmacies, or other entities engaged in the retail sale of goods that include milk, bread, soda, and snack foods, including those retail establishments with a Type 20 or 21 license issued by the California Department of Alcoholic Beverage Control (Category C stores).
4. Not regulate:
    a. "Product bags" - these include plastic or paper bags without handles, that are provided to a customer to carry meat, produce, or other food items to the point of sale, or to protect food or merchandise from being damaged or contaminated by other food or merchandise when items are placed together in a reusable bag or a recyclable paper single-use carryout bag at the point of sale.
    b. Restaurants.
    c. Non-profit stores that sell used goods.

5. Require stores subject to the ordinance to provide or make available to customers only recyclable paper single-use carryout bags or reusable bags for carrying away goods or materials from the point of sale.
6. Require stores subject to the ordinance to charge at least $0.10 per reusable bag at the point of sale to customers.
7. Allow stores subject to the ordinance to provide reusable bags for free to customers during an infrequent and limited time promotion that cannot exceed a total of 90 calendar days within any consecutive 12-month period.
8. Require stores subject to the ordinance to keep complete and accurate records of the number of recyclable paper single-use carryout bags provided each calendar month, both at a cost and for free to customers, and the total amount of monies collected each calendar month for the sale of recyclable paper single-use carryout bags to customers.
9. Not require periodic reporting, although the City may request data.
10. Phase implementation to allow for the transitional use of remaining single-use plastic and non-recyclable paper carryout bag inventories.

A grace period of six months for large retailers (Category A and B stores) and one year for small retailers (Category C stores) would be provided to allow retailers to phase out stocks of plastic single-use carryout bags and paper bags that do not qualify as "recycled paper single-use carryout bags". Upon completion of the applicable grace period, retailers would have to charge $0.10 per recyclable paper single-use carryout bag, which would be retained by the retailer. During the grace period, the retailers could continue to provide plastic single-use carryout bags, and would not be required to provide paper carryout bags to customers.

The ordinance would not prohibit a customer from using plastic or paper single-use carryout bags that they bring themselves into a store. Also, the ordinance would not prohibit a store from providing "product bags" to protect or contain meat or prepared food; or for bagging fruits, vegetables, and other fresh produce; or for other goods that must be protected from moisture, damage or cross-contamination, and which are typically placed inside a single-use carryout bag at the point of sale. Pharmacy bags used to carry out prescription drugs would be exempt from the ordinance. Dry cleaners could continue to provide dry cleaning plastic bags, and clothing retailers could continue to provide specialty plastic bags for suits, dresses and similar clothing items. Restaurants and certain other food service providers could continue to provide plastic bags to customers for prepared take-out food intended for consumption off the premises, as could vendors at City farmers markets.

ESD has conducted a public education program for several years, and would continue these activities through the grace period. Program activities include: disseminating information to the public, providing information to Town Councils and Planning Groups, and promoting the use of reusable bags at major events throughout the City. Since 2009, ESD has purchased and distributed tens of thousands of reusable bags. The City would continue these activities through the grace period.

The ordinance is conservatively projected to reduce carryout bags used within the City from 729,616,000 per year to 265,264,000 per year (Table 2-2).

Table 2-2
Comparison of Expected Carryout Bag Annual Usage Pre- and Post- Ordinance

Type of Bag	Existing Condition (Annual consumption)	With Ordinance (Annual consumption)	Explanation
Plastic Single-Use Carryout Bags	700,000,000	35,000,000	Existing condition calculated using the population of San Diego as it relates to 20 billion bags distributed in California annually.[1] It is not known the precise number of bags that would remain in circulation post ordinance; however, the larger jurisdiction that most closely mirrors the City in terms of type of retailers affected is the City of Los Angeles, which assumed that approximately 5% of plastic single-use carryout bags would remain in circulation.[2]
Paper Single-Use Carryout Bags	29,474,000	221,053,000	Varying data exists regarding the percentage of paper bag use when plastic and paper bags are both provided free of charge. Four percent of paper bag use is conservatively used in this analysis.[3, 4] Data on the effect of plastic bag regulation on paper bag use varies widely. Some data show an increase in paper bag use, others show as much as 16% decrease. Certain exempt customers would be allowed to use paper single-use carryout bags at no charge, and the many visitors to San Diego may need to purchase paper single-use carryout bags. Looking at the worst case scenario for this analysis, the total bags expected post ordinance was calculated assuming 30% of the bag trips per week would be utilizing paper bags.[2] The volume of a paper single-use carryout bag is approximately 150% the volume of a plastic single-use carryout bag. However, to be conservative, it is assumed that paper would replace plastic at a 1:1 ratio. To be conservative, these estimates do not take into account a post-ordinance increase in the number of purchases in which no bags are used.
Reusable Bags	142,000	9,211,000	Although a "reusable bag" is designed to be used at least 125 times, it is conservatively assumed that such bags would be used by a customer only once per week for one year (52 times). Based on the pre-ordinance plastic and paper bag usage, it is assumed approximately 1% of bags used currently are reusable. Post ordinance usage of reusable bags is assumed to be 65% of the bag trips per week.[1] Again, to be conservative, the estimate does not take into account a post-ordinance increase in the number of purchases in which no bags are used.
Total	729,616,000	265,264,000	

[1] Green Cities California 2010
[2] City of Los Angeles Single-Use Carryout Bag Ordinance FEIR, May 2013, San Jose Single-Use Carryout Bag Ordinance EIR, October 2010.
[3] Equinox 2013
[4] AECOM 2010 Economic Impact Analysis

This EIR references pertinent government policies and guidelines; certified EIRs; and specific, industry-accepted life cycle studies in preparing the analysis. The Green Cities California Master Environmental Assessment (MEA), The Boustead Report, and the Ecobilan Study in particular are the most recent, commonly accepted reports addressing the environmental impacts of single-use and reusable bags. A full reference list is contained in Section 11, References, Individuals & Agencies Consulted.

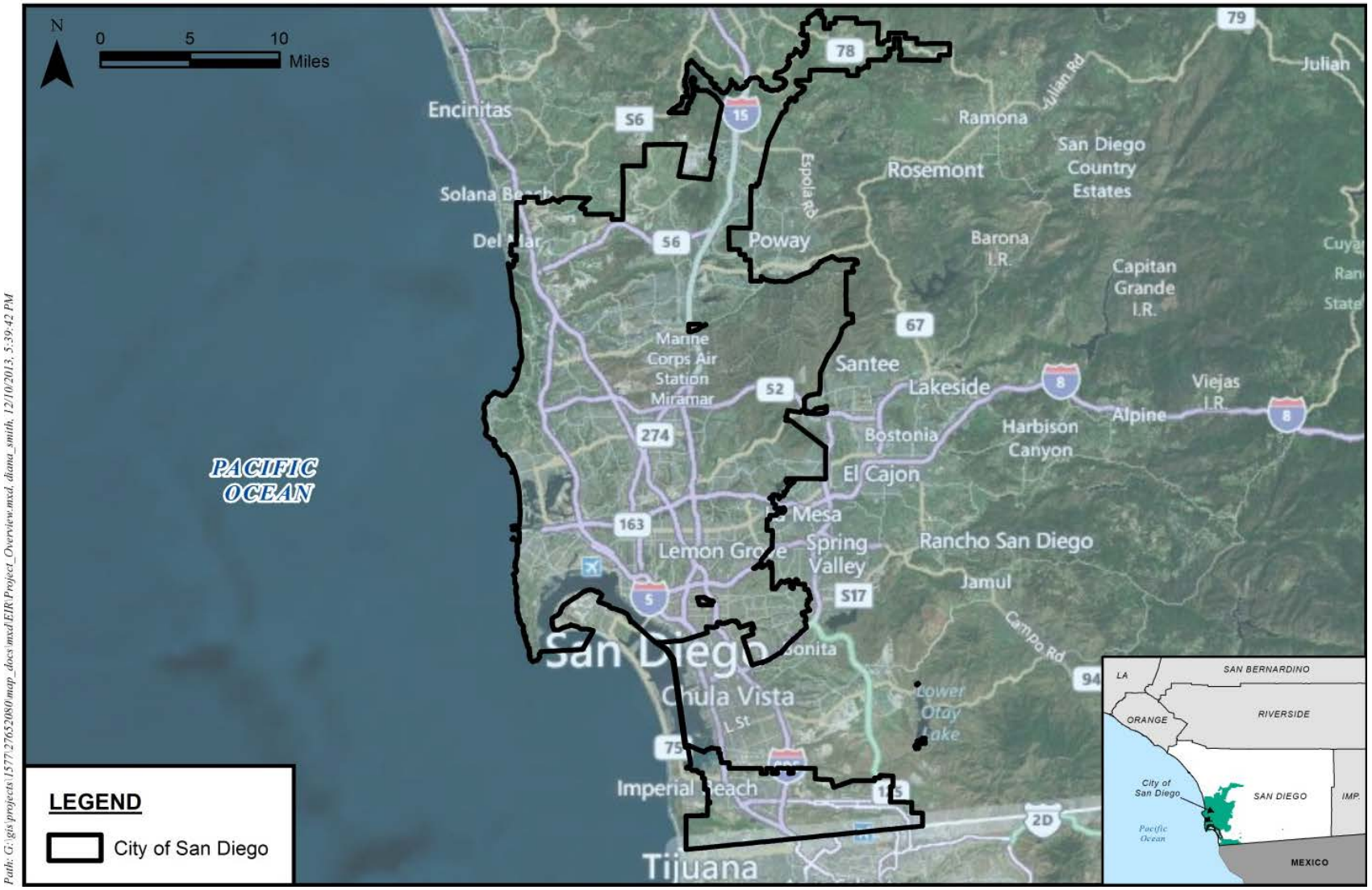
Of particular interest among the previous EIRs, comparisons are made in this analysis with the City of Los Angeles, which implemented a carryout bag ordinance in 2013. There are many parallels between the two large southern California cities, as identified on the U.S. Census Bureau website. While San Diego is less than half the size of Los Angeles, with a population of 1.4 million people as compared to 3.9 million, the two cities are comparable in many ways. Generally, the City of San Diego has a slightly more affluent population, which would not be expected to result in adverse effect related to ordinance implementation. San Diego has a higher rate of home ownership, lower rate of home language other than English, lower mean travel time to work, and a higher median income.[18]

2.7 ENVIRONMENTAL SETTING

The ordinance would apply Citywide, approximately 372 square miles, stretching from Rancho Bernardo to the north to the Pacific Ocean on the west to the International Border on the south (see Figure 2-1). Adjoining jurisdictions include unincorporated San Diego County, Solana Beach, Del Mar, Escondido, Poway, La Mesa, El Cajon, Santee, Lemon Grove, Coronado, National City, Chula Vista, and Imperial Beach.

[18] 2015 U.S. Census Bureau http://quickfacts.census.gov/qfd/states/06/0666000.html

Figure 2-1
Project Assessment Area (from San GIS)



SECTION 3 ENVIRONMENTAL IMPACT ANALYSIS

This section of the EIR examines the potential environmental effects of the project for the specific issue areas that were identified through the Initial Study and NOP process as having the potential for a significant impact.

The following aspects of each environmental issue are considered:

- Environmental Setting, which describes the existing environmental conditions as they exist before the commencement of the project to provide a baseline for comparing "before the project" and "after the project" environmental conditions.
- Impact Criteria, which define and list specific criteria that were identified through a review of the City's CEQA Guidelines and Significance Thresholds[19] and NOP process as having the potential for a significant impact.
- Environmental Impacts, which presents evidence, based to the extent possible on scientific and factual data, of the cause and effect relationship between the project and potential changes in the environment. The magnitude, duration, extent, frequency, range or other parameters of a potential impact support conclusions about the significance. Direct effects and reasonably foreseeable indirect effects are considered. If, after thorough investigation, a particular impact is too speculative for evaluation, that conclusion is noted (CEQA Guidelines Section 15145).
- Mitigation Measures, which includes measures that may be needed to reduce or avoid the potentially significant impact identified in the EIR analysis. Standard existing regulations, requirements, and procedures applicable to the project are considered a part of the existing regulatory environment.
- Level of Impact after Mitigation, which indicates what effect will remain after application of mitigation measures, and whether the remaining effect is considered significant. When impacts, even with the inclusion of mitigation measures, cannot be mitigated to a level considered to be less than significant, they are identified as "unavoidable significant impacts."

[19] City of San Diego CEQA Thresholds: http://www.sandiego.gov/development-services/pdf/news/sdtceqa.pdf

3.1 AIR QUALITY

This section provides an overview of existing air quality conditions and evaluates potential impacts associated with the ordinance. The analysis focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. "Emissions" refer to the quantity of pollutants released into the air, measured in kilogram (kg) per year, pounds per hour, pounds per day (ppd), or pounds per year. "Concentrations" refer to the amount of pollutant material per volumetric unit of air, measured in parts per hundred million (pphm), parts per million (ppm), or micrograms per cubic meter ($\mu g/m^3$).

3.1.1 Environmental Setting

3.1.1.1 Air Pollutants and Ambient Air Quality Standards

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards for outdoor concentrations to protect public health. The federal and state standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. The California State standards are generally more stringent than federal standards, especially in the case of small particulate matter (PM_{10}) and sulfur dioxide (SO_2). The City is located within the San Diego Air Basin (SDAB). The SDAB continues to exceed federal and state ambient air quality standards for ozone (O_3) and federal particulate matter standards ($PM_{2.5}$ and PM_{10}).

Table 3-1 outlines current federal and state ambient air quality standards, and sources and health effects of these criteria pollutants. Additional information about health effects associated with each pollutant is provided in the South Coast Air Quality Management District (SCAQMD) CEQA Air Quality Handbook, which is hereby incorporated by reference.

Table 3-1
Ambient Air Quality Standards and Air Pollutant Sources and Effects

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]	Sources	Health Effects
		Primary [3,4]	Secondary [3,5]	Concentration [3]		
Ozone	1-hour	–	Same as primary standard	0.09 ppm (180 µg/m^3)	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	Aggravation of respiratory and cardiovascular diseases, irritation of eyes, impairment of cardiopulmonary function, plant leaf injury
	8-hour	0.075 ppm (147 µg/m^3)		0.070 ppm (137 µg/m^3)		
Carbon Monoxide	8-hour	9 ppm (10 mg/m^3)	–	9.0 ppm (10 mg/m^3)	Incomplete combustion of fuels and other carbon-containing substances such as motor vehicle exhaust, natural events, such as decomposition of organic matter	Reduced tolerance for exercise, impairment of mental function, impairment of fetal development, death at high levels of exposure, aggravation of some heart diseases (angina)
	1-hour	35 ppm (40 mg/m^3)		20 ppm (23 mg/m^3)		
Nitrogen Dioxide[6]	Annual average	0.053 ppm (100 µg/m^3)	Same as primary standard	0.030 ppm (57 µg/m^3)	Motor vehicle exhaust, high temperature stationary combustion, atmospheric reactions	Aggravation of respiratory illness, reduced visibility, reduced plant growth, formation of acid rain
	1-hour	0.100 ppm (188 µg/m^3)		0.18 ppm (339 µg/m^3)		
Sulfur Dioxide[7]	Annual average	0.030 ppm (for certain areas)[7]	–	–	Combustion of sulfur-containing fossil fuels, smelting of sulfur-bearing metal ores, industrial processes	Aggravation of respiratory diseases (asthma, emphysema), reduced lung function, irritation of eyes, reduced visibility, plant injury, deterioration of metals, textiles, leather, finishes, coating, etc.
	24-hour	0.14 ppm (for certain areas)[7]	–	0.04 ppm (105 µg/m^3)		
	3-hour	–	0.5 ppm (1,300 µg/m^3)	–		
	1-hour	0.075 ppm (196 µg/m^3)	–	0.25 ppm (655 µg/m^3)		

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]	Sources	Health Effects
		Primary [3,4]	Secondary [3,5]	Concentration [3]		
Respirable Particulate Matter (PM10)	24-hour	150 µg/m^3	Same as primary standard	50 µg/m^3	Stationary combustion of solid fuels, construction activities, industrial processes, industrial chemical reactions	Reduced lung function, aggravation of the effects of gaseous pollutants, aggravation of respiratory and cardio-respiratory diseases, increased coughing and chest discomfort, soiling, reduced visibility
	Annual arithmetic mean	–		20 µg/m^3		
Fine Particulate Matter (PM2.5)	24-hour	35 µg/m^3	Same as primary standard	–	Combustion from mobile and stationary sources, atmospheric chemical reactions	Health problems, including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing, and premature deaths.
	Annual arithmetic mean[11]	12 µg/m^3		12 µg/m^3		
Lead [8,9]	30-day average	–	–	1.5 µg/m^3	Contaminated soil and water	Increased body burden, impairment of blood formation and nerve conduction
	Calendar quarter	1.5 µg/m^3 (for certain areas)[9]	Same as primary standard	–		
	Rolling 3-month average	0.15 µg/m^3		–		
Vinyl Chloride[8]	24-hour	No federal standards		0.01 ppm (26 µg/m^3)		
Hydrogen Sulfide	1-hour			0.03 ppm (42 µg/m^3)		
Sulfates	24-hour			25 µg/m^3		
Visibility Reducing Particles[10]	8-hour (10 am to 6 pm, Pacific Standard Time)			See footnote 10		Visibility impairment on days when relative humidity is less than 70%

Source: USEPA-NAAQS, http://www.epa.gov/air/criteria.html; CARB-CAAQS, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf and SCAQMD Air Quality Handbook. South Coast Air Quality Management District (SCAQMD) CEQA Air Quality Handbook

Notes:

[1] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[2] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility-reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in § 70200 of Title 17 of the California Code of Regulations.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. (A torr is a unit of pressure equal to $1/760^{th}$ of an "atmosphere.") Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas. (A "mole" corresponds to approximately 6.022×10^{23} elementary entities of the substance.)

[4] National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety.

[5] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[6] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb.

[7] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated non-attainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[8] The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[9] The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[10] In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

[11] On December 14, 2012, USEPA promulgated a new PM2.5 annual NAAQS of 12 $\mu g/m^3$.

$\mu g/m^3$	=	micrograms per cubic meter	NAAQS	=	National Ambient Air Quality Standards
CAAQS	=	California Ambient Air Quality Standards	ppm	=	parts per million
mg/m^3	=	milligram per cubic meter			

3.1.1.2 Toxic Air Contaminants (TAC)

TACs are generally defined as contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. TACs are also defined as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Other factors, such as the amount of the chemical, its toxicity, and how it is released into the air, the weather, and the terrain, all influence whether the emission could be hazardous to human health. TACs are emitted by a variety of industrial processes such as petroleum refining, electric utility and metal plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust, and may exist as PM_{10} and $PM_{2.5}$ or as vapors (gases). TACs include metals and other particles, gases absorbed by particles, and certain vapors from fuels and other sources.

Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material[20]. The visible emissions in diesel exhaust include $PM_{2.5}$ and PM_{10}. These particles have hundreds of chemicals adsorbed onto their surfaces, including many known or suspected carcinogens and mutagens. Compared to other air toxics that the California Air Resources Board (CARB)[21] has identified and controlled, diesel particulate matter (PM) emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk. In addition to these general risks, diesel PM can also be responsible for elevated localized or near-source exposures ("hot-spots").

The emission of toxic substances into the air can be damaging to human health and to the environment. Human exposure to these pollutants at sufficient concentrations and durations can result in cancer, toxics poisoning, and rapid onset of sickness, such as nausea or difficulty in breathing. Other less measurable effects include immunological, neurological, reproductive, developmental, and respiratory problems, some of which may not become apparent for years after exposure. Pollutants deposited onto soil or into lakes and streams affect ecological systems, and eventually human health, through consumption of contaminated food and water. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of contracting cancer.

3.1.1.3 Ground-level Ozone and Atmospheric Acidification

In terms of air quality, ground-level ozone and atmospheric acidification are of particular concern. Ozone is found in two regions of the Earth's atmosphere – at ground-level and in the upper regions of the atmosphere. Both types of ozone have the same chemical composition (O_3). While upper atmospheric ozone protects the earth from the sun's harmful rays, ground-level ozone is the main component of smog.

"Smog" is a mixture of pollutants but is primarily made up of ground-level ozone. Smog usually is produced through a complex set of photochemical reactions involving volatile organic compounds (VOCs) and nitrogen oxides in the presence of sunlight that result in the production of ozone. Smog-forming pollutants come from many sources, such as automobile exhausts, power plants, factories, and

[20] California Air Resources Board, Health Effects of Diesel: http://www.arb.ca.gov/diesel/tru/documents/health_effects_diesel_exhaust-hei_perspective.pdf
[21] http://hank.baaqmd.gov/pln/pm/index.htm

many consumer products, including paints, hair spray, charcoal starter fluid, solvents, and even plastic popcorn packaging. In typical urban areas, at least half of the smog precursors come from cars, buses, trucks, and boats.

Major smog occurrences often are linked to heavy motor vehicle traffic, high temperatures, sunshine, and calm winds. Weather and geography affect the location and severity of smog. Because temperature regulates the length of time it takes for smog to form, smog can form faster and be more severe on a hot and sunny day. When temperature inversions occur (warm air stays near the ground instead of rising) and winds are calm, smog may be trapped over the city for days. As traffic and other sources add more pollutants to the air, the smog gets worse. Smog is often more severe away from the pollution sources. This is because the chemical reactions that cause smog occur in the atmosphere. Smog and ground-level ozone problems exist in many major cities, including much of California, including the City of San Diego.

Ground-level ozone can harm human health, even at low concentrations. People with lung disease including asthma, children, older adults, and people who are active outdoors may be particularly sensitive to ozone. Children are at greatest risk because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases exposure. Children are also more likely than adults to have asthma. Ground-level ozone also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas.

Air pollutant emissions, in particular emissions of nitrogen and sulfur dioxides (NO_2 and SO_2), have caused regional scale acidification of the atmosphere and sensitive aquatic and terrestrial ecosystems in North America and Europe. These chemical changes commonly known as “acid rain” are making the oceans more acidic (that is, decreasing the pH of the oceans) and affecting terrestrial ecosystems.

3.1.1.4 Existing Air Quality

The San Diego Air Pollution Control District (SDAPCD) is the agency principally responsible for comprehensive air pollution control in the region. It monitors air quality at 13 locations throughout the SDAB. There are 19 air quality monitoring stations within the SDAPCD’s system. Three were selected to represent air quality in the project area: the Kearny Mesa/Kearny Villa Road Monitoring Station, which is approximately located in the center of the City’s boundaries near the City’s Miramar Landfill, the San Diego-Beardsley Street Monitoring Station, which is located in Downtown San Diego where most commercial uses have the heaviest concentration and where any changes associated with carryout bags would have the most impact, and the Otay Mesa Monitoring Station, which is located near the City’s southern boundary, just north of the U.S.–Mexico border, which may be effected by conditions across the border. The Union Street, 12th Avenue, B Street, and Logan Avenue Stations all monitor the downtown area, and are represented by the Beardsley Street Station. The Kearny Mesa/Kearny Villa Road Monitoring Station represents air quality in the vicinity of Overland Avenue. More distant stations such as Miracosta College, to the north in Del Mar, and Victoria Drive in Alpine would not provide additional detail regarding conditions with the project area.

Table 3-2 shows the state and federal standards, the highest pollutant levels, and the highest number of exceedances recorded among these three San Diego monitoring stations. As shown, criteria pollutants NO_2 and SO_2 did not exceed the state and national standards from 2010 to 2012; carbon monoxide (CO)

exceeded the national 8-hour standard in 2010 to 2012. The one-hour state standard for O_3 was exceeded one to two times each year during this period. The 8-hour state standard for O_3 was exceeded up to three times each year during this period, while the 8-hour federal standard for O_3 was exceeded one time each in 2011 and 2012. The 24-hour state standard for PM_{10} was exceeded in 2010 and 2011 during this period. The 24-hour and annual federal standards for PM_{10} and $PM_{2.5}$ were not exceeded between 2010 and 2012.

Table 3-2
2010-2012 Ambient Air Quality Data at the San Diego Monitoring Stations[1]

Pollutant	Pollutant Concentration and Standards	2010	2011	2012
Ozone (O_3)	Maximum 1-hr Concentration (pphm)	10	10	10
	Days 9 pphm state 1-hr Standard Exceeded	2	1	1
	Maximum 8-hr Concentration (pphm)	7	9	8
	Days 7 pphm State 8-hr Standard Exceeded	3	3	2
	Days 7.5 pphm National 8-hr Standard Exceeded	0	1	1
Carbon Monoxide (CO)	Maximum 1-hr Concentration (ppm)	3.1	2.8	1.6
	Days 20 ppm State1-hr Standard Exceeded Days 35 ppm	0	0	0
	National 1-hr standard Exceeded Maximum 8-hr Concentration (ppm)	2.2	2.4	1.9
	Days 9.0 ppm State 8-hr Standard Exceeded	0	0	0
	Days 9 ppm National 8-hr Standard Exceeded	0	0	0
Nitrogen Dioxide (NO_2)	Maximum 1-hr Concentration (ppm)	0.091	0.100	0.077
	Days 0.18 ppm State 1-hr Standard Exceeded	0	0	0
	Days 0.100 ppm National 1-hr Standard Exceeded	0	0	0
Respirable Particulate Matter (PM_{10})	Maximum 24-hr concentration ($\mu g/m^3$)	108	125	45
	Exceed State 24-hr Standard (50 $\mu g/m^3$)	Yes	Yes	No
	Exceeded National 24-hr Standard (150 $\mu g/m^3$)	No	No	No
Fine Particulate Matter ($PM_{2.5}$)	Maximum 24-hr Concentration ($\mu g/ m^3$)	40	35	30
	Exceed National 24-hr Standard (35 $\mu g/m^3$)	Yes	Yes	No
	Maximum Annual Concentration ($\mu g/m^3$)	10.4	10.8	11.0
	Exceed National Annual Standard (12 $\mu g/m^3$)	No	No	No
Sulfur Dioxide (SO_2)	Maximum 24-hr Concentration (ppm)	0.007	0.006	N/A
	Days 0.04 ppm State 24-hr Standard Exceeded	0	0	N/A
	Days > 0.14 ppm National 24-hr Standard Exceeded	0	0	N/A

3.1.1.5 Sensitive Receptors

The SDAPCD defines sensitive receptors as persons particularly susceptible to health effects due to exposure to an air contaminant. The examples of land uses (sensitive sites) where sensitive receptors are typically located include residences, businesses, schools, daycare centers, hospitals, hotels, government facilities, retirement homes, or any other location where extended public access is possible.

3.1.1.6 Current Air Pollutant Emissions Associated with Single-Use Carryout Bags and Reusable Bags

Single-use carryout bags can affect air quality in two ways: through emissions and acidification associated with manufacturing processes, and through emissions and acidification associated with deliveries to retailers. If all emissions are considered at a combined rate, paper single-use carryout bags have 1.9 times the emissions of plastic single-use carryout bags, on a per bag basis.[22] This impact is slightly less when paper bags with post consumer recycled content are used; however, to be conservative, this reduction was not included in the analysis. Thicker (at least 2.25 millimeter thick) LDPE bags, which are considered for purposes of this study to be representative of the impacts of reusable bags[23], produce three times the emissions of a plastic single-use carryout bag, on a per bag basis.[24] In addition, paper single-use carryout bags produce 1.3 times the ground-level ozone of a plastic single-use carryout bag; and reusable bags result in 1.4 times the ground-level ozone formation of a plastic single-use carryout bag.[25] Table 3-3 summarizes emissions associated with current bag use.

Table 3-3
Estimated Current Emissions from All Carryout Bags Contributing to Ground Level Ozone and Atmospheric Acidification (AA)

Bag Type	Number of Bags Used per Year[1]	Emissions to Ozone Formation (kg) per 1,000 Bags[2]	Emissions to Ozone Formation per Year (kg)	AA Emissions (kg) per 1,000 Bags[3]	AA Emissions per Year (kg)
Single-Use Plastic	700,000,000	0.023	16,100	1.084	758,800
Single-Use Paper	29,474,000	0.03	884	2.03	59,832
Reusable LDPE	142,000	0.032	5	3.252	462
Total	729,616,000	-	16,989	-	819,094

[1] See Table 2-2 for discussion of how these numbers were estimated.
[2] Emissions per 1,000 bags from Ecobilan, 2004; Santa Monica Single-use Carryout Bag Ordinance Final EIR, January 2011, and County of San Mateo Single Use Bag Ban Ordinance EIR, June 2012.
[3] Emissions per 1,000 bags from FRIDGE, 2002 and Green Cities California MEA, 2010; Santa Monica Single-use Carryout Bag Ordinance Final EIR, January 2011; and EIR; and County of San Mateo Single Use Bag Ban Ordinance EIR, June 2012.

[22] Summary of Los Angeles County Environmental Impact Report http://www.dpw.co.santa-cruz.ca.us/www.santacruzcountyrecycles/Law/DocList/SC058-LA_County_EIR_summary.pdf
[23] LDPE bags are the most commonly used reusable bags, and it would not be possible to consider every type of reusable bag.
[24] Summary of Los Angeles County Environmental Impact Report http://www.dpw.co.santa-cruz.ca.us/www.santacruzcountyrecycles/Law/DocList/SC058-LA_County_EIR_summary.pdf
[25] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material, February 2004.

Based on a City population of approximately 1,326,238 persons in January 2013[26] and a statewide estimate of approximately 531 plastic single-use carryout bags used per person per year,[27] retail customers in the City currently use an estimated 700,000,000 plastic single-use carryout bags per year. Assuming that deliveries are made in separate dedicated loads by diesel trucks and each truck carries 2,080,000 plastic single-use carryout bags per truck load,[28] approximately 337 annual truck trips are needed to deliver the plastic single-use carryout bags used in the City per year. Diesel fuel emissions from these trips contribute to the local and regional air pollutant emissions.

3.1.1.7 Regulations Applicable to Manufacturing Facilities

Title V Permit. Title V is a federal program designed to standardize air quality permits and the permitting process for major sources of emissions. USEPA regulations [Title 40 of the Code of Federal Regulations, Chapter1, Part 70 (Part 70)] require states and local permitting authorities to develop a permit program for USEPA approval. Title V requirements apply to "major sources," facilities that emit, or have the potential to emit, any criteria pollutant or hazardous air pollutant at levels equal to or greater than the Major Source Thresholds (MST). This program would likely apply to facilities that manufacture bags.

Major Source Thresholds (MST). The MST for criteria pollutants may vary depending on the attainment status (e.g., marginal, serious, extreme) and the Criteria Pollutant or Hazardous Air Pollutant (HAP) of the geographic area in which a facility is located. Single-use carryout bag manufacturing facilities that emit any criteria pollutant or HAP at levels equal to or greater than the MST of the local air quality management district must obtain, and maintain compliance with, a Title V permit.

San Diego Air Pollution Control District (SDAPCD) Equipment Permits. As previously mentioned, the SDAPCD is the agency principally responsible for air pollution control in the region. Specifically, the SDAPCD is responsible for monitoring air quality, and for developing and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. SDAPCD regulates stationary sources, area sources, point sources, and certain mobile source emissions.

SDAPCD requires operators that plan to build, install, alter, replace, or operate any equipment that emits or controls the emission of air contaminants to apply for, obtain, and maintain equipment permits. The SDAPCD routinely inspects operating facilities to verify that equipment has been built and installed as required and to confirm that the equipment operates in compliance with SDAPCD rules and regulations.

3.1.1.8 Regulations Applicable to Delivery Trucks

On-Road Heavy-Duty Diesel Vehicles (In-use) Regulation. California Code of Regulations (CCR) Title 13, Division 3, Chapter 1, Section 2025 requires heavy diesel trucks and buses (with gross vehicular weight greater than 26,000 pounds) to have particulate matter filters. By January 1, 2023, nearly all trucks

[26] From Population Estimates for Cities, Counties, and the State. http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/view.php
[27] Master Environmental Assessment on Single Use and Reusable Bags, Green Cities California, March 2010.
[28] Santa Monica Single-use Carryout Bag Ordinance Final Environmental Impact Report, January 2011; County of San Mateo Single Use Bag Ban Ordinance, June 2012.

and buses will need to have 2010 model year engines or equivalent. Diesel trucks making deliveries of single-use carryout bags in California would be required to adhere to this regulation.

Diesel-fueled Commercial Motor Vehicle Idling Limit. The purpose of this airborne toxic control measure is to reduce public exposure to diesel particulate matter and other air contaminants by limiting the idling of diesel-fueled commercial motor vehicles. This regulation can be found in section 2485 within Chapter 10 – Mobile Source Operational Controls, Article 1 – Motor Vehicles, Division 3, title 13, of the CCR. As stated in the CCR, this regulation applies to diesel-fueled commercial motor vehicles that operate in the state with gross vehicular weight ratings of greater than 10,000 pounds that are or must be licensed for operation on highways. The in-use truck requirements require operators of both in-state and out-of-state registered sleeper berth equipped trucks to manually shut down their engine when idling more than five minutes at any location within California.

Toxic Air Contaminants. The SDAPCD is the implementing agency for approximately 3,130 San Diego facilities required to comply with the Air Toxics "Hot Spots" Act.[29] The SDAPCD has a long and successful history of reducing air toxics and criteria pollutant emissions in the SDAB. The toxic air contaminant emissions from stationary sources in San Diego County have been reduced by approximately 89.2 percent since 1989.[30] Based on the most recent estimates, those sites inventoried emit less than 2 million pounds of TACs annually (down from approximately 2.5 million pounds in 2005).[31]

3.1.2 Impact Criteria

The ordinance would have a significant impact related to air quality if it would:

- Result in air emissions that would substantially deteriorate ambient air quality, including exposure of sensitive receptors to substantial pollutant concentrations, (e.g., exposure of multiple species habitat planning areas and buffers or new residential areas resulting to project-related truck route emissions),
- Affect the ability of the Regional Air Quality Strategy (RAQS) to meet the federal and state clean air standards.
- Conflict with implementation of any regional air quality plans.

The City's CEQA Significance Determination Thresholds (January 2011) provide guidance on significance thresholds for operational air quality impacts. A significant impact related to air quality would occur if the project would generate regional emissions that exceed the daily amounts presented in Table 3-4.

[29] http://www.arb.ca.gov/ab2588/ab2588.htm, which provides an overview and refers to Health & Safety Code section 44300 et seq. and the implementing California Code of Regulations sections, which are 93300-93300.5.
[30] Air Toxics "Hot Spots" Program Report for San Diego County, http://www.arb.ca.gov/ab2588/ab2588.htm
[31] Air Toxics "Hot Spots" Program Report for San Diego County, http://www.arb.ca.gov/ab2588/ab2588.htm

3.1.3 Environmental Impact Analysis

Would the project result in air emissions that would substantially deteriorate ambient air quality, including exposure of sensitive receptors to substantial pollutant concentrations (e.g., exposure of multiple species habitat planning areas and buffers or new residential areas resulting to project-related truck route emissions)?

Would the proposed project affect the ability of the Regional Air Quality Strategy (RAQS) to meet the federal and state clean air standards?

Would the proposed project conflict with implementation of any regional air quality plans?

Table 3-4
Operational Emissions Thresholds

Criteria Pollutant	lb/hr	lb/day	tons/year
Volatile Organic Compounds (VOC)	N/A	137	15
Nitrogen Oxides (NOX)	25	250	40
Carbon Monoxide (CO)	100	550	100
Sulfur Oxides (SOX)	25	250	40
Fine Particulates (PM2.5)	N/A	N/A	N/A
Particulates (PM10)	N/A	100	15
Lead and lead compounds	N/A	3.2	0.6

Source: California Environmental Quality Act - Significance Determination Thresholds, City of San Diego Development Services Department, January 2011
N/A : not available

3.1.3.1 Potential Benefit of Durable Items

Air emissions are associated with the production of most goods, transportation to market, and, ultimately, with disposal or recycling of the product at the end of life. When landfills become the destination for waste products, landfills control emissions, but this control is usually not 100 percent effective. Often, recycling is considered preferable to disposal in landfills from an air emissions perspective, but emissions associated with materials being collected, transported to a distant recycling manufacturing facility, then transported back to market, must be considered as compared to the relative impacts of producing items from virgin materials. The only way to avoid emissions associated with the manufacture and ultimate disposal or recycling of products is not to generate them in the first place. Therefore, the top of the waste management hierarchy, per the California Public Resources Code (PRC), Section 41780 et seq., is "source reduction," also known as waste prevention. The per-unit environmental footprint of production of a durable item is often more than that of a non-durable item, but because a greater quantity of non-durable items would have to be used to provide a replacement, over the life of a durable product, the emissions and other impacts may be less. The purpose of this analysis is to compare the emissions associated with expected bag use/consumption as a result of adoption and implementation of the ordinance with existing bag use/consumption habits.

3.1.3.2 Expected Consumer Behavior

As described in the Environmental Setting, on a per bag basis, emissions associated with plastic single-use carryout bags are lower than those associated with recyclable paper single-use carryout bags and also lower than reusable bags.[32],[33] However, studies have shown that price effects consumer behavior. Prohibiting plastic single-use carryout bags, and charging $0.10 for each recyclable paper single-use carryout bag is intended to discourage the use of a disposable product. As summarized in Table 2-2, the net effect of the ordinance is an expected reduction from 700 million plastic single-use carryout bags currently used annually to 265,264,000 million bags total (plastic and recyclable paper single-use carryout bags and reusable bags).

For comparison, according to data collected by the County of Los Angeles after the County's Single-Use Bag Ordinance was enacted, approximately 125,000 paper bags were provided annually per large store compared to approximately 2.2 million plastic bags and 196,000 single-use paper bags provided per store prior to the ordinance going into effect in the third quarter of 2011. Paper single-use carryout bag usage continued to decline with an overall reduction of 16 percent between implementation and December 2013.[34]

3.1.3.3 Manufacturing Facility Emissions

No large-scale manufacturing facilities of carryout bags are located within the City. Therefore, the project would have no local manufacturing-related air emissions that would substantially deteriorate ambient air quality, including exposure of sensitive receptors to substantial pollutant concentrations (e.g., exposure of Multi-Habitat Planning Area (MHPA) and buffers or new residential areas resulting to project-related truck route emissions). The project would not affect the ability of the RAQS to meet the federal and state clean air standards, or conflict with implementation of any regional air quality plans.

Where manufacturing facilities are located, they are subject to permitting, including that required under the Clean Air Act (CAA) in the U.S., and in California, discretionary review under CEQA, and, if in San Diego, subject to the requirements set by the SDAPCD. Manufacturing facilities that emit any criteria pollutant or hazardous air pollutant at levels equal to or greater than the MST of the local air quality management district are required to obtain and maintain compliance with a Title V permit. Compliance with air quality management requirements typically mitigates emissions impacts. The possibility of a new facility producing either reusable bags, or plastic, or paper single-use carryout bags that would not be in compliance with these stated regulations is remote, unlikely, and highly speculative.

Table 3-5 provides a general, non-site-specific, theoretical estimate of the post-ordinance ozone and acidic emissions from bag manufacturing. This table estimates that the ordinance would reduce emissions contributing to ground-level ozone by approximately 9,258 kg per year, and would reduce emissions that contribute to atmospheric acidification by approximately 295,831 kg per year. This is a worst case

[32] Fund for Research into Industrial Development, Growth and Equity (FRIDGE), Socio-Economic Impact of the Proposed Plastic Bag Regulations, 2002.
[33] Master Environmental Assessment on Single-Use and Reusable Bags, Green Cities California, March 2010.
[34] County of Los Angeles, Department of Public Works, December 2013: http://dpw.lacounty.gov/epd/aboutthebag

scenario because paper bags made with recycled content have slightly lesser impacts. Thus, it is anticipated that the ordinance would result in a beneficial effect related to these emissions.

Table 3-5
Ground-level Ozone and Atmospheric Acidification (AA) Levels – Post Ordinance

Carryout Bag Type	Est. Number of Bags Used per Year[1]	Emissions to Ozone Formation (kg) per 1,000 Bags[2]	Emissions to Ozone Formation per Year (kg)	AA Emissions (kg) per 1,000 Bags[3]	AA Emissions per Year (kg)
Single-Use Plastic	35,000,000	0.023	805	1.084	37,940
Single-Use Paper	221,053,000	0.03	6,632	2.06	455,369
Reusable	9,211,000	0.032	295	3.252	29,954
Total Post Ordinance			7,731		523,263
Existing			16,989	Existing	819,094
Net Change			(9,258)	Net Change	(295,831)

[1] See Table 2-2 for how these numbers were estimated.
[2] Emissions per 1,000 bags from Ecobilan, 2004; Santa Monica Single-use Carryout Bag Ordinance Final EIR, January 2011, and County of San Mateo Single Use Bag Ban Ordinance EIR, June 2012.
[3] Emissions per 1,000 bags from FRIDGE, 2002 and Green Cities California MEA, 2010; Santa Monica Single-use Carryout Bag Ordinance Final EIR, January 2011; and EIR; and County of San Mateo Single Use Bag Ban Ordinance EIR, June 2012.

3.1.3.4 Transportation Emissions

Emissions may be generated by trucks that deliver carryout bags. CARB's EMFAC 2011 computer program was used to calculate mobile emissions resulting from the number of trips generated by the proposed ordinance. As shown in Table 3-7 under a "worst-case" conservative scenario where all recycled paper and reusable bags are delivered in separate truck loads, the proposed ordinance may generate 1.64 net new truck trips per day each with a roundtrip length of 20 miles. Table 3-6 shows that emissions associated with such trips would be negligible and substantially below the City and SDAPCD CEQA significance thresholds.

Table 3-6
Emissions from Increased Truck Trips

Emissions Source	Emissions (pounds per day)				
	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Trucks	<1	<1	<1	<1	<1
City Significance Threshold	250	550	250	100	N/A
Exceeds Threshold?	No	No	No	No	No

The increased use of reusable bags and the use of recyclable paper bags that would be available for purchase by customers at the regulated stores may lead to additional truck trips delivering those bags. This estimate of the potential change in truck trips is based on a conservative "worst case" scenario, albeit unlikely, where it is assumed that: (1) five percent of existing plastic bag use in the City would continue; (2) 30 percent of existing plastic bag use would shift to recyclable paper bags on a 1:1 ratio; and (3) 65 percent of existing bag use would shift to reusable bags where a reusable bag is conservatively assumed to be used by a customer only once per week for one year, or 52 times. Table 3-7 summarizes the estimated existing and future truck trips per day if all bags are delivered in separate dedicated truck loads. More than likely, however, bags would be delivered to stores as part of larger mixed loads of groceries and merchandise, and there may not be an actual net increase in truck traffic from the change in bag use. Therefore, impacts related to truck trips are less than significant.

Table 3-7
Estimated Truck Trips per Day for Separate Dedicated Load Delivery

Bag Type	Number of Bags per Year	Number of Bags per Truck Load[2]	Truck Trips per Year	Truck Trips per Day
Existing Truck Trips				
Single-Use Plastic	700,000,000	2,080,000	337	0.922
Single-Use Paper	29,474,000	217,665	135	0.371
Reusable LDPE	142,000	108,862	1	0.004
Future Truck Trips following the Implementation of the Ordinance				
Single-Use Plastic[1]	35,000,000	2,080,000	17	0.05
Single-Use Paper[1]	221,053,000	217,665	970	2.66
Reusable[1]	9,211,000	108,862	85	0.23
		Total	1,071	2.93
		Existing Truck Trips	473	1.29
		Net New Truck Trips	598	1.64

[1] See Table 2-2 for an explanation of the assumptions used.
[2] City of Los Angeles Single-Use Carryout Bag Ordinance FEIR, May 2013.

3.1.4 Mitigation Measures

The impact of the ordinance would be beneficial or less than significant with respect to air quality. No mitigation measures are required.

3.1.5 Level of Impact after Mitigation

No significant impacts would result from adoption and implementation of the ordinance; therefore, no mitigation measures are required.

3.2 GREENHOUSE GAS EMISSIONS

This section provides an overview of existing greenhouse gas (GHG) conditions and evaluates the climate change impacts associated with the ordinance.

3.2.1 Environmental Setting

The greenhouse effect refers to a planet-wide, overall warming that results when the atmosphere traps heat radiating from Earth toward space. Certain gases in the atmosphere act like the glass in a greenhouse, allowing sunlight in, but blocking heat from escaping. The gases that contribute to the greenhouse effect include water vapor, CO_2, methane (CH_4), nitrogen dioxide (NO_2), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride (SF_6), and chlorofluorocarbons. While the greenhouse effect is essential to life on earth, emissions from burning fossil fuels, deforestation, and other causes have increased the concentration of GHGs to dangerous levels.

Of all the GHGs, CO_2 is the most abundant pollutant that contributes to climate change through fossil fuel combustion. CO_2 comprised 84 percent of the total GHG emissions in California in 2002.[35] The other GHGs are less abundant but have higher global warming potential (GWP) than CO_2. To account for their higher potential, emissions of other GHGs are frequently expressed in the equivalent mass of CO_2, denoted as CO_{2e}. The CO_{2e} of CH_4 and NO_2 represented 6.4 percent and 6.8 percent, respectively, of the 2002 California GHG emissions. Other high GWP gases represented 3.5 percent of these emissions. In addition, there are several human-made pollutants such as carbon monoxide, nitrogen oxides, and sulfur dioxide that have indirect effects on terrestrial or solar radiation absorption by influencing the formation or destruction of other GHGs.

3.2.1.1 Effects of Climate Change

Globally, climate change has the potential to affect environmental resources through potential impacts related to future air temperatures and precipitation (rain/hail/snow) patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Scientists have projected that the average global surface temperature could rise by 1.0 to 4.5 degrees Fahrenheit (°F) in the next 50 years, and the increase may be as high as 2.2 to 10°F in the next century.[36] According to the California Environmental Protection Agency (CalEPA) 2010 Climate Action Team Biennial Report, potential impacts of climate change in California may include loss of snow pack (which serves as water storage), sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years.[37] Below is a summary of some of the most important and far-reaching potential effects that could occur in California as a result of climate change. Scientific modeling tools are unable to predict

[35] http://www.arb.ca.gov/cc/inventory/data/data.htm
[36] http://www.epa.gov/climatechange/science/future.html
[37] California Environmental Protection Agency, Climate Action Team Biennial Report, April 2010.

specifically what impacts would occur locally within a similar degree of accuracy. In general, regional and local predictions are made based on downscaling statewide models.[38]

Sea Level Rise. A sea level rise of eight inches has occurred along the California coast over the last century, and climate change has the potential to induce up to 55 inches of additional sea level rise in the coming century.[39] Sea level rise may be a product of climate change through two main processes: expansion of sea water as the oceans warm and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply due to salt water intrusion.

Air Quality. Higher temperatures are conducive to air pollution formation, and could worsen air quality. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout California.[40]

Water Supply. Analysis of paleoclimatic (pre-historic) data such as tree-ring reconstructions of stream flow and precipitation indicates a history of widely varying hydrologic conditions in California, including a pattern of recurring drought. In the last century, California's temperature has risen about 1°F, mostly at night and during the winter, with higher elevations experiencing the greatest increase.[41] Warmer winter storms result in less snowfall at lower elevations, reducing the total snowpack. The average spring snowpack in the Sierra Nevada decreased by about 10 percent, a loss of 1.5 million acre-feet (AF) of snowpack storage increase.[42] The Sierra snowpack provides the majority of California's water supply by accumulating snow during our wet winters and releasing it slowly during our dry springs and summers. The California Department of Water Resources reports that the snowpack is at historic lows.[43]

Hydrology. Climate change could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flash floods, extreme rain or snow events; coincidental high tide and high runoff events; sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture. California has a $30 billion agricultural industry that produces half of the country's fruits and vegetables.[44] Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency.[45]

[38] California Energy Commission, Inventory Draft 2009 Biennial Report to the Governor and Legislature. Staff Draft Report, March 2009.
[39] California Climate Change Center, The Impacts of Sea-Level Rise on the California Coast, May 2009.
[40] California Energy Commission, Inventory Draft 2009 Biennial Report to the Governor and Legislature, Staff Draft Report, March 2009.
[41] California Energy Commission, Inventory Draft 2009 Biennial Report to the Governor and Legislature, Staff Draft Report, March 2009 and http://www.epa.gov/climatechange/science/indicators/weather-climate/temperature.html
[42] California Energy Commission, Inventory Draft 2009 Biennial Report to the Governor and Legislature, Staff Draft Report, March 2009 and http://www.epa.gov/climatechange/science/indicators/weather-climate/temperature.html and http://www.usda.gov/wps/portal/usda/usdahome?contentid=2015/03/0062.xml
[43] http://www.water.ca.gov/news/newsreleases/2015/040115snowsurvey.pdf
[44] http://www.cdfa.ca.gov/Statistics/

However, if temperatures rise and drier conditions prevail: water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality.[46]

Ecosystems and Wildlife. Climate change and the potential resulting temperature increases, changes in weather patterns and soil moisture changes could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage.[47] [48]

3.2.1.2 Global Greenhouse Gas Concentrations

Data describing atmospheric GHG concentrations over the past 800,000 years show that concentrations of CO_2 have increased since pre-industrial times, from approximately 280 parts per million (ppm) to approximately 353 ppm in 1990 and approximately 379 ppm in 2005.[49] In 2000, the United Nations International Panel on Climate Change described potential global emission scenarios for the coming century. The scenarios vary from a best case characterized by low population growth, clean technologies, and low GHG emissions, to a worst case where high population growth and fossil fuel dependence result in extreme levels of GHG emissions. While some degree of climate change is inevitable, most climate scientists agree that to avoid dangerous climate change, atmospheric GHG concentrations need to be stabilized at 350 to 400 ppm.[50]

3.2.1.3 California Greenhouse Gas Emissions

According to CARB's California Greenhouse Gas Inventory for 2000-2009,[51] California produced 457 million metric tons of CO_2e in 2009. The major source of GHG in California is transportation, contributing 38 percent of the state's total GHG emissions. Electricity generation is the second largest source, contributing 23 percent of California's GHG emissions, with industrial sources of GHG, dominated by the cement industry, producing most of the remaining emissions.

3.2.1.4 Greenhouse Gas Emissions from Carryout Bags

Carryout bags have the potential to contribute to the generation of GHGs through emissions associated with the manufacturing process, truck trips delivering bags to retailers, and as a result of recycling or disposal at the end of life.

[45] http://www.omafra.gov.on.ca/english/crops/facts/00-077.htm
[46] California Climate Change Center, Climate Scenarios for California, 2006.
[47] Parmesan, C., Ecological and Evolutionary Responses to Recent Climate Change, 2004.
[48] Parmesan C, Galbraith H., Observed Ecological Impacts of Climate Change in North America, Pew Center for Global Climate Change, 2004.
[49] City of West Hollywood, Climate Action Plan, September 6, 2011.
[50] www.fs.fed.us/sustainableoperations/documents/ghg, and http://unfccc.int/resource/docs/2009/awg7/eng/crp01.pdf.
[51] CARB Greenhouse Gas Inventory http://www.arb.ca.gov/cc/inventory/data/data.htm

Manufacturing Process. GHG emissions differ depending on the manufacturing process and material type. For plastic carryout bags, whether single-use or reusable, manufacturing starts with petroleum and/or natural gas, and consumes energy that generates GHG emissions. Energy consumption varies depending on if the process is from virgin materials, or from recycled feedstocks. For bags made from wood or plant fibers, fertilizers also generate GHG emissions.

Truck Trips. Delivery trucks that transport carryout bags from manufacturers or distributors to local retailers also generate GHG emissions.

GHG Emission Rates per Bag. The Boustead Report, commissioned by the Progressive Bag Alliance, a consortium of plastic bag manufacturers, compared single-use plastic and paper carryout bags and assumed that one single-use paper bag could carry the same volume of groceries as 1.5 single-use plastic bags.[52] The Boustead Report estimates that 1,500 single-use plastic bags would generate 0.04 metric tons of CO_2e as a result of manufacturing, transport, and disposal. It estimates that single use paper and reusable LDPE would generate 0.132 and 0.104 metric tons of CO_{2e} emissions per 1,000 bags, respectively. Table 3-8 lists the GHG emissions using the per-bag impact rates discussed above and the estimated number of existing plastic single-use carryout bags used in the City. Manufacturing and transportation of plastic single-use carryout bags, paper single-use carryout bags, and reusable LDPE bags currently used in the City each year generates an estimated 22,572 metric tons of CO_2e per year.

Table 3-8
Current Greenhouse Gas Emissions from Carryout Bags

Bag Type	Number of Bags Used per Year	CO_{2e} Emissions (metric tons) per Number of Bags[1]	CO_{2e} per Year (metric tons)	CO_{2e} per Person[2] (metric tons)
Single-Use Plastic	700,000,000	0.04 per 1,500 bags	18,667	0.014
Single-Use Paper	29,474,000	0.132 per 1,000 bags	3,891	0.003
Reusable LDPE	142,000	0.104 per 1,000 bags	15	0.00001
Total			22,572	0.017

[1] Based on Boustead Report, 2007 and AEA Technology Scottish Report, 2005.
[2] Based on the 2013 City population of 1,326,238 residents.

3.2.1.5 Greenhouse Gas Emissions and Climate Change Regulations

Federal

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 includes provisions that will increase energy efficiency and the availability of renewable energy, which are

[52] Boustead Consulting and Associates Ltd., Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper, 2007.

expected to reduce GHG emissions.[53] First, the Act sets a Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022. Second, it increased Corporate Average Fuel Economy Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Third, the Act includes new standards for lighting and for residential and commercial appliance equipment.

National Fuel Efficiency Policy. The National Fuel Efficiency Policy requires a fleet-wide average of 35.5 miles per gallon by 2016 starting with model years 2012.[54] The Policy is expected to increase fuel economy by more than five (5) percent. However, federal fuel economy standards have not yet been promulgated to establish specific benchmarks.

State

CEQA. Courts have upheld a requirement that GHG impacts must be considered in CEQA documents. CARB has developed draft interim thresholds of significance for GHGs that may be adopted by local agencies for their own use. The interim thresholds focus on common project types that, collectively, are responsible for substantial GHG emissions – specifically, industrial, residential, and commercial projects. CARB is developing thresholds in these sectors to advance climate objectives, streamline project review, and encourage consistency and uniformity in analysis.

Executive Order (EO) S-3-05. EO S-3-05 set the following GHG emission reduction targets: by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. It calls for the Secretary of the CalEPA to be responsible for coordination of state agencies and progress reporting. A recent California Energy Commission (CEC) report concludes that the primary strategies to achieve this target should be a major "decarbonization" of electricity supplies and fuels, and major improvements in energy efficiency.[55]

In response to the Executive Order, the Secretary of the CalEPA created the Climate Action Team (CAT). The CAT currently has members from 18 state agencies and departments, and ten working groups. The working groups focus on reducing GHG emissions and facilitating climate change adaptation in: Agriculture; Biodiversity; Energy; Forestry; Land Use and Infrastructure; Ocean and Coastal; Public Health; Water; State Government; and Research. The CAT is responsible for preparing reports that summarize California's progress in reducing GHG emissions. The most recent CAT Report was published in December 2010 and discusses mitigation and adaptation strategies, state research programs, policy development, and future efforts.

Assembly Bill 32 (AB 32). The California Global Warming Solutions Act of 2006, also known as AB 32, requires CARB to adopt rules and regulations that achieve GHG emissions reductions of 1990 levels by 2020. It requires that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce statewide GHG emissions from stationary sources, and develop tracking,

[53] http://www2.epa.gov/laws-regulations/summary-energy-independence-and-security-act
[54] The White House Office of the Press Secretary, President Obama Announces National Fuel Efficiency Policy, May 2009: http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel- Efficiency-Policy/
[55] California Energy Commission, California's Energy Future – The View to 2050, May 2011.

reporting, and enforcement mechanisms to ensure that reductions are achieved. Because AB 32 requires 2020 emissions to be reduced to the level of 1990 emissions, it is expected that the regulations will affect many existing sources of GHG emissions and not just new projects. Senate Bill (SB) 1368, a companion bill to AB 32, requires the California Public Utilities Commission (PUC) and the CEC to establish GHG emission performance standards for the generation of electricity. These standards will also apply to power that is generated outside of California and imported into the state.

On June 1, 2007, CARB adopted three measures to reduce GHG emissions: setting a low carbon fuel standard (LCFS), reducing refrigerant loss from motor vehicle air conditioning maintenance, and increasing methane capture from landfills.[56]

CARB has determined that the total statewide aggregated GHG 1990 emissions level is 427 million metric tons of CO_2.[57] CARB's 2020 target reductions are currently estimated to be 174 million metric tons of CO_2.

In 2008, CARB developed a Climate Change Scoping Plan (Scoping Plan) to achieve the 2020 GHG reduction target.[58] The Scoping Plan proposes actions to reduce carbon emissions, improve the environment, reduce oil dependency, diversify energy sources, and enhance public health while creating new jobs and improving the state economy. The GHG reduction strategies contained in the Scoping Plan include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. Key approaches for reducing GHG emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs and building and appliance standards.
- Achieving a statewide renewable electricity standard of 33 percent.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures to reduce transportation sector emissions.

CARB has also developed GHG reporting regulations for facilities that generate more than 25,000 metric tons of CO_2 per year. These facilities include cement plants, which are the single largest industrial GHG generators, oil refineries, electric generating facilities, co-generation facilities, hydrogen plants, and other stationary combustion sources.

Senate Bill 375 (SB 375). SB 375 (Steinberg, Chapter 728, Statutes of 2008) requires a reduction in emissions from cars and light trucks. It requires new Regional Transportation Plans (RTPs) to include

[56] California Air Resources Board, Proposed Early Action Measures to Mitigate Climate Change.
[57] http://www.arb.ca.gov/cc/inventory/1990level/1990level.htm
[58] http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

Sustainable Communities Strategies (SCSs). This legislation also allows the development of an Alternative Planning Strategy (APS) if the targets cannot be feasibly met through an SCS.

Executive Order (EO) S-1-07, the Low Carbon Fuel Standard. EO S-1-07 calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020.[59] Implementation of the LCFS has been assigned to CARB, and CARB has identified it as an early action item in the Scoping Plan. CARB expects the LCFS to achieve the minimum 10 percent reduction goal.

Executive Order S-13-08. This order directed the California Natural Resources Agency to coordinate with ten state agencies, multiple scientists, a consulting team, and stakeholders to develop the 2009 California Climate Adaptation Strategy.[60] This Strategy describes the vulnerability of California to climate change impacts and outlines possible solutions that can promote resiliency. Adaptation in this context refers to preparation for the impacts of climate change and adjustments in natural or human systems.

Senate Bill 1368 (SB 1368). SB 1368 (Perata, Chapter 598, Statutes of 2006) directs the CEC and the PUC to adopt a performance standard for GHG emissions for the future electricity used in California, regardless of whether it is generated in-state or purchased from other states.[61]

Local

City Climate Action Plan (CAP).[62] The City has developed a draft Climate Action Plan. The 2015 draft CAP addresses the importance of energy and water efficient buildings; clean and renewable energy; bicycling, walking, transit, and land uses that promote GHG reduction and alternative transportation; "zero waste" or waste minimization; and climate resiliency. It provides a baseline emissions inventory and establishes GHG reduction targets for 2020 and 2035. The City projects GHG emissions of approximately 14.0 million metric tons (MMT) of CO_{2e} in 2020 and 16.4 MMT in 2035. To achieve its proportional share of GHG reduction, the City would need to reduce GHG emissions to approximately 11.9 MMT of CO_{2e} in 2020 and 8.4 MMT of CO_{2e} in 2035. In addition, it provides a framework for providing actions that implement the plan, methods to monitor progress, as well as including considerations of social equity, job creation, and also adaptation strategies for climate change.

GHG CEQA Screening Criteria. The Environmental and Economic Sustainability Task Force (EESTF) of the City has developed recommended screening criteria for GHGs from projects in the City.[63] These criteria are intended to be used in the review of discretionary projects pursuant to CEQA.

[59] http://www.arb.ca.gov/fuels/lcfs/eos0107.pdf
[60] http://www.gov.ca.gov/news.php?id=11036
[61] http://www.energy.ca.gov/emission_standards/index.html
[62] City of San Diego, Climate Action Plan.
http://www.sandiego.gov/planning/genplan/cap/pdf/sd_cap_032515_draft.pdf
[63] GHG Significance Thresholds, Environmental and Economic Sustainability Task Force, City of San Diego. 2015

3.2.2 Impact Criteria

The project would have a significant impact related to GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; and/or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

CARB has not developed significance thresholds for evaluating potential impacts on GHG; however, it has determined that the total statewide aggregated GHG 1990 emissions level and 2020 emissions limit is 427 million metric tons of CO_2 per year. This equates to a target emission rate of 9.6 metric tons of CO_2 per capita per year.

3.2.3 Environmental Impact Analysis

Would the proposed project generate GHG emissions, either directly or indirectly, that may have a cumulatively significant impact on the environment?

Would the proposed project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG?

3.2.3.1 Greenhouse Gas Emissions

The intent of the ordinance is to reduce the number of plastic single-use carryout bags in trash loads, reduce the environmental impacts related to plastic single-use carryout bags, deter the use of paper single-use carryout bags, and promote the use of reusable bags by retail customers.

On a per bag basis, plastic single use carryout bags produce the least GHGs; paper single-use carryout bags produce 3.3 times as much per bag (slightly less if made with recycled paper), and reusable LDPE bags generate 2.6 times the GHG emissions of one plastic single-use carryout bag. However, reusable bags are intended to be used multiple times. Taking into account the reuse of reusable bags, the total number of carryout bags that would be manufactured, transported and disposed of under the ordinance would be reduced. Under conservative assumptions, the ordinance would result in the reduction of plastic single-use carryout bags currently used in the City from approximately 700 million annually to approximately 35 million continuing to be used each year in the City.

A study prepared by the Equinox Center on economic and environmental impacts concludes that plastic bag bans have a beneficial effect on GHGs. However, this conclusion depends on many factors assumed during the manufacturing process, and may overstate GHG-related benefits of ordinances.[64]

A report prepared by the United Kingdom's Environment Agency, "Life Cycle Assessment of Supermarket Carrier Bags: a Review of the Bags Available in 2006," evaluated the environmental impacts of various types of "supermarket carrier bags" using the thin HDPE plastic carryout bag as a

[64] Plastic Bag Bans: Analysis of Economic and Environmental Impacts. Equinox Center. October 23, 2013.

baseline for estimating other bags' "global warming potential (GWP)." The UK study estimates how many times reusable bags of various types would need to be used in order to take them "below the GWP of HDPE bags." The UK report indicates that LDPE reusable bags have lower global warming potential than HDPE carryout bags after four uses, non-woven polypropylene (PP) bags after 11 uses, and cotton bags after 131 uses. Even if as many as 40.3 percent of HDPE carryout bags are re-used as "bin liners" (trash can liners), the report states that LDPE reusable bags have lower GWP after five (5) uses, non-woven PP bags after 14 uses, and cotton bags after 173 uses. The levels for LDPE and non-woven PP are within LDPE reusable bags' design life of 125 uses. Cotton bags are expected conservatively to be used at least 52 times per year, and last many years, such that they would likely exceed the 173 uses to equal the GWP of HDPE.

The UK study concludes that reusable bags of any type initially require more "upstream" material and energy resources as they are designed to be more durable than single-use carryout bags, but since the reusable bags' higher production impacts are distributed over multiple uses, they have a lower overall impact over time on climate change.

Another study, prepared by the Australia Department of Environment and Heritage, 2002, shows that over the course of a year, virtually any type of reusable bag is environmentally superior to single-use plastic carryout bags with respect to GHG emissions, material consumption, litter, and primary energy use.[65]

This EIR primarily uses a 1:1 ratio of single-use plastic to paper bags for its analysis although most studies use 1:1.5, since paper bags hold more than plastic bags. The use of a 1:1 ratio is more conservative than a 1:1.5 ratio used by most studies.

As shown in Table 3-9, the GHG emissions associated with the manufacturing, transportation and disposal of reusable and single-use carryout bags used in the City after implementation of the ordinance would be approximately 31,070 metric tons of CO_{2e} per year, as compared to the current level of 22,572 metric tons of CO_{2e} per year. This is an increase of 8,498 metric tons of CO_{2e} per year. The per capita increase of .006 metric tons of CO_{2e} per person would be less than one tenth of one percent (.06 percent) of the state target emission rate of 9.6 metric tons of CO_{2e} per capita, and is consistent with waste reduction goals and behaviors targeting GHG reductions. It would therefore result in a less than significant impact related to GHG emissions.

3.2.3.2 Consistency with Adopted Plans, Policies, and Regulations

The CAT Report identifies strategies that California could pursue to meet the reduction levels established in EO S-3-05. These are strategies that could be implemented by various state agencies to ensure that the Governor's targets are met and can be met with the existing authority of the state agencies. In addition, in 2008 the California Attorney General published a document entitled: The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level. Included in this document are various measures that may mitigate the global warming related impacts of a project. Table 3-10 illustrates that the ordinance would be consistent with these strategies. The City's CAP does not include

[65] Plastic Shopping Bags –Analysis of Levies and Environmental Impacts, 2002, http://greenbag.com.au/UserFiles/AU_analysis.pdf

specific CEQA thresholds, but does reference the City's Zero Waste Plan as one of its strategies.[66] The Zero Waste Plan identifies support for local, state and federal producer responsibility policies and laws targeting, among other materials, plastic film, and it promotes reuse policies such as distribution events for reuseable bags, all of which are consistent with the project. The City's Conservation Element of its General Plan includes a significant component on GHG reduction for reducing waste (page CE-9), reducing potential for polluted runoff (page CE-23), and improving and maintaining urban runoff quality (page CE24), all of which the project is consistent with.[67] Therefore, the ordinance would not conflict with these adopted plans, policies, or regulations for reducing the emissions of GHGs.

Table 3-9
Estimated Greenhouse Gas Emissions from Carryout Bags post Ordinance

Bag Type	Number of Bags Used per Year post Ordinance	Global Warming Impact Rate per Bag[1]	CO_2 Emissions (metric tons)	CO_2 per Year (metric tons)	CO_2 per Person (metric tons)
Single-Use Plastic	35,000,000	1.0	0.04 per 1,500 bags[1]	933	.001
Single-Use Paper	221,053,000	3.3[3]	0.132 per 1,000 bags[2]	29,179	.022
Reusable	9,211,000	2.6	0.104 per 1,000 bags[2]	958	.001
Total post Ordinance				31,070	.023[4]
Existing (pre Ordinance) from Table 3-8				22,572	.017
Net Change post Ordinance				8,498	.006

[1] Relationship based on Boustead Report, 2007, as explained above.
[2] Based on AEA Technology Scottish Report, 2005.
[3] Slightly less impact associated with recycled paper bags.
[4] Due to rounding

Table 3-10
Ordinance Consistency with Applicable Climate Change Action Team Strategies

Strategy	Project Consistency
Vehicle Climate Change Standards AB 1493 (Pavley, Chapter 200, Statutes of 2002) requires the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks.	Consistent The trucks that deliver carryout bags to and from manufacturers, distribution centers, and stores within the City on public roadways would be subject to CARB vehicle standards that are in effect at the time of vehicle purchase.
Diesel Anti-Idling CARB Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling (§2485) limits diesel-fueled commercial motor vehicle idling to five minutes or less.	Consistent Current California law restricts diesel truck idling to five minutes or less. Diesel trucks operating from and making deliveries within the City are subject to this law.
Alternative Fuels: Biodiesel Blends Require the use of 1% to 4% biodiesel displacement of California diesel fuel.	Consistent The diesel vehicles that deliver carryout bags to and from manufacturers, distribution centers, and stores within the City on public roadways will be required to use this fuel once it is commercially available.

[66] http://www.sandiego.gov/mayor/news/releases/20150713_ZeroWaste.shtml
[67] http://www.sandiego.gov/planning/genplan/index.shtml

Strategy	Project Consistency
Alternative Fuels: Ethanol Increased use of E-85 fuel.	Consistent Truck drivers delivering carryout bags could choose to purchase flex-fuel vehicles and use this fuel once it is commercially available regionally and locally.
Heavy-Duty Vehicle Emission Reduction Measures Increased efficiency in the design of heavy duty vehicles and an education program for the heavy-duty vehicle sector.	Consistent The heavy-duty trucks that deliver carryout bags to and from manufacturers, distribution centers, and stores within the City on public roadways would be subject to all applicable CARB efficiency standards that are in effect at the time of vehicle manufacture.
50% Diversion of Waste Required at the City-level; 75% Diversion Statewide Goal. The Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production and methane emission from landfills.	Consistent The City has completed a Source Reduction and Recycling Plan in compliance with California law, and is working toward "zero waste" concepts. Reduction in disposal of carryout bags would be consistent with these strategies.
Fuel-Efficient Replacement Tires & Inflation Programs State legislation established a statewide program to encourage the production and use of more efficient tires.	Consistent Carryout bag delivery drivers could purchase tires for their vehicles that comply with state programs for increased fuel efficiency.
Alternative Fuels: Non-Petroleum Fuels Increasing the use of non-petroleum fuels in California's transportation sector, as recommended in the California Energy Commission's 2003 and 2005 Integrated Energy Policy Reports.	Consistent Carryout bag delivery drivers could purchase alternative fuel vehicles and use these fuels once they are commercially available regionally and locally.

3.2.4 Mitigation Measures

Impacts related to GHG emissions would be less than significant. No mitigation measures are required.

3.2.5 Level of Impact after Mitigation

No significant impacts were identified; therefore, no mitigation measures are required.

3.3 AGRICULTURAL AND FOREST RESOURCES

This section examines the potential impact on agricultural and forest resources associated with the adoption and implementation of the City ordinance.

3.3.1 Environmental Setting

Worldwide consumption of paper has risen by 400 percent in the past 40 years leading to increase in deforestation, with 35 percent of harvested trees being used for paper manufacture. Logging of old growth forests accounts for less than 10 percent of wood pulp, but is one of the most controversial issues. The City contains native forest habitats including southern coast live oak riparian forest, southern cottonwood willow riparian forest, southern riparian forest, and Torrey pine forest. Nearby protected forest sites include the Cleveland National Forest. The City does not contain forests grown for commercial timber harvest.

3.3.2 Impact Criteria

Impact is considered significant if the project would:

- Result in the loss of forest land or conversion of forest land to non-forest use, and/or involve other changes in the existing environment which, due to their location or nature, could result in the conversion of forest land to non-forest use.

3.3.3 Environmental Impact Analysis

Would the proposed project have any significant impacts on agricultural and forestry resources?

The preliminary data submitted by stores following the implementation of the Los Angeles County's single-use plastic carryout bag reduction ordinance, which also imposed a $0.10 charge on paper single-use carryout bags, shows a significant overall reduction of 11 percent in paper single-use carryout bag usage within Los Angeles County between 2009 and 2012, including a nearly 13 percent reduction within the first three quarters of the year after the enactment of the ordinance.[68] Since then, the County of Los Angeles has released further information that in the third quarter of 2012, annual paper single-use carryout bag usage per store declined to approximately 121,000 per store. The data indicate that the use of paper single-use carryout bags in large stores not only did not temporarily increase as a result of the single-use plastic carryout bag reduction ordinance, but actually decreased significantly after the enactment of the ordinance. As with the County of Los Angeles, a similar effect is anticipated to occur within the City of San Diego. However, under a conservative scenario, as summarized in Table 2-2, it is assumed that the ordinance could increase annual recyclable paper single-use carryout bag consumption from 29 million to as much as 221 million.

According to representatives of the American Forest & Paper Association,[69] most of the trees used to manufacture paper are grown for that purpose by the lumber industry in commercially grown forests,

[68] Department of Public Works, December 2013: http://dpw.lacounty.gov/epd/aboutthebag
[69] City of Los Angeles FEIR citing Single-Use Carryout Bag Ordinance Draft EIR; City of San Jose, July 2010.

which comprise approximately 70 percent of the U.S. forested lands.[70] About 17% of the 3.3 billion cubic meters of wood used worldwide each year is for papermaking, and much of this wood is in the form of wood chips and other residue left behind from sawmill operations lands.[71] In the U.S., forest planting exceeds forest production, and as a result, there are more forest trees now than there were 70 years ago.[72] Over half of the wood harvested in the world is used for fuel, mostly for cooking and domestic heating. The U.S. is the world's leading producer of paper and paperboard, with over 500 mills in operation. Worldwide, there are approximately 10,000 paper and paperboard mills in operation. Every year, Americans use more than 90 million short tons of paper and paperboard. That's an average of 700 pounds of paper products per person each year.[73]

The location and type of forest (certified sustainable, plantations, reforested, etc.), or the location of other fiber production, such as cotton, the specific amount of fiber that could be attributed to the project, and the amount and source of recycled material used in bag manufacture is speculative. To paint a very broad picture, if paper bag use increases from 29,474,000 per year to 221,053,000 per year, that could result in an increase in forest product use. However, the ordinance specifies 40 percent recycled content for the recycled paper single-use carryout bags, which would reduce the consumption of forest products on a per bag basis.

No specific threshold has been established for forest product use associated with a project. Normally life cycle issues are not addressed in analyses done for CEQA. However, to approximate the possible impact, and considering that 1,000 paper bags weighs 140 pounds,[74] it is possible that the ordinance could generate demand for somewhere from 0 to 26,821,000 pounds (13,411 tons) of additional paper per year. This worst case consumption represents far less than .00095 percent of the forest products used in the U.S. each year (approximately 400 million cubic meters, or 1,412,586,700 tons[75]); and forest product consumption is currently considered sustainable.[76] Therefore, the ordinance would not have a significant impact on agricultural or forest resources.

3.3.4 Mitigation Measures

The project would not result in a significant impact to agricultural or forest resources. Therefore, no mitigation is required.

3.3.5 Level of Impact after Mitigation

Not applicable; no mitigation is required.

[70] City of Los Angeles FEIR citing American Forest & Paper Association, 2012: http://www.afandpa.org/ourindustry.aspx?id=35
[71] http://www.tappi.org/paperu/all_about_paper/faq.htm
[72] *ibid*
[73] *ibid*
[74] http://www.nashvillewrapscommunity.com/blog/2008/04/paper-bags-versus-plastic-bags-real-numbers/
[75] http://ipst.gatech.edu/faculty/ragauskas_art/technical_reviews/Pulp%20and%20Paper%20General.pdf
[76] http://www.mnn.com/earth-matters/wilderness-resources/stories/more-trees-than-there-were-100-years-ago-its-true

3.4 HAZARDS AND HAZARDOUS MATERIALS

This section provides an overview of hazards and hazardous materials potentially associated with the ordinance, including a general discussion of hazards associated with manufacture, which does not occur locally, and also hazards associated with potential contamination of reusable bags.

3.4.1 Environmental Setting

3.4.1.1 Regulatory Framework

Federal

Federal agencies with responsibility for hazardous materials management include the USEPA, Department of Labor, Occupational Safety and Health Administration (OSHA), and U.S. Department of Transportation (USDOT).

Resource Conservation and Recovery Act (RCRA). RCRA gives the USEPA the authority to control hazardous waste from "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste by "large-quantity generators" (1,000 kg/month or more). Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. At a minimum, each generator of hazardous waste must register and obtain a hazardous waste activity identification number. If hazardous wastes are stored for more than 90 days or treated or disposed at a facility, any treatment, storage, or disposal unit must be permitted under RCRA. Additionally, all hazardous waste transporters are required to be permitted and must have an identification number. RCRA allows individual states to develop their own program for the regulation of hazardous waste as long as it is at least as stringent as RCRA. The USEPA has delegated RCRA enforcement to the State of California.

Occupational Safety and Health Act. The Occupational Safety and Health Act, which is implemented by the federal OSHA, contains provisions with respect to hazardous materials handling. Federal OSHA requirements, as set forth in Title 29 of the Code of Federal Regulations (CFR) Section 1910, et. seq., are designed to promote worker safety, worker training, and a worker's right-to-know. OSHA has delegated the authority to administer OSHA regulations to the State of California.

Title 49 of the CFR, which contains the regulations set forth by the Hazardous Materials Transportation Act, specifies additional requirements and regulations with respect to the transport of hazardous materials. Title 49 of the CFR requires that every employee who transports hazardous materials receive training to recognize and identify hazardous materials and become familiar with hazardous materials requirements. Drivers are also required to be trained in function and commodity specific requirements.

State

California agencies with regulatory authority over hazardous chemical materials management include the Department of Toxic Substances Control (DTSC), Regional Water Quality Control Board (RWQCB), and California Occupational Safety and Health Administration (CalOSHA). Other California agencies involved with hazardous waste management include the Department of Industrial Relations (California OSHA implementation), Office of Emergency Services (OES; California Accidental Release Prevention

implementation), Department of Fish and Wildlife (CDFW), CARB, California Highway Patrol (CHP), Office of Environmental Health Hazard Assessment (OEHHA; Proposition 65 implementation) and Department of Resources Recycling and Recovery (CalRecycle).

DTSC. DTSC has responsibility for regulating the generation, storage and disposal of hazardous materials as required by RCRA, although DTSC may delegate enforcement authority to local jurisdictions. In addition, DTSC is responsible for and/or provides oversight for contamination cleanup, and administers statewide hazardous waste reduction programs. DTSC operates programs to: (1) oversee cleanups in the aftermath of improper hazardous waste management; (2) ensure that those who generate, handle, transport, store, and dispose of wastes do so properly; and (3) evaluate soil, water, and air samples taken at potentially contaminated sites.

CalOSHA. CalOSHA administers rules and procedures related to exposure to hazardous materials during demolition and construction activities. In addition, CalOSHA requires employers to implement a comprehensive, written Injury and Illness Prevention Program (IIPP). An IIPP is an employee safety program for potential workplace hazards, including those associated with hazardous materials.

Local

Certified Unified Program Agency. The primary local agency, known as the Certified Unified Program Agency (CUPA), with responsibility for implementing federal and state laws and regulations pertaining to hazardous materials management is the San Diego County Department of Environmental Health (DEH), Hazardous Materials Division. The Unified Program is the consolidation of six California environmental regulatory programs into one program under the authority of a CUPA. CUPAs must be certified by CalEPA to implement the six state environmental programs:

- Hazardous Materials Release Response Plan and Inventory (Business Plans)
- California Accidental Release Prevention (CalARP)
- Hazardous Waste (including Tiered Permitting)
- Underground Storage Tanks (USTs)
- Above Ground Storage Tanks (Spill Prevention Control and Countermeasures (SPCC) requirements)
- Uniform Fire Code (UFC) Article 80 Hazardous Material Management Program (HMMP) and Hazardous Material Identification System (HMIS)

As the CUPA for the County, the San Diego County DEH, Hazardous Materials Division maintains the records regarding location and status of hazardous materials sites in the county and administers programs that regulate and enforce the transport, use, storage, manufacturing, and remediation of hazardous materials. The CUPA's records form the basis for emergency preparedness, disaster preparedness, and public and firefighter safety planning.

The City's Local Enforcement Agency (LEA) is designated to CalRecycle to enforce state and federal solid waste regulations on facilities within the City.

3.4.1.2 Existing Conditions

The manufacture of single-use plastic, single-use paper, and reusable carryout bags may generate hazardous materials.[77] Plastic bag manufacture starts with oil, the production of which has its own associated impacts. In the case of plastic recycling processes, manufacture begins with appropriate types of post-consumer plastic. Raw materials are heated to about 1,832°F and thus the process consumes energy, and produces steam and sulfide by-products.

Paper bag manufacture consumes electricity and water, and typically generates both air and water pollution during the pulping process. It takes about 91 percent more energy to recycle a pound of paper than a pound of plastic. Though not without impacts, the Kraft process that is typically used for paper bags does not use sulfites in the pulping process and does not involve bleaching, and thus has fewer impacts than other common paper manufacturing processes. Paper made with recycled content typically uses fewer chemicals in manufacturing compared to paper made from virgin wood sources, although it consumes more energy.

When generated within California, facilities that manufacture bags must comply with the California Health and Safety Code Section 25531-25543.3, which establishes a program for the prevention of accidental releases of regulated hazardous substances. Once manufactured, the finished carryout bags do not meet the criteria of a hazardous waste, because they do not possess at least one of the four characteristics of hazardous wastes: ignitability, corrosivity, reactivity, or toxicity. These bags do not appear on any of the special USEPA lists,[78] and are not considered to be hazardous material.

3.4.2 Impact Criteria

The project would have a significant impact related to hazards and hazardous materials if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

3.4.3 Environmental Impact Analysis

Would the proposed project create a significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous materials?

None of the commonly used carryout bags possess any of the four characteristics of hazardous wastes (ignitability, corrosivity, reactivity, or toxicity) and do not appear on special USEPA lists.[79] Therefore, the ordinance would not involve the routine transport, use, or disposal of hazardous materials as defined by

[77] City of Los Angeles FEIR states "The manufacturing process is addressed in detail in the Master Environmental Assessment on Single-Use and Reusable Bags, Green Cities California, March 2010, and addressed in numerous EIRs prepared by other California jurisdictions for similar single-use plastic carryout ordinances, including those of the Cities of San Francisco, San Jose, and Ukiah."
[78] City of Los Angeles FEIR citing Code of Federal Regulations, Title 40, Chapter 1, Part 261: "Identification and Listing of Hazardous Waste."
[79] City of Los Angeles FEIR citing Code of Federal Regulations, Title 40, Chapter 1, Part 261: "Identification and Listing of Hazardous Waste."

the Hazardous Materials Transportation Uniform Safety Act.[80] However, as summarized in Table 2-2, the ordinance could increase recyclable paper single-use carryout bag consumption, under a worst case scenario, to as much as 221 million and reusable bag consumption could increase from 142,000 to 9 million.

Public Hazards Associated with Paper Manufacture. Of the types of paper produced, Kraft paper has some of the least impacts, and thus compares well with plastics manufacture. Recycled paper single-use carryout bags compare even more favorably in terms of hazardous materials production during manufacture. The ordinance would require paper single-use carryout bags to contain at least 40 percent post-consumer recycled content. Although paper single-use carryout bag consumption may increase, the 40 percent recycled content requirement is expected to reduce the consumption of paper single-use carryout bags made without recycled content to virtually zero in regulated stores. The exact quantities of hazardous materials are impossible to quantify because the exact facilities that would be used are unknown. The ordinance would be expected to decrease, in relative terms, hazardous materials compared to the rate of generation in the baseline condition as a result of the recycled content provision. Therefore, no negative impact would occur.

Public Hazards Associated Energy Consumption Associated with Paper Manufacture. Energy consumption is also associated with hazardous materials production, although this varies dramatically depending on the specifics of the energy generation facilities. Paper bag production consumes more energy than plastic bag production, and manufacture of recycled paper single-use carryout bags consumes slightly more energy. Thus, if more paper bags are used as a result of the ordinance, it may result in an increase in energy consumption at the point of manufacture. Because the exact facilities are unknown, it would be impossible to determine exactly the magnitude of this impact. Furthermore, it is unlikely that a single facility within an energy distribution area could result in demand sufficient to result in a measurable change in hazardous materials production. Therefore, no hazardous materials impacts associated energy consumption can be identified.

Public Hazards Associated with Paper Bags. Under the worst case scenario, more paper single-use carryout bags would be used as a result of the ordinance, and more of these bags would be present in homes. According to the City of New York Health Department, the University of Connecticut, University of Nebraska, and other sources, cockroaches are known to eat almost any organic substance including grease, paper (including bags, books, magazines, and cardboard boxes), pet food, garbage, the glue on can labels, and the detritus found on dirty clothes. Cockroaches are known to live in the walls, cupboards, furniture, in piles of dirty laundry, under appliances, in garbage cans and recycling containers, within the seals on refrigerator doors, and in any pile of paper or cardboard, including paper bags, and magazines. Cockroaches are disease vectors and are associated with asthma.[81]

[80] City of Los Angeles FEIR citing Code of Federal Regulations, Title 40, Chapter 1, Parts 106–180.
[81] Environmental Health Watch. "Cockroach Control Guide." 2010. City of Los Angeles FEIR citing San Jose DEIR, citing Environmental Health Watch. http://www.ehw.org/wp-content/uploads/2011/01/Cockroach-Control-Guide-Color.pdf; University of Connecticut Integrated Pest Management. "Integrated Pest Management for Cockroaches."http://ipm.uconn.edu/documents/raw2/Integrated%20Pest%20Management%20for%20Cockroaches/Integrated%20Pest%20Management%20for%20Cockroaches.php?aid=136; New York City Department of Health and Mental Hygiene. "Cockroach." (For help with PDFs call 518-402-8748)

Paper single-use carryout bags are generally used once and then discarded or recycled. They are not constructed for multiple uses. The ordinance is unlikely to cause accumulations of piles of paper single-use carryout bags within homes in amounts greater than existing conditions. Also, paper single-use carryout bags are accepted in the City's curbside recycling program and therefore easily removed from the home. Moreover, the existence of paper single-use carryout bags is only one of several attractive havens that can harbor roaches, none of which would be affected by the ordinance. Possible health impacts associated with increased use of paper single-use carryout bags would therefore be less than significant.

Public Hazards Associated with Reusable Bags. Reusable bags may become contaminated with food residue, and could expose the public to illness. In 2009, the Environment and Plastics Industry Council (EPIC), a standing committee of the Canadian Plastics Industry Association, examined the cleanliness of reusable bags in Canada.[82] The study involved 25 used reusable bags and four control bags (three unused reusable bags and one unused single-use plastic bag) analyzed in two series of testing. The reusable plastic bags tested ranged in age from one month to three years. The plastic bags in this study were tested for "total plate count" (i.e., all readily grown, but not necessarily harmful, aerobic bacteria), total coliforms, *E. coli*, *Salmonella*, mold, and yeast. The unused control bags showed no evidence of bacteria, mold, yeast or total coliforms.[83] Out of the 25 used reusable bags tested, 16 showed the presence of some level of bacteria (i.e., readily grown, but not necessarily harmful, aerobic bacteria), five contained yeast, and six contained mold. Unacceptable total coliform count was found in three of the reusable bags. One had been exposed to an obvious meat spill and had never been washed.

A study funded by the American Chemistry Council in 2010 made similar findings.[84] Eighty-four reusable bags were collected from shoppers in three cities and all were found to contain bacteria. The study found that bacteria could be eliminated by ordinary washing, but that 97 percent of the shoppers said they had never washed their bags. The authors of the study deliberately spilled meat juices on a bag and then placed it inside a hot car or truck for two hours to show accelerated bacteria growth. The study found bacteria and coliforms in most of the bags and E. coli in 12 percent of the bags. The results of the study suggest that the cause of contamination was spillage of liquid from meat.

However, it is common practice to place produce and meat into plastic bags provided for the purpose of preventing such spills. These types of plastic bags ("product bags") are not regulated by the ordinance. This practice would continue if the ordinance is adopted. Additional studies show that bacteria are present

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http://www.nyc.gov/html/doh/html/ehs/ehscroach.shtml; and Barb Ogg, Ph.D., and Clyde Ogg. "Least Toxic Cockroach Control." http://lancaster.unl.edu/enviro/pest/factsheets/120-94.htm

[82] City of Los Angeles FEIR citing San Jose DEIR citing Sporometrics: Grocery Carry Bag Sanitation: A Microbiological Study of Reusable Bags and "First or Single-Use" Plastic Bags. 2009: http://www.plastics.ca/_files/file.php?fileid=0&filename=file_A_Microbiological_Study_of_Reusable_Grocery_Bags_May20_09.pdf

[83] City of Los Angeles FEIR states "Coliforms are defined as rod-shaped gram-negative non-spore forming organisms. Coliforms are abundant in the feces of warm-blooded animals, and are also be found in the aquatic environment, in soil and on vegetation. Coliforms are easy to culture and their presence is used to indicate that other pathogenic organisms of fecal origin *may* be present."

[84] City of Los Angeles FEIR citing city of San Jose Single-Use Carryout Plastic Bag Ordinance Draft EIR, citing Charles P. Gerba, David Williams and Ryan G. Sinclair**,** "Assessment of the Potential for Cross Contamination of Food Products by Reusable Shopping Bags," http://myplasticfreelife.com/images/GerbaWilliamsSinclair_BagContamination.pdf

in kitchens in the U.S.[85] One study tested sink basins, faucet handles, table tops, counter tops, refrigerator doors, oven controls, cutting boards, and sponges. Of the samples, 99 percent tested positive for some level of bacteria and 46 percent showed the presence of some amount of total coliforms, even when disinfectants were used. This study demonstrates that people are routinely exposed to bacteria and other microbiological contaminants as part of existing environmental conditions but that illness is unlikely to result. Therefore, overall, the practice of bagging meat would reduce the chances of unacceptable bacteria growth. However, if bacteria do occur in reusable bags, studies suggest that no illness would result.

3.4.4 Mitigation Measures

Impacts related to hazards and hazardous materials would be less than significant. No mitigation measures are required.

3.4.5 Level of Impact after Mitigation

Impacts related to hazards and hazardous materials would be less than significant. No mitigation measures are required.

[85] City of Los Angeles FEIR citing San Jose DEIR citing Josephson, K.L., Rubino, J.R., Pepper, I.L. "Characterization and quantification of bacterial pathogens and indicator organisms in household kitchens with and without the use of a disinfectant cleaner." *Journal of Applied Microbiology*, Vol. 83 No.6, pp.737-50. 1997.

3.5 HYDROLOGY AND WATER QUALITY

This section provides an overview of existing hydrology and water quality conditions and evaluates the potential impacts associated with the ordinance.

3.5.1 Environmental Setting

3.5.1.1 Watersheds

The region's watersheds are depicted in Figure 3-1. Table 3-11 below provides information concerning each watershed and contaminants known to affect the water quality within each.

San Diego area stream systems include the San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River, along with a number of creeks. Most of the streams of the San Diego Region are interrupted in character, having both perennial and ephemeral components due to the rainfall pattern and the development of surface water impoundments. Surface water impoundments capture flow from nearly all the Region's major surface water streams. Many of the major surface water impoundments are a blend of natural runoff and imported water.[86]

The Municipal Separate Storm Sewer System (MS4) Permit issued by the RWQCB addresses discharges from the storm drain system to local streams, coastal lagoons, and the Ocean. The MS4 permit implements requirements of the CWA and Federal NPDES stormwater regulations.

The Regional (Region 9) MS4 Permit jointly covers several municipal, county government, and special district entities (referred to jointly as Copermittees) located in Southern Orange County, Southwestern Riverside County, and San Diego County who own and operate large MS4s. A key feature of the Regional MS4 Permit is that it provides an adaptive management pathway for the Copermittees to select and address the highest priority water quality issues through an iterative process.

This process is incorporated in watershed-specific Water Quality Improvement Plans (WQIPs). The WQIPs have been developed through a collaborative effort by the Copermittees in each Watershed Management Area, and other key stakeholders. The WQIPs include descriptions of the highest priority pollutants or conditions in a specific watershed, goals and strategies to address those pollutants or conditions, and time schedules associated with those goals and strategies. The Watershed Management Areas addressed in separate Water Quality Improvement Plans (WQIPs) where the City of San Diego is involved include: San Dieguito River, Los Peñasquitos, Mission Bay & La Jolla (Peñasquitos watershed split into 2 areas), San Diego River, San Diego Bay (which encompasses Pueblo San Diego, Sweetwater and Otay watersheds), and Tijuana River.

[86] California Regional Water Quality Control Board, San Diego Region. http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/

Figure 3-1 San Diego Watersheds
From SanGIS Regional Warehouse Layer, Ecology, Watersheds, updated 5/27/2015

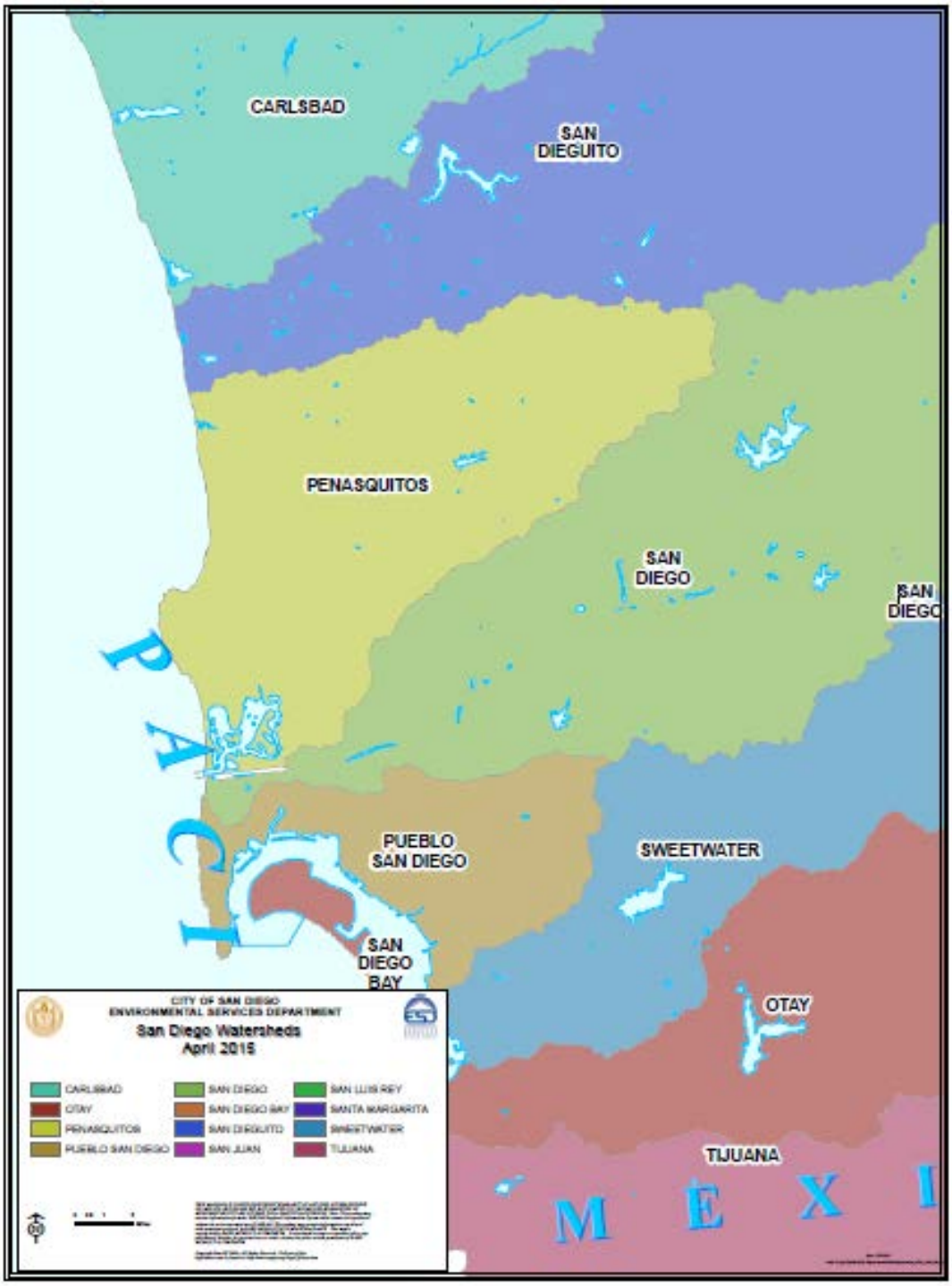


Table 3-11
San Diego Watersheds

Watershed	Major Water Bodies	Clean Water Act 303 (d) List	Major Impacts	Constituents of Concern	Sources/ Activities
San Dieguito	San Dieguito River, San Dieguito Lagoon, and Lake Hodges	Color, manganese, pH; eutrophic; fecal coliform, dissolved oxygen, phosphorus, indicator bacteria, TDS, chloride, sulfates	Surface water quality degradation, habitat degradation and loss, sediment, invasive species, eutrophication, and flooding	Coliform bacteria, TDS, nutrients, petroleum chemicals, toxics, and trash	Urban runoff, agricultural runoff, mining operations, sewage spills, and sand mining
Los Peñasquitos	Los Peñasquitos Creek, Los Peñasquitos Lagoon, Rose Creek, Tecolote Creek, Mission Bay, Miramar Reservoir	Phosphate, TDS, sediment/siltation, eutrophic, lead, indicator bacteria, sediment toxicity, cadmium, copper, phosphorous, toxicity, turbidity, zinc	Surface water quality degradation, beach closures, sedimentation, habitat degradation and loss, invasive species, eutrophication	Indicator bacteria, nutrients, trace metals, toxics, and sediment	Urban runoff, sewage spills, dredging, and landfill leachate
San Diego River	San Diego River, El Capitan Reservoir, San Vincente Reservoir, Lake Murray, Boulder Creek, Santee Lakes	Color, manganese, pH, eutrophic, fecal coliform, dissolved oxygen, pH, phosphorus, TDS, indicator bacteria, fecal coliform, low dissolved oxygen, chloride, pH (high), sulfates	Surface water quality degradation, habitat degradation and loss, sediment, invasive species, eutrophication, and flooding	Coliform bacteria, TDS, nutrients, petroleum chemicals, toxics, and trash	Urban runoff, agricultural runoff, mining operations, sewage spills, and sand mining
Pueblo San Diego	Chollas Creek, Paleta Creek,	Copper, indicator bacteria, lead, zinc, benthic community effects, sediment toxicity, mercury, PCBs, chlordane, lindane/HCH, PAH	Surface water quality degradation, habitat degradation, sediment toxicity in San Diego Bay, and sewer overflows	Trace metals, toxic substances, and coliform bacteria	Urban runoff
Sweetwater	Sweetwater River, Sweetwater Reservoir, Loveland Reservoir, and San Diego Bay	Aluminum, manganese, dissolved oxygen, copper	Surface water quality degradation, reduced ground water recharge, sedimentation, habitat degradation and loss, flood control, and invasive species	Coliform bacteria, trace metals, and other toxic constituents	Agricultural and urban runoff
Otay	Upper and Lower Otay Reservoirs, Otay River, San Diego Bay	Color, iron, manganese, nitrogen, ammonia (total ammonia), pH (high), PCBs, phosphorus, turbidity, copper	Surface water quality degradation, reduced ground water recharge, sedimentation, habitat degradation and loss, flood control, and invasive species	Coliform bacteria, trace metals, and other toxic constituents	Urban runoff, agricultural runoff, resource extraction, septic systems, marinas and boating activities

Watershed	Major Water Bodies	Clean Water Act 303 (d) List	Major Impacts	Constituents of Concern	Sources/ Activities
Tijuana River	Tijuana Estuary, Tijuana River, Cottonwood Creek, Pine Valley, Campo Creek, Barrett Lake, Lake Moreno	Color, manganese, pH, indicator bacteria, enterococcus, phosphorus, turbidity, eutrophic, low dissolved oxygen, pesticides, solids, synthetic organics, trace elements, trash, lead, nickel, thallium	surface water quality degradation, trash, sedimentation, eutrophication, habitat degradation and loss, flooding, erosion, and invasive species	Freshwater: coliform bacteria, nutrients, trace metals, pesticides, miscellaneous toxics, low dissolved oxygen, and trash Groundwater: TDS, nitrates, petroleum, MTBE, and solvents	Urban runoff, sewage spills, industrial discharges, agricultural, orchards, livestock, domestic animals, and septic systems

HCH = hexachlorocyclohexane; MTBE = methyl tertiary-butyl ether; PAH = polycyclic aromatic hydrocarbon; PCB = polychlorinated biphenyl; TDS = total dissolved solid
Source: Project Clean Water 2015

San Diego Region area ground water basins shown in Figure 3-2 are relatively small in area and usually shallow. Although these ground-water basins are limited in size, the ground water yield from the basins has been historically important to the development of the Region. The larger ground-water basins can be of future significance in the Region for storage of both imported water and reclaimed wastewater. Nearly all of the local groundwaters of the Region have been intensively developed for municipal and agricultural supply purposes.[87]

The State of California Groundwater Ambient Monitoring and Assessment Program reports that the San Diego Drainages Hydrogeologic Province study unit contains high concentrations of one or more inorganic constituents in 18 percent of the primary aquifers. The study unit contains moderate concentrations of these constituents and at moderate concentrations in 32 percent of the primary aquifers. The organic constituents come from products used in the home, business, industry, and agriculture.

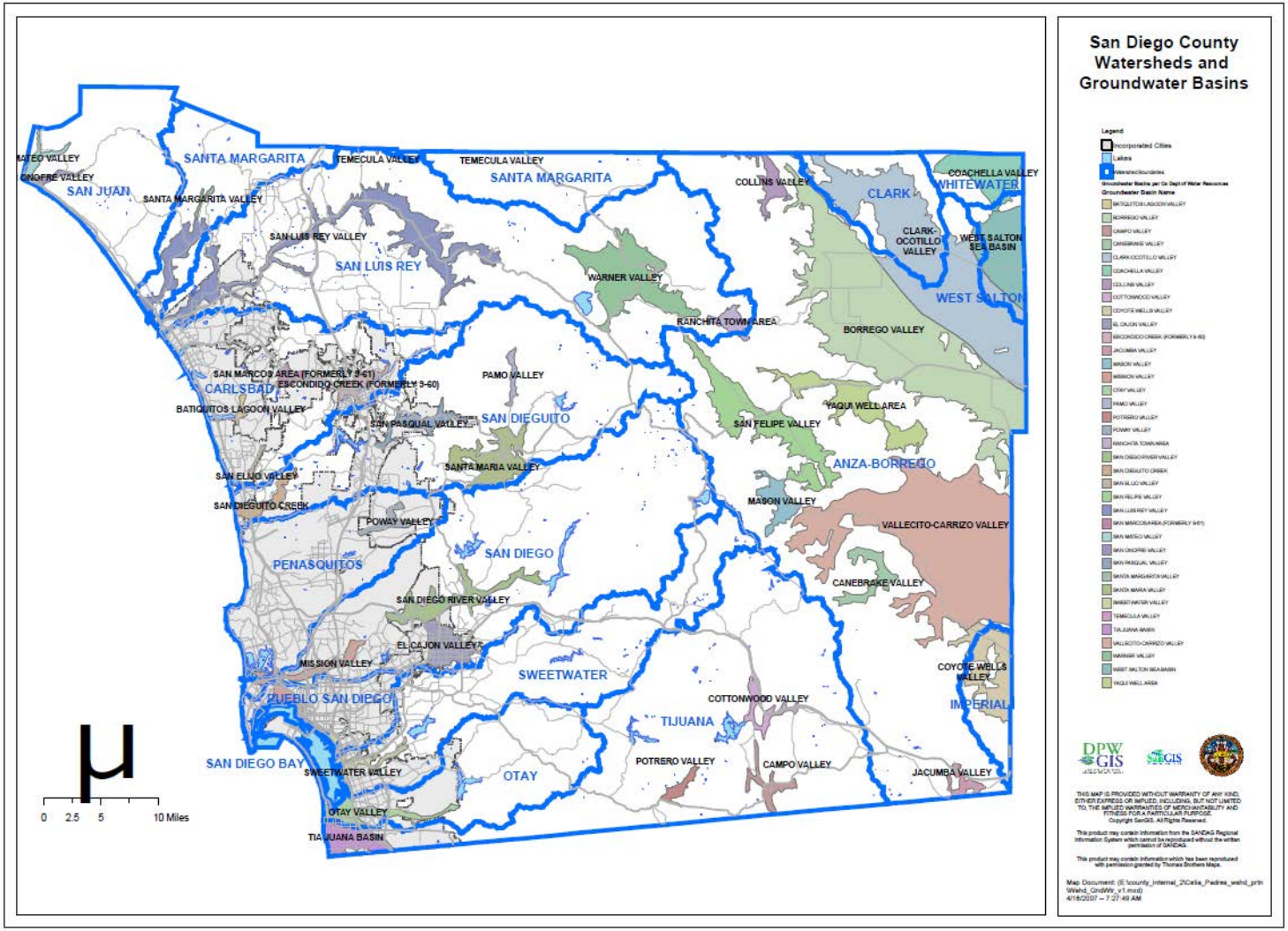
3.5.1.2 Federal Regulation

Clean Water Act 1972

The CWA, as amended, is the primary federal law dealing with surface water quality control and protection of beneficial uses of the nation's waters, including lakes, rivers, aquifers, and coastal areas. The purpose of the CWA is to provide guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters through prevention and elimination of pollution. The CWA applies to discharges of pollutants into waters of the U.S. The CWA establishes a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES. Under the CWA, municipalities across the nation are issued Municipal NPDES permits. In California, the State Water Resources Control Board (SWRCB) administers the NPDES program along with the Regional Water Quality Control Boards. The following CWA sections are most relevant to this analysis.

[87] *ibid*

Figure 3-2 Groundwater Basins in the San Diego Area



- Section 303(d) of the CWA requires states to adopt water quality standards for all surface waters in the United States. Water quality standards consist of designated beneficial uses (e.g., wildlife habitat, agriculture supple, fishing etc.) for a particular water body, along with water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of constituents – such as lead, suspended sediment, and fecal coliform bacteria – or narrative statements that represent the quality of water that supports a particular use. Section 303(d) requires states to identify streams whose water quality is "impaired" (affected by the presence of pollutants or contaminants) and to establish the Total Maximum Daily Load (TMDL) or the maximum quantity of a particular constituent that a water body can assimilate without experiencing adverse effect (USEPA 2012). The SWRCB and the applicable Regional Water Quality Control Board (RWQCB) are responsible for implementing and ensuring compliance with the provisions of the CWA.
- Section 401 of the CWA requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the U.S. obtain a state certification that the discharge complies with other provisions of the CWA. The SWRCB administers the certification program within California through its nine RWQCBs.
- Section 402 of the CWA establishes the NPDES permit program to regulate the discharge of pollutants from point sources. The CWA defines point sources of water pollutants as "any discernible, confined, and discrete conveyance" that discharges or may discharge pollutants. These are sources from which wastewater or storm water is transmitted in some type of conveyance (pipe and channel) to a water body and are classified as municipal or industrial. Municipal point sources consist primarily of domestic treated sewage and processed water, including municipal sewage treatment plant outfalls and storm water conveyance system outfalls. These outfalls contain harmful substances that are emitted directly into waters of the U.S. Without a permit, the discharge of pollutants from point sources into navigable waters of the U.S. is prohibited. NPDES permits require regular water quality monitoring. Assessments must be completed to ensure compliance with the permit standards.
- Section 404 of the CWA establishes a permit program, administered by USACE, regulating discharge of dredged or fill materials into waters of the U.S., including wetlands. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. CWA Section 404 permits are issued by USACE.

National Flood Insurance Act 1968

The National Flood Insurance Act of 1968 established the National Flood Insurance Program (NFIP). The NFIP is a federal program administered by the Flood Insurance Administration of the Federal Emergency Management Agency (FEMA). It enables individuals who have property within the 100-year floodplain to purchase insurance against flood losses. Community participation and eligibility, flood hazard identification, mapping, and floodplain management aspects are administered by state and local programs and support directorate within FEMA. FEMA works with the states and local communities to identify flood hazard areas and publishes a flood hazard boundary map of those areas. Floodplain mapping is an

ongoing process as such maps must be regularly updated for both major rivers and tributaries, as land uses and development patterns change.

Executive Order 11988, Floodplain Management

EO 11988 requires federal agencies to avoid to the extent possible development in floodplains; to reduce hazard and risk associated with floods; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial value of the floodplain. Local zoning is generally used to regulate construction in potentially hazardous floodplains. Since the City was certified as a participant in the NFIP in July 1976, construction without required engineered flood protection has not been permitted.

3.5.1.3 State and Regional Regulation

The Porter-Cologne Water Quality Control Act is the primary state law that establishes California's legal and regulatory framework for water quality control.[88] The Porter-Cologne Water Quality Control Act is embodied in the California Water Code, which authorizes the SWRCB to implement the provisions of the federal CWA. California is divided into nine regions governed by RWQCBs. The RWQCBs implement and enforce provisions of the California Water Code and the CWA under oversight of the SWRCB. San Diego is located within the purview of the San Diego RWQCB (Region 9). The Porter-Cologne Act also provides for the development and periodic review of Water Quality Control Plans (Basin Plans) that designate beneficial uses of California's major rivers and groundwater basins and establish water quality objectives for those waters.

The SWRCB has jurisdiction over water resources throughout California. Created by the State Legislature in 1967, the SWRCB protects water quality by setting statewide policy, coordinating and supporting RWQCB efforts, and reviewing petitions that contest RWQCB actions. The SWRCB oversees the RWQCBs, which develop regional Basin Plans.[89] There are nine RWQCBs that exercise rulemaking and regulatory activities by basins. Region 9 consists of most of San Diego County and parts of Orange and Riverside Counties, and is governed by the San Diego RWQCB.

A Water Quality Control Plan for the San Diego Basin (Region 9) was adopted by the RWQCB on September 8, 1994. This plan has been amended and updated since then, with the latest version available on the State website.[90] The Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan: (1) designates beneficial uses for surface and ground waters; (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's anti-degradation policy; (3) describes implementation programs to protect the beneficial uses of all waters in the Region; and (4) describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan [California Water Code sections 13240 thru 13244, and section 13050(j)]. Additionally, the Basin Plan incorporates by reference all applicable State and Regional Board plans and policies.

[88] http://www.waterboards.ca.gov/laws_regulations/docs/portercologne.pdf
[89] *ibid*
[90] http://www.swrcb.ca.gov/sandiego/water_issues/programs/basin_plan/

The Water Quality Control Plan for the ocean waters of California (California Ocean Plan) is a water quality control plan for marine waters and prohibits discharges into Areas of Special Biological Significance (ASBS) such as La Jolla and San Diego-Scripps .[91] ASBS areas are designated by the SWRCB and require special protections. On April 7, 2015 the SWRCBSWRCB adopted an amendment to the Water Quality Control Plan for the California Ocean Plan to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California, (collectively referred to as the "Trash Amendments"). The Trash Amendments include the following six elements: (1) establish a narrative water quality objective for trash, (2) corresponding applicability, (3) establish a prohibition on the discharge of trash, (4) provide implementation requirements for permitted storm water and other dischargers, (5) set a time schedule for compliance, and (6) provide a framework for monitoring and reporting requirements. These Trash Amendments will address all water bodies in the state currently listed as "impaired" due to the presence of trash.[92]

3.5.1.4 Local Regulation

San Diego's MS4 Permit, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, (Regional MS4 Permit) specifies that runoff management programs developed under this Regional MS4 Permit fulfill the need for coastal cities to develop a runoff nonpoint source plan identified in the Nonpoint Source Program Strategy and Implementation Plan. Annual reports are required to be submitted to the RWQCB.

The City, along with other government agencies, professional engineers and members of the local development community, developed a new Regional Best Management Practices (BMPs) Design Manual that conforms to current MS4 Permit requirements. The Manual will supersede the existing Countywide Model Standard Urban Runoff Stormwater Management Plan (SUSMP) and will provide technical guidance and regional standards for pollutant and flow control requirements for new development and significant redevelopment. The City is updating its own Storm Water Standards Manual. The Storm Water Standards Manual will be consistent with the concepts, compliance approaches, and performance standards of the Regional BMP Design Manual. However, the City's will be updating only City specific requirements to customize the Regional BMP Design Manual for its local jurisdiction.

Other local guidelines related to water quality include:

- *The San Diego County Hydrology Manual.* This manual provides a uniform procedure for flood and storm water analysis in San Diego County. It provides a guide for standardization of hydrology studies in the county.
- *San Diego County Drainage Design Manual.* This manual establishes design standards and procedures for storm water drainage and flood management facilities in San Diego County.
- *City of San Diego Drainage Design Manual.* This manual is an appendix to the City Land Development Manual. It provides a guide for designing drainage and drainage-related facilities for developments within the City.

[91] California Ocean Plan, California Water Resources Control Board, 2009.
[92] http://www.waterboards.ca.gov/water_issues/programs/trash_control/documentation.shtml

- *San Diego RWQCB Order No R9-213-001, as amended by Order No. R9-2015-001, NDPES Permit No. CAS0109266*. This order requires jurisdictions within the San Diego region to prepare Jurisdictional Runoff Management Plans.
- *City of San Diego Jurisdictional Runoff Management Plan.* The document describes how the City plans to protect and improve the water quality of rivers, bays, and the ocean.
- *Water Quality Improvement Plans.* The regional MS4 permit includes a requirement for collaborative WQIPs that are based on watershed management areas and identify and comprehensively address the highest priority water quality conditions for each area. The City of San Diego is included in six WQIPs.
- *City of San Diego Storm Water Standards Manual.* This manual requires that urban runoff pollution issues be specifically addressed in development planning for public and private projects.[93] It is being updated in response to the current MS4 Permit.

The City's General Plan, in the Conservation Element, also addresses water quality issues. The intent of the Conservation Element is the conservation and preservation of natural resources. The Conservation Element contains policies intended to protect the ocean from contamination and address storm water and water quality (see Table 3-12).

3.5.2 Impact Criteria

The ordinance would have a significant impact related to hydrology and water quality if it would:

- Degrade surface or ground water quality or lower ground-water;
- Substantially alter drainage patterns or runoff flow rates or volumes;
- Violate any water quality objectives set by the SWRCB or RWQCB.

3.5.3 Environmental Impact Analysis

Would adoption of the ordinance have any impact on surface water or ground water quality, or would it lower ground water?

Would adoption of the ordinance result in a substantial alteration to on- and off-site drainage patterns or changes in runoff flow rates or volumes?

Would adoption of the ordinance substantially degrade water quality or violate any water quality objectives set by the SWRCB, due to increases in sediments or other contaminants?

As summarized in Table 2-2, it is anticipated that the ordinance would reduce annual plastic single-use carryout bag consumption from 700 million to 35 million, that recyclable paper single-use carryout bag consumption could increase from 29 million to as much as 221 million (under a worst case scenario), and

[93] City of San Diego. 2007. Draft General Plan Final PEIR. 3.7 Hydrology. September.

reusable bag consumption could increase from 142,000 to 9 million. Thus the total annual bag consumption under the ordinance would decrease from approximately 729 million to 265 million.

Surface Water - Litter

The potential for each type of single-use carryout bag to become litter is based on the bag's weight, material type, and quantity used. Because they are lightweight, blow around easily, and are difficult to recycle, a large percentage of plastic single-use carryout bags end up as litter.[94] When litter enters water bodies via wind action and direct disposal or it enters the storm drain system, it clogs storm drains or is transported into the local watersheds and coastal habitats, violating waste discharge requirements. As summarized in Table 2-2, the ordinance is anticipated to remove approximately 665 million plastic single-use carryout bags per year, significantly reducing litter that results from those bags. As a result, it is anticipated that the ordinance would result in a beneficial effect on water quality due to litter impacts.

Fewer paper single-use carryout bags become litter than plastic single-use carryout bags because they are heavier and therefore do not blow around as readily, and also are more commonly recycled.[95] Further, because paper single-use carryout bags disintegrate when soaked with water, they are less likely to clog storm drains. Therefore, paper single-use carryout bags, the use of which may increase with implementation of the ordinance, would not be expected to cause surface water impacts due to litter.

Because of the weight and sturdiness of reusable bags, they are less likely to become litter compared to plastic single-use carryout bags.[96] The increased use of reusable bags, which is anticipated and encouraged under the ordinance, is not expected to result in litter or cause any surface water impacts.

Surface Water - Manufacture

During production and manufacture, all three bag types have the potential to contaminate surface water. No manufacture of any of the three bag types is known to occur in San Diego. The impacts associated with manufacture of the three types of bags are difficult to compare, and vary depending on the facility.

Plastic single-use carryout bag manufacturers use "pre-production plastic," which ultimately comes from oil and natural gas. Gas or oil is pumped from the ground, shipped to a refinery, then shipped to a pre-production plastic manufacturing facility. There is potential for surface water contamination at all points in the process. Pre-production plastic, which typically occurs as plastic resin pellets, are a concern when accidentally released into storm drains during use or transport.

Paper single-use carryout bags are typically made from Kraft pulp that is produced by chemically separating cellulose from lignin. Commercial tree groves that are the source of virgin materials may use fertilizers, pesticides and other chemicals in the production of raw materials. These chemicals may increase the potential for higher concentrations of trace metals, biodegradable wastes, and excessive major nutrients, such as nitrogen and phosphorus in waters. Increased nutrients in water encourage the growth of oxygen-depleting organisms, causing eutrophication.

[94] Master Environmental Assessment on Single-Use and Reusable Bags, Green Cities California, March 2010.
[95] City of Los Angeles. Single-Use Carryout Bag Ordinance FEIR, May 2013.
[96] Master Environmental Assessment on Single-Use and Reusable Bags, Green Cities California, March 2010.

Reusable carryout bags can be manufactured with various materials, including PP, multiple types of cloth (cotton canvas, nylon, etc.), and recycled plastic beverage containers (polyethylene terephthalate, or PET), among others, although LDPE is the most common material type. The potential for water quality to be degraded is dependent on the type of material used in the manufacturing process. Similar to paper bags, certain types of reusable bags, such as cotton, may use fertilizers, pesticides, and other chemicals during production of raw materials and manufacturing. These pollutants may cause eutrophication if released into the waterways.

Several Life Cycle Assessments (LCAs) have analyzed the impacts of bag manufacturing upon eutrophication and concluded that paper carryout bag manufacturing releases more pollutants, such as nitrates and phosphates, into water than does plastic carryout bag manufacturing. For example, according to an LCA performed by Ecobilan, 0.2 gram of phosphate equivalent are generated in the production of enough plastic carryout bags to hold 9,000 liters of groceries, which is a typical volume of groceries purchased annually in France per customer (the Ecobilan Study was conducted for stores in France).[97] In contrast, 2.3 grams of phosphate equivalent are generated in the production of enough paper carryout bags to hold 9,000 liters of groceries.[98]

The results of the Ecobilan Study were used to analyze the potential effects of eutrophication due to the conservative worst-case scenario assumption of plastic and paper single-use carryout bags currently in use as compared to that expected post-ordinance (Table 3-12). In order to better apply the Ecobilan data to bag usage in the City, eutrophication per bag was calculated in grams of phosphate equivalent, and then multiplied by the estimated number of bags. This method was used to estimate the current eutrophication due to plastic and paper carryout bags and the projected eutrophication that would be anticipated if the ordinance is implemented.

Table 3-12
Eutrophication Comparison of Current and Expected Bag Usage

Bag Type	Number of Bags Used per Year (Current)	Eutrophication (kilograms phosphate equivalent)	Number of Bags Used per Year (Ordinance)	Eutrophication (kilograms phosphate equivalent)
Single-Use Plastic	700,000,000	218	35,000,000	11
Single-Use Paper	29,474,000	154	221,053,000	1,157
Total	729,474,000	372	256,053,000	1,168

Based on Ecobilan, 2004

[97] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material, February, 2004.
[98] *ibid*

Using the Ecobilan results, it was determined that the ordinance could result in an increase in eutrophication of approximately two kilograms of phosphate equivalent per day (calculations as follows: 1,168 – 372/365).

Increased demand for reusable bags may also have the potential to indirectly increase eutrophication impacts from facilities that manufacture reusable bags. However, impacts of reusable bag manufacturing on eutrophication are likely to be less significant than the impacts due to plastic and paper carryout bag manufacturing, when considered on a per-use basis. For example, the Ecobilan Study evaluated the eutrophication impacts of a reusable bag that is 70 micrometers thick (approximately 2.8 mils), weighs 44 grams, and holds 37 liters of groceries.[99] The analysis concluded that this particular reusable bag has a smaller impact on eutrophication than a plastic carryout bag, as long as the reusable bag is used a minimum of three times. The impacts of the reusable bag are reduced further when the bag is used additional times. Although the Ecobilan data is particular to a specific type of reusable bag, it illustrates the general concept of how the eutrophication impacts of reusable bag manufacturing are reduced with each time a bag is used. A conversion from plastic carryout bags to reusable bags would be anticipated to have reduced impacts upon eutrophication. Within the City, where there are no manufacturing facilities, there are no anticipated impacts related to eutrophication to surface water quality in the watersheds of the City as a result of the proposed ordinance. Therefore, indirect impacts to water quality from eutrophication due to a potential increase in the demand for paper carryout bag manufacturing would be expected to be below a level of significance.

The ordinance is anticipated to have a beneficial impact on water quality due to a decrease of litter attributed to plastic carryout bags in water bodies locally. In the vicinity of manufacturing facilities, if loads are accidentally damaged, plastic bag litter may be an issue, and this potential impact would also be decreased by the proposed ordinance.

Groundwater

Industrial activities, such as the production of raw materials and manufacturing of carryout bags have the potential to create discharges that can seep into the subsurface and pollute groundwater. When situated in the U.S., these activities are subject to all applicable federal, state and local water quality standards and waste discharge requirements, including the NPDES program requirements. No carryout bag production facilities exist within the San Diego region.

The ordinance does not require any construction of new structures, such as manufacturing facilities, that could result in an increase in impervious surfaces that would potentially reduce groundwater levels. The impacts associated with manufacture of the three types of bags would not be local, and would be speculative, due to the great variety of sources available. Any future facilities manufacturing reusable bags in the City would require water supplied by the San Diego County Water Authority (SDCWA) from its portfolio of water sources and would be subject to SDCWA's water allocations, as applicable. Therefore, the ordinance would result in a less than significant impact related to groundwater.

[99] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material, February, 2004.

Table 3-13
Relevant General Plan Water Quality Goals, Objectives, and Policies

Policy/Objective	Policy /Objective Description
CONSERVATION ELEMENT – COASTAL RESOURCES	
Coastal Resources Goal	Coastal resource preservation and enhancement
Coastal Resources Goal	Clean coastal waters by continuing to improve the quality of ocean outfall discharges.
CE-C.1	Protect, preserve, restore, and enhance important coastal wetlands and habitat (tide pools, lagoons and marine canyons) for conservation, research, and limited recreational purposes.
CONSERVATION ELEMENT – WATER RESOURCES MANAGEMENT	
CE-D.3.c	Improve and maintain urban runoff water quality through implementation of storm water protection measures.
CONSERVATION ELEMENT – URBAN RUNOFF MANAGEMENT	
Urban Runoff Goal	Protection and restoration of water bodies, including reservoirs, coastal waters, creeks, bays, and wetlands.
Urban Runoff Goal	Preservation of natural attributes of both the floodplain and floodway without endangering life and property.

3.5.4 Mitigation Measures

Impacts related to surface water quality would be less than significant, and, where litter is reduced, beneficial. Impacts related to ground-water would be less than significant. No mitigation measures are required.

3.5.5 Level of Impact after Mitigation

No significant impacts are anticipated; therefore, no mitigation measures are required.

3.6 UTILITIES/PUBLIC SERVICE SYSTEMS

This section examines potential impacts associated with the ordinance on water, wastewater, and solid waste utilities systems.

3.6.1 Environmental Setting

3.6.1.1 Water

The City of San Diego's Public Utilities Department (PUD) manages the water supply and water delivery for the City. PUD serves approximately 1.3 million people within more than 200 square miles of developed land with its system of 3,302 miles of water pipelines.[100] The City imports approximately 80 to 90 percent of its water, purchased from the SDCWA, which is a blend from the Colorado River and State Water Project (SWP) sources.[101] It was projected that 240,472 acre-feet per year (AFY) will be distributed by PUD in 2015, of which 195,688 AFY will be delivered to metered customers.[102] Table 3-14 presents total water deliveries and total water use by PUD for 2005 through 2035.

Table 3-14
City of San Diego Public Utilities Department
Total Water Deliveries and Total Water Use, AFY, 2005-2035

	2005 (Actual)	2010 (Actual)	2015 (Projection)	2020 (Projection)	2025 (Projection)	2030 (Projection)	2035 (Projection)
Total Water Deliveries	199,178	162,291	195,688	213,409	228,061	238,772	247,986
Total Water Use (includes sales and losses)	228,391	204,886	240,472	260,211	276,375	288,481	298,860

Source: City of San Diego, Public Utilities Department, 2010 Urban Water Management Plan, 2011.

With a total of 951,000 acres (1,486 square miles), the SDCWA's service area encompasses the western one-third of San Diego County. The supplies available to the SDCWA's member agencies originate from the following sources: (1) conserved water from the Imperial Irrigation District (IID) Transfer Agreement, (2) conserved water from the All-American Canal (AAC) and Coachella Canal (CC) lining projects, (3) imported water supplied by Metropolitan Water District (MWD) from the Sacramento-San Joaquin Bay-Delta and the Colorado River, and (4) local supplies such as surface water runoff, ground-water, and reclamation.[103]

[100] City of San Diego, Public Utilities Department: Water General Information, http://www.sandiego.gov/water/gen-info/overview/index.shtml
[101] City of San Diego, Public Utilities Department, 2012 Long-Range Water Resources Plan, Final, December 2013.
[102] City of San Diego, Public Utilities Department, 2010 Urban Water Management Plan, 2011.
[103] http://www.sdcwa.org/master-plan-update

IID Transfer Agreement

In 1998, the SDCWA entered into an agreement with the IID for the long-term transfer of conserved Colorado River water to San Diego County. Water conserved by Imperial Valley farmers or through system efficiency improvements within the IID system can be transferred to the SDCWA for use in San Diego County. Deliveries into San Diego County from the Transfer Agreement began in 2003 with an initial delivery of 10,000 AF. SDCWA is to receive increasing amounts of transfer water according to a water delivery schedule contained in the transfer agreement. In 2012, the SDCWA received 106,722 AF. The quantities will increase annually to 200,000 AF by 2021 and then remain fixed for the duration of the agreement. The initial term of the Transfer Agreement is 45 years, with a provision that either agency may extend the agreement for an additional 30-year period.

All-American Canal and Coachella Canal Lining Project

As part of the 2003 Colorado River Quantification Settlement Agreement (QSA) and related contracts, the SDCWA contracted for 77,700 AF per year (AFY) of conserved water from projects that lined portions of the AAC and CC. The projects reduced the loss of water that occurred through seepage, and the conserved water is delivered to the SDCWA. The 2003 Allocation Agreement provides for up to 77,700 AFY to be allocated to the SDCWA. An additional 4,850 AFY is also available to the SDCWA depending on environmental requirements from the CC lining project. For planning purposes, the SDCWA assumes that 2,500 AF of the 4,850 AF will be available each year for delivery, for a total of 80,200 AFY. The canal-lining contracts are in effect for a period of 110 years. Both canal-lining projects have been completed, and full deliveries of conserved water to the SDCWA are occurring.

Metropolitan Water District of Southern California (MWD)

SDCWA purchases imported water from MWD to meet a large portion of its water supply portfolio. The SDCWA is the largest purchaser of the 26 MWD member agencies. The imported sources consist of Colorado River supply delivered through the Colorado River Aqueduct (CRA) and Sacramento-San Joaquin Bay Delta supplies delivered through the SWP; both supplies are blended at MWD's Skinner Reservoir. To meet emerging challenges from dry hydrologic conditions and regulatory restrictions that limit supplies from the SWP, MWD's water supply strategy consists of significant investments in dry-year water transfers and the use of storage programs to maximize available supplies in wet years for use in dry years. MWD supplies available to the SDCWA would be 336,600 AF when assuming MWD is allocating 1.8 million acre-feet (MAF) and that the SDCWA's preferential right percentage is 18.7 percent, as estimated for year 2030.[104]

Local Supplies

Surface Water Runoff

The local surface water yield is derived from the 25 surface reservoirs in San Diego County. These reservoirs have a total capacity of approximately 742,000 AF, providing significant seasonal and carry over storage for member agencies and the SDCWA. Of the total surface storage, nearly 70 percent is

[104] http://www.sdcwa.org/updating-regional-water-facilities-master-plan

owned and operated by the City, with Helix Water District, Ramona Municipal Water District, Sweetwater Authority, and the City of Escondido operating the majority of the remaining storage capacity. The estimated total average annual inflow to these reservoirs is roughly 100,000 AF, ranging from negligible inflow during an extremely dry year up to an historical high of 853,000 AF. In the 2010 UWMP, the projected average annual water supply available from these local reservoirs is approximately 48,000 AF. The average annual available surface water supply is lower than the average annual inflow due to reservoir evaporation, reservoir spills, and later uses and losses not directly accounted for in the reservoir balance measurements. The natural runoff into these reservoirs is primarily derived from watersheds that capture Pacific storm precipitation high in the Peninsular Range and drain to the Pacific Ocean. The largest of these reservoirs is El Capitan reservoir (City of San Diego) with a capacity of more than 112,000 AF. The City also had 90,230 AFY of storage capacity in the San Vicente Reservoir, recently greatly enhanced by a dam-raise project, which added 152,000 AF of storage capacity.

Groundwater

Groundwater basins in San Diego County are limited due to the region's geology. Where the hydrogeology is favorable (usually small alluvial sand and gravel aquifers), much of the higher water quality supply has been developed through construction of relatively shallow wells. Outside these areas, ground-water has been developed in fractured bedrock formations, which generally yield only small quantities of water. The most developed areas for groundwater supply are within the Santa Margarita River watershed (Marine Corps Base [MCB] Camp Pendleton), Mission Basin (City of Oceanside), San Diego Formation (Sweetwater Authority), and Warner Basin (Vista Irrigation District). The total estimated groundwater supply produced within the SDCWA service area is estimated to be approximately 22,030 to 28,360 AFY with dry-year supplies expected to be up to 22,238 AFY.

Reclamation

Water recycling has been identified as a growing part of the SDCWA's resource mix. Water may be recycled for non-potable or indirect potable purposes. Agencies in San Diego County use recycled water to fill lakes, ponds, and ornamental fountains; to irrigate parks, campgrounds, golf courses, freeway medians, community greenbelts, school athletic fields, food crops, and nursery stock; and to control dust at construction sites. Recycled water can also be used in certain industrial processes, in cooling towers, for flushing toilets and urinals in non-residential buildings, and potentially for street sweeping purposes. Currently, approximately 27,900 AFY of recycled water is used within the SDCWA's service area, and this volume is projected to grow to nearly 50,000 AFY by 2035.

Recycled water is produced by the North City Water Reclamation Plant (NCWRP) and the South Bay Water Reclamation Plant (SBWRP). These plants treat wastewater to a level that is approved for irrigation, manufacturing, and other non-drinking, or non-potable purposes. The NCWRP has the capability to treat 30 million gallons a day (mgd) and the SBWRP can treat 15 mgd.

Water Conservation

With the passage of the Water Conservation Act of 2009 (Senate Bill 7 of the Seventh Extraordinary Session, SBX7-7), retail urban water agencies are required to achieve a 20 percent reduction in urban per

capita water use by December 31, 2020. Water conservation is an important part of the SDCWA's water supply portfolio. SDCWA's water conservation programs: (1) reduce demand for expensive, imported water; (2) demonstrate a continued commitment to the BMP; (3) assist the SDCWA's member agencies in meeting the requirements of SBX7-7; and (4) ensure a reliable future water supply.[105] The SDCWA's member agencies have direct contact with retail customers. This contact is crucial to implementing conservation programs. Since 1991, more than 656,000 AF have been conserved through the region's conservation programs.[106]

Water Supply Treatment Processes

PUD provides high quality drinking water by using proven technology, updated facilities, and state-certified operators. The City has three water treatment plants, the Alvarado Water Treatment Plant (AWTP), Miramar Water Treatment Plant (MWTP), and Otay Water Treatment Plant (OWTP) that use several treatment processes to provide safe drinking water to the public. South San Diego receives water from the OWTP, central San Diego from the AWTP, and north San Diego from the MWTP.[107] The plants are managed by the PUD. The Department actively participates with the American Water Works Association's (AWWA) Partnership for Safe Water Program, the mission of which is to improve the quality of drinking water delivered to customers of public water supplies by optimizing system operations.[108] Operations use conventional water treatment methods, including coagulation, flocculation, sedimentation, and sand/multi-media filtration. In addition to conventional treatment, advanced disinfection has been added to the treatment processes.

Water Use Associated with Carryout Bags

Several studies, including the Ecobilan Study and the Boustead Study, show that the production of paper single-use carryout bags requires more water than does the production of plastic single-use carryout bags.[109] [110] These studies provide specific data, on a per bag basis, for single-use plastic, single-use paper, and LDPE reusable bags. Findings are variable because water use for paper bags varies depending on which Life Cycle Assessment (LCA) data are used. The Ecobilan Study determined the amount of water needed to manufacture bags to carry 9,000 liters of groceries:

- plastic single-use bags use 52.5 liters (or 13.9 gallons) of water,
- paper single-use bags use 173 liters (or 45.7 gallons) of water, and
- reusable bags (assuming they are used 52 times) use 1.096 liters (0.29 gallons) of water.

[105] San Diego County Water Authority, Urban Water Management Plan, http://wahoobeta.sdcwa.org/uwmp
[106] *ibid*
[107] City of San Diego, Water Quality, From Source to Tap, Our Water Treatment Process, Water Treatment Plants: http://www.sandiego.gov/water/quality/watersources/treatmentprocess/treatmentplants.shtml
[108] *ibid*
[109] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material, February, 2004.
[110] Boustead Consulting and Associates Ltd. 2007. Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper.

This study provides a useful comparison, since it is not a per bag rate, but a "per volume of goods" rate. Therefore the three types of bags can be directly compared with respect to water use during bag manufacture, with reusable bags being far superior to either paper or plastic single-use bags, although plastic is better than paper.

Using slightly different assumptions and data, the Boustead LCA study determined that the manufacturing of plastic single-use bags would require approximately 58 gallons of water for 1,500 bags and approximately 1,004 gallons of water for 1,000 paper single-use bags (assuming that one paper bag could carry the same quantity of groceries as 1.5 plastic bags). The water consumption rate is somewhat less for bags with recycled content. (Using recycled scrap paper instead of virgin material saves 7,000 gallons of water per ton of paper produced.)[111] The Boustead data does not include estimates for reusable bags. Using the data from these two different studies, Tables 3-15 and 3-16 summarize the existing water use associated with the manufacture of plastic single-use carryout bags used in the City. As shown, the manufacture of 700 million plastic single-use carryout bags currently consumes between 46.40 and 125 AF. Since no manufacturing facilities are located in the City or within the regions served by the City's water sources, water consumption associated with plastic single-use carryout bag use does not directly affect PUD's water supply or conveyance.

Table 3-15
Current Water Consumption Associated with Single-Use Plastic Bags based on Ecobilan Data

	Number of Single-Use Plastic Bags	Gallons of Water per bag	Gallons of Water per year	Acre-feet of Water per year
Single-Use Plastic	700,000,000	0.0216	15,120,000	46.40

Source: Ecobilan. February 2004. Environmental Impact Assessment of Carrefour Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material. Prepared for: Carrefour Group. Neuilly-sur-Seine, France.

Table 3-16
Current Water Consumption Associated with Single-Use Bags based on Boustead Data

	Number of Single-Use Bags per Year	Gallons of Water per bag	Gallons of Water per year	Acre-feet of Water per year
Single-Use Plastic	700,000,000	0.058	40,600,000	125
Single-Use Paper	29,474,000	1.00	29,474,000	90

Source: Boustead Consulting and Associates Ltd. 2007. Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper. Prepared for Progressive Bag Affiliates.

[111] http://www.kab.org/site/PageServer?pagename=recycling_facts_and_stats

3.6.1.2 Wastewater

The City of San Diego Metropolitan Wastewater Department (MWWD) provides regional wastewater treatment services for the City of San Diego and 15 other cities and sanitation districts: Chula Vista, Coronado, Del Mar, El Cajon, Imperial Beach, La Mesa, National City, and Poway; the Lemon Grove Sanitation District; the Padre Dam Municipal and Otay water districts; and the County of San Diego (on behalf of the Winter Gardens Sewer Maintenance District, and the Alpine, Lakeside, and Spring Valley sanitation districts).

The MWWD system comprises the Point Loma Wastewater Treatment Plant and Ocean Outfall, the NCWRP and SBWRP, the Metro Biosolids Center (MBC), the Environmental Monitoring and Technical Services Laboratory, nine major pump stations, and 75 smaller pump stations. The pump stations move wastewater through sewers to the various treatment plants.

The Point Loma Wastewater Treatment Plant (PLWTP) treats roughly 175 million gallons of wastewater per day (although it has a maximum capacity of 240 million gallons per day) and discharges it through the Point Loma Ocean Outfall (PLOO) into the Pacific Ocean. Any sludge or biosolids accumulated from the processing of the wastewater at this plant is sent to the MBC for further processing. Up to 30 million gallons of wastewater can be treated per day at the NCWRP. Wastewater from northern San Diego is processed and purified, and then redistributed through a reclaimed water pipeline for irrigating, landscaping, and industrial uses. Water processed through the SBWRP can either be discharged into the ocean through the South Bay Ocean Outfall (SBOO), or sent on to Tertiary Treatment to be used for reclaimed water purposes. The SBWRP has the capacity to process 15 million gallons per day.[112]

3.6.1.3 Wastewater Treatment

Table 3-17 presents capacity and average flows for the PLWTP, NCWRP, and SBWRP. PLWTP treats approximately 175 mgd of wastewater, generated in a 450 square mile area by more than 2.2 million residents.[113] Located on a 40-acre site in Point Loma, the plant has a treatment capacity of 240 mgd. Treated wastewater from the PLWTP is discharged into the Pacific Ocean through a 4.5-mile outfall pipe. PLOO discharges advanced primary treated wastewater at a depth of 320 feet.[114]

The NCWRP and the SBWRP pull flow from the sewers for treatment and reuse. Both plants operate as secondary treatment plants and reclaim water to tertiary standards. The NCWRP returns all secondary effluent that is not reclaimed back to PLWTP. The solids that are removed, either by sedimentation or biological oxidation, are pumped to the MBC for further treatment. The SBWRP discharges excess secondary effluent to the SBOO and returns all solids removed from the sewage to the PLWTP.[115]

[112] City of San Diego, Wastewater Facilities, http://www.sandiego.gov/mwwd/facilities/index.shtml.
[113] City of San Diego, Water Quality, From Source to Tap, Our Water Treatment Process, Water Treatment Plants: http://www.sandiego.gov/water/quality/watersources/treatmentprocess/treatmentplants.shtml
[114] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material. February, 2004.
[115] City of San Diego, http://www.sandiego.gov/mwwd/pdf/pl2014_fullrpt.pdf

Table 3-17
Wastewater Treatment/Reclamation Plants Summary

Wastewater Treatment/ Reclamation Plant	Treatment Level	Capacity (mgd)	Average Flows (mgd)
Point Loma Wastewater Treatment Plant (PLWTP)	Advanced Primary Treatment, chemically enhanced primary sedimentation and anaerobic biosolids processing	240	175
North City Water Reclamation Plant (NCWRP)	Tertiary Treatment	30	16.4
South Bay Water Reclamation Plant (SBWRP)	Tertiary Treatment	15	8

Source: City of San Diego, 2012 Annual Report and Summary Point Loma Wastewater Treatment Plant & Ocean Outfall, www.sandiego.go/mwwd/pdf/2012/reports/plintro.pdf.

Wastewater Generation Associated with Single-Use Bags

Several studies have estimated wastewater generation associated with single-use plastic, paper and reusable bags manufacturing to determine a per bag wastewater use rate. In addition to the water consumption rates in Tables 3-15 and 3-16, at the point of manufacture, per Ecobilan data:[116]

- single-use carryout plastic bags produce 50 liters of wastewater for 9,000 liters of groceries carried,
- single-use carryout paper bags produce 130.7 liters of wastewater per 9,000 liters of groceries carried, and
- reusable bags produce 1.096 liters of wastewater per 9,000 liters of groceries carried, assuming a reusable bag is used 125 times.

In addition, washing reusable bags would generate local effluent. If each reusable bag weighs 60 grams, current effluent generation from washing the 142,000 reusable bags currently estimated to be used annually would be 142,000 x 60 grams = 8,520,000 grams of wash or 18,783 pounds (1 pound equals 0.0022046 grams). Assuming each load is 6 pounds,[117] and 32 gallons of water per load[118] for a top load (less water efficient) washer, and assuming each bag is laundered once per year, that is 100,176 gallons per year of effluent under existing conditions. (18,783 pounds/6 pounds per load equals 3,130.5 loads. 3,130.5 loads x 32 gallons of wastewater per load equals 100,176 gallons of wastewater.)

[116] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material, February 2004. Also, this waste water data from Ecobilan was used in the Long Beach CEQA addendum used for the Long Beach ordinance: http://www.lbds.info/civica/filebank/blobdload.asp?BlobID=3641
[117] http://housekeeping.about.com/od/laundry/f/fullload.htm#
[118] http://www.home-water-works.org/indoor-use/clothes-washer

3.6.1.4 Solid Waste

ESD provides solid waste management for the City. The ESD's Collection Services Division provides refuse, recyclable material, and yard waste collection from eligible waste generators,[119] and provides service to street litter bins in commercial districts.[120] Plastic single-use carryout bags are not accepted in the City's recycling containers because they jam sorting equipment and are therefore difficult to recycle. ESD develops and implements the City's solid waste reduction and diversion programs, directs disposal operations at the City's Miramar Landfill, manages the City's inactive landfill sites, collects landfill fees, and enforces and supports the City's solid waste codes.

The City operates a Non-Exclusive Solid Waste Collection Franchise System to collect from waste generators that are not eligible for City service. Waste generators may select from any franchised hauler that provides collection services within the City. Most, but not all, refuse collected within the City is taken to the Miramar Landfill, a Class III landfill. The permitted daily intake capacity is 8,000 tons per day; however, the Miramar Landfill receives less than this limit, averaging 2,520 tons per day.[121]

The City spends approximately $6 million dollars annually on litter control, illegal dump abatement, and dead animal pick up. This includes hauling away litter collected by community group cleanup events. The City also conducts 108 annual community cleanup events. Two days per week the City provides dedicated crews to de-litter alleys. The City also provides education and outreach regarding litter at community meetings, task force groups, and with City Council offices. Special programs have been established at Chollas Creek and other drainages to provide a cleaner environment for residents and prevent the spread of pollution to the ocean.

At the City's Miramar Landfill, more than $300,000 is spent on litter control annually, with blowing bags being a significant problem. Alpha Crews at the landfill spend 90 percent of their time picking up litter, 50 percent of which is plastic bags.[122] This amounts to $140,000 spent annually on plastic bag litter abatement at the landfill. City field operations spend more than $200,000 annually on litter control at various City facilities. Probation crew spends 80 percent of their time on litter, 10 percent of which is plastic bags, costing approximately $20,000 annually.[123] The Park and Recreation Department provides workers to control litter at City parks and open spaces. The City's storm water program must deal with plastic bags and other litter in the storm water system. The City's sewer system also screens plastic bags from the sewer system. Plastic bags blowing from refuse containers and collection trucks cause additional work for the City's collection forces and for private waste hauling firms. To address these problems, the City provides public information campaigns on litter control.

Approximately 700 million plastic single-use carryout bags are used in the City per year. Despite efforts to implement recycling programs, only about five percent of the plastic bags in California and nationwide

[119] City of San Diego "About Environmental Services": http://www.sandiego.gov/environmental-services/geninfo/about.shtml
[120] *ibid*
[121] CalRecycle: http://www.calrecycle.ca.gov/SWFacilities/Directory/37-AA-0020/Detail
[122] Claytor, Kate, City of San Diego Environmental Services Department, pers com., 2015
[123] *ibid*

are currently recycled.[124] Therefore, the majority of plastic single-use carryout bags are disposed in a landfill. Plastic single-use carryout bags also make up a large portion of the litter in streams, rivers, and the ocean.[125]

Several studies have been conducted to determine the amount of solid waste generated per plastic single-use carryout bag. Using USEPA recycling rates and Ecobilan data, 0.0074 kg of solid waste are generated per plastic single-use carryout bag.[126] Using USEPA recycling rates and Boustead data, 0.0047 kg are generated per plastic single-use carryout bag.[127] Reusable plastic bags are not included in the Boustead approximations. Using these studies, Tables 3-18 and 3-19 estimate the amount of solid waste associated with the number of plastic single-use carryout bags currently used in the City. They generate approximately 5,424 tons of solid waste per year, based on the Ecobilan data, and approximately 3,445 tons of solid waste per year based on Boustead data.

Table 3-18
Current Solid Waste Generation Associated with Single-Use Plastic Bags based on Ecobilan Data

Number of Single-use Plastic Bags Per Year pre Ordinance	5% Recycling Rate	Solid Waste per Bag (kg)	Solid Waste per Year (tons)
700,000,000	665,000,000	0.0074	5,424

Sources: Green Cities California MEA, March 2010

Environmental Impact Assessment of Carrefour Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material. Prepared for: Carrefour Group. Neuilly-sur-Seine, France.

Paper bags do not appear as a separate component in litter data, and are classified by the Ecobilan study as having the lowest risk for litter.[128] The Ecobilan study reports that paper bags can generate up to 80 percent more solid waste on a per bag basis compared to plastic bags if not recycled or composted; although plastic single use bags are occasionally reused, paper bags are more frequently composted or recycled.[129]

[124] Master Environmental Assessment on Single-Use and Reusable Bags, Green Cities California, March 2010; and Boustead Consulting and Associates Ltd. 2007. Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper.
[125] CalRecycle: http://www.calrecycle.ca.gov/publiced/holidays/ReusableBags.htm
[126] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material, February 2004.
[127] Boustead Consulting and Associates Ltd. 2007. Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper.
[128] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material, February 2004.
[129] *ibid*

Table 3-19
Current Solid Waste Generation Associated with Single-Use Plastic and Paper Bags based on Boustead Data

Type of Bag	5% Recycling Rate Solid Waste per Plastic Bag, 30% per Paper Bag	Solid Waste per Bag (kg)	Solid Waste per Year (tons)
Plastic Single-Use	665,000,000	0.0047	3,445
Paper Single-Use	20,631,800	0.034	773

Sources: Green Cities California MEA, March 2010

Boustead Consulting and Associates Ltd. 2007. Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper. Prepared for Progressive Bag Affiliate.

3.6.1.5 Regulations Applicable to the Project

The laws, plans, and Executive Orders governing water, wastewater, and solid waste that are most applicable to the project include:

Assembly Bill 2449. AB 2449 (Chapter 845, Statutes of 2006) requires certain stores to provide a plastic bag collection bin in a publicly accessible spot, and to make reusable bags available to shoppers for purchase. AB 2449 applies to retail stores of more than 10,000 square feet that include a licensed pharmacy and to supermarkets (grocery stores with gross annual sales of $2 million or more that sell dry groceries, canned goods, nonfood items, or perishable goods). Stores are required to maintain records of their compliance and make them available to CalRecycle or the local jurisdiction. Senate Bill 1219 (Chapter 384, Statutes of 2012) extended these requirements until January 1, 2020.

California Integrated Waste Management Act, Assembly Bill 939. The California Integrated Waste Management Act of 1989 required each local jurisdiction to divert 50 percent of waste generated within the jurisdiction from disposal by January 1, 2000. Diversion methods include, in order of priority, source reduction, recycling and composting activities, with a maximum of 10 percent of the diversion to be accomplished through transformation processes that generate energy. In 2011, with enactment of Assembly Bill 341, the state adopted a policy goal of 75 percent diversion by the year 2020.

City of San Diego Thresholds. The City of San Diego established a threshold of 1,500 tons of waste per year. Projects exceeding this threshold may have potentially significant solid waste impacts.[130]

Executive Order S-06-08. In 2008, California Governor Arnold Schwarzenegger issued Executive Order S-06-08, which declared that there is a statewide drought and encouraged local water districts and agencies to reduce water consumption locally and regionally.

Urban Water Management Planning Act. The Urban Water Management Planning Act requires urban water suppliers to develop water management plans to actively pursue the efficient use of available

[130] City of San Diego CEQA Thresholds: http://www.sandiego.gov/development-services/pdf/news/sdtceqa.pdf

supplies. Every five years, water suppliers are required to develop UWMPs to identify short-term and long-term water demand management measures to meet growing water demands. SDCWA, as a water supplier, has prepared and adopted an UWMP.[131]

Water Conservation Act. The Water Conservation Act requires water agencies to reduce per capita water use by 20 percent by 2020 (known as 20x2020), and to increase recycled water use. Water suppliers are required to set a water use target for 2020 and an interim target for 2015 using one of four methods stipulated in the Act. That requirement calls for the SDCWA's 24 member agencies to collectively achieve 77,000 AFY of new water use efficiency from their baseline levels by 2020 through demand reductions and increased use of recycled water. The SDCWA Board incorporated this water savings target into the 2010 update of the UWMP, which estimates this goal will offset 13 percent of the region's water use demands by 2020.[132]

City of San Diego General Plan. The City General Plan was comprehensively updated and adopted by unanimous vote of the City Council in 2008. The policies of the General Plan related to wastewater, water, and solid waste that are most relevant to the project are listed in Table 3-20.

Table 3-20
Relevant General Plan Water Supply Goals, Objectives and Policies

Policy	Description
Wastewater	
PF-F.4.	Maintain conveyance and treatment capacity.
PF-F.5.	Construct and maintain facilities to accommodate regional growth projections that are consistent with sustainable development policies.
PF-F.8.	Manage infrastructure assets optimally through efficient repair and replacement.
Water	
PF-H.1.b.	Develop, coordinate, facilitate, and implement water conservation plans and projects that are sustainable in reducing water demands.
PF-H.1.c.	Develop potential ground water resources and storage capacity, combined with management of surface water in ground water basins to meet overall water supply and resource management objectives.
PF-H.2.	Provide and maintain essential water storage, treatment, supply facilities and infrastructure to serve existing and future development.
Solid Waste	
PF-I.2.	Maximize waste reduction and diversion.
PF-I.2.e.	Collaborate with public and private entities to support the development of facilities that recycle materials into usable products or that compost organic materials.

[131] San Diego County Water Authority, http://www.sdcwa.org/uwmp
[132] San Diego County Water Authority, Water Use Efficiency Policy Principles, April 2012, http://www.sdcwa.org/sites/default/files/files/water-management/conservation/policy-principles-conservation2012_04_26_BoardPacket.pdf

Policy	Description
PF-I.2.k.	Promote manufacturer and retailer responsibility to divert harmful, reusable, and recyclable products upon expiration from the waste stream.
PF-I.2.m.	Expand and stabilize the economic base for recycling in the local and regional economy by encouraging and purchasing products made from recycled materials.
PF-I.3.c.	Ensure efficient, environmentally-sound refuse and recyclable materials collection and handling through appropriate infrastructure, alternative fuel use, trip coordination, and other alternatives.
PF-I.5	Plan for sufficient waste handling and disposal capacity to meet existing and future needs. Evaluate existing waste disposal facilities for potential expansion of sites for new disposal facilities.

Source: City of San Diego, General Plan: Public Facilities, Services and Safety Element, March 2008.

The San Diego Municipal Code (§43.0309 MS4 Protection) specifies that "Any person owning or occupying a premises through which the MS4 passes shall: (a) Keep and maintain that part of the premises reasonably free of trash, debris and other obstacles which would pollute, contaminate, or retard the flow of water through the MS4; and (b) Maintain existing structures within or adjacent to the MS4 so that those structures will not become a hazard to the use, function, or physical integrity of the MS4."[133]

3.6.2 Impact Criteria

The project would result in a significant impact on utilities and public service systems if it would:

- Result in the need for new facilities or services, or required alteration to existing infrastructure that could result in impacts, or exceed thresholds, or impose unplanned-for demands.

3.6.3 Environmental Impact Analysis

Would the proposed project result in the need for new systems, or require substantial alteration to existing infrastructure within the project area?

Would the proposed project result in demand for new or physically altered governmental facilities or services that could cause significant impacts in the project area?

The ordinance does not include any local development, and therefore would have no effect on local utilities or public services.

3.6.3.1 Water

There are no manufacturing facilities of carryout bags within the City. Therefore, manufacturing facilities would not use the SDCWA for water supply.

[133] http://www.sandiego.gov/city-clerk/officialdocs/legisdocs/muni.shtml

According to the Boustead study, plastic single-use carryout bags use 125 acre feet per year (AFY) of water, and paper bags use 90 AFY of water for a total of 215 AFY of water use under existing conditions. Based on the projections in Table 3-21, a worst-case scenario, that would increase to 684 AFY with the ordinance due to the potential increase in paper bag numbers, a difference of 469 AFY. In contrast, in Los Angeles County, paper bag use actually decreased slightly after implementation of its ordinance.[134] Again, no manufacturing facilities exist locally so there would be no alterations to existing infrastructure within the project area.

Table 3-21
Projected Water Consumption Associated with Single-Use Bags based on Boustead Data

	Number of Single-Use Bags per Year	Gallons of Water per bag	Gallons of Water per year	Acre-feet of Water per year
Single-Use Plastic	35,000,000	0.058	2,030,000	6
Single-Use Paper	221,053,000	1.00	221,053,000	678

Source: Boustead Consulting and Associates Ltd. 2007. Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper. Prepared for Progressive Bag Affiliates.

In addition, reusable bags may result in the consumption of water within the San Diego region as a result of washing. However, it is expected that they would likely be washed along with a household's regular laundry load.[135] This would not result in increased water use. Additionally, many of the reusable bags distributed by retailers and others are made from plastics that can be easily cleaned with a damp sponge. Nonetheless, in order to consider the most conservative, albeit unlikely, scenario, this analysis assumes that 9,069,000 additional reusable bags would be washed, (9,211,000 reusable bags post-ordinance - 142,000 bags pre-ordinance), according to Table 2-2. If each reusable bag weighs 60 grams (0.132277 pounds),[136] this would result in 1,199,620 pounds of additional wash (9,069,000 x 0.132277). Assuming each load is six pounds,[137] and 32 gallons of water is used per load[138] for a top load (less water efficient) washer, and assuming each reusable bag is laundered once per year, that results in 199,937 additional wash loads per year (1,199,620 / 6 = 199,937). This equates to 6.4 mg/year (199,937 loads x 32 gallons per load = 6,397,984/1,000,000 = 6.4 mg/year), or 19.64 AFY (1 mg/year = 3.069 AFY), or 0.017 mgd (6.4 mg/year / 365 days per year = 0.017 mgd). As shown in Table 3-14, the total existing water supply of the SDCWA was projected as approximately 240,472 AFY in 2015 and 288,481 AFY in 2030.[139] Based on SDCWA water supply estimates, this conservative estimate of additional water demand associated with reusable bag washing would represent approximately 0.008 percent (calculation: 19.64 AFY /

[134] Plastic Bag Bans: Analysis of Economic and Environmental Impacts. Equinox Center. October 2013.
[135] Master Environmental Assessment on Single Use and Reusable Bags, Green Cities California, March 2010.
[136] http://www.clemson.edu/cedp/press/pubs/grocery-bags/grocery-bags.pdf
[137] http://housekeeping.about.com/od/laundry/f/fullload.htm#
[138] http://www.home-water-works.org/indoor-use/clothes-washer
[139] City of San Diego, 2012 Long-Range Water Resources Plan, http://www.sandiego.gov/water/pdf/2012lrpwrfinalreport.pdf

240,472 AFY x 100 = .008 percent) supply of total water use in 2015, and the impact would be less than significant.

3.6.3.2 Wastewater

The manufacture of single-use carryout bags and reusable bags produces wastewater. Because there are no known carryout bag manufacturing facilities located within the City, the shift in bag type resulting from the ordinance would have no impact on local facilities.

At the point of manufacture, to determine whether that change is an increase or decrease in wastewater production, the proportion of bag types relative to their wastewater generation can be considered.

According to the Ecobilan data,[140]

- single-use carryout plastic bags produce 50 liters of wastewater for 9,000 liters of groceries carried,
- single-use carryout paper bags produce 130.7 liters of wastewater per 9,000 liters of groceries carried, and
- reusable bags produce 1.096 liters of wastewater per 9,000 liters of groceries carried, assuming a reusable bag is used 125 times.

These units differ from the units used throughout this analysis, but can be used to set up a relationship of 50 to 130.7 to 1.096. Then applying those factors to the bag usage data estimated in Table 2-2, the wastewater produced by the bags manufactured pre-ordinance would be 21% higher than the wastewater produced by the bags manufactured after the ordinance. Thus the ordinance would have an overall benefit in terms of wastewater production due to manufacturing.

Washing reusable bags would generate local effluent. For this analysis, it is assumed that 100 percent of the water used to wash reusable bags would become wastewater (no grey water use, although the City now allows grey water systems), and that there would be 9,069,000 more reusable bags to wash under the ordinance (9,211,000 reusable bags post-ordinance – 142,000 pre-ordinance), according to Table 2-2. If each of the additional 9,069,000 reusable bags weighs 60 grams (0.132277 pounds),[141] that would result in 1,199,620 additional pounds of wash (9,069,000 x 0.132277). Assuming each load is 6 pounds,[142] and 32 gallons of water per load[143] for a top load (less water efficient) washer, and assuming each reusable bag is laundered once per year, that is 199,537 additional wash loads per year (1,199,620 / 6 = 199,937), or 6.4 mg/year (199,937 loads x 32 gallons per load = 6,397,984/1,000,000), or 0.017 mgd (6.4 mg/year / 365 days per year). The existing remaining capacity of sewer treatment plants serving the City is approximately 86 mgd, therefore, the additional 0.017 mgd from washing reusable bags would represent

[140] Ecobilan, Environmental Impact Assessment of Carryout Bags: An Analysis of the Life Cycle of Shopping Bags of Plastic, Paper, and Biodegradable Material, February 2004. Also, this waste water data from Ecobilan was used in the Long Beach CEQA addendum used for the Long Beach ordinance: http://www.lbds.info/civica/filebank/blobdload.asp?BlobID=3641
[141] http://www.clemson.edu/cedp/press/pubs/grocery-bags/grocery-bags.pdf
[142] http://housekeeping.about.com/od/laundry/f/fullload.htm#
[143] http://www.home-water-works.org/indoor-use/clothes-washer

approximately 0.000204 percent of the available capacity of City treatment plants. This additional wastewater generation would not exceed the remaining capacity of the treatment plants. There is adequate capacity to treat the additional wastewater that may result from the ordinance under the conservative "worst case" scenario, and no new facilities would be necessary. Therefore, the impact would be less than significant.

3.6.3.3 Solid Waste

Carryout bag manufacture facilities do not exist in the San Diego area. At the point of manufacture, some carryout paper bag facilities and some reusable bag manufacturing facilities are net *consumers* of solid waste, because they generate bags from 100 percent recycled feedstocks.[144] At the point of use, reusable bags are intended to reduce the amount of waste generated. Paper single-use carryout bags, although they weigh more than plastic single-use carryout bags, are more readily recycled, and when they are disposed of, they decompose more readily than plastic bags. Plastic single-use carryout bags pose solid waste management problems because they clog machinery in recycling facilities, are a frequent component in litter, and do not degrade readily in landfills. Using USEPA recycling rates and Ecobilan data, 0.0074 kg of solid waste are generated per plastic single-use carryout bag, although the Boustead data estimated only 0.0047 kg per plastic single-use carryout bag.

Tables 3-18 and 3-19 estimate the current amount of solid waste associated with the number of single-use carryout bags used in the City. As depicted in Table 3-18, plastic single-use carryout bag use generates approximately 5,424 tons of solid waste per year, based on the Ecobilan data. Using Boustead data, Table 3-19 depicts that solid waste generation per year from plastic single use bags is 3,445 tons, and from single-use paper bags is 773 tons, for a total of 4,218 tons. After the ordinance, the total tonnage is anticipated to be slightly higher at 5,708 tons, as depicted in Table 3-22. This is an increase of 1,490 tons, which is below the City threshold of 1,500 tons for a direct impact. Again, given that the increase in paper bags due to the project is a worst-case, unlikely scenario, and that paper bag use actually *declined* in Los Angeles County after implementation of their ordinance, an increase in solid waste of this amount is unlikely but still results in a less than significant impact.

Although reusable bags generate more waste on a per bag basis than either paper or single-use plastic, the Ecobilan study concludes that because of the multiple uses of such bags, their overall impact is less.[145]

According to a study commissioned by the Natural Resources Defense Council, California state and local government spends roughly $428 million annually to protect the Pacific Ocean and state waterways from litter, and between 8 and 25 percent of that cost is attributable to plastic bag waste.[146] California, along with its cities and counties, spends an estimated $34 million to $107 million annually to manage plastic bag litter in the state, based on cleanup data for San Jose and Los Angeles County.[147]

[144] For paper sources, see, for example, http://www.papermart.com/recycled-bags/id=42957-INDEX, and for reusable sources, see, for example, http://www.truereusablebags.com/
[145] *ibid*
[146] CalRecycle: http://www.calrecycle.ca.gov/publiced/holidays/ReusableBags.htm
[147] *ibid*

Table 3-22
Solid Waste after Ordinance Based on Boustead Data

Type of Bag	Number of Bags Not Recycled per Year	Solid Waste per Bag (kg)	Kg per Year	Tons per Year
Single-Use Plastic	33,250,000[1]	0.0047	156,275	172
Single-Use Paper	154,737,100[2]	0.034	5,261,061	5,536
Total	180,987,100		5,179,336	5,708

[1] Five percent of 35 million is 1,750,000, which is subtracted from the total 35 million single-use plastic bags to represent a 5 percent recycling rate.

[2] Thirty percent of 221,053,000 is 63,315,900, which is subtracted from the total 35 million paper bags to represent a 30 percent recycling rate.

The City would most likely experience savings through litter abatement. The City has experienced specific financial impacts in abating plastic carryout bag litter. In fiscal year 2013, the ESD spent approximately $160,000 on the abatement of plastic bag litter, including controlling wind-blown plastic bags at the Miramar Landfill and abating plastic bags in rights-of-way and on City property throughout San Diego. This amount alone would equal over 50,000 reusable bags that could be purchased and distributed to City residents. Additionally, other City departments including Transportation and Storm Water, and Parks and Recreation, as well as non-profit organizations such as I Love A Clean San Diego and the Surfrider Foundation have also incurred significant costs in cleaning up plastic bag litter.[148]

It is anticipated that the City and other sponsors would host reusable bag distribution events and provide public outreach of the ordinance requirements and on the correct maintenance of reusable bags. Reusable bags may be provided for free during an infrequent (once per 12-month period), limited time (up to 90-days) promotion by stores subject to the ordinance.

The ordinance grace period would include a public education component conducted by the City. ESD has already been conducting a public education program for several years. Program activities include providing information to the City's Neighborhood Town Councils and Planning Groups, providing information to retailers, and participating in many major events promoting the use of reusable bags throughout the City to help raise awareness about the benefits of using reusable bags. Since 2009, ESD has purchased and distributed tens of thousands of reusable bags to encourage shoppers to switch from using single-use carryout bags. ESD would continue these activities throughout the grace period.

Continuing these activities would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives of sanitation services. Impact would be less than significant.

[148] City of San Diego, 2013. Report to the City Council "Request for Feedback on Plastic Bag Reduction Ordinance." August 30.

3.6.4 Mitigation Measures

Impacts related to water, wastewater, and solid waste would be less than significant. No mitigation measures are required.

3.6.5 Level of Impact after Mitigation

No significant impacts to any utility or public service are anticipated, and no mitigation measures are proposed.

3.7 MINERAL RESOURCES

This section examines mineral resources. Statewide, regional, and local mineral resources are addressed. The ordinance is evaluated in terms of whether its implementation would result in the permanent loss of or access to, mineral resources occurring within the City.

3.7.1 Environmental Setting

Mineral resources located in San Diego County serve various public, commercial, scientific, and recreational purposes. Mineral resources are used in both private developments and public projects. Local extraction sites are valuable assets used to help facilitate the continual growth of the region. Locally important mineral resources in the County include construction materials, rocks that can be used for dimension stones, and also minerals of historical significance including precious metals and gemstones.[149]

Geologic processes in San Diego County such as intrusive emplacement of magma, volcanism, erosion, sedimentation, and hydrothermal processes determine the type, location, and concentration of mineral resources. There is a direct association between specific types of mineral deposits and the host rock that contains those deposits. For example, in San Diego County, gold and tungsten occur mainly in metamorphic rocks, while concrete quality sand is found in the floodplains of the major river valleys. Gem and crystal specimen minerals are found in the County's pegmatites. Pegmatites are rocks from water-rich magma that cooled slowly as it moved through fractures in the host rock. Large crystals formed in these slow-cooling magmas.[150]

The local supply of marble and gneiss are used mainly for dimension stone in buildings. Cretaceous Age (65 to 135 million years ago (mya)) crystalline rocks, including granites, diorites, and gabbros and Upper Jurassic (135 to 160 mya) metavolcanics underlie most of the mountainous terrain in the central portion of the County. These rocks are associated with the Peninsular Ranges batholiths that underlie southern California and Baja California.[151]

Tertiary Age (1.8 to 65 mya) sedimentary rocks include sandstone, conglomerate, and mudstone and are found in the western portion of the County. Deposits of recent alluvium, including sand, gravel, silt, and clay are found in river and stream valleys, around lagoons, in intermountain valleys, and in the desert basins. Both tertiary age rocks and recent alluvium can be mined and processed for construction materials. Sand and gravel are plentiful in the desert.[152]

3.7.1.1 Statewide/Regional/Local Mineral Resources

The California Board of Mining and Geology adopted guidelines for the management of mineral resources and preparation of local plans. The guidelines require local general plans to reference the state-

[149] San Diego County General Plan Update EIR, August 2011, http://www.sandiegocounty.gov/pds/gpupdate/docs/BOS_Aug2011/EIR/FEIR_2.10_-_Minerals_2011.pdf
[150] *ibid*
[151] *ibid*
[152] *ibid*

identified mineral deposits and sites that are identified by the California State Geologist for Conservation and/or Future Mineral Extraction.

San Diego's important mineral resources include salt, sand, and gravel, all of which are being produced in San Diego. The California State Geologist classifies these resources as Mineral Resources Zone-2 (MRZ-2). MRZ-2 sites contain potentially significant sand and gravel deposits that are to be conserved. Any proposed development plan must consider access to the deposits for purposes of extraction. According to the City's General Plan FEIR, the location of San Diego's high quality mineral resource areas are concentrated along major drainages such as the Otay River, Tijuana River, San Diego River, Carroll Canyon, and San Dieguito River.

3.7.2 Regulatory Framework

Bureau of Land Management. The Bureau of Land Management (BLM), an agency within the U.S. Department of the Interior, administers 261 million surface acres of public lands. The BLM is responsible for managing commercial mineral production from the public lands in an environmentally sound and responsible manner. The BLM is responsible for supervising the exploration, development, and production operations of mineral resources on both federal and Native American lands. The BLM is responsible for maintaining viable national policies and processes for solid minerals resources under federal jurisdiction. Solid minerals include coal and non-energy leasable minerals, hard rock minerals on acquired lands, locatable minerals, and salable minerals.

Surface Mining and Reclamation Act. The Surface Mining and Reclamation Act of 1975 (SMARA) requires that the State Mining and Geology Board (Board) map areas that contain regionally significant mineral resources. Construction aggregate resources (sand and gravel) deposits were the first commodity selected for classification by the Board. Once mapped, the Board is required to designate for future use those areas that contain aggregate deposits that are of prime importance in meeting the region's future need. The primary objective of SMARA is for each jurisdiction to develop policies that will conserve important mineral resources. SMARA requires that once policies are adopted, local agency land use decisions must be in accordance with its mineral resource management policies. These decisions must also balance the mineral value of the resource to the market region as a whole, not just their importance to the local jurisdiction.

California Geologic Survey (CGS). The California State Geologist maps Mineral Resource Zones (MRZ) using the following categories:

- MRZ-1: Areas where available geologic information indicates there is little or no likelihood for presence of significant mineral resources.
- MRZ-2: Areas underlain by mineral deposits where geologic data indicate that significant measured or indicated resources are present or where adequate information indicates that significant mineral deposits are present or where there is a high likelihood for their presence.
- MRZ-3: Areas containing known mineral occurrences of undetermined mineral resource significance.

- MRZ-4: Areas of no known mineral occurrences, but where geologic information does not rule out the presence or absence of significant mineral resources.

City of San Diego General Plan Conservation Element. The City's General Plan provides growth and development policies by providing a comprehensive long-range view of the City as a whole. The Conservation Element of the General Plan consists of an identification and analysis of the existing natural resources in the City. Policies of the Conservation Element include the preservation of mineral resources and access to these resources. The applicable Conservation Element policies and objectives are shown in Table 3-23.

Table 3-23
Safety Element and Conservation Element Policies Applicable to Mineral Resources

Policy	Policy Description
CONSERVATION ELEMENT – MINERALS PRODUCTION	
Policy CE-K.1.	Promote the recycling and reclamation of construction materials to provide for the City's current and future growth and development needs.
Policy CE-K.2.	Permit new or expanding mining operations within the Multiple Habitat Planning Area (MHPA) in accordance with Multiple Species Conservation Program (MSCP) policies and guidelines.
Policy CE-K.3.	Produce sand and gravel with minimal harm and disturbance to adjacent property and communities.
Policy CE-K.4.	Plan rehabilitation of depleted mineral areas to facilitate reuse consistent with state requirements, the Surface Mining and Reclamation Act (SMARA), and local planning goals and policies, including the MSCP.

Source: City of San Diego General Plan, Conservation Element, 2008.

3.7.3 Impact Criteria

The project would have a significant impact related to mineral resources if it would:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

3.7.4 Environmental Impact

No carryout bag manufacturing facilities are proposed, and no local resources are known to be used in such manufacturing elsewhere. Single-use plastic bags and reusable non-woven plastic PP bags are produced using a byproduct of gas or oil refining. As such, this consumption will be addressed in the following section associated with energy resources. No other known mineral consumption is associated with carryout bag manufacture. No impacts are anticipated.

3.7.5 Mitigation Measures

There are no known impacts to mineral resources. No mitigation measures are required.

3.7.6 Level of Impact after Mitigation

Not applicable; no mitigation measures are required.

3.8 ENERGY

This section examines energy consumption. Statewide, regional, and local energy resources are addressed and the project is evaluated in terms of whether its implementation would result in wasteful consumption of energy.

3.8.1 Environmental Setting

Fossil fuels are the primary raw material used in the production of plastic bags, and essential to the modern manufacturing process used to produce other types of bags. According to Hyder Consulting (2007),[153] single-use plastic bags and reusable non-woven plastic PP bags are produced using a by-product of gas or oil refining. Although Kraft paper bags, cotton bags, and starch-based biodegradable bags are manufactured from renewable resources, significant fossil fuel use is required for the manufacture of most types of bags.

Most plastic bags that are produced domestically use ethane, which is a byproduct of natural gas refining. Imported single-use bags often originate from oil. In the U.S., plastics are made from liquid petroleum gases (LPGs), natural gas liquids (NGLs), and natural gas. LPGs are by-products of petroleum refining, and NGLs are removed from natural gas before it enters transmission pipelines. In 2010, about 191 million barrels of LPG and NGL were used in the U.S. to make plastic products in the plastic materials and resins industry, equal to about 2.7 percent of total U.S. petroleum consumption.[154] According to the "cradle-to-grave" Boustead Consulting study (2007), approximately 23.2 kg of fossil fuel is used in the manufacture of 1,000 paper single-use carryout bags composed of at least 30 percent recycled fiber, whereas it takes 14.9 kg to produce 1,500 plastic single-use carryout bags.[155]

3.8.2 Regulatory Framework

Bureau of Land Management. The BLM, an agency within the U.S. Department of the Interior, administers 261 million surface acres of public lands. The BLM is responsible for managing commercial energy production from the public lands in an environmentally sound and responsible manner. The BLM is responsible for the leasing of federal oil, gas, and geothermal resources, and is also responsible for supervising the exploration, development, and production operations of these resources on both federal and Native American lands.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 includes provisions that will increase energy efficiency and the availability of renewable energy, which are expected to reduce GHGs. First, the Act sets a Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022. Second, it increased Corporate Average Fuel Economy Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of

[153] Hyder Consulting P/L, 2007, Comparison of existing life cycle analysis of shopping bag alternatives. Sustainability Victoria, Australia
[154] U.S. Energy Information Administration: "Frequently Accessed Questions." http://www.eia.gov/
[155] Boustead Associates (2007) assumes that 1500 plastic bags have an equivalent carrying capacity of 1000 paper bags.

cars and light trucks by 2020. Third, the Act includes new standards for lighting and for residential and commercial appliance equipment.

California Division of Oil, Gas, and Geothermal Resources. The Division of Oil, Gas, and Geothermal Resources (DOGGR) within the California Department of Conservation supervises the drilling, operation, maintenance, and abandonment of oil, gas, and geothermal wells to protect the environment, public health, and safety, and encourage good conservation practices. DOGGR collects data on the location of groundwater, oil, gas, and geothermal resources, and records the location of all drilled and abandoned wells.

City of San Diego General Plan Conservation Element. The City's General Plan provides growth and development policies by providing a comprehensive long-range view of the City as a whole. The Conservation Element of the General Plan consists of an identification and analysis of the existing natural resources in the City. Policies of the Conservation Element include:

CE-F8: influence the development of federal, state, and local efforts to increase fuel efficiency and reduce GHGs.

CE-1.1: Maintain a centralized Energy Conservation and Management Program and Comprehensive Plan for all City operations.

CE-1.2: Coordinate City energy planning programs with federal, state, and regional agencies. Maximize energy efficient use of clean renewable resources, and demand response.

3.8.3 Impact Criteria

Appendix F of the CEQA Guidelines requires that potentially significant energy implications of a project be considered in an EIR to the extent relevant and applicable to the project. Particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy should be included in the analysis. Therefore, although no local manufacturing occurs and specific information on manufacturing facilities is speculative, a general analysis of energy consumption associated with the different bag manufacturing methods is included. A general analysis of potential increases in fuel use due to increased truck trips is also addressed. This section may cross reference other sections, such as the GHG section and Air Quality section, and shall describe measures, if any, designed to conserve energy, and address all applicable issues described in Appendix F of the CEQA Guidelines.

3.8.4 Environmental Impact

No carryout bag manufacturing facilities are proposed, and no local resources are known to be used in such manufacturing elsewhere. The project would not directly increase the demand for energy consumption within the city.

Energy consumption for the various manufacturing processes varies. Generally, paper bag manufacturing processes have the highest energy consumption rate, and single-use plastic bags the lowest. The Boustead report estimates the consumption to be, in annual mega joules per 1,000 bags, 649 for paper, 148 for

recyclable plastic, and 325 for degradable plastic.[156] The Ecobilan study had a lower energy use rate for paper bags; compared to one single-use plastic bag, a paper bag used 1.1 times as much energy, and a reusable bag consumes 2.8 times as much energy. According to the Equinox Center analysis, despite the greater per bag energy consumption associated with paper bag and reusable bag manufacture, the ordinance is likely to result in an overall annual reduction of energy consumption because of the overall reduction in carryout bag consumption, and the consideration of a "no bag" option.[157] The Ecobilan study was chosen for this energy analysis because it looked at all three types of bags expected to be used after a single-use carry out bag reduction ordinance is implemented. Table 3-24 shows the projected 40 percent reduction in energy use from the project. The project would result in a benefit to energy use with regard to manufacturing.

Table 3-24
Approximate Energy Consumption Comparison for Reusable Bags based on Ecobilan Study

Type of Bag	Number of Bags Used Per Year, Pre-Ordinance	Energy Consumption Rate	Pre-ordinance Energy Use	Number of Bags Used per Year, Post-Ordinance	Post-ordinance Energy Use
Single-Use Plastic	700,000,000	1	700,000,000	35,000,000	35,000,000
Single-Use Paper	29,474,000	1.1	32,421,400	221,053,000	243,158,300
Reusable	142,000	2.8	397,600	9,211,000	25,790,800
Total	729,616,000		732,819,000	265,264,000	303,949,100

According to Table 3.7, under a worst-case scenario, the potential increase in paper bag use could result in 598 additional truck trips per year. At 20 miles per trip, that would result in 11,960 additional miles driven per year. A typical, loaded tractor trailer gets about six miles per gallon[158] resulting in an increase of 1,993 gallons of diesel gasoline per year. This would amount to .00007% of the total diesel gasoline use in California (based on 2.7 billion gallons of diesel fuel used in California in the fiscal year ending June 30, 2104).[159] More than likely, however, bags would be delivered to stores as part of larger mixed loads of groceries and merchandise, and there may not be an actual net increase in truck traffic from the change in bag use. Impacts to energy related to truck trips are less than significant.

3.8.5 Mitigation Measures

Impact to energy resources would be less than significant. Impact to energy usage would be beneficial. No mitigation measures are required.

[156] Boustead Consulting and Associates Ltd. 2007. Life Cycle Assessment for Three Types of Grocery Bags – Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper.
[157] Plastic Bag Bans: Analysis of Economic and Environmental Impacts. Equinox Center. October 2013.
[158] http://www.fastcoexist.com/1678431/we-can-do-better-than-six-miles-per-gallon-redesigning-americas-truck-fleet
[159] http://www.sandiegouniontribune.com/news/2014/dec/02/california-burns-more-gasoline/

3.8.6 Level of Impact after Mitigation

Not applicable; no mitigation measures are required.

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SECTION 4 ALTERNATIVES TO THE PROJECT

The following discussion considers alternatives to the City Single-Use Carryout Bag Reduction Ordinance project. The CEQA Guidelines state that an EIR need not consider every conceivable alternative to the project [Section 15126.6(a)], or an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative [Section 15126.6(f)(3)]. The Guidelines require that a range of alternatives be addressed "governed by 'a rule of reason' that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice." The discussion of alternatives must focus on alternatives that are potentially feasible and capable of achieving major project objectives while avoiding or substantially lessening any significant environmental effects of the project [CEQA Guidelines, Section 15126.6(f)].

The City's primary objectives for the ordinance are to:

- Reduce the millions of plastic single-use carryout bags currently used and disposed of in the City each year;
- Reduce litter and the associated adverse impacts to storm water systems, aesthetics, and the environment;
- Reduce the adverse environmental impacts associated with single-use carryout bags, including impacts to air quality, water quality, and solid waste;
- Deter the use of paper single-use carryout bags by retail customers in the City; and
- Promote a shift toward the use of reusable carryout bags.

The analysis in this EIR indicates that the ordinance would result in less than significant or beneficial effects with regard to air quality, water quality, and energy. The project was found to result in either a less than significant impact or no impact in the other environmental issue areas analyzed in the EIR. Therefore, the discussion of the alternatives to the project focuses on the alternatives that could achieve the project objectives to a greater or lesser extent.

The alternatives considered and compared to the project in the EIR include:

Alternative 1: "No Project" alternative

Alternative 2: Apply the Single-Use Carryout Bag Reduction Ordinance to All Retail Vendors

Alternative 3: Apply the Single-Use Carryout Bag Reduction Ordinance to Only Large ("Big-Box") Retail Vendors

Alternative 4: Apply the Single-Use Carryout Bag Reduction Ordinance, but Impose a Higher Fee on Recyclable Paper Single-Use Carryout Bags

4.1 ALTERNATIVE 1: NO PROJECT

The No Project alternative, required to be evaluated in the EIR, considers "existing conditions…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" [CEQA Guidelines Section 15126.6(e)(2)].

The ordinance was found to have both beneficial and negative effects, but no significant impacts. Possible negative effects were identified in the issue areas of Hazards and Hazardous Materials and also Agricultural and Forest Resources. In contrast, the No Project alternative would have no such potential negative effects. However, the No Project alternative would also fail to provide the anticipated benefits associated with other issue areas analyzed for this report.

Under the No Project alternative, no Single-Use Carryout Bag Reduction Ordinance would be enacted, and the existing use of carryout bags in the City would remain unchanged. Impacts associated with plastic single-use carryout bags would remain at current levels, increasing proportionately with increases in the City's population size. The City's objectives for the project would not be achieved with the No Project alternative.

4.2 ALTERNATIVE 2: APPLY THE SINGLE-USE CARRYOUT BAG REDUCTION ORDINANCE TO ALL RETAIL VENDORS

To simplify enforcement and public information campaigns, the ordinance proposes to regulate only the categories of retail establishments that are responsible for the majority of single-use carryout bags. It is anticipated that this approach would be broadly accepted, and customers would not find it overly inconvenient. In contrast, under Alternative 2, the ordinance's restrictions would be applied to all retailers in the City.

4.2.1 Bag Use Effects

The ordinance is assumed to result in a 95 percent reduction in plastic single-use carryout bags used in the City, with five percent of plastic single-use carryout bags continuing to be used annually because the ordinance does not apply to all retail stores. This assumption is based on assumptions used for the cities of Los Angeles and San Jose.[160] Los Angeles is a large jurisdiction with many similarities with the City, as explained in section 2.6 of this EIR. San Jose is smaller, and surpasses San Diego on a "sustainability" score,[161] but still provides a useful precedent. Alternative 2 would capture most or all of the remaining approximately five percent of single-use plastic bags not covered by the ordinance. Table 4-1 provides the projected bag consumption under this alternative.

[160] City of Los Angeles FEIR citing Single-Use Carryout Bag Ordinance Draft EIR; City of San Jose, July 2010.
[161] http://www.sandag.org/uploads/publicationid/publicationid_1637_14034.pdf

Table 4-1
Estimated Single-Use Carryout Bag Use: Alternative 2 versus Ordinance

Type of Bag	Alternative 2*	Proposed Ordinance	Explanation
Single-Use Plastic	0	35,000,000	The ordinance does not apply to all retailers; therefore some plastic single-use carryout bags would remain in circulation.
Single-Use Paper	257,895,000	221,053,000	Although the volume of a paper single-use carryout bag is generally 150% of the volume of a plastic single-use carryout bag and fewer paper bags would be needed to carry the same number of items, it is conservatively assumed that paper would replace plastic at a 1:1 ratio. It is assumed that if plastic single-use bags are removed from all retail stores, 35% of all bag use will be paper bags. Numbers of bags expected under this alternative are calculated utilizing trips per week since reusable bags are assumed to be used 52 times per year.
Reusable	9,211,000	9,211,000	It is assumed that if plastic single-use bags are removed from all retail stores, 65% of all bag use will be reusable bags. These calculations conservatively assume that a reusable bag would be used by a customer only once per week for one year (52 times).
Total	267,105,000	265,264,000	

*City of San Jose, 2010
Estimates rounded to nearest 1,000 bags

4.2.2 Environmental Effects

With the ordinance, the ozone and atmospheric acidification pollutants, and energy use would be reduced as compared to existing conditions. As shown in Table 4-2, Alterative 2 would result in slightly higher ozone emission levels (8,032 kg/yr as compared to 7,731 kg/year), atmospheric acidification (561,218 kg/year versus 523,263 kg/year) and GHG levels (35,000 metric tons per year versus 31,070 metric tons per year), although the two alternatives are very close.

In comparison to the ordinance, Alternative 2 would have a higher water consumption rate (approximately 258 million gallons/year, compared to approximately 213 million gallons/year), as shown in Table 4-3. This amount of additional wash is not considered a significant impact given the region's overall water supply. Overall, the two alternatives are very close in their projected impacts. Given the variability of the data, the differences are not significant, thus the two alternatives can be considered virtually environmentally comparable.

Alternative 2 would virtually eliminate plastic single-use carryout bags and thus would promote the shift towards reusable bags to a greater extent than the ordinance. Similar to the ordinance, it would have no significant impacts.

Table 4-2
Alternative 2 Emissions Compared to Project Emissions

Bag Type	Ordinance Ozone Emissions per Year (kg)	Alternative 2 Ozone Emissions per Year (kg)	Ordinance AA Emissions per Year (kg)	Alternative 2 AA Emissions per Year (kg)	Ordinance GHG CO_{2e} per Year (Metric Tons)	Alternative 2 GHG CO_{2e} per Year (Metric Tons)
Single-Use Plastic	805	0	37,940	0	933	0
Single-Use Paper	6,632	7,737	455,369	531,264	29,179	34,042
Reusable	295	295	29,954	29,954	958	958
Total	7,731	8,032	523,263	561,218	31,070	35,000

Source: Refer to **Table** 3-3 and 3-5 in Section 3.1, Air Quality and **Table** 3-9 in section 3.2, GHG Emissions

Table 4-3
Alternative 2 Water Consumption Compared with Project

	Alternative 2 Number of Single-Use Bags per Year	Gallons of Water per bag	Alternative 2 Gallons of Water per Year	Project Gallons of Water per Year
Single-Use Plastic	0	0.058	0	2,030,000
Single-Use Paper	257,895,000	1.00	257,895,000	211,053,000
Total	257,895,000		257,895,000	213,083,000

See Table 3-14 for source of the coefficients.

4.2.3 Relation to Project Objectives

Alternative 2 would contribute to the project objectives by further reducing the millions of plastic single-use carryout bags currently used in the City. There is a possibility, however, that if consumers found the ordinance overly burdensome, compliance and enforcement could become challenging, thereby reducing the beneficial effect of this alternative. Additionally, the project is the most consistent of all the alternatives when compared to other California ordinances, making it easier for the general population to understand and follow, and for chain stores to implement.

4.3 ALTERNATIVE 3: APPLY THE SINGLE-USE CARRYOUT BAG REDUCTION ORDINANCE TO ONLY LARGE ("BIG-BOX") RETAIL VENDORS

Under existing conditions, retailers typically provide single-use carryout bags for no charge, which means they must absorb the cost. Thus, for many retailers, the ordinance would be financially beneficial. However, under the ordinance, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participants are exempted from the charge and would be provided recyclable paper single-use carryout bags at no charge if they do not opt to provide their own reusable bag. This exemption contributes to the worst case scenario's possibility of increased paper single-use carryout bag use and may also cause a financial hardship on retailers because paper single-use carryout bags are more expensive than plastic single-use carryout bags. While financial hardship is not an environmental consideration, it may have an impact on the acceptance, and thus the effectiveness, of the ordinance. Therefore, it is appropriate to consider an option that would limit the ordinance to only the largest retailers, and compare the relative benefits and impacts. For Alternative 3, the ordinance would be applied to only large retail vendors that distribute large numbers of plastic bags (those defined as Category A and B stores in the ordinance).

4.3.1 Bag Use Effects

Under Alternative 3, the number of plastic single-use carryout bags precluded from distribution within the City would be less than the ordinance due to the exemption of small vendors (those defined as Category C

stores in the ordinance) from the ordinance requirements (Table 4-4). Based on staff research in San Diego using North American Industry Classification System (NAICS) codes, it is assumed that 280 large vendors would be subject to the ordinance, and at 2.21 million plastic single-use carryout bags each[162], there would be a remaining 81,200,000 plastic single-use carryout bags being distributed (700,000,000-618,800,000). Thus, under Alternative 3, 81.2 million plastic single-use carryout bags would be used annually, instead of 35 million under the ordinance. As a result, assuming that 35% of the remaining bags would be paper, based on weekly bag trips, the shift to paper would be reduced from approximately 221 million to approximately 216 million. While plastic single-use carryout bag use would be greater than the proposed project, under this alternative, paper single-use carryout bag use is anticipated to be less.

Table 4-4
Estimated Single-Use Carryout Bag Use: Alternative 3 Compared to Project

Type of Bag	Alternative 3*	Ordinance
Single-Use Plastic	81,200,000	35,000,000
Single-Use Paper	216,580,000	221,053,000
Reusable	7,735,000	9,211,000
Total	305,515,000	265,264,000

*City of San Jose, 2010

4.3.2 Environmental Effects

Alternative 3 would result in more emissions of all types compared to the proposed project. As shown in Table 4-5, this alternative would generate 8,613 kg per year ozone emissions, 559,330 kg per year of acidification emissions, and 31,558 metric tons per year of GHG emissions, compared to 7,731; 523,263; and 31,070, respectively. Thus, Alternative 3 would have a greater impact on air quality, but is anticipated to still be less than significant.

Table 4-5
Alternative 3 Emissions Compared to Project Emissions

Bag Type	Ordinance Ozone Emissions per Year (kg)	Alternative 3 Ozone Emissions per Year (kg)	Ordinance AA Emissions per Year (kg)	Alternative 3 AA Emissions per Year (kg)	Ordinance GHG CO_{2e} per year metric tons	Alternative 3 GHG CO_{2e} per year metric tons
Single-Use Plastic	805	1,868	37,940	88,021	933	2,165
Single-Use Paper	6,632	6,497	455,369	446,155	29,179	28,589
Reusable	295	248	29,954	25,154	958	804
Total	7,731	8,613	523,263	559,330	31,070	31,558

Source: Refer to **Table** 3-3 and 3-5 in Section 3.1, Air Quality and **Table** 3-9 in section 3.2, GHG Emissions

[162] City of Los Angeles Single-Use Carryout Bag Ordinance FEIR, May 2013

In comparison to the ordinance, Alternative 3 would have a higher water consumption rate (approximately 221 million gallons/year, compared to approximately 213 million gallons/year), as shown in Table 4-6. This increased water consumption due to additional wash is not considered a significant impact given the region's overall water supply.

Table 4-6
Alternative 3 Water Consumption Compared with Project

	Alternative 3 Number of Single-Use Bags per Year	Gallons of Water per bag	Alternative 3 Gallons of Water per Year	Ordinance Gallons of Water per Year
Single-Use Plastic	81,200,000	0.058	4,709,600	2,030,000
Single-Use Paper	216,580,000	1.00	216,580,000	211,053,000
Total	297,780,000		221,289,600	213,083,000

See Table 3-14 for source of the coefficients.

In terms of solid waste impacts, when compared to the ordinance, Alternative 3 would have slightly more impact than the proposed ordinance. Because the increase in paper bags is a worst case scenario, and could actually decrease due to the project, this impact may not occur.

Overall, the two alternatives are very close in their projected impacts. Given the variability of the data, the differences are not significant, thus the two alternatives can be considered virtually environmentally comparable.

4.3.2.1 Relation to Project Objectives

This alternative would partially achieve the objectives of the City's Single-Use Carryout Bag Reduction Ordinance. By limiting the application of the ordinance to only large retail vendors, it is anticipated that the consumption of single-use carryout bags would not be reduced as much as under the ordinance. As a result, the objectives of deterring the use of single-use carryout bags and promoting a shift to reusable bags would occur to a lesser extent under this alternative than with the ordinance.

4.4 ALTERNATIVE 4: APPLY THE SINGLE-USE CARRYOUT BAG REDUCTION ORDINANCE, BUT IMPOSE A HIGHER FEE ON RECYCLABLE PAPER SINGLE-USE CARRYOUT BAGS

While the ordinance has not been found to have a significant impact in any issue area, it may increase paper single-use carryout bag consumption under a "worst case" scenario. Additional paper single-use carryout bag consumption increases GHG production on a per bag basis and uses a manufacturing process that consumes more water and energy per bag than plastic bag manufacture. Increasing the fee on recyclable paper single-use carryout bags could discourage a potential shift to consume more paper bags. The ordinance imposes a $0.10 fee on each recyclable paper single-use carryout bag at the point of sale; Alternative 4 imposes a $0.25 fee per recyclable paper single-use carryout bag and a minimum $0.25 fee for reusable carryout bags.

4.4.1 Bag Use Effects

With a higher fee, it is anticipated that the use of paper single-use carryout bags would be reduced in comparison to the ordinance. Other jurisdictions have included provisions for increasing the bag fee if consumers relied too heavily on paper bags; however, no jurisdiction has implemented this option or provided data on the effectiveness. Therefore, the effect of increasing the fee can only be very broadly estimated. According to a study commissioned by the City of San Jose,[163] if plastic bags are banned and paper bags cost $0.25 each, consumers will use 89% reusable bags and 11% paper single-use carryout bags; this assumption was applied to the number of plastic single-use bags that would be reduced through Alternative 4 (700,000,000 – 35,000,000 = 665,000,000). Those percentages were used to calculate the number of paper single-use carryout bags and reusable bags in Alternative 4 (Table 4-7) with the conservative assumption that a reusable bag is used once per week for a year.

Table 4-7
Estimated Annual Carryout Bag Use: Alternative 4 versus Ordinance

Type of Bag	Alternative 4	Ordinance
Single-Use Plastic	35,000,000	35,000,000
Single-Use Paper	73,150,000	221,053,000
Reusable	11,382,000	9,211,000
Total	119,532,000	265,264,000

4.4.2 Environmental Effects

Alternative 4 has lower ozone emissions (3,364 kg per year, compared with 7,731 per year), lower acidification emissions (225,643 kg per year compared to 523,263 kg per year), and lower GHG impacts (11,773 metric tons of CO_{2e} compared to 31,070 metric tons of CO_{2e}) as compared to the project impacts (Table 4-8), primarily due to the significant decrease in paper bags.

As shown in Table 4-9, the lesser consumption of paper bags would also reduce the overall water consumption associated with this Alternative. The increase in reusable bags per year under this Alternative could increase water consumption slightly, but would do relatively little to diminish the overall benefit to water consumption associated with this Alternative.

Alternative 4 would result in a beneficial effect of reducing solid waste by significantly reducing the number of recyclable paper single-use carryout bags as compared to the ordinance, and increasing the use of reusable bags, which may be recycled if they are made from LDPE, HDPE, or PP, or compostable if cotton or canvas. Additionally, Solid Waste litter will be reduced due to a decrease in plastic carryout bag litter. Overall, this Alternative would result in beneficial or less than significant environmental impacts in the areas of Air Quality, GHG Emissions, Energy, and Solid Waste.

[163] Herrera 2010

Table 4-8
Alternative 4 Emissions Compared to Project Emissions

Bag Type	Ordinance Ozone Emissions per Year (kg)	Alternative 4 Ozone Emissions per Year (kg)	Ordinance AA Emissions per Year (kg)	Alternative 4 AA Emissions per Year (kg)	Ordinance GHG CO_{2e} per year metric tons	Alternative 4 GHG CO_{2e} per year metric tons
Single-Use Plastic	805	805	37,940	37,940	933	933
Single-Use Paper	6,632	2,195	455,369	150,689	29,179	9,656
Reusable	295	364	29,954	37,014	958	1,184
Total	7,731	3,364	523,263	225,643	31,070	11,773

Source: Refer to **Table** 3-3 and 3-5 in Section 3.1, Air Quality and **Table** 3-9 in section 3.2, GHG Emissions

Table 4-9
Alternative 4 Water Consumption Compared with Project

	Alternative 4 Number of Single-Use Bags per Year	Gallons of Water per bag	Alternative 4 Gallons of Water per Year	Project Gallons of Water per Year
Single-Use Plastic	35,000,000	0.058	2,030,000	2,030,000
Single-Use Paper	73,150,000	1.00	73,150,000	211,053,000
Total	108,150,000		75,180,000	213,083,000

See Table 3-14 for source of the coefficients.

4.4.3 Relation to Project Objectives

Alternative 4 would achieve all objectives of the City's Single-Use Carryout Bag Reduction Ordinance. With a higher fee, it is anticipated that the use of recyclable paper single-use carryout bags would be reduced when compared to the ordinance because of the additional cost. As a result, the objective of deterring the use of paper single-use carryout bags would be achieved to a greater extent, and the objective of promoting a shift to reusable bags could occur more rapidly and to a greater extent than under the ordinance.

Table 4-10 compares the impacts of each of the alternatives to the project. Benefits are notated with green (the environmentally preferable alternative for each issue area is denoted with darker green), neutral impacts are noted in white, and less than significant impacts are pink. Alternative 4 is the

environmentally superior alternative for most issue areas, while the project and Alternatives 2 and 3 have very similar levels of impact. Alternative 1 (no project) has the greatest impacts in several issue areas.

4.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Alternative 1, the "No Project" would not achieve any of the project objectives.

Alternative 2, Apply the Single-Use Carryout Bag Reduction Ordinance to All Retail Vendors is not environmentally superior to the project, and would achieve all project objectives.

Alternative 3, Apply the Single-Use Carryout Bag Reduction Ordinance to Only Large ("Big-Box") Retail Vendors is not environmentally superior to the project. In the long term, Alternative 3 would only partially achieve the objectives of the project due to the fewer number of vendors covered by the ordinance and the larger number of single-use carryout bags that would still be provided by vendors within the City.

Alternative 4, Apply the Single-Use Carryout Bag Reduction Ordinance, but Impose a Higher Fee on Recyclable Paper Single-Use Carryout Bags, is considered environmentally superior to the project because it would result in greater beneficial environmental effects and would achieve all of the project objectives, and would reduce or eliminate all impacts associated with the project.

Table 4-10
Comparison of Alternatives

Alternative	Ozone (kg/yr)	AA Emissions (kg/yr)	GHG Emissions (metric tons/yr)	Forest and Agricultural Resources	Hazards and Hazardous Materials	Water consumption (gallons per year)	Energy (million mega joules)	Solid Waste (tons/yr)	Project Purpose
Project	7,731	523,263	31,070	Less than significant	Less than significant	213,083,000	Less than significant	5,708	Achieves
No Project	16,969	818,567	22,572	No change	No change	40,600,000	No change	4,219	Does not achieve
Alternative 2 - All Retail Vendors	8,032	561,218	35,000	Less than significant	Less than significant	257,895,000	Slightly more than project impact (less than significant)	6,766	Achieves
Alternative 3 - Large Retailers-Only	8,613	559,330	31,558	Less than significant	Less than significant	221,289,600	Slightly more than project impact (less than significant)	6,082	Partially achieves
Alternative 4- Increase Fee	3,364	225,643	11,773	Less than significant	Less than significant	75,180,000	50% less energy than project	2,901	Achieves

Source: Summary of Tables in Section 4.

Nature of Impact or Beneficial Effect	Color Code
Best benefit	
Benefit	
Neutral	
Less than Significant Impact	

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SECTION 5 SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED IF THE PROJECT IS IMPLEMENTED

No significant environmental effects have been identified.

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SECTION 6 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

The ordinance would preclude specified retail establishments in the City from distributing plastic single-use carryout bags, or providing paper single-use carryout bags that do not qualify as “recyclable”. The ordinance would institute a 10 cent ($0.10) charge for each recyclable paper single-use carryout bag and at least a $0.10 charge for each reusable bags at the point of sale. The objective of the ordinance is to reduce adverse environmental impacts related to single-use carryout bags and promote a shift toward the use of reusable bags. Implementation of the ordinance to reduce single-use carryout bags in specified retail stores would not result in any changes in the existing land uses or new physical development within the City. Therefore, the ordinance would not alter or cause irreversible physical alterations to existing land uses.

As discussed in Chapter 3.0, Environmental Impact Analysis, the shift toward reusable bags within the City would not result in any significant adverse impact on the environment and would incrementally reduce air pollutant emissions, be consistent with applicable plans, policies, and regulations related to reducing GHG emissions, and is anticipated to result in beneficial effects on air quality, hydrology and water quality, and energy.

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SECTION 7 GROWTH-INDUCING EFFECTS

CEQA Guidelines require a discussion of "…ways in which the project could foster economic or population growth…in the surrounding environment," including the project's potential to remove obstacles to population growth. For example, the extension of infrastructure may encourage or facilitate other activities that could induce growth, and the types of projects that provide housing and infrastructure to support additional growth are typically considered to result in growth inducing effects.

The intent of the ordinance is to significantly reduce the amount of litter in the City attributable to single-use carryout bags and their associated adverse environmental impacts. Implementation of the ordinance to reduce single-use carryout bags in specified retail stores would not result in any changes in the existing land uses or new physical development that would directly or indirectly induce substantial economic or population growth within the City. While there are no known plastic, paper or reusable bag manufacturing facilities in the City, jobs related to the ordinance, if any, could be filled by the City's existing labor force that currently has an unemployment rate of 7.0 percent as of October 2013; therefore, the project would not affect long-term local or regional employment patterns.[164] In addition, revenues generated by sales of recyclable paper single-use carryout bags and reusable carryout bags to customers would remain with the affected stores. Therefore, the ordinance would not result in, or contribute to, a growth-inducing impact.

[164] Federal Reserve Bank Unemployment Data: http://research.stlouisfed.org/fred2/series/CASAND5URN?cid=27558

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SECTION 8 CUMULATIVE IMPACTS

Per CEQA guidelines section 15065(a)(3), "Cumulatively considerable means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." Impacts are significant if:

1. The combined impact of the project and other projects is significant (14 Cal Code of Regulations section 15130(a)(2), and
2. The project's incremental effect is cumulatively considerable (14 Cal Code of Regulations section 15130(a)).

In many cases, the impact of an individual project may not be significant, but its cumulative impact may be significant when combined with those impacts from other related projects. Section 15355 of the CEQA Guidelines defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." CEQA Guidelines Section 15130(b) states that "the discussion [of cumulative impacts] need not provide as great detail as is provided for the effects attributable to the project alone." Section 15130(b) further states that a cumulative impacts discussion "should be guided by standards of practicality and reasonableness."

Cumulative impacts can occur from the interactive effects of a single project. For example, the combination of noise and dust generated during construction activities can be additive and can have a greater impact than either noise or dust alone. However, substantial cumulative impacts more often result from the combined effect of past, present, and future projects located in proximity to a proposed project. Thus, it is important for a cumulative impacts analysis to be viewed over time and in conjunction with other related past, present, and reasonably foreseeable future projects, the impacts of which might compound or interrelate with those of the project under review.

As provided by Section 15130(b) of the CEQA Guidelines, the following elements are necessary in an adequate discussion of cumulative impacts:

1) Either: (A) a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency; or (B) a summary of projections contained in an adopted general plan or related planning document that is designed to evaluate regional or area wide conditions. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.

2) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available.

3) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable options for mitigating or avoiding any significant cumulative effects of the proposed projects.

For the analysis of cumulative impacts associated with the single-use carryout bag ordinance, the subject area primarily includes the City of San Diego; however, in addition, single-use carryout bag and polystyrene ordinances elsewhere in California are considered. As listed in Table 2-1, many jurisdictions are passing ordinances regulating plastic single-use carryout bag use. In addition, many jurisdictions are

regulating polystyrene products, which are made from a non-biodegradable synthetic polymer and include Styrofoam and many hard plastics. Locally, Solana Beach is the only city in San Diego county that has passed a polystyrene ordinance[165]. Encinitas has discussed the possibility.[166]

The following jurisdictions have enacted ordinances for regulating polystyrene products:[167] Alameda (2008), Albany (2008), Aliso Viejo (2005), Arcata (2015), Belmont (2012), Berkeley (1988), Burlingame (2011), Calabasas (2008), Campbell (2014), Capitola (2012), Carmel, (1989), Carpentaria (2009), Cupertino (2014), Dana Point (2012), Del Ray Oaks (2010), El Cerrito (2014), Emeryville (2008), Fairfax (1993), Fort Bragg (2014), Foster City (2012), Fremont (2011), Gonzales (2015), Greenfield (2015), Half Moon Bay (2011), Hayward (2011), Hercules (2008), Hermosa Beach (2012), Huntington Beach (2005), Lafayette (2015), Laguna Beach (2008) Laguna Hills (2008), Laguna Woods (2004), Livermore (2010), Los Altos (2014), Los Altos Hills (2012), Los Angeles City (2008), Los Angeles County (2008), Los Gatos (2014), Malibu (2005), Manhattan Beach (2013), Marin County (2010), Marina (2011), Mendocino County (2015), Menlo Park (2012), Millbrae (2008) Mill Valley (2009), Monterey City (2009), Monterey County (2010), Morgan Hill (2014), Mountain View (2014), Newport Beach (2008), Novato (2013), Oakland (2007), Ojai (2014), Orange County (2005), Pacific Grove (2008), Pacifica (2010), Palo Alto (effective April 22, 2010), Pittsburg (1993), Portola Valley (2012), Redwood City (2013), Richmond (2014), Salinas (2011), San Bruno (2010), San Carlos (2012), San Clemente (2011), San Francisco (2007), San Jose (2014), San Juan Capistrano (2004), San Leandro (2012), San Luis Obispo City (2015), San Mateo City (2013), San Mateo County (2008 and 2011), San Rafael (2013), Santa Clara (2013), Santa Cruz City (2012, Santa Cruz County (2008 and 2012), Santa Monica (2007), Sausalito (2008), Scotts Valley (2009), Seaside (2010), Sonoma City (1989), Sonoma County (adopted 1989), South San Francisco (2008), Sunnyvale (2013), Ukiah (2015), Ventura County (2004), Walnut Creek (2014), Watsonville (2009 and 2014), West Hollywood (1990), and Yountville (1989). Most of these ordinances were enacted citing CEQA Guidelines section 15308, an exemption for actions taken for the protection of the environment, and did not identify any potential impacts.

A complete list of past, present, and probable future projects that could have impacts on all the issue areas addressed in this EIR would require a consideration of every project that might have an impact within each issue area, and would be both impossibly lengthy, unreasonable, and also speculative. However, consistent with Section 15130(b)(1)(B) of the CEQA Guidelines, the growth projections as provided in the San Diego Association of Governments (SANDAG) 2050 Regional Growth Forecast (SANDAG 2011),[168] and the potential cumulative impacts associated with this future population growth, can be factored into the cumulative impact discussion. The Regional Growth Forecast provides estimates and forecasts of employment, population, and housing for the period between 2008 and 2050. The growth forecast is completed in two stages. During the first stage, SANDAG produces a forecast for the entire San Diego region based on existing demographic and economic trends. During the second stage, SANDAG develops a subregional forecast by working with local jurisdictions to understand existing land

[165] http://www.delmarbeachclub.com/blog/2015/10/28/solana-beach-first-in-county-to-ban-polystyrene-the-san-diego-union-tribune-62/
[166] 2015 Encinitas Advocate http://www.encinitasadvocate.com/news/2014/jul/01/encinitas-polystyrene-styrofoam-ban/
[167] http://cawrecycle.org/issues/plastic_campaign/polystyrene/local
[168] SANDAG Regional Growth Forecast, http://www.sandag.org/index.asp?projectid=355&fuseaction=projects.detail

use plans. The Regional Growth Forecast's growth projections show 1,333,617 people in the City of San Diego in 2008, and 1,947,184 in 2050, for a 46 percent projected increase.[169]

8.1.1 Air Quality

If a project involves development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project might be in conflict with the State Implementation Plan and RAQS and may contribute to a potentially significant cumulative impact on air quality. The project does not involve any development, thus it would be consistent with the existing zoning and General Plan land use designations which incorporate SANDAG's 46 percent growth forecast. Additionally, the project would not include a residential component that would increase local population growth, nor would the project provide additional water supplies that would result in growth-inducing effects. The project would not increase employment, nor would it cause impacts associated with increased employment.

If project emissions were to exceed applicable regional thresholds for any nonattainment pollutant, then the project could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality. However, as explained in Section 3.1, the project would not exceed the City of San Diego's significance thresholds for criteria pollutants: VOCs, oxides of nitrogen (NOx), CO, sulfur oxides (SOx), particulate matter less than or equal to 10 microns in diameter (PM_{10}), or particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$).

Adopted and pending single-use carryout bag ordinances would continue to reduce the amount of single-use plastic and paper carryout bags used, and promote a shift toward reusable carryout bags. Similar to the proposed ordinance, other ordinances would be expected to generally reduce the overall number of bags manufactured and associated air pollutant emissions, while existing and future manufacturing facilities would continue to be subject to federal and state air pollution regulations. Similar to the proposed ordinance, other adopted and pending ordinances would be expected to result in less than significant or beneficial impacts, and could incrementally reduce the amount of emissions that contribute to ground-level ozone and atmospheric acidification, which would result in a significant beneficial effect on air quality.

The project would not be growth inducing and thus would not alter SANDAG's 46 percent growth forecast, project emissions are below regional thresholds, and other comparable projects would not be expected to have significant impacts. As shown in Table 4-10, the project is anticipated to result in a net reduction in air emissions, providing a benefit, and thus would not contribute to cumulatively significant air quality impacts.

8.1.2 GHG

Because of the broad nature of GHG emissions, it is not feasible to analyze GHG emissions solely on an individual, project-level basis. Unlike air quality impacts, which could result in more localized or location-specific effects, any discussion and evaluation of GHG emissions already involves a cumulative-

[169] SANDAG Regional Growth Forecast, http://www.sandag.org/index.asp?projectid=355&fuseaction=projects.detail

level assessment. As discussed and analyzed in Section 3.2, Greenhouse Gases, the project's GHG emissions were evaluated to determine whether they would have a significant cumulative impact on the environment. The project would not exceed the City's 900 MT CO_{2e} per year screening threshold that has been established for the purposes of assessing the GHG emissions of projects in the City.

The City's proposed CAP provides standards that are intended to reach rigorous GHG reduction targets even given SANDAG's 46 percent population increase projection. The CAP incorporates the City's Zero Waste Plan. The project is specifically addressed in the Zero Waste Plan, and thus is consistent with the Zero Waste Plan and the CAP.

Adopted and pending single-use carryout bag ordinances of more than 100 other jurisdictions within California would continue to reduce the amount of single-use plastic and paper carryout bags and promote a shift toward reusable carryout bags. Each of these is expected to result in insignificant, neutral, or beneficial GHG impacts. All known ordinances combined would still be below all known thresholds, would not be inconsistent with any known plan, and are not expected to generate a significant cumulative increase in GHG emissions.

Because the GHG analysis provided in Section 3.2 is, in essence, a cumulative impact analysis that finds this project not to have a significant effect, and because other comparable projects are also not anticipated to have a significant effect, and because the project is consistent with applicable planning documents, the proposed ordinance would not combine with other projects to result in a significant GHG emissions impact.

8.1.3 Agricultural and Forest Resources

Forest and agricultural impacts are generally considered as land use changes from agricultural or forest to another use, or as management activities. Product demand, and factors that influence product demand, are not typically analyzed, because the analysis includes features that are too broad and speculative to be considered realistically.

When there are management activities or land use changes associated with a project to analyze, these can have complex and long-lasting effects on terrestrial and aquatic resources. When considered in isolation, individual activities may appear to have minimal effects, but the overall consequences of recurring activities may be substantial.

The most common impacts to agricultural and forest resources considered under CEQA in the City include conversion of agricultural or forest land to other uses, and projects requiring brush management. The City balances fire safety with habitat via brush management guidelines within section 142.0412 of the Municipal Code.[170]

The proposed project includes no such change in land use, and involves no brush management. The proposed project would have no impact on any local forest or agricultural land within the City.

[170] City Municipal Code. http://www.sandiego.gov/development-services/industry/information/landscape/index.shtml

As previously stated, product demand is not typically analyzed in CEQA documents because it entails features that are too broad and speculative to be considered realistically. Market forces that influence product demand are also too broad and speculative to be considered realistically. Though not a typical consideration, the potential for this project to create a potentially greater demand for forest and/or farm products has been identified, but found in Section 3.3 to not result in significant impacts.

In order to consider the cumulative impacts of the project, other similar market forces that might alter demand for these common market products would need to be identified, but this effort would be speculative in the extreme. The SANDAG population data can be used to propose a 46 percent increase in consumption over time, spread over various projects, to approximate unknown market forces. Nationally, forest planning documents do not rely on SANDAG forecasts, but include comparable population and market demand factors. Management of production and market forces has prevented depletion of these resources.[171] The project would be consistent with SANDAG and comparable forecasts used to manage these resources.

Although an investigation of cumulative impacts associated with market forces from all cloth and paper production in the U.S. is beyond the scope of this EIR, this analysis can consider market forces associated with comparable projects. More than 100 California cities and counties, large and small, have adopted local ordinances restricting retailers from using plastic single-use carryout shopping bags.[172] Adopted and pending carryout bag ordinances generally have neutral effects with respect to agricultural and forest resources, especially if they contain post consumer recycled content provision, such as the one in the ordinance. Most ordinances are intended to reduce the amount of plastic single-use carryout bags and deter the use of paper single-use carryout bags. Given the neutral or nearly neutral impact of these ordinances, and given that currently forests are sustainable, and the amount of forest land has remained about the same since 1900,[173] the proposed ordinance would not contribute to any significant cumulative impact to forest or agricultural lands.

8.1.4 Hazards and Hazardous Materials

As analyzed in Section 3.4, the project's individual impacts related to hazards and hazardous materials would be less than significant. Other projects located within the City would be required to comply with all applicable hazards materials regulations set forth by the appropriate federal, state, and local jurisdiction, which are intended to address and reduce the risk of hazards. All related projects, regardless of location, would be subject to the requirements set forth by the USEPA, Federal Aviation Administration, Department of Toxic Substances Control, California Department of Transportation, the San Diego County DEH , and local fire departments, all of which are designed to minimize impacts related to hazards and hazardous materials. No specific projects that would contribute to a cumulative significant impact in the project area have been identified.

It is highly speculative and virtually impossible to identify all projects that could have impacts associated with hazards and hazardous materials and consider potential cumulative impacts. However, related projects from outside the project area can be identified. More than 100 California cities and counties,

[171] http://forestry.about.com/library/bl_us_forest_acre_trend.htm
[172] CalRecycle. http://www.calrecycle.ca.gov/publiced/holidays/ReusableBags.htm
[173] About Forestry: http://forestry.about.com/library/bl_us_forest_acre_trend.htm

large and small, have adopted local ordinances restricting retailers from using plastic single-use carryout shopping bags.[174] The City's ordinance would not increase exposure to bacteria compared to what is typically found in a kitchen, and there is no reason to believe the proposed ordinance, or any other carryout bag reduction ordinance, would result in accumulations of paper single-use carryout bags that could harbor cockroaches. None of the ordinances involve the routine transport, use, or disposal of hazardous materials as defined by the Hazardous Materials Transportation Uniform Safety Act;[175] therefore, they do not contribute to a cumulative significant impact. Similarly, no hygiene-related hazards are associated with the proposed ordinance or with other carryout bag reduction ordinances, and therefore, they would not contribute to a cumulative significant impact.

8.1.5 Hydrology and Water Quality

The cumulative effects of past and current projects and practices have resulted in substantial water quality problems in the region's major waterways. Because water quality problems are generally cumulative in nature, all efforts must be made to reduce pollutant concentrations within storm water discharges to the maximum extent practicable, even if the impact of an individual project appears inconsequential. A cumulative significant impact may exist in those areas identified as "water quality limited" segments (or impaired water bodies) under CWA Section 303(d). As explained in Section 3.5 of this EIR, most of the major water bodies in the region are listed under CWA Section 303(d) as impaired for one or more pollutants. The project is expected to decrease plastic bag litter in these waterways. Combined with other anti-litter activities, a potentially significant beneficial effect is anticipated to be achieved. The potential less than significant impact associated with water consumption from bag manufacture would occur within the water system of the manufacturing facility. It is unlikely that one region would host more than one manufacturing facility, and thus the less than significant impacts associated with manufacturing would not be cumulatively significant.

Other projects in the City would be required to comply with applicable federal, state, and local water quality regulations. Development projects over one acre in size would be required to obtain coverage under the NPDES Construction General Permit, which requires project proponents to identify and implement storm water BMPs that effectively control erosion and sedimentation and other construction-related pollutants. The MS4 Permit and the City's storm water standards manual also require smaller projects of less than one acre to implement a minimum set of water quality BMPs. Because adverse water quality and major hydrologic alterations are linked to the large-scale, cumulative effects of development projects, as well as industrial and/or agricultural land uses, the provisions within the various NPDES permits, by their nature, address cumulative conditions. The project proposes no development, and would provide no cumulatively significant contribution to any cumulative significant effect such projects might have.

The typical long-term effect of substantial increases in impervious surfaces is that peak flows within the watershed's drainages are greater in magnitude, shorter in duration, and more responsive to storm events, since a greater portion of precipitation is carried by surface runoff rather than percolated into the soil. These effects are undesirable with respect to flood hazards, water quality, and habitat quality. However, the project proposes no development with impervious surfaces, and therefore would provide no

[174] CalRecycle. http://www.calrecycle.ca.gov/publiced/holidays/ReusableBags.htm
[175] City of Los Angeles FEIR citing Code of Federal Regulations, Title 40, Chapter 1, Parts 106–180.

contribution to any cumulative significant effect other projects might have. Furthermore, the project is anticipated to have a beneficial effect on water quality by reducing litter associated with plastic single-use carryout bags.

More than 100 California cities and counties, large and small, have adopted local ordinances restricting retailers from using plastic single-use carryout shopping bags. Prohibitions on plastic single-use carryout bags cover approximately one-third of California's population.[176] As summarized in Table 2-2, the annual number of bags generated for disposal/recycling would be reduced with implementation of the proposed ordinance, and the number of plastic single-use carryout bags entering the storm drain system as litter would be significantly reduced, thereby reducing water quality impacts associated with plastic single-use carryout bags and complying with applicable water quality standards and waste discharge requirements. In the U.S., manufacturing of carryout bags would continue to be regulated by applicable federal, state, and local water quality regulations, including applicable NPDES permits. Accordingly, implementation of the ordinance in combination with past, present, or reasonably foreseeable future ordinances would result in less than significant or beneficial cumulative impact on water quality. The adopted and reasonably foreseeable future ordinances in California, and the proposed ordinance, do not involve any construction of new structures, such as manufacturing facilities, that would result in an increase in impervious surfaces potentially reducing ground-water levels.

8.1.6 Utilities and Public Service Systems

8.1.6.1 Water

As analyzed in Section 3.6.1.1, the project's individual impacts related to water would be less than significant. Water providers prepare and adopt long-term master plans in order to respond to future demands with system-wide improvements. These plans are periodically updated based on both individual provider's projections and SANDAG population forecasts. Any new or expanded utilities as a result of cumulative growth is typically discussed and evaluated in these master plans. Regardless of land use type, most other related projects located within the City would be required to contribute their fair share of development impact fees or other mitigation fees. Those projects that would trigger the need for additional utilities would not only be required to pay their fair share to fund such facilities, but would be required to comply with the requirements of CEQA by analyzing the potential environmental impacts associated with implementation of such utilities.

Similar to the project, other adopted and pending single-use carryout bag reduction ordinances may incrementally increase water use associated with washing of reusable bags for hygienic purposes. However, because the incremental increase is so small, and because the impact associated with washing of reusable bags would be confined to the region in which the ordinance is proposed, each region with a different water supplier, impacts would not be cumulative. Also, water agencies already institute programs to educate people about washing with full loads and other conservation measures.

Therefore, the proposed ordinance does not contribute to a cumulative significant impact on water within the project area. Further, the proposed ordinance does not contribute to a cumulative significant impact outside the project area in combination with similar ordinances throughout the State.

[176] CalRecycle: http://www.calrecycle.ca.gov/publiced/holidays/ReusableBags.htm

8.1.6.2 Wastewater

As analyzed in Section 3.6.1.2, the project's individual impacts related to wastewater would be less than significant. On an individual basis, the project would not generate substantial quantities of wastewater. Utility providers prepare and adopt long-term master plans in order to respond to future demands with system wide improvements. These plans are periodically updated based on both individual provider's projections and SANDAG population forecasts. Any new or expanded utilities as a result of cumulative growth is typically discussed and evaluated in these master plans. Regardless of land use type, most other related projects located within the City would be required to contribute their fair share of development impact fees or other mitigation fees. Those projects that would trigger the need for additional utilities would not only be required to pay their fair share to fund such facilities, but would be required to comply with the requirements of CEQA by analyzing the potential environmental impacts associated with implementation of such utilities.

Similar to the proposed ordinance, other adopted and pending single-use carryout bag reduction ordinances may incrementally increase wastewater associated with washing of reusable bags. However, because other agencies have separate treatment plants than those that serve the City, the ordinance's increase in wastewater would not impact treatment plants in those areas. Also, water agencies already institute programs to educate people about washing with full loads and other conservation measures. These existing measures, if effective, would eliminate the contribution of reusable bags to wastewater systems.

Therefore, the proposed ordinance does not contribute to a cumulative significant impact on wastewater within the project area. Further, the proposed ordinance does not contribute to a cumulative significant impact outside the project area in combination with similar ordinances throughout the State.

8.1.6.3 Solid Waste

The City's Source Reduction and Recycling Element and Zero Waste Plan are based on SANDAG population forecasts, and include waste reduction measures to manage waste associated with anticipated growth. The cumulative effects of past and current projects have resulted in substantial generation of solid waste, and associated solid waste management challenges. In the City, proposals for facilities that generate 60 tons per year or more of waste must develop waste management plans targeting the Statewide 75 percent waste reduction goal.[177] All projects proposed in the City must comply with this requirement, and with local ordinances, which include an educational component, in addition to requirements for commercial and residential facilities to provide recycling services. Foreseeable development compliance with these requirements is anticipated to reduce cumulative impacts associated with the project, together with all other anticipated development within the City, to below a level of significance.

Other adopted and pending single-use carryout bag reduction ordinances in other jurisdictions throughout California may incrementally increase solid waste associated with carryout bags according to the Boustead study; however, these ordinances may also result in a reduction of solid waste based on the Ecobilan study.[178] Some of the ordinances include a public education component, as does the project. All

[177] City of San Diego CEQA Thresholds: http://www.sandiego.gov/development-services/pdf/news/sdtceqa.pdf
[178] CalRecycle: http://www.calrecycle.ca.gov/publiced/holidays/ReusableBags.htm

jurisdictions must take measures to comply with state law, and many are taking steps to contribute toward the statewide goal of 75 percent waste reduction, resulting in a statewide waste diversion rate of 65 percent.[179] Further, as public information and outreach becomes more effective, waste reduction rates are anticipated to improve. Therefore, the project is not anticipated to contribute to a cumulative significant solid waste impact.

8.1.7 Mineral Resources

The County's supply of mineral resources is exhaustible and the mineral resource deposits are essentially non-renewable. There is, however, a vast amount of mineral deposits. Mining has been authorized in only a fraction of the area that technically could be mined. Although plentiful in the eastern, desert portion of the County, in the western portion of the County, the rate of consumption of alluvial deposits outweighs natural rates of replenishment. Erosion of the foothills and mountains, transport by gravity and water, and deposition of this new material into the County's alluvial river valleys and basins only very slowly replenishes sands and gravels.[180] Conservation of the County's mineral resources is important to ensure that resources are available for future generations.[181]

The project would consume no aggregate resources, nor would it preclude the future mining of local aggregate or other mineral resources. It is expected to have no impacts on mineral resources. Therefore, no cumulative impact would be associated between the proposed ordinance and other projects, including ordinances in other jurisdictions outside the project area, which would also be expected to have no impact on mineral resources.

8.1.8 Energy Resources

As analyzed in Section 3.8, the project would not have an impact on electricity, natural gas, and petroleum consumption. The proposed ordinance is anticipated to have a beneficial effect on energy resources. Other projects in the City would be expected to comply with all applicable federal, state, and local regulations pertaining to energy efficiency, including the energy conservation requirements set forth by Title 24, Part 6, of the . Therefore, the proposed ordinance is not anticipated to contribute to a cumulatively significant impact on energy in combination with other projects in the project area, and it is anticipated that the proposed ordinance, in combination with other similar ordinances outside the project area, will result in a beneficial cumulative impact on energy.

According to Table 3.7, under a worst-case scenario, the potential increase in paper bag use could result in 598 additional truck trips per year. At 20 miles per trip, that would result in 11,960 additional miles driven per year. A typical, loaded tractor trailer gets about six miles per gallon[182] resulting in an increase of 1,993 gallons of diesel gasoline per year. This would amount to .00007% of the total diesel gasoline use in California (based on 2.7 billion gallons of diesel fuel used in California in the fiscal year ending

[179] CalRecycle: http://www.calrecycle.ca.gov/LGCentral/GoalMeasure/DisposalRate/Graphs/EstDiversion.htm
[180] *ibid*
[181] *ibid*
[182] http://www.fastcoexist.com/1678431/we-can-do-better-than-six-miles-per-gallon-redesigning-americas-truck-fleet

June 30, 2104).[183] Even if all of the bag ordinances enacted throughout the State resulted in a similar minor increase in diesel consumption, the increased demand would not result in any shortages in diesel availability. More than likely, however, bags would be delivered to stores as part of larger mixed loads of groceries and merchandise, and there may not be an actual net increase in truck traffic from the change in bag use. Cumulative impacts to energy related to truck trips are less than significant.

[183] http://www.sandiegouniontribune.com/news/2014/dec/02/california-burns-more-gasoline/

SECTION 9 OTHER EFFECTS FOUND NOT TO BE SIGNIFICANT

9.1 VISUAL IMPACTS, AESTHETICS

Because the project does not include any development, no alterations to the landscape are proposed. Any consideration of visual impacts at the location of manufacture would be purely speculative, and therefore is not included. The proposed ordinance is intended to reduce litter, which would reduce existing visual impacts.

9.2 BIOLOGICAL RESOURCES

Because the project does not include any development, no alterations to habitats are proposed. Any consideration of impacts to habitat in the location of any potential, future manufacturing facilities would be purely speculative, and therefore is not included. The proposed ordinance is intended to reduce litter, which would be considered a highly beneficial effect.

9.3 CULTURAL RESOURCES

Because the project does not include any development, no alterations to cultural resources are proposed. Any consideration of impacts to cultural resources at the location of carryout bag manufacture would be purely speculative, and therefore is not included. The proposed ordinance is intended to reduce litter, which could reduce distracting litter at cultural resource sites.

9.4 GEOLOGY, SOILS

Because the project does not include any development, no local geology or soils can be identified. Any consideration of geological or soil impacts at the location of carryout bag manufacture would be purely speculative, and therefore is not included.

9.5 LAND USE, PLANNING

Because the project does not include any development, no land uses would be modified, and no planning documents intended to guide development are pertinent. Any consideration of land use or planning impacts at the location of manufacture would be purely speculative, and therefore is not included.

9.6 NOISE

Because the project does not include any development, no noise would be associated with the project. Any consideration of noise impacts at the location of carryout bag manufacture would be purely speculative, and therefore is not included.

9.7 POPULATION, HOUSING

Because the project does not include any development, it would create no demand for housing and would not be growth inducing. Any consideration of population or housing impacts at the location of carryout bag manufacture would be purely speculative, and therefore is not included.

9.8 PUBLIC SERVICES (OTHER THAN SOLID WASTE, WATER, AND SEWER)

Because the project does not include any development, no impacts to police, fire, libraries, or other City services would occur. Any consideration of service impacts at the location of carryout bag manufacture would be purely speculative, and therefore is not included.

9.9 RECREATION

Because the project does not include any development, no impacts to recreational resources would occur. Any consideration of impacts to recreational assets at the location of manufacture would be purely speculative, and therefore is not included. The proposed ordinance is expected to reduce litter, and therefore may have a beneficial effect in terms of reduced maintenance costs to recreation.

9.10 TRANSPORTATION/TRAFFIC

The project does not include any development. Traffic impacts would be limited to carryout bag delivery impacts. Detailed information on the impact of delivery can be found in Section 3.1 Air Quality. A very slight increase in truck trips is possible in the worst case scenario, but it would not result in a significant impact.

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THE CITY OF SAN DIEGO

PLANNING DEPARTMENT
Date of Notice: May 13, 2015
PUBLIC NOTICE
OF THE PREPARATION OF A PROGRAM ENVIRONMENTAL IMPACT REPORT
AND
A SCOPING MEETING
INTERNAL ORDER No. 21003516

PUBLIC NOTICE: The City of San Diego as the Lead Agency has determined that the project described below will require the preparation of a Program Environmental Impact Report (PEIR) in compliance with the California Environmental Quality Act (CEQA). This Notice of Preparation of a PEIR and Scoping Meeting was publicly noticed and distributed on May 13, 2015. This notice was published in the SAN DIEGO DAILY TRANSCRIPT and placed on the City of San Diego website at:

http://www.sandiego.gov/city-clerk/officialdocs/notices/index.shtml

SCOPING MEETING: A public scoping meeting will be held by the City of San Diego's Planning Department on **Wednesday, June 3, 2015** from 6:00 p.m. to 7:30 PM in the City of San Diego RHC Auditorium located at 9601 Ridgehaven Court, San Diego CA 92123. **Please note that depending on the number of attendees, the meeting could end earlier than the end times noted above.** Verbal and written comments regarding the scope and alternatives of the proposed EIR will be accepted at the meeting.

Please send in written/mail-in comments may also be sent to the following address**: Myra Herrmann, Environmental Planner, City of San Diego Planning Department, 1222 First Avenue, MS 501, San Diego, CA 92101 or e-mail your comments to DSDEAS@sandiego.gov with the Project Name and Number in the subject line Number** within 30 days of the receipt of this notice/date of the Public Notice above. Responsible agencies are requested to indicate their statutory responsibilities in connection with this project when responding. An EIR incorporating public input will then be prepared and distributed for the public to review and comment.

PROJECT NAME / No.: SINGLE-USE CARRYOUT BAG ORDINANCE /347344
COMMUNITY AREAS: Citywide
COUNCIL DISTRICT: All Council Districts

PROJECT DESCRIPTION: CITY COUNCIL APPROVAL for the enactment of an ordinance restricting the use of plastic and paper single-use carryout bags, and promoting the use of reusable bags. This proposed ordinance would amend Chapter 6, Article 6 of the San Diego Municipal Code, adding new Division 8, Sections 66.0801, 66.0802, 66.0803, 66.0804, 66.0805, 66.0806, 66.0807, and 66.0808.

The City of San Diego is proposing to reduce the adverse environmental impacts associated with single-use plastic carryout bags, including plastic bag litter. The City proposes to adopt and implement an ordinance to regulate the use of single-use plastic carryout bags and promote the use of reusable bags within the City. The proposed ordinance would: prohibit plastic single-use carryout bags at the point of sale in retail stores and require retailers to provide reusable bags to consumers for sale or at no charge, and mandate a charge on recycled content paper single-use carryout bag and reusable carryout bags at the point of sale in retail stores. More specifically, the proposed Carryout Bag Reduction Ordinance would:

1. Preclude the distribution of single-use plastic carryout bags and non-recyclable single-use paper carryout bags to point-of-sale customers at stores subject to the ordinance.
2. Require stores subject to this ordinance to collect a 10 cent charge for each recyclable single-use paper carryout bag provided to point-of-sale customers.
3. Apply to the following:
    a. Retail stores with annual sales of $2 million selling food and non-food goods, and a line of dry grocery, canned goods, or nonfood items and some perishable items.
    b. Stores with at least 10,000 square feet of retail space with a pharmacy.
    c. Drug stores, pharmacies, supermarkets, grocery stores, convenience food stores, food marts, or other entities selling a limited line of goods that includes milk, bread, soda, and snack foods.
4. Not regulate:
    a. Produce/product bags used to keep individual items separated and protected from other items in the carryout bag.
    b. Restaurants.
    c. Non-profit stores that sell used goods.
    d. Participants in the WIC or Supplemental Food Programs. (The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides Federal grants to States for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk.)
5. Require stores subject to the ordinance to provide or make available to customers only recyclable paper single-use carryout bags or reusable carryout bags for carrying away goods or materials from the point of sale.
6. Require stores subject to the ordinance to charge at least 10 cents per reusable carryout bag.
7. Allow reusable bags to be provided for free during an infrequent (once per 12-month period), limited time (up to 90-days) promotion.
8. Require stores subject to the ordinance to keep complete and accurate records of the number of recyclable single-use paper carryout bags sold and the total amount of monies collected for the sale of recyclable single-use paper carryout bags.
9. Not require periodic reporting, although the City may request data.
10. Provide complaint-based enforcement.
11. Phase implementation to allow for the transitional use of remaining single-use plastic and non-recyclable paper carryout bag inventories.
12. Provide City-sponsored reusable bag distribution events and provide public outreach to describe the ordinance requirements and the correct maintenance of reusable bags.

The proposed ordinance would not preclude plastic or paper bags that are used by customers and the store to protect or contain meat or prepared food; or used for produce, or for other goods that must be protected from moisture. Restaurant, pharmacy, clothing, and dry cleaner bags would be exempt from the proposed ordinance. A grace period of six months for large retailers and one year for small retailers would be provided to allow retailers to phase out stocks of plastic bags. After the grace period, retailers would charge $0.10 per paper bag, which would be retained by the retailer. The City's Environmental Services Department (ESD) has conducted a public education program for several years, and will continue these activities through the grace period.

Applicant: City of San Diego, Environmental Services Department

Recommended Finding: Pursuant to Section 15060(d) of the CEQA Guidelines, it appears that the proposed project may result in significant environmental impacts in the following areas: **Air Quality/Odor, Greenhouse Gas Emissions, Agricultural & Forestry Resources, Hazards and Hazardous Materials, Hydrology and Water Quality, Energy, Public Services and Facilities, and Public Utilities.**

Availability in Alternative Format: To request the this Notice or the City's letter to the applicant detailing the required scope of work (EIR Scoping Letter) in alternative format, call the Planning Department at (619) 235-5200 (800) 735-2929 (TEXT TELEPHONE).

Additional Information: For environmental review information, contact Myra Herrmann at (619) 446-5372. The Scoping Letter and supporting documents may be reviewed, or purchased for the cost of reproduction, in the Planning Department at 1222 1st Avenue, Fifth Floor. For information regarding public meetings/hearings on this project, contact the Project Manager, Jennifer Ott-Rol, at (858) 573-1285 or via email: jott@sandiego.gov. This notice was published in the SAN DIEGO DAILY TRANSCRIPT and distributed on **May 13, 2015**.

Tom Tomlinson
Interim Director
Planning Department

DISTRIBUTION: See Attached
ATTACHMENT: Scoping Letter

SIGN IN SHEET

For the

Single Use carryout Bag Ordinance/Project # 412659

ENVIRONMENTAL IMPACT REPORT SCOPING MEETING

Wednesday, June 3, 2015

Name (please print)	Address (please print and include City, state & zip code) or Email address
STEPHEN JOSEPH	11693 SAN VICENTE BLVD #150 LOS ANGELES, CA 90049 savetheplastic bag@earthlink.net
Ken Prue	City of San Diego ESD
Justin Garver	City of San Diego CD1
Jennifer Ott	City of SD ESD
Roger Kyhe	4088 Newport Ave 92107

BALLERINI

REPORTER'S TRANSCRIPT OF
THE CITY OF SAN DIEGO'S PLANNING DEPARTMENT
EIR PUBLIC SCOPING MEETING
PROJECT NO: 347344

Pages 1 to 23

San Diego, California
Wednesday, June 3, 2015

Reported by Adriana S. Angulo, CSR
Certificate No. 13824

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REPORTER'S TRANSCRIPT OF
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Pages 1 to 23

San Diego, California
Wednesday, June 3, 2015

Reported by Adriana S. Angulo, CSR
Certificate No. 13824

MS. HERRMANN: Good evening and thank you for coming to the Environmental Impact Report Public Meeting for the single-use carryout bag ordinance.

My name is Myra Herrmann, Senior Environmental Planner for the City of San Diego's Planning Department. These meetings are referred to as EIR scoping meetings and are for the purpose of helping to define the scope of work for the EIR.

This meeting is required by the California Environmental Quality Act for projects which may have statewide, regional, or area environmental impacts. The City's environmental review staff has determined that this project meets the threshold and, therefore, scheduled this meeting to get public input prior to the preparation of the project's environmental document.

The environmental review staff is required by the City's Municipal Code to provide the public and decision makers with independently prepared environmental documents which disclose impacts to the physical environment.

This information is used by decision-makers as part of the deliberative process in approving or denying a project. The environmental document does not recommend approval or denial that is provided as information on the environmental impacts of a project.

Now I'm just going to go over a few comments

about how the meeting is going to be conducted. First, I'll provide a brief description of the project followed by a short presentation by Environmental Services Department staff.

At the end of the meeting, time permitting, the public is welcome to review any materials provided by the staff or the consultants and ask any additional questions for clarification; however, these will not become part of the scoping meeting record.

This meeting is designed to get as much public input on areas that need to be addressed in the EIR in the time allotted for the meeting; therefore, each speaker is asked to introduce themselves, state their address, and complete their comments within three minutes.

The entire meeting is scheduled to last two hours and will end at 8:00 p.m. Unless no further comments by the public are made, then we may end early if everybody is okay with that.

In addition to verbal comments, which are being taken for the record, there are forms available on the table to your right which you can provide written comments on. We will need to have these comment forms submitted to staff by the close of the meeting, or you can mail a completed form with your comments to the address listed on the back of the page. It's a tri-fold form. So all you

have to do is fold it, stamp it, seal it, and then you can just mail it to me.

Please remember to put your name and address on the sign-in sheet before you leave, that's on the table there as well, if you would like to receive a notice of availability for the draft EIR.

Please refrain from conducting a debate on the merits of the project in this meeting. That is not the purpose for this gathering. Rather, please focus your comments on those environmental impacts you would like thoroughly analyzed in the project's environmental document.

Lastly, I will be acting as moderator and timekeeper for the duration of the meeting and, therefore, would respectfully request that you yield when notified that your three minutes is up; however, we don't have a lot of people here, so I can be flexible if you go beyond three minutes. If you have, you know, four -- you know, we can just take you at the end and come back, and that's perfectly fine as well.

Thank you for your patience. I'll now begin with the project description, and then there will be a brief presentation by the applicant.

This meeting is being conducted with accordance with CEQA for the single-use carryout bag ordinance on

Wednesday, June 3rd, 2015. We started at approximately 6:05.

This is City Council approval for the enactment of an ordinance restricting the use of plastic and paper single carryout -- single-use carryout bags, and promoting the use of reusable bags. This proposed ordinance will amend Chapter 6, Article 6, of the San Diego Municipal Code adding new Division 8, Sections 66.0801, 66.0802, 66.0803, 66.0804, 66.0805, 66.0806, 66.0807, 66.0808, and 66.0809.

The City of San Diego is proposing to reduce the adverse environmental impacts associated with single-use plastic carryout bags including plastic litter -- plastic bag litter. The City proposes to adopt and implement an ordinance to regulate the use of single-use plastic carryout bags and promote the use of reusable bags within the City.

The proposed ordinance would: Prohibit plastic single-use carryout bags at the point of sale in retail stores, and require retailers to provide reusable bags to consumers for sale or at no charge, and mandate a charge on recycled content paper single-use carryout bags and reusable carryout bags at the point of sale in retail stores. Specific details about the proposed ordinance will be provided by staff in the Environmental Services

Department.

So at this point, I'm going to turn the mic over to Jennifer Ott from Environmental Services. She'll provide some additional information and she has a PowerPoint, then I'll come back up and let the public speak.

MS. OTT: So I'm Jennifer Ott, Recycling Specialist with the Environmental Services Department. Just some really quick housekeeping-type of things. There is a drinking fountain in the lobby. There's restrooms behind this wall. You can go out and to the left. If there is an emergency, there is a door here that you can exit out of, and then immediately to your left to get to the outdoors. And then the door you came in is obviously through the lobby. Let's see.

Okay. So a little bit about the purpose and need for the project. There's at least 500 million single-use plastic bags being distributed in San Diego every year, and there's about a 3 percent recycling rate of those bags. The bags that are not recycled end up either littered or in the landfill. In local studies done by non-profit groups and by our stormwater department, there's been -- between 2 and 11 percent of the litter found in our community has been found to be plastic bags.

The Environmental Services Department itself

spends about $160,000 a year cleaning plastic bag litter, largely at the Miramar landfill where it rolls around. And the ordinance that we're bringing forward is something that's modeled after other successful ordinances in the State of California.

There's 110 ordinances in the State of California right now covering 139 municipalities, and the ordinance that we're bringing forward is a conservative one compared to some, and a typical one compared to others.

So the stores that would be subject to the ordinance are in three categories: There's retail stores with annual sales of $2 million or more that have a line of grocery stores and perishable items. So that's typically going to be the large grocery store chains that you're familiar with -- Albertsons, Vons, and independent stores like H Mart, Mitsuwa, and stores like that.

The second category is stores with at least 10,000 square feet of retail space with a pharmacy. So that might be CVS, Rite Aid, Walmart, Target.

And then the third category is smaller stores, like drugstores, corner markets, liquor stores that sell milk, bread, soda, and snack food. So that's going to be like 7-Eleven and other corner markets.

So the ordinance that would preclude stores from providing single-use plastic bags and paper bags that

don't have a recycled content and meet the requirements of this ordinance, those stores would be required to charge 10 cents per paper bag -- a paper bag that, again, meets the requirements that I'll tell you about. And they'll also be required to charge at least 10 cents per reusable bag that they provide.

The ordinance would not regulate bags without a handle that are used to carry produce, meat, seafood, bulk food, inside the store to the point of sale. The ordinance would not regulate bags holding prescription medication that's dispensed at a pharmacy. It would not regulate dry cleaner bags. It would not regulate restaurants and recipients of WIC. And the Supplemental Food Program in California would not be required to pay the 10 cents. So the store would be required to give paper bags to those customers for free.

So the ordinance does have requirements for paper bags that are allowed to be provided by the stores, and that is that they are 100 percent recyclable which would be recyclable in the curbside program in the City of San Diego. They need to be made with 40 percent post-consumer content material and labeled with certain information -- whoops, sorry.

I can provide a copy of this to anybody who wants it. My card is on the table over here, and I can email it

to you.

The ordinance also requires that reusable bags have a minimum useful life of 125 uses, which is defined as carrying 22 pounds over a distance of 175 feet, 125 times. That they carry at least a 15-liter volume. That the bags are machine washable or made of a material that can be disinfected by wiping clean. That there's certain minimum levels of heavy metal. And if they are made of plastic, that they're at least 2.25 mils thick, and they contain 20 percent post-consumer recycled content. And they also have requirements in our ordinance for how those need to be labeled.

Our ordinance does not require any reporting by the stores proactively. It does require them to keep records to be assessed by the City of San Diego if we ask them to. And that would be information on the number of bags that are provided to consumers and the amount of money that they bring in in selling those bags.

And the ordinance would initially cover larger grocery stores and pharmacies, the first two categories of stores, and then six months later it would go into effect for the smaller stores that are in the third category.

And I would be happy to rewind these slides if you want to because I had forgotten to move them forward. Does anyone want to see the slides that I missed?

Okay. That's it.

MS. HERRMANN: So at this point, if there's anybody who wants to speak on the record and make any comments, I invite you to come up to the mic. The mic is turned on. And as a reminder, state your name and address, and then make your comments, and then I'll let you know when your time is up.

STEVEN JOSEPH: Come up to the mic means this side?

MS. HERRMANN: You can just grab the mic and pick it up in your hand.

STEVEN JOSEPH: This is all transcribed? I hope I'm not going to be held too much to the three minutes because it looks like we're still early.

My name is Steven Joseph. I'm counsel for Save the Plastic Bag Coalition, and my -- I'm sorry. My name is Steven Joseph and I'm counsel for Save the Bag Coalition. And do you want my address as well?

11693 San Vicente Boulevard, Number 150, Los Angeles, California 94133.

I just have a question before I begin. I just want to confirm that written comments don't need to be submitted until the 12th of June; is that right?

MS. HERRMANN: Written comments from the NOP, yeah. Unless you have some that you want to submit

tonight, you can do that as well.

STEVEN JOSEPH: The scoping comments can be submitted by June 12th?

MS. HERRMANN: Yes.

STEVEN JOSEPH: Okay. So the primary scoping issue that I have -- and there are some issues that lead up to this, but I want to make sure I hit my three-minute time limit -- is that the scoping document does not mention water usage. It mentions water quality. And that is a big issue now obviously because of the governor's executive order managing restrictions in San Diego as well as the wet drought that we're experiencing -- they're experiencing in the State of Washington and the State of Oregon.

The wet drought is -- I'm sure, because I'm in an environmental agency, that you all know it means a lack of snow rather than a lack of rain, and you all know what that implies. So I'm really mystified that that hasn't been included in the scope of work.

Equinox which is, I think, the leading advocate for the plastic bag ban in the City did an analysis in 2013 where they did look at water usage, and they concluded, based upon their figures, that an extra 13 million gallons of water every year would be used as a result of this ordinance. That figure is, I think, far

too low for several reasons.

First of all, they did not take into account tourism in the City at all, and that is going to be a big cause of additional paper bag usage. People aren't going to be coming into the City bringing their reusable bags. So that's not a reality. Secondly, they didn't take into account the WIC -- I'm not sure who to look at. You or you.

MS. HERRMANN: Just whoever.

STEVEN JOSEPH: They didn't take into account the WIC and Supplemental Food Program recipients who are going to be getting the free paper bags, which is a very, very big driver of paper bag usage in Los Angeles County and in San Francisco.

And it's not something you're going to know too much about because you don't have a reporting requirement unlike those cities and counties in your ordinance. So that is going to be a big issue. Because as long as there's no reporting, people are going to be free to hand out paper bags as much as they want, and they're not going have to report it to the City. So that's going to be a big factor.

Just excuse me one moment.

MS. HERRMANN: That's okay, Steven. How much additional time do you need?

STEVEN JOSEPH: Probably a couple minutes.

MS. HERRMANN: Go ahead. I'll let you go ahead.

STEVEN JOSEPH: And so there are various factors that the Equinox analysis did not take into account, and we're going to be so busy with written comments to make sure that those are addressed. Unlike in the Equinox, which wasn't a legal document, they need to be addressed in your document.

But, again, water usage is the critical factor. And in explaining water usage, I think it's very important in this day in age, given where we are with the drought, to explain it in gallons. Put the metrics in there very carefully so we know where the water usage is coming from.

Washing reusable bags, which is something you must encourage -- and as much as washing the reusable bag is possible as one source, but also the manufacturer of paper bags which is not really occurring that much in California. There is paper recycling in California, which is, you know, sent up to the State of Oregon and the State of Washington and other places, and that's another heavy use of water.

Also, plastic reusable bag recycling also involves a lot of water usage, because the plastic -- the post-consumer plastic has to be washed. For instance, agricultural plastic. And with reusable bags now

containing 20, 30, or 40 percent polyethylene -- recycled polyethylene, that is to say polyethylene reusable bags, that has to be taken into account as well.

There may be closed-loop water recycling in some places, but it's not everywhere. So you have to look at places like Encore in Salinas and Roplast in Oroville. They're in California. And you need to look at the water usage that they have.

Even in the closest you can have water usage because of the evaporation and, you know, you have to throw out a certain amount of the water. So you have to take all those things into account. And then honestly tell the City, tell the City Council, tell the citizens of this city, how much water is going to be added to usage.

I won't be showing or sending you the Boustead Report which was done in 2007. It's a peer review, a very careful peer reviewed study. It's not just a rubber stamp peer review, but every single figure was peer reviewed. It stated that each paper bag involves 1 gallon of water usage in order to make it.

So if you have 30 million extra bags as a result of the ordinance, you're going to have 30 million gallons of extra water. If you have 200 million bags, which is what we believe is going to be the case, you're going to have 200 million gallons of extra water.

The other thing is, finally -- and thank you for the extra time -- you mentioned 500 million bags are used in San Diego each year. The Equinox figure, I think, is more about 800 or 875, but I'm going from memory there.

Also, you don't have reportings. So I don't know how you possibly know how many bags are being used. So I think you need to verify by means of substantial evidence the basis for that figure. I don't think you can just pull it out of the air. And if that's the figure that's going to be the basis for everything else in the report, I think you have to be very careful in making sure that's a valid figure. But you're in conflict with Equinox right now so I think that needs to be resolved.

Do you have any questions for me?

That's it. Thank you.

MS. HERRMANN: Is there anybody else who wants to speak? Feel free to come up to the mic. I'll set the timer. I don't need to introduce you. You can just walk up.

ROGER KUBE: So my name is Roger Kube. I'm here on behalf of the Surfrider Foundation, San Diego County Chapter, and we want to reiterate our support for this project and the perspective that this is an environment serving legislation.

We are an organization representing about 250,000

surfers, and beachgoers worldwide that value the protection and enjoyment of our oceans, waves, and beaches. And here locally and globally we have a Rise Above Plastics program aimed to reduce the impact of plastics in the marine environment by raising awareness about the dangers of plastic pollution and by advocating for the reduction of single-use plastics.

We appreciate the staff's time and dedication and commitment to this issue. Initially, we have a number of questions and requests. The first question is, why the City of San Diego has chosen to do a Program EIR versus a Regular EIR. Typically, a Programmatic EIR is simply used for a large project and will have changes and variations in the future. And if this is why the City is doing a Programmatic EIR, what chain of actions or what do you contemplate could be changed in the future? Potential amendments, I guess.

Also, I got clarification to this question today, which is to confirm that when SP-270 is upheld, would that override the covered bags, also the covered stores? And then if the City of San Diego did decide to amend their ordinance after SP-270 would pass to, let's say, cover other stores like Home Depot or Lowes, would they be preempted even if SP-270 is upheld since they're not covered or they're not part of a covered store in SP-270?

So it's our understanding that the reading of the stores subject to the ordinance excludes large home improvement department stores; and if that's the case, we respectfully disagree with the comment located in Roman No. XI, "Alternatives," No. 2, where it says, "Apply to the Carryout Bag Reduction Ordinance to all Retail Vendors," that the current draft ordinance selects the retail establishments responsible for the majority of single-use bags.

High volume stores such as Home Depot or Lowes distribute a considerable amount of single-use bags based on -- just common knowledge. As you walk into Home Depot, that's all that they provide.

Also, I don't know if this is a potential loophole or not. But in the language of page 2 of 11 of the NOP, No. 3-C, at the end of this sentence on No. 3 -- and I know this mimics other ordinances like L.A. County's ordinance, for example. But does No. 3 where it shows at the end "and" at the end of the sentence -- does it mean that if they remove one of those grocery items, let's say, bread, that they're excluded from the ordinance?

I know Jennifer had that up on the slide before with that exact sentence, but I can't recall exactly what it says. But it's the third definition of a store.

So the question is, basically, if one of those

stores removes one of those items, for example, bread, does that mean that they're no longer subject to this ordinance?

I know that's definitely not the intent of the ordinance, but it would seems that an "or" would maybe remove that possibility of a store simply removing one of those items from their store, and then not having to comply.

Also, we do request a full analysis of the project alternative applied to the carryout bag reduction ordinance to all vendors. We believe that this is the most environmentally superior option. And we also notice there's not a project alternative that analyzes the ban on plastic, no fee on paper.

In order to demonstrate why the fee is critical to the success of the legislation, we believe it's appropriate to analyze this option in order to show its inadequacy. So it would be good to have this analysis in the report. It's not critical. But, again, it just shows the inadequacy of a no fee -- sorry about that.

We are encouraged that on page 23, the City does plan to monitor and report on the efficacy of the project, but we also would like to see that that be a requirement.

So the reporting like the other -- most of the other 110 jurisdiction requirements, at least the larger

jurisdictions, require the reporting. That will help to demonstrate the efficacy of the bag ban.

So if you look at San Jose, for example, or Washington D.C., Los Angeles County, Alameda County, their reporting comes back to approve that this is, in fact, helping to reduce single-use bags.

For example, San Jose experienced a downward trend in the presence of single-use bags in the street by about 59 percent, storm drains by 89 percent, and creek litter by 60 percent. And they had an upward trend in the use of reusable bags from 4 percent to 62 percent. So that type of reporting will validate the efficacy of this type of ordinance.

Los Angeles County found a 95 percent reduction of all single-use bags with a 30 percent reduction of single-use paper bags, again, demonstrating the efficacy of the ordinance. And then the Alameda County's bag ban resulted in 85 percent fewer bag purchases overall and twice as many customers were bringing in their own bag after the ordinance was enacted for or not using a bag at all.

Then, finally, San Francisco, the first city to ban single-use plastic bags. There was an 18 percent decrease in street litter found from 2007 to 2009 after the ordinance was enacted. And those are all verifiable

sources from the cities themselves. So we encourage mandatory reporting for that purpose. Let's see here.

I think that's pretty much it. Again, we want to thank the City's staff and time and commitment to this issue. Our organization sees firsthand the impact of plastic bag pollution in San Diego County along with San Diego Coastkeeper.

In 2014 we had about 7,000 volunteers remove about 280,00 pieces of trash from our beaches. 81 percent of that debris collected was plastic. So a plastic bag ban is an easy place to start with the plastic source reduction since there's a superior alternative in reusable bags. In taking this step to proactively protect our environment, we'll work to protect San Diego's oceans and beaches, marine wildlife, reduce litter, and also save taxpayer money. So we support it. Thank you.

STEVEN JOSEPH: May I ask you a question?

MS. HERRMANN: Anybody else who would like to speak before we move on?

No?

Technically, no questions and answers unless it's procedural as part as the meeting goes.

STEVEN JOSEPH: Which company is going to do the EIR?

MS. HERRMANN: The City has a consultant that's

preparing the EIR. AECOM. They're a local consulting firm.

STEVEN JOSEPH: AECOM?

MS. HERRMANN: Exactly, yes. Okay. If there is nobody else who wants to speak, then I'm going to go ahead and take this opportunity to make some closing remarks, and then go ahead and close the meeting.

This closes the public environmental scoping meeting for the single-use carryout bag ordinance. Your input will be transcribed, considered by City staff for use and scope of the EIR, and included as part of the official record for the document. Speakers and commentators will also be placed on the notification list for further and potential related actions related to this project.

So, please, if you haven't already signed in on this sheet, make sure that your name and either your mailing address, if you want to receive information that way, or your email address is on there so that we can contact you and provide you with notices.

I would also like to remind everyone that this is just the start of the environmental review process and opportunities for public input. There will be other opportunities to provide comment on the project such as during public review of the draft EIR and any future

public hearings.

Thank you for taking the time to participate in the meeting. It is about 6:37 and I'm going to go ahead and close the meeting now. Have a great evening.

And as I stated before, if you have questions for City staff, we'll be here for about the next 10 or 15 minutes, but none of that will be on the record.

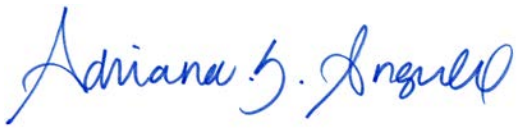
Thank you.

****

REPORTER'S CERTIFICATE

I, Adriana S. Angulo, Certified Shorthand Reporter in and for the County of San Diego, State of California, do hereby certify that the record in the foregoing matter was taken at the time and place set forth herein; that the entire proceedings were transcribed by me; and the foregoing transcript consisting of 23 pages contains a true record of the proceedings.

IN WITNESS WHEREOF, I have hereunto set my hand this 11th day of June 2015.



Adriana S. Angulo, CSR
Certificate No. 13824

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Edmund G. Brown Jr.
Governor

Ken Alex
Director

Notice of Preparation

May 13, 2015

To: Reviewing Agencies

Re: Single-Use Carryout Bag Ordinance
SCH# 2015051034

Attached for your review and comment is the Notice of Preparation (NOP) for the Single-Use Carryout Bag Ordinance draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Myra Herrmann
City of San Diego
1222 First Avenue, MS-501
San Diego, CA 92101

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2015051034
Project Title Single-Use Carryout Bag Ordinance
Lead Agency San Diego, City of

Type NOP Notice of Preparation

Description The City of San Diego is proposing to reduce the adverse environmental impacts associated with single-use plastic carryout bags, including plastic bag litter. The City proposes to adopt and implement an ordinance to regulate the use of single-use plastic carryout bags and promote the use of reusable bags within the City. The proposed ordinance would: prohibit plastic single-use carryout bags at the point of sale in retail stores and require retailers to provide reusable bags to consumers for sale or at no charge, and mandate a charge on recycled content paper single-use carryout bag and reusable carryout bags at the point of sale in retail stores.

Lead Agency Contact

Name Myra Herrmann
Agency City of San Diego
Phone (619) 446-5375 **Fax**
email
Address 1222 First Avenue, MS-501
City San Diego **State** CA **Zip** 92101

Project Location

County San Diego
City
Region
Cross Streets Citywide
Lat / Long
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways I-5, I-15, I-805, SR 22, SR 94,
Airports Lindbergh Field, Miramar,Montgom
Railways San Diego Trolley, AT&SF
Waterways Pacific Ocean, San Diego Bay, Mission Bay, San Diego River, Lake Murray, San Vincente Reservoir,
Schools Multiple
Land Use

Project Issues Air Quality; Drainage/Absorption; Forest Land/Fire Hazard; Minerals; Solid Waste; Toxic/Hazardous; Water Quality; Growth Inducing; Cumulative Effects; Public Services

Reviewing Agencies Resources Agency; Department of Parks and Recreation; Resources, Recycling and Recovery; Department of Fish and Wildlife, Region 5; Native American Heritage Commission; Caltrans, District 11; Air Resources Board; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 9

Date Received 05/13/2015 **Start of Review** 05/13/2015 **End of Review** 06/11/2015

Note: Blanks in data fields result from insufficient information provided by lead agency.

SURFRIDER FOUNDATION
SAN DIEGO COUNTY CHAPTER

Surfrider Foundation San Diego County Chapter
9883 Pacific Heights Blvd, Suite D
San Diego, CA 92121
Phone: (858) 622-9661 Fax: (858) 622-9961

June 3, 2015

Myra Hermmann
Environmental Planner
City of San Diego Planning Department
1222 First Avenue, MS 501
San Diego, CA 92101

Re: Single-Use Carryout Bag Ordinance/347344

Dear Myra Hermmann,

On behalf of Surfrider Foundation San Diego County Chapter, we submit this letter to reiterate our support for this project and the perspective that this is environment-serving legislation. The Surfrider Foundation is an organization representing 250,000 surfer and beach-goers worldwide that value the protection and enjoyment of oceans, waves and beaches. Our Rise Above Plastic's Program aims to reduce the impact of plastic in the marine environment by raising awareness about the dangers of plastic pollution and by advocating for a reduction of single-use plastics and the recycling of all plastics. We appreciate staff's time and commitment to this issue. Initially, we also have a number of comments and requests.

Based on our reading of the stores subject to the ordinance, on page 2 of 11, #3, large home improvement and department stores would be excluded from the ordinance. If so, we respectfully disagree with the comment, on page 10 of 11, located in "XI Alternatives, #2, Apply The Carry Out Bag Reduction Ordinance to All Vendors" that the current draft ordinance selects "the retail establishments responsible for the majority of single-use bags." High volume stores such as Home Depot or Lowes distribute a considerable amount of single-use bags.

On page 2 of 11, #3c, does the word "and" at the end of the sentence mean if they remove one of those grocery items (let's say bread), then they are excluded from the ordinance? It would seem that an "or" would remove the possibility of a store simply removing one of those items from their store and then not have to comply.

We request a full analysis of the Project Alternative, "Apply The Carry Out Bag Reduction Ordinance to All Vendors" in the EIR. We believe that this is the environmentally superior alternative.

We notice that there is not a Project Alternative that analyzes a "ban on plastic, no fee on paper" alternative. In order to demonstrate why the fee is critical to the success of the legislation, we believe it is appropriate to analyze this option in order to show its inadequacy. It would be good to have this analysis in the report.

We are encouraged that on page 11 of 11 the City plans to monitor and report on the efficacy of the project. We encourage monitoring and reporting to be a requirement. As a demonstration of why it's critical to the ordinance's success and how it has been conducted in the past, below are a sample of results regarding the efficacy of bag bans in other jurisdictions:

- In San Jose, Calif., which prohibits single use shopping bags, except for recycled paper bags at a 10-cent fee, the city experienced a downward trend in the presence of single-use plastic bags in the street (by 59 percent), storm drain (by 89

Surfrider Foundation San Diego County Chapter
9883 Pacific Heights Blvd, Suite D
San Diego, CA 92121
Phone: (858) 622-9661 Fax: (858) 622-9961

percent), and creek litter (by 60 percent), and an upward trend in the use of reusable bags (from 4 percent to 62 percent). (See http://www.cawrecycles.org/files/SanJose_updatememo_Nov2012.pdf).

- In the nation's capital, Washington D.C., a 5-cent fee on single-use bags resulted in the reduction from 270 million bags to 55 million bags within the first year, and 50 percent fewer bags were found in an annual local river cleanup.

- Los Angeles County found a 95% reduction of all single-use bags with a 30% reduction of single-use paper bags. (See http://dpw.lacounty.gov/epd/aboutthebag/ and http://ladpw.org/epd/aboutthebag/PDF/Bag%20Ban%20Status%20Nov%202012.pdf

- Alameda County's bag ban resulted in 85% fewer bag purchases overall, and twice as many customers are bringing their own bag after the ordinance was enacted or are not using a bag at all. (See http://www.stopwaste.org/about/news/successful-results-bag-ordinance).

- In San Francisco, the first city to ban single-use plastic bags, there was an 18% decrease in street litter found from 2007-2009 after the ordinance was enacted. (See Table ES-5 here: http://www.cawrecycles.org/files/SF2009LitterReportFINAL-Sep15-09.pdf).

- San Mateo County reports its reusable bag ordinance resulted in 162% more people bringing their own reusable bags and 130% more people carrying out items without a bag. (See http://www.cawrecycles.org/files/San%20Mateo%20County%20Bag%20Report%202014.pdf).

Again, we want to thank city staff's time and commitment to this issue. Our organization sees first-hand the impact of plastic pollution in San Diego County. In 2014, 7,013 volunteers removed 207,804 items of trash from our beaches. Eighty-one percent of the debris collected was plastic. A plastic bag ban is an easy place to start with a plastic source reduction, since there's a superior alternative in using reusable bags. Taking this step to proactively protect our environment will work to protect our San Diego ocean and beaches, marine wildlife, reduce litter and save taxpayers money.

Best Regards,

Roger Kube

Roger Kube
Advisory Committee

Michael Torti
Policy Manager
Rise Above Plastics

The Surfrider Foundation is a grassroots nonprofit environmental organization dedicated to the protection and enjoyment of the world's oceans, waves and beaches through a powerful activist network. Founded in 1984 by a handful of visionary surfers in Malibu, California, the Surfrider Foundation now maintains over 250,000 supporters, activists and members worldwide. For an overview of the Surfrider Foundation San Diego County Chapter's current programs and initiatives visit www.surfridersd.org or contact info@surfridersd.org or (858) 622-9661.

RINCON BAND OF LUISEÑO INDIANS

Culture Committee

1 W. Tribal Road · Valley Center, California 92082 ·
(760) 297-2621 or·(760) 297-2622 & Fax:(760) 749-8901

May 18, 2015

Myra Herrmann
Environmental Planner
City of San Diego
Planning Department
1222 First Avenue, MS 501
San Diego, CA 92101

Re: Single-Use Carryout Bag Ordinance Project No. 347344

Dear Ms. Herrmann:

This letter is written on behalf of the Rincon Band of Luiseño Indians. Thank you for inviting us to submit comments on the Single-Use Carryout Bag Ordinance Project No. 347344. Rincon is submitting these comments concerning your projects potential impact on Luiseño cultural resources.

The Rincon Band has concerns for the impacts to historic and cultural resources and the finding of items of significant cultural value that could be disturbed or destroyed and are considered culturally significant to the Luiseño people. This is to inform you, your identified location is not within the Luiseño Aboriginal Territory. We recommend that you locate a tribe within the project area to receive direction on how to handle any inadvertent findings according to their customs and traditions.

If you would like information on tribes within your project area, please contact the Native American Heritage Commission and they will assist with a referral.

Thank you for the opportunity to protect and preserve our cultural assets.

Sincerely,

Rose Duro
Chairman
Rincon Culture Committee

June 1, 2015

Myra Herrmann
Environmental Planner
City of San Diego Planning Department
1222 First Ave., MS 501
San Diego, CA 92101

RE: Single-Use Carryout Bag Ordinance/347344

Dear Ms. Herrmann:

On behalf of the California Grocers Association, I write to encourage the City of San Diego to consider regulating the use of single-use carryout bags by using a ban/charge model that has proven successful in over 100 jurisdictions in California. Grocery industry experience has shown that this type of carryout bag ordinance maximizes environmental gain and minimizes impacts to businesses.

The California Grocers Association is a non-profit, statewide trade association representing the food industry since 1898. CGA represents approximately 500 retail member companies operating over 6,000 food stores in California and Nevada, and approximately 300 grocery supplier companies. Retail membership includes chain and independent supermarkets, convenience stores and mass merchandisers. CGA members include numerous grocery companies operating throughout Burbank.

The model of banning single-use plastic bags and allowing recyclable paper bags for a charge has shown to encourage reusable bag use, provide consumers no-cost and low-cost carryout options, and minimize operational and financial impacts to retailers. Over 110 California jurisdictions have passed this type of ordinance successfully including Long Beach, Huntington Beach and the City and County of Los Angeles.

By banning single-use plastic bags and placing a charge on single-use paper bags consumers are encouraged to use reusable bags while still retaining a choice at checkout. Since passing a similar ordinance in 2010, Los Angeles County has seen all single-use bag consumption reduced by more than 90 percent. They also found that consumers quickly adapted and businesses felt minimal impact.

Experience has shown after implementation of an ordinance which bans single-use plastic bags and places a charge on single-use paper bags few consumers choose to pay for a single-use paper bag. Grocery industry experience shows the use of reusable bags or no bag at all by consumers increases from less than 15% before ordinance implementation to over 75% immediately after implementation. Within the first year the rate of reusable bag use by consumers rises above 90%.

In jurisdictions which chose to partially regulate carryout bags by only banning single-use plastic bags grocers have experienced dramatic cost increases. Without regulating all single-use carryout bags consumers are not encouraged to use reusable bags and instead simply switch from one type of single-use bag to another single-use bag which provides no environmental benefit and increases operational costs for retailers.

It is important to recognize the significant price differential between plastic bags ($0.01) and paper bags ($0.06 to over $0.012). When San Francisco chose to only regulate single-use plastic bags consumers switched to using single-use paper bags. This consumer reaction cost an average San Francisco grocery store $80,000 dollars per store per year.

As an industry which averages a 1% profit margin an unnecessary regulatory cost increase in the tens of thousands of dollars can determine the success of a store. It is important to note that the City of San Francisco, along with other jurisdictions, have amended their original ordinances which only banned single-use plastic bags to now include a charge on single-use paper bags.

We believe it is critical neighboring jurisdictions adopt similar carryout bag ordinances in order avoid a patchwork of regulation. Industry experience has shown inconsistent regulation confuses consumers and creates competitive disadvantages for retailers operating near neighboring jurisdictions, as well as for retailers with multiple store locations in different jurisdictions.

Again, we applaud the city council in San Diego for considering this important issue and we urge you to move forward with the recommended ban/charge approach to regulate carryout bags. Thank you for your consideration and please consider CGA a partner as you encourage reusable bag use.

Sincerely,

LAURA PERALTA
Director, Local Government Relations

cc: Mayor Kevin Faulconer, City of San Diego
Council President Sherri Lightner, City of San Diego
Council President Pro Tem Marti Emerald, City of San Diego
Councilmember David Alvarez, City of San Diego
Councilmember Chris Cate, City of San Diego
Councilmember Myrtle Cole, City of San Diego
Councilmember Todd Gloria, City of San Diego
Councilmember Mark Kersey, City of San Diego
Councilmember Scott Sherman, City of San Diego
Councilmember Lorie Zapf, City of San Diego

SAVE THE PLASTIC BAG COALITION

11693 San Vicente Blvd. #150
Los Angeles, CA 94133
Phone: (310) 266-6662
E-mail: savetheplasticbag@earthlink.net
Website: www.savetheplasticbag.com

June 11, 2015

Myra Herrmann
Environmental Planner
City of San Diego Planning Department
1222 First Avenue, MS 501
San Diego, CA 92101

VIA E-MAIL
DSDEAS@sandiego.gov

RE: Single-Use Carryout Bag Ordinance / 347344
Comments on and objections to NOP and scoping letter

Dear Ms. Herrmann:

Save The Plastic Bag Coalition is a plastic bag industry association with a mission of ensuring that the true environmental impacts of plastic bag bans are known and understood by decision makers and the public before carryout ordinances are adopted. We are concerned about exaggerations and misinformation by environmental campaigners regarding the environmental impacts of plastic bags and the minimizing of the environmental impacts of paper bags and reusable bags.

The "Scope of Work" dated May 13, 2015 is too limited and fails to include significant points, including but not limited to increased water usage. (Water usage is not the same as water quality.) Therefore, pursuant to CEQA we object to the Scope of Work on the following grounds.

1. SUBSTANTIAL EVIDENCE REGARDING THE EFFECTIVENESS OF THE 10-CENT FEE BASED ON PRE-ORDINANCE DATA MUST BE THE BASIS FOR THE EIR

Based on *substantial evidence*, the EIR must address whether the 10-cent fee is working in other jurisdictions such Los Angeles (LA) County to reduce paper bag usage. LA County claims that it achieved a huge reduction in paper bag usage with its 10-cent fee. STPB filed a Public Records Act request demanding proof. (Exhibit STPB 1.) In response, LA County stated: "We failed to find any existing records that satisfy your request for records showing how the figures were calculated." (Exhibit STPB 2. See also STPB 3 and 4.) LA County has no *pre-ordinance* figures for paper bag usage.

The only survey of *pre-ordinance* and post-ordinance paper bag usage was done by Santa Monica High School *based on 50,400 observed transactions*. (Exhibit STPB 5.) It is the *only* source of substantial evidence available to the City of San Diego for determining the effectiveness of the 10-cent fee. It contains the following charts.

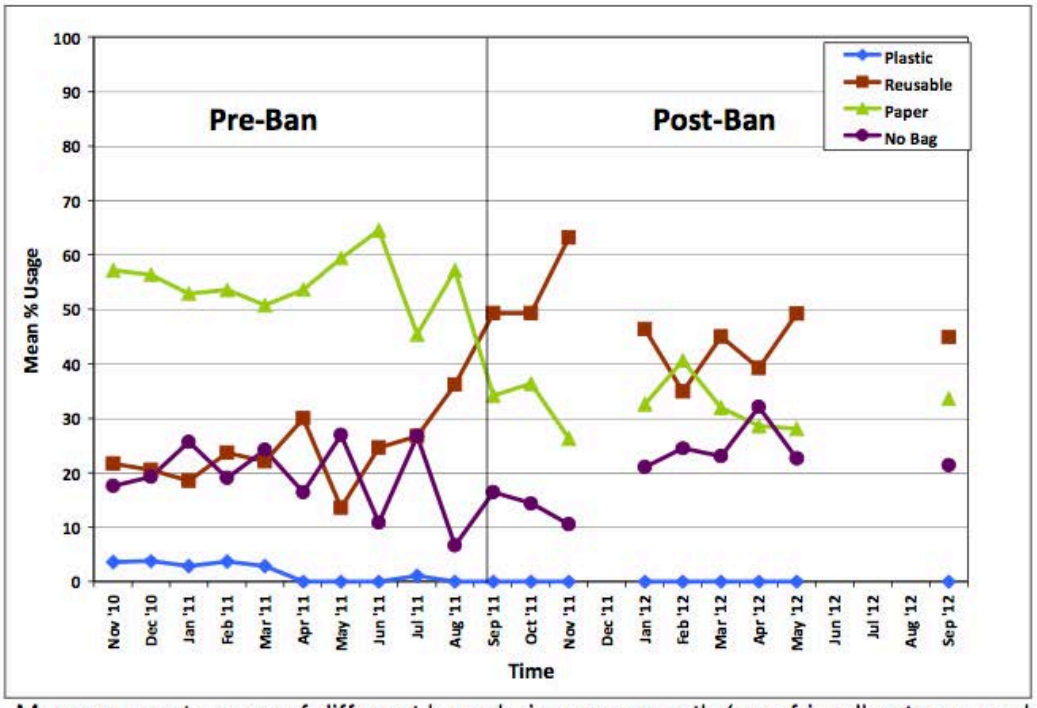


Figure 3. Mean percent usage of different bag choices per month (eco-friendly stores pooled) before and after the plastic bag ban. Gaps represent months no data were collected (see Table 1 below).

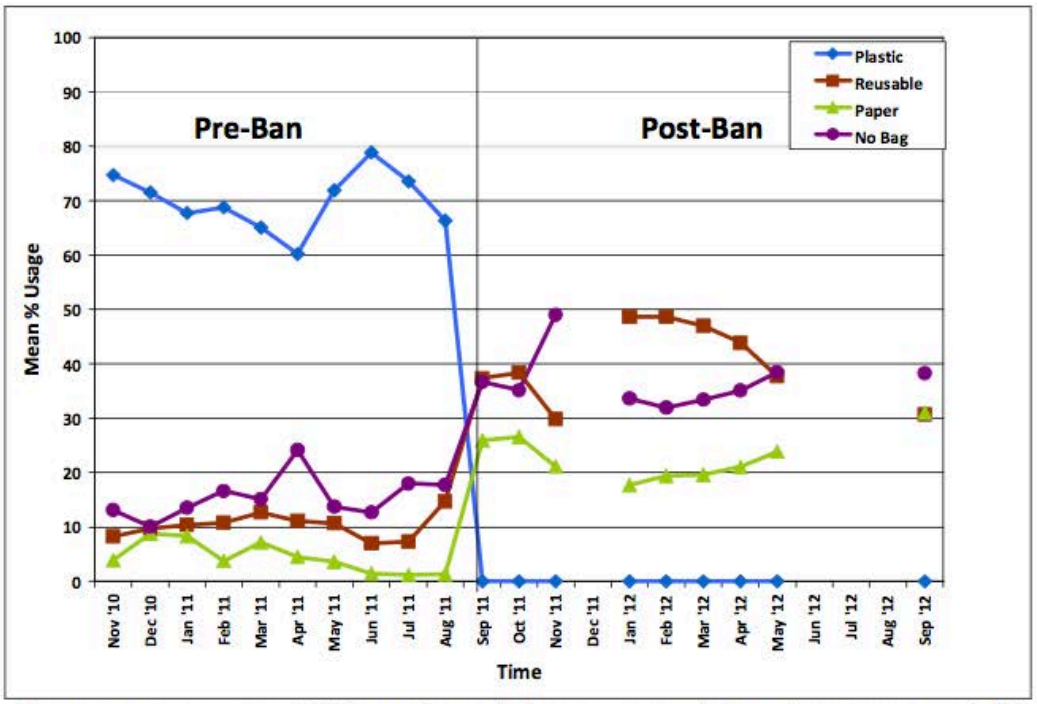


Figure 4. Mean percent usage of different bag choices per month (regular stores pooled) before and after the plastic bag ban. Gaps represent months no data were collected (see Table 1 below).

Figure 3 shows a timeline for Whole Foods and Trader Joe's, which are described in the report as "eco-friendly" stores.

Figure 4 shows a timeline for Albertsons, Vons, and Ralphs, which are described in the report as "regular" stores. Customers at these stores are more representative of the general public and include less affluent customers. There are far more regular-type stores in the City of Los Angeles than eco-friendly stores. Eco-friendly stores would be a tiny percentage of the stores that would be covered by the proposed City of San Diego ordinance.

With respect to "regular" stores, figure 4 is substantial evidence that:

- Paper bag usage was between 0 and 10% of market share before the Santa Monica ordinance took effect. At times it was very close to zero percent.

- **When the ban took effect in September 2011, paper bag usage increased dramatically to about 27%. It then dropped and rose again to about a 30% increase by September 2012.**

- The paper bag trend line shows that paper bag usage is increasing.

- When the ban took effect in September 2011, reusable bag usage increased dramatically to about 49%. It then dropped to 30% by September 2012.

- The reusable bag trend line shows that reusable bag usage is decreasing.

The authors of the Santa Monica High School survey stated as follows in their report:

> The upward drift in paper bag use at regular stores in 2012 warrants further investigation. Specifically, it would be of interest to ensure grocery stores, one year after the ban, are following the law; are they continuing to disincentivize paper bag use by charging 10 cents per paper bag? Other variables could be contributing as well, including patron apathy, regulars stores undercharging for the number of paper bags used, and stores prematurely removing strategic parking lot and store signage reminding customers to bring in their reusable bags. A study comparing the number of paper bag sold to the volume purchased should establish if any undercharging is occurring, and ultimately, whether regular stores are obeying the law. If undercharging is not occurring, a steeper fee of more than 10 cents may need to be considered.

The Santa Monica High School survey that when a plastic bag ordinance takes effect, consumers are initially very responsive. However, over the course of time, the responsiveness diminishes.

The Santa Monica High School Survey, which shows that paper bag usage increased at regular stores from about 1% in the month before the Santa Monica ordinance took effect to about 30% one year after the ordinance took effect, contradicts the LA County assertion that paper bag usage decreased dramatically after the County ordinance took effect. The Santa Monica High School survey is based on actual pre-ordinance surveys and constitutes substantial evidence.

There are very few stores in Santa Monica with a large number of WIC and Supplemental Food Program customers. Santa Monica is an affluent city. In the City San Diego, the number of WIC and Supplemental Food Program is far higher than Santa Monica. Therefore, the increase in paper bag usage in San Diego would be significantly higher than in Santa Monica. We contend that in the City of San Diego paper bag usage will be over 50% all post-ordinance instead of the 30% that Santa Monica has experienced.

There is no substantial evidence for taking a position that customers will buy less paper bags at regular-type stores in the City of San Diego than they do at such stores in the City of Santa Monica.

We demand that the City of San Diego discuss the Santa Monica High School survey in the EIR and address its findings (including but not limited to figure 3) as they relate to the proposed ordinance in the City of San Diego, without biased selectivity or factual cherry-picking and in a totally non-misleading way.

2. THE BASELINE NUMBER OF BAGS USED IN THE CITY MUST BE PROPERLY ESTIMATED AS IT IS THE MOST IMPORTANT BASELINE METRIC

At the scoping meeting on June 3, 2015, the City's PowerPoint presentation stated that "at least 500 million bags" are distributed in the City each year. Exhibit STPB 16 second slide.) The city did not provide a breakdown of that figure or any source or basis for it. The number of bags used and a breakdown (plastic, paper, reusable) are essential for the preparation of an accurate EIR. All the metrics in the EIR will be affected by that figure. The EIR must provide cite substantial evidence supporting the figure.

3. THE LACK OF A PROPOSED REPORTING REQUIREMENT MUST BE ADDRESSED AND STUDIED IN THE EIR

Page 2 of the Scope of Work states that the proposed ordinance will not require regular reporting, although the City may request data.

Other California cities that have adopted plastic bag bans do require regular reporting. For example, Section 12.85.040 of the Los Angeles County carryout bag ordinance (Exhibit STPB 6) states:

> E. All stores must report to the Director of Public Works, on a quarterly basis, the total number of recyclable paper carryout bags provided, the total amount of monies collected for providing recyclable paper carryout bags, and a summary of any efforts a store has undertaken to promote the use of reusable bags by customers in the prior quarter. Such reporting must be done on a form prescribed by the Director of Public Works, and must be signed by a responsible agent or officer of the store confirming that the information provided on the form is accurate and complete. For the periods from January 1 through March 31, April 1 through June 30, July 1 through September 30, and October 1 through December 31, all quarterly reporting must be submitted no later than 30 days after the end of each quarter.
>
> F. If the reporting required in Subsection E is not timely submitted by a store, such store shall be subject to the fines set forth in Section 12.85.080.

Without reporting, the City of San Diego will have no way of knowing whether the 10-cent fee is actually reducing paper bag usage, whether stores are encouraging reusable bag usage, and how they are spending the 10-cent fee. Paper bag usage could double or triple compared to the period prior to the ordinance and the City of San Diego would not be aware of it. If the City were aware of it through reporting, it could take action including increasing the fee.

The decision not to require reporting may have a significant negative environmental impact. This must be addressed in the EIR.

4. PLASTIC CARRYOUT BAGS ARE NOT "SINGLE-USE" AS THEY ARE FREQUENTLY REUSED; IF THEY ARE BANNED, REPLACEMENTS FOR THE REUSES MUST BE FOUND; THIS MUST BE ADDRESSED AND STUDIED IN THE EIR

Plastic carryout bags are frequently reused as bin liners and for multiple other purposes. This must be addressed and studied in the EIR. We object to the use of the term "single-use" as this indicates that they are not reused, which is simply untrue.

If plastic carryout bags are not available for such reuse purpose, they must be replaced. The need for replacements must be addressed and studied in the EIR.

5. THE IMPACT OF TOURISM ON PAPER BAG USAGE MUST BE ADDRESSED AND STUDIED IN THE EIR

San Diego is a tourist town. This is a critically important factor. In 2013, there were 33.1 million visitors to San Diego, including 16.4 million overnight visitors. They spent $8.9 billion. (Exhibit STPB 7.) There was a 24% increase in 2014. (Exhibit STPB 12.)

Most visitors will use paper bags if plastic bags are banned, even if a there is a paper bag fee. Tourists will not arrive in San Diego with reusable bags and they will not buy and carry around a reusable bag if they are in the city here for a short time. Therefore, there will be a huge upsurge in paper bag usage. This must be addressed and studied in the EIR.

6. THE IMPACT OF THE PAPER BAG FEE EXEMPTIONS MUST BE ADDRESSED AND STUDIED IN THE EIR

The NOP states that the ordinance will not regulate participants in the WIC and Supplemental Food Programs. A paper bag exemption for such customers means a huge increase in paper bag usage at stores in less affluent areas.

The California Independent Grocers Association ("CIGA") objected to the City of Los Angeles ordinance and pointed out that at some stores in South Los Angeles, 80% to 90% of customers are on food stamps or WIC." (Exhibit STPB 8.)[1]

The City of San Diego has less affluent areas too. The environmental impact of the proposed fee exemption in the City of San Diego must be must be addressed and studied in the EIR. The City must attempt to quantify pre-ordinance carryout bag usage at stores in less affluent areas and project what will happen when plastic bags are banned and paper bags are provided free to WIC and Supplemental Food Program customers at those stores.

7. PAPER BAGS WILL BE MORE THAN 50% OF TOTAL POST-BAN BAG USAGE, RESULTING IN 415 MILLION MORE PAPER BAGS

The Equinox Analysis contends that if the ordinance is adopted, paper bag usage would increase to 16%. We contend that figure is wrong and hugely understates post-ban

[1] CIGA stated in its objections: "If the County and the City of LA wish to ban plastic bags and require that stores provide food stamp and WIC customers with free paper bags that cost about five times more than plastic bags, then the County and the City of LA should bear the cost of providing those costly paper bags to such customers. Storeowners should not be required to bear this cost, just because they are serving parts of LA with high levels of economically challenged customers. Storeowners (including many independent small family-owned businesses) are being penalized for serving low-income communities. How many bags are Whole Foods and other high-end stores in Santa Monica, Malibu, Brentwood, or West Hollywood forced to give away each month to food stamp and WIC customers without governmental compensation? Probably none. The free bag requirement discriminates against stores in economically challenged areas. The federal government has launched a drive to get more people into the food stamp program. As a result, the number of food stamp recipients increased from 33 million in 2009 to 46.6 million in 2012, a 41% increase. This heavily impacts stores that must give away paper bags free of charge to food stamp and WIC customers without government compensation…. Members of the LA Board of Supervisors and the LA City Council would protest loudly and file lawsuits if each of them, as individuals, was required to purchase 100,000 paper bags at a cost of $10,000 from their own pockets and give them to economically challenged members of the public, without government compensation. They have no right to expect owners of stores in economically challenged areas to act any differently." STPB notes that this constitutes an unconstitutional taking that is very likely to be litigated at some point.

paper bag usage. It is inconsistent with the Santa Monica survey (30%) and does not take into account the WIC and Supplemental Food Stamp fee exemptions, tourism, and the lack of a reporting requirement. We contend that paper bag usage in the City of San Diego would increase to more than 50% of all bags distributed by stores post-ordinance when these factors are taken into account.

8. THE IMPACT OF INCREASED WATER USAGE MUST BE ADDRESSED AND STUDIED IN THE EIR

California is experiencing a major drought and water shortage. On April 25, 2014, the Governor proclaimed a Continued State of Emergency to exist throughout the State of California due to the continuing drought. On April 1, 2015, the Governor issued Executive Order B-29-15 to address the problem. (Exhibit STPB 9.)

The Executive Order states that State Water Resources Control Board (Water Board) shall impose restrictions to achieve a statewide 25% reduction in potable urban water usage through February 28, 2016. These restrictions will require water suppliers to California's cities and towns to reduce usage as compared to the amount used in 2013. These restrictions should consider the relative per capita water usage of each water suppliers' service area, and require that those areas with high per capita use achieve proportionally greater reductions than those with low use. The restrictions may be continued after March 1, 2016.

The City of San Diego has implemented Mandatory Water Use Restrictions. See: http://www.sandiego.gov/water/conservation/drought/prohibitions.shtml

On May 5, 2015, the California State Water Resources Control Board ("Water Board") adopted an emergency regulation requiring an immediate reduction on overall potable urban water use statewide in accordance with the Governor's April 1, 2015 Executive Order. See:

http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/emergency_regulation.shtml

In Oregon and the State of Washington, they are experiencing a "wet-drought." In the 2014-15 winter, high temperatures that marked the warmest winter on record for the State of Washington and the second warmest for Oregon. This meant that much of the precipitation fell as rain, and not snow. Like California, parts of both these states depend on melting snowfall to fill their reservoirs, leaving them with potential shortages this year. Elevated temperatures also meant that what snow there was melted much earlier than normal.

Three-fourths of snow survey sites in Oregon had record-low snow measurements as of April 1, 2015, and fewer than half of them had any snow on the ground, according to a report by the Natural Resources Conservation Service. The snowpack across much of the Cascades Range in Washington was less than 25 percent, while the Olympic Mountains checked in at only 3 percent on April 1, 2015, an "unbelievably low" amount according to Karin Bumbaco, assistant state climatologist in Washington. (Exhibit STPB 10.)

The following is a list of paper mills in Oregon and the State of Washington.

Boise Paper:

- St. Helens Paper Mill, St. Helens, Oregon
- Wallula Paper Mill, Wallula, Washington

Georgia-Pacific:

- Camas Paper Mill, Camas, Washington
- Toledo Mill, Toledo, Oregon

- Plum Creek Timber, Seattle, Washington

- Weyerhaeuser, Federal Way, Washington

See: http://en.wikipedia.org/wiki/List_of_paper_mills#United_States.

Paper bag production requires vast quantities of water, especially when recycled paper is used as it must be washed with water.

When consumers wash reusable bags requires large amounts of water, they must be washed with water, which is all local usage in the City of San Diego.

Equinox concluded as follows regarding the environmental impact of a plastic bag ban combined with a 10-cent paper bag fee: (Exhibit STPB 11 at page 4)

Water Consumption: 30 million gallon increase

The Equinox Analysis reported that the manufacture of a "single-use" plastic bags requires only 3.8% of the water required for a paper bag. (Page 16.)

The Boustead report which is peer reviewed, states as follows: (Exhibit STPB 13 at p. 59)

> **The standard polyethylene plastic bag uses significantly less water, compared with the paper or compostable grocery bag systems. Paper grocery bags use approximately 1 gallon of water for every bag, compared with the plastic bag system, which uses only .008 gallons per bag or 1 gallon for every 116 bags.**

We contend that the increase in water consumption which will be far higher than 30 million gallons per year when the WIC and Supplemental Food Program exemptions, the impact of tourism, and the lack of a reporting requirement are taken into account. *Equinox took none of those factors into account in its Analysis.*

As we have stated, paper bag usage will increase from the present 3% to 50% of all bag use. That means a huge increase in gallons of water consumed.

The EIR must address the increased water usage that will result from the proposed ordinance. The fact that some of the increased water usage will occur outside of the City of San Diego and outside California is irrelevant. Out-of-town and out-of-state environmental impacts must be addressed in an EIR. In *Save The Plastic Bag Coalition v. City of Manhattan Beach*, 52 Cal.4th 155, 173 (2011), the California Supreme Court stated:

> The other environmental impacts reflected in the record are those that might be felt beyond Manhattan Beach, as a result of processes associated with the manufacture, distribution, and recycling of paper bags in general. We have noted that the area defined by section 21060.5, that is, the area that will be affected by a proposed project, may be greater than the area encompassed by the project itself. "`[T]he project area does not define the relevant environment for purposes of CEQA when a project's environmental effects will be felt outside the project area.' [Citation.] Indeed, `the purpose of CEQA would be undermined if the appropriate governmental agencies went forward without an awareness of the effects a project will have on areas outside of the boundaries of the project area.' [Citation.]" (*Muzzy Ranch Co. v. Solano County Airport Land Use Com., supra,* 41 Cal.4th at p. 387.)

The EIR is intended to inform the public in a way that ordinary citizens can easily understand. Therefore, the additional water consumption must be described in terms of equivalents such as:

- The complete water needs of x number of persons per year. (Average per capita consumption in the City of San Diego is 150 gallons per day. (Exhibit STPB 14).
- x bathtubs
- x dishwasher cycles
- x washer cycles
- x toilet flushes

(See Exhibit STPB 15.)

In addition, the legal impacts of adopting an ordinance that will result in increased water usage must be addressed and studied in the EIR. The proposed ordinance is inconsistent with the policy goal of conserving water in the Governor's Executive Order and the Water Board's Emergency Regulation of May 5, 2015.

This is not the time to be increasing water usage in the City of San Diego, California, Oregon, or in the State of Washington. It is critically important and we demand that the EIR honestly, comprehensively, and clearly disclose the water usage

impacts of the proposed ordinance to the City Council and the citizens of San Diego.

As the Court of Appeal stated in *People v. County of Kern* (1974) 39 Cal.App.3d 830, 842:

> Only by requiring [an agency] to fully comply with the letter of the law can a subversion of the important public purposes of CEQA be avoided, and only by this process will the public be able to determine the environmental and economic values of their elected and appointed officials, thus allowing for appropriate action come election day should a majority of the voters disagree.

CONCLUSION

The scope of the EIR must be expanded as stated herein. We must point out that it is not our role or responsibility to research the environmental impacts of the points that we have raised. It is the City's role and responsibility. In *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 311, the court stated:

> While a fair argument of environmental impact must be based on substantial evidence, mechanical application of this rule would defeat the purpose of CEQA where the local agency has failed to undertake an adequate initial study. The agency should not be allowed to hide behind its own failure to gather relevant data.… CEQA places the burden of environmental investigation on government rather than the public. If the local agency has failed to study an area of possible environmental impact, a fair argument may be based on the limited facts in the record. Deficiencies in the record may actually enlarge the scope of fair argument by lending a logical plausibility to a wider range of inferences.

Sincerely.

Stephen L. Joseph
Counsel

SAVE THE PLASTIC BAG COALITION

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Phone: (415) 577-6660
Fax: (415) 869-5380
E-mail: savetheplasticbag@earthlink.net
Website: www.savetheplasticbag.com

April 18, 2012

Suk Chong
LA County DPW
900 S. Fremont Avenue
Alhambra, CA 91803

VIA E-MAIL AND REGULAR MAIL
schong@dpw.co.la.ca.us

PUBLIC RECORDS ACT REQUEST

Dear Mr. Chong:

On April 4, 2012, Coby Skye of LA County DPW told the City of Los Angeles Energy and Environment Committee that unincorporated LA County had experienced a 24% reduction in paper bag usage and a 94% drop in all carryout bag usage since the LA County carryout bag ordinance took effect with its 10-cent paper bag fee.

On April 5, 2012, Cathy Browne of Los Angeles-based plastic bag manufacturer Crown Poly asked Mr. Skye to provide the basis for those figures. You responded by e-mail as follows:

> ***The table below shows the data behind the 94% drop (actual 2009 single-use plastic and paper bags usage vs extrapolated 2011 paper bag usage based on two quarters of store data):***

	Total bags per store per year (average)
Single use plastic bags 2009	***2,153,354 plastic bags***
Single use paper bags 2009 *	***191,426 paper bags***
Total single use bags used in 2009	***2,344,781 bags***
Single use paper bags 2011 (extrapolated from last 6 months of 2011)	***145,251 paper bags***
Percent change in overall single use bag usage	***- 93.81%***
Percent change in single use paper bag usage	***- 24.12%***

> **** Percent of paper bags was estimated from data collected in EIR***

> ***2009 is the last year for which we received data from the stores.***

DOCUMENT REQUESTS

Pursuant to the California Public Records Act (Government Code §6250 to §6276.48), we hereby request and demand copies of the following documents, reports, and records.

A. The 2009 plastic bag figure:

According the EIR, which was completed in 2010, LA County was unable to determine any reliable figures for plastic bag usage. (EIR page 3.1-15.) Now you have come up with a figure of 2,153,354 from an unidentified source.

Please provide copies of all documents, reports, and records containing the sources and bases of the 2,153,354 figure and how it was calculated.

B. The 2009 "estimated" paper bag figure:

In 2009, stores were ***not*** required to report paper bag usage to the CIWMB or LA County. LA County has no data on paper bags usage in 2009. Therefore, you state: "Percent of paper bags was estimated from data collected in EIR."

We have reviewed the EIR and can find no estimate for paper bag usage in 2009 or any other year. The figure 191,426 is not in the EIR.

Please provide copies of all documents, reports, and records containing the sources and bases of the 191,426 figure and how it was calculated, including any relevant pages from the EIR.

C. The 2011 paper bag figure:

Please provide copies of all documents, reports, and records containing the sources and bases of the 145,251 figure and how it was calculated.

REQUEST FOR ASSISTANCE

Pursuant to §6253.1 of the Public Records Act, LA DPW is required to assist us in making a "make a focused and effective request that reasonably describes an identifiable record or records." Therefore, in accordance with §6253.1, LA DPW is requested to assist and cooperate with us by identifying records and information that are responsive to this request.

REQUEST FOR TIMELY RESPONSE

Later this month or in early April, on a date that has yet to be announced, the Los Angeles City Council will consider the proposal to ban plastic bags and impose a 10-cent fee on paper bags, or ban both plastic and paper bags. Therefore strict compliance with the deadlines in the Public Records Act is requested and demanded in order to ensure that the documents

requested herein are provided well in advance of that date.

Sincerely,

Stephen L. Joseph
Counsel

RESPONSE TO PUBLIC RECORDS REQUEST

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE, ALHAMBRA, CA 91803

April 26, 2012

SENT BY E-MAILTO: ***savetheplasticbag@earthlink.net***

Mr. Stephen L. Joseph

RESPONSE MEMO TRANSMITTING RECORDS IN CONNECTION WITH YOUR PUBLIC RECORDS REQUEST

We have reviewed your public records request dated April 18, 2012, and we offer the following:

☒ **Enclosed are the records you have requested.**

☐ We have collected the records you requested. These records are now available for pick up from the front counter of the Survey/Mapping and Property Management Division, on the 10th floor of the County of Los Angeles Department of Public Works, Headquarters Building, at the address shown above, during normal business hours.

☒ **We failed to find any existing records that satisfy your request for records showing how the figures were calculated.**

Remarks**:** In connection with the EIR that was completed in 2010 and referred to in the letter from the Save the Plastic Bag Coalition, dated April 18, 2012, the 2009 plastic bag figure, The 2009 "estimated" paper bag figure and the 2011 paper bag figure possibly from unidentified sources, the following is requested:

- Request for copies of all documents, reports, and records containing the sources and bases of the 2,153,354 figure for plastic bag usage and how it was calculated.
- Request for copies of all documents, reports, and records containing the sources and bases for the 191,426 (paper bag) figure and how it was calculated, including any relevant pages from the EIR.

Request for copies of all documents, reports, and records containing the sources and bases of the 145,251 (2011 paper bag) figures and how it was calculated

Customer Service is very important to us. Please take a minute to complete the customer survey through the following link: http://ladpw.org/general/survey/index.cfm?pid=IiJBMCAK. For more information regarding this response, please contact:

MARY-ELIZABETH OHDE, Supervising Title Officer III
Claims & Litigation Section, Mapping & Property Management Division
Office Hours: Monday through Thursday, 7 a.m. – 5:45 p.m.
Phone: (626) 458-7091 - Fax: (626) 979-5408
Email Address: **mohde@dpw.lacounty.gov**

ATTACHMENT A

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	01/31/09	6,480.00			486,000
	02/28/09	4,620.00			346,500
	03/31/09	5,400.00			405,000
	04/30/09	7,560.00			567,000
	05/31/09	6,720.00			504,000
	06/30/09	6,480.00			486,000
	07/31/09	4,320.00			324,000
	08/31/09	8,640.00			648,000
	09/30/09	6,480.00			486,000
	10/31/09	4,320.00			324,000
	11/30/09	3,715.20			278,640
	12/31/09	7,430.40			557,280
	01/31/09	5,010.00			375,750
	02/28/09	1,260.00			94,500
	03/31/09	2,160.00			162,000
	04/30/09	3,240.00			243,000
	05/31/09	1,080.00			81,000
	06/30/09	3,240.00			243,000
	07/31/09	4,320.00			324,000
	08/31/09	2,160.00			162,000
	09/30/09	1,080.00			81,000
	10/31/09	2,160.00			162,000
	11/30/09	2,786.40			208,980
	12/31/09	3,715.20			278,640
	01/01/09		20	2,000	40,000
	01/08/09		20	2,000	40,000
	01/15/09		20	2,000	40,000
	01/22/09		16	2,000	32,000
	01/29/09		27	2,000	54,000
	02/05/09		12	2,000	24,000
	02/12/09		26	2,000	52,000
	02/19/09		16	2,000	32,000
	02/26/09		16	2,000	32,000
	03/05/09		20	2,000	40,000
	03/12/09		20	2,000	40,000
	03/19/09		16	2,000	32,000
	03/26/09		20	2,000	40,000
	04/02/09		16	2,000	32,000
	04/09/09		20	2,000	40,000
	04/16/09		16	2,000	32,000
	04/23/09		16	2,000	32,000
	04/30/09		16	2,000	32,000
	05/07/09		16	2,000	32,000
	05/14/09		16	2,000	32,000
	05/21/09		25	2,000	50,000
	05/28/09		20	2,000	40,000

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	06/04/09		16	2,000	32,000
	06/11/09		16	2,000	32,000
	06/18/09		20	2,000	40,000
	06/25/09		10	2,000	20,000
	07/02/09		16	2,000	32,000
	07/09/09		16	2,000	32,000
	07/16/09		16	2,000	32,000
	07/23/09		16	2,000	32,000
	07/30/09		10	2,000	20,000
	08/06/09		42	2,000	84,000
	08/13/09		25	2,000	50,000
	08/20/09		16	2,000	32,000
	08/27/09		16	2,000	32,000
	09/03/09		32	2,000	64,000
	09/10/09		25	2,000	50,000
	09/24/09		45	2,000	90,000
	10/15/09		35	2,000	70,000
	10/22/09		16	2,000	32,000
	10/29/09		16	2,000	32,000
	11/05/09		10	2,000	20,000
	11/12/09		10	2,000	20,000
	11/19/09		30	2,000	60,000
	12/03/09		24	2,000	48,000
	12/10/09		10	2,000	20,000
	12/17/09		30	2,000	60,000
	12/24/09		6	2,000	12,000
	12/31/09		6	2,000	12,000
	01/01/09		20	2,000	40,000
	01/08/09		15	2,000	30,000
	01/22/09		30	2,000	60,000
	02/05/09		30	2,000	60,000
	02/12/09		10	2,000	20,000
	02/19/09		10	2,000	20,000
	02/26/09		20	2,000	40,000
	03/05/09		15	2,000	30,000
	03/19/09		20	2,000	40,000
	03/26/09		15	2,000	30,000
	04/02/09		10	2,000	20,000
	04/09/09		31	2,000	62,000
	04/16/09		10	2,000	20,000
	04/23/09		20	2,000	40,000
	05/07/09		20	2,000	40,000
	05/14/09		15	2,000	30,000
	05/28/09		30	2,000	60,000
	06/04/09		15	2,000	30,000
	06/11/09		10	2,000	20,000

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	06/18/09		4	2,000	8,000
	06/25/09		18	2,000	36,000
	07/02/09		18	2,000	36,000
	07/09/09		10	2,000	20,000
	07/16/09		12	2,000	24,000
	07/23/09		10	2,000	20,000
	07/30/09		15	2,000	30,000
	08/06/09		16	2,000	32,000
	08/13/09		12	2,000	24,000
	08/20/09		13	2,000	26,000
	08/27/09		25	2,000	50,000
	09/03/09		15	2,000	30,000
	09/10/09		19	2,000	38,000
	09/17/09		10	2,000	20,000
	09/24/09		10	2,000	20,000
	10/01/09		16	2,000	32,000
	10/08/09		14	2,000	28,000
	10/15/09		14	2,000	28,000
	10/22/09		8	2,000	16,000
	10/29/09		15	2,000	30,000
	11/05/09		13	2,000	26,000
	11/12/09		18	2,000	36,000
	11/19/09		10	2,000	20,000
	11/26/09		15	2,000	30,000
	12/03/09		11	2,000	22,000
	12/10/09		5	2,000	10,000
	12/17/09		9	2,000	18,000
	12/24/09		6	2,000	12,000
	12/24/09		12	2,000	24,000
	12/31/09		6	2,000	12,000
	01/01/09		12	2,000	24,000
	01/08/09		26	2,000	52,000
	01/15/09		9	2,000	18,000
	01/22/09		28	2,000	56,000
	01/29/09		14	2,000	28,000
	02/05/09		18	2,000	36,000
	02/12/09		19	2,000	38,000
	02/19/09		30	2,000	60,000
	02/26/09		19	2,000	38,000
	03/05/09		6	2,000	12,000
	03/12/09		12	2,000	24,000
	03/19/09		20	2,000	40,000
	03/26/09		7	2,000	14,000
	04/02/09		19	2,000	38,000
	04/09/09		15	2,000	30,000
	04/16/09		14	2,000	28,000

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	06/18/09		20	2,000	40,000
	07/02/09		20	2,000	40,000
	07/09/09		15	2,000	30,000
	07/16/09		10	2,000	20,000
	07/23/09		10	2,000	20,000
	07/30/09		20	2,000	40,000
	08/06/09		10	2,000	20,000
	08/13/09		10	2,000	20,000
	08/20/09		25	2,000	50,000
	09/03/09		25	2,000	50,000
	09/17/09		61	2,000	122,000
	10/15/09		15	2,000	30,000
	11/05/09		8	2,000	16,000
	11/12/09		12	2,000	24,000
	11/19/09		13	2,000	26,000
	11/26/09		5	2,000	10,000
	12/03/09		15	2,000	30,000
	12/10/09		7	2,000	14,000
	12/17/09		12	2,000	24,000
	12/24/09		19	2,000	38,000
	12/31/09		10	2,000	20,000
	01/01/09		12	2,000	24,000
	01/08/09		14	2,000	28,000
	01/15/09		15	2,000	30,000
	01/22/09		14	2,000	28,000
	01/29/09		18	2,000	36,000
	02/05/09		12	2,000	24,000
	02/12/09		14	2,000	28,000
	02/19/09		14	2,000	28,000
	02/26/09		12	2,000	24,000
	03/05/09		15	2,000	30,000
	03/12/09		10	2,000	20,000
	03/19/09		10	2,000	20,000
	03/26/09		17	2,000	34,000
	04/02/09		15	2,000	30,000
	04/09/09		22	2,000	44,000
	04/16/09		10	2,000	20,000
	04/23/09		12	2,000	24,000
	04/30/09		22	2,000	44,000
	05/07/09		13	2,000	26,000
	05/14/09		6	2,000	12,000
	05/21/09		20	2,000	40,000
	05/28/09		19	2,000	38,000
	05/28/09		10	2,000	20,000
	06/11/09		12	2,000	24,000
	06/18/09		12	2,000	24,000

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	04/23/09		21	2,000	42,000
	04/30/09		14	2,000	28,000
	05/07/09		15	2,000	30,000
	05/14/09		23	2,000	46,000
	05/21/09		10	2,000	20,000
	05/28/09		24	2,000	48,000
	06/04/09		15	2,000	30,000
	06/11/09		8	2,000	16,000
	06/18/09		15	2,000	30,000
	06/25/09		20	2,000	40,000
	07/02/09		7	2,000	14,000
	07/09/09		32	2,000	64,000
	07/16/09		11	2,000	22,000
	07/23/09		7	2,000	14,000
	07/30/09		14	2,000	28,000
	08/06/09		12	2,000	24,000
	08/13/09		20	2,000	40,000
	08/20/09		14	2,000	28,000
	08/27/09		16	2,000	32,000
	09/03/09		17	2,000	34,000
	09/10/09		16	2,000	32,000
	09/17/09		12	2,000	24,000
	09/24/09		20	2,000	40,000
	10/01/09		17	2,000	34,000
	10/08/09		13	2,000	26,000
	10/15/09		7	2,000	14,000
	10/22/09		27	2,000	54,000
	10/29/09		10	2,000	20,000
	11/05/09		15	2,000	30,000
	11/12/09		15	2,000	30,000
	11/19/09		12	2,000	24,000
	11/26/09		20	2,000	40,000
	12/03/09		20	2,000	40,000
	12/10/09		10	2,000	20,000
	12/17/09		13	2,000	26,000
	12/24/09		5	2,000	10,000
	12/24/09		10	2,000	20,000
	12/31/09		12	2,000	24,000
	01/31/09	180.00			13,500
	02/28/09	77.00			5,775
	03/31/09	344.00			25,800
	04/30/09	179.00			13,425
	05/31/09	128.00			9,600
	06/30/09	674.00			50,550
	09/30/09	155.00			11,625
	11/30/09	154.00			11,550

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	12/31/09	357.00			26,775
	01/31/09	354.75			26,606
	02/28/09	331.50			24,863
	03/31/09	382.50			28,688
	04/30/09	655.50			49,163
	05/31/09	264.00			19,800
	06/30/09	255.00			19,125
	07/31/09	510.00			38,250
	08/31/09	309.00			23,175
	09/30/09	400.50			30,038
	10/31/09	255.00			19,125
	11/30/09	273.00			20,475
	12/31/09	427.50			32,063
	01/31/09	690.00			51,750
	02/28/09	383.00			28,725
	03/31/09	674.00			50,550
	04/30/09	548.00			41,100
	05/31/09	383.00			28,725
	06/30/09	383.00			28,725
	07/31/09	579.00			43,425
	08/31/09	843.00			63,225
	09/30/09	419.00			31,425
	10/31/09	255.00			19,125
	11/30/09	78.00			5,850
	12/31/09	537.00			40,275
	01/31/09	701.25			52,594
	02/28/09	255.00			19,125
	03/31/09	385.50			28,913
	04/30/09	586.50			43,988
	05/31/09	841.50			63,113
	06/30/09	586.50			43,988
	07/31/09	255.00			19,125
	08/31/09	306.00			22,950
	09/30/09	1,020.00			76,500
	11/30/09	510.00			38,250
	12/31/09	510.00			38,250
	01/31/09	128.00			9,600
	02/28/09	256.00			19,200
	03/31/09	344.00			25,800
	04/30/09	140.00			10,500
	05/31/09	242.00			18,150
	06/30/09	128.00			9,600
	07/31/09	309.00			23,175
	08/31/09	255.00			19,125
	09/30/09	128.00			9,600
	11/30/09	193.00			14,475

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	01/31/09	382.50			28,688
	02/28/09	216.75			16,256
	03/31/09	18.00			1,350
	04/30/09	127.50			9,563
	05/31/09	510.00			38,250
	06/30/09	255.00			19,125
	07/31/09	127.50			9,563
	08/31/09	306.00			22,950
	09/30/09	459.00			34,425
	12/31/09	382.50			28,688
	03/31/09	255.00			19,125
	04/30/09	64.00			4,800
	05/31/09	244.00			18,300
	06/30/09	392.00			29,400
	08/31/09	64.00			4,800
	09/30/09	128.00			9,600
	10/31/09	128.00			9,600
	12/31/09	281.00			21,075
	01/31/09	191.25			14,344
	02/28/09	191.25			14,344
	03/31/09	318.75			23,906
	04/30/09	382.50			28,688
	05/31/09	255.00			19,125
	06/30/09	318.75			23,906
	07/31/09	318.75			23,906
	08/31/09	318.75			23,906
	09/30/09	436.50			32,738
	10/31/09	127.50			9,563
	11/30/09	255.00			19,125
	12/31/09	446.25			33,469
	12/31/09	57,000.00			4,275,000
	12/31/09	43,000.00			3,225,000
	12/31/09	52,000.00			3,900,000
	12/31/09	61,000.00			4,575,000
	12/31/09	64,000.00			4,800,000
	12/31/09	49,000.00			3,675,000
	12/31/09	41,000.00			3,075,000
	12/31/09	53,000.00			3,975,000
	12/31/09	4,756.90			356,768
	12/31/09	3,272.60			245,445
	12/31/09	2,385.65			178,924
	12/31/09	2,202.40			165,180
	12/31/09	3,783.10			283,733
	12/31/09	1,469.70			110,228
	12/31/09	2,775.75			208,181
	12/31/09	2,216.65			166,249

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	01/31/09	3,168.00			237,600
	02/28/09	2,376.00			178,200
	03/31/09	1,584.00			118,800
	04/30/09	1,584.00			118,800
	05/31/09	2,376.00			178,200
	06/30/09	1,584.00			118,800
	07/31/09	3,168.00			237,600
	08/31/09	2,376.00			178,200
	09/30/09	2,376.00			178,200
	10/31/09	3,168.00			237,600
	11/30/09	2,376.00			178,200
	12/31/09	2,376.00			178,200
	01/31/09	1,584.00			118,800
	02/28/09	1,584.00			118,800
	03/31/09	1,584.00			118,800
	04/30/09	2,376.00			178,200
	05/31/09	1,584.00			118,800
	06/30/09	1,584.00			118,800
	07/31/09	1,584.00			118,800
	08/31/09	792.00			59,400
	09/30/09	1,584.00			118,800
	10/31/09	1,584.00			118,800
	11/30/09	1,584.00			118,800
	12/31/09	792.00			59,400
	01/31/09				1,008,000
	02/28/09				1,008,000
	03/31/09				1,225,000
	04/30/09				1,008,000
	05/31/09				672,000
	06/30/09				1,008,000
	07/31/09				1,176,000
	08/31/09				840,000
	09/30/09				1,008,000
	10/31/09				1,176,000
	11/30/09				1,344,000
	12/31/09				1,248,000
	01/31/09				504,000
	02/28/09				1,008,000
	03/31/09				840,000
	04/30/09				840,000
	05/31/09				672,000
	06/30/09				840,000
	07/31/09				840,000
	08/31/09				840,000
	09/30/09				672,000
	10/31/09				504,000

CY2009_raw

Store Name	Date	Weight of Plastic Bags (lbs)	# of Cases Purchased	Bags per Case	Calculated Total Plastic Bags Purchased
	11/30/09				1,008,000
	12/31/09				648,000
	TOTAL				75,004,059
Average per store					**2,206,002**

ATTACHMENT B

SECTION 5.0
CONCLUSION

The findings of this study represent a sampling of stores within the County. This section provides a summary of each bag type (plastic, paper, and reusable) at the nontraditional and traditional stores surveyed. In addition, the resulting comparison of the carrying capacity of plastic bags and paper bags is also provided in this section.

5.1 BAGS BY TYPE

5.1.1 Plastic Bags

The data collected through direct observations demonstrate generally 4 percent of the bags used at nontraditional stores were plastic, whereas 96 percent of the bags used at the traditional stores were plastic. The study observed a combined total of 17,194 plastic bags used at both nontraditional and traditional stores. Of the total number of plastic bags (17,194) observed at both store types, the plastic bags used at nontraditional stores accounted for 0.5 percent (85) and those used at traditional accounted for 99.5 percent (17,109) (Table 5:1.1-1, *Plastic Bag Usage Summary*).

TABLE 5.1.1-1
PLASTIC BAG USAGE SUMMARY

Summary	Nontraditional Stores	Traditional Stores
Plastic bags observed (count)	85	17,109
Plastic bags observed (percentage of total bags observed at store)	4 percent	96 percent
Percentage of all plastic bags	0.5 percent	99.5 percent
Total plastic bags observed (all stores)	**17,194**	

5.1.2 Paper Bags

The findings of this study represent a sampling of the stores within the County. The data collected through direct observation demonstrate that of the bags used at nontraditional stores, generally 78 percent were paper; whereas at traditional stores surveyed, 2 percent of the bags used were paper. Researchers observed a total of 1,751 paper bags used at both the nontraditional and traditional stores. Of the total number of paper bags observed at both store types, the paper bags used at nontraditional stores accounted for 84 percent (1,479) and 16 percent (272) at traditional stores (Table 5.1.2-1, *Paper Bag Usage Summary*).

TABLE 5.1.2-1
PAPER BAG USAGE SUMMARY

Summary	Nontraditional Stores	Traditional Stores
Paper bags observed (count)	1,479	272
Paper bags observed (percentage of total bags observed at store)	78 percent	2 percent
Percentage of all paper bags	84 percent	16 percent
Total paper bags observed	**1,751**	

5.1.3 Reusable Bags

The findings of this study represent a sampling of stores within the County. The data collected through direct observation demonstrate that of the bags used at nontraditional stores, generally 18 percent were reusable; whereas at the traditional stores surveyed, 2 percent of the bags used were reusable. The study observed a combined total of 752 reusable bags used at both traditional and nontraditional stores. Of the total amount of reusable bags observed at both store types, the reusable bags used at nontraditional stores accounted for 45 percent (342) and 55 percent (410) at traditional stores (Table 5.1.3-1, *Reusable Bag Usage Summary*).

TABLE 5.1.3-1
REUSABLE BAG USAGE SUMMARY

Summary	Nontraditional Stores	Traditional Stores
Reusable bags observed (count)	342	410
Reusable bags observed (percentage of total bags observed at store)	18 percent	2 percent
Percentage of all reusable bags	45 percent	55 percent
Total reusable bags observed	**752**	

However, the number of reusable bags varied greatly over the observations conducted. The survey team noted that, although a majority of the nontraditional stores were located within the western portion of the County (primarily in the Third Supervisorial District),[1] the number of reusable bags used within the surveyed stores varied throughout the County. In fact, reusable bags represented up to 9 percent of the bags used at one store located in the southeast portion of the County.

The findings in this study suggest that there are a number of consumers currently using reusable bags in lieu of either paper bags or plastic bags. The 18 percent of reusable bags used by nontraditional store customers could be indicative of the approximate percentage of consumers that might be expected to shift to the use of reusable bags should the proposed ordinances be implemented in the County, as the proposed ordinances will ban the issuance of plastic carryout bags and will include an environmental awareness campaign to encourage the use of reusable bags.

[1] There were nontraditional stores located in or adjacent to all five Supervisorial Districts.

ATTACHMENT C

	Q3	Q4
	31,490	27,892
	9,842	8,098
	4,250	3,607
	35,260	56,550
	16,010	14,360
	16,260	11,000
	11,230	14,670
	15,670	14,384
	0	0
	0	0
	30,000	27,500
	8,793	13,944
	16,255	4,372
	16,255	10,743
	16,255	12,510
	16,255	14,779
	16,255	8,882
	16,255	1,724
	16,255	3,356
	16,255	4,050
	155,749	142,828
	98,450	75,360
	361,615	230,474
	249,557	126,404
	344,515	237,988
	7,081	6,943
	330	300
	2,222	1,387
	5,113	4,799
	4,915	4,297
	26,645	44,401
	0	0
	64,315	64,389
	33,603	37,517
	35,003	31,815
	145,874	150,662
	152,103	127,854
	32,128	24,121
	39,401	39,058
	34,159	29,315
	15,808	14,949
	9,751	10,310
	10,725	10,244
	4,878	4,309
	4,649	5,253
	1,940	2,014
	4,853	4,935
	3,374	3,794
	4,593	3,696
	0	0
	0	0
	34,112	35,236
	16,553	17,487
	0	0
	64,800	429,736
	54,511	350,262
	0	0
	0	0
	0	0
	0	0
	47,605	50,647
	0	0
	34,748	31,190
	46,455	40,065
	6,636	6,078
	3,554	3,771
	3,872	4,112
	4,283	6,084
	3,040	3,401
	4,450	5,162
	4,396	4,249
	3,638	2,919
	47,160	77,432
tal :	2,542,007	2,759,670
age:	34,822	37,804
ore:	145,251	

SAVE THE PLASTIC BAG COALITION

350 Bay Street, Suite 100-328
San Francisco, CA 94133
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May 2, 2012

City Council
City of Los Angeles
200 North Spring St.
Los Angeles, CA 90012

Copy to:
County of Los Angeles DPW
900 S. Fremont Avenue
Alhambra, CA 91803
Attn: Suk Chong

RE: False bag reduction figures provided to LA City Council by LA County DPW

Dear Members of the LA City Council:

On April 4, 2012, Coby Skye of LA County DPW told the Energy and Environment Committee that unincorporated LA County had experienced a 24% reduction in paper bag usage and a 94% drop in all carryout bag usage since its ordinance took effect on July 1, 2011.

Mr. Skye's figures are demonstrably false and incorrect.

Following the committee meeting, we made a Public Records Act to the County regarding the figures. LA DPW has provided three document which show as follows:

1. ***The County has no data whatsoever regarding paper bag usage before the ordinance took effect.*** In an e-mail sent by Suk Chong of LA County DPW after Mr. Skye appeared before the committee, Mr. Chong admitted that the County had ***"estimated"*** such paper bag usage as it has no data. ***It is unfortunate that Mr. Skye chose not to share this fact with the committee.***

2. Eleven stores reported using zero paper bags in 2011 Q3 and Q4, which is not credible. Presumably, if they really did dispense zero bags in 2011 Q3 and Q4, they also dispensed zero plastic and paper bags prior to July 1, 2011.

3. Only supermarkets and large stores were subject to the ban in 2011. However, 37 of them reported less than 68 paper bags per day in 2011 Q4. One store reported three paper bags per day. Another reported 15 paper bags per day. That is not credible.

4. Most of the remaining stores reported significant paper bag usage. One store reported 4,774 bags per day. Another store reported 3,891 per day.

5. There is clearly a huge disparity in the sizes of the stores reporting paper bag usage. A store providing three paper bags per day cannot possibly be in the same size range as one providing 4,774 bags per day. ***The County is comparing apples and oranges***

to show a false reduction in bag usage.

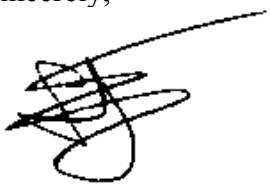
6. Many stores reported ***huge increases in paper bag usage*** in 2011 from Q3 to Q4. One store reported an increase from 64,800 to 429,738, which is a ***670% increase***. Another store reported an increase from 54,511 to 350,262, which is a ***640% increase***. Mr. Skye should have mentioned this to the committee.

7. We know that many stores lost a significant number of customers who opted to shop in incorporated parts of the County to avoid the paper bag fee.

The County is touting the success of its 10-cent paper bag fee, but its figures are not credible and it has not provided balanced information.

Please contact me if you would like copies of our Public Records Act request and the County's responses.

Sincerely,



Stephen L. Joseph
Counsel

For Immediate Release **3/16/13**

The Effects of the Plastic Bag Ban on Consumer Bag Choice at Santa Monica Grocery Stores

Research Report by Team Marine (www. teammarine.org), Santa Monica High School
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Faculty Advisor: Benjamin Kay – bkay@smmusd.org (310) 395-3204 x71127

Background

To date, 69 cities or counties within California have adopted ordinances to ban single-use plastic bags[1] with Los Angeles City's upcoming implementation to bring the total affected to 25% of the state population[2]. Ban proponents have emphasized the negative environmental and economic impacts of plastic bags, noting that volunteer recycling efforts recover less than 5% of the produced material[3,4,5]. The plastics industry and pro-plastic affiliates have responded that recycling rates are rising, and that bans exacerbate environmental and economic impacts by increasing paper bag usage (i.e., problem shifting)[6,7,8]. Meanwhile, few comprehensive studies have quantitatively assessed: (1) the effectiveness of bag bans in eliminating plastic bags, (2) pre- and post-ban trends in carryout bag choice, (3) potential problem shifting to paper bags, and (4) the effects of age and gender on bag selection. Such data are needed for municipalities to make informed decisions about implementing ban ordinances and are critical to the success or failure of future bans at all levels of government.

Summary

We conducted a 19-month study over two years to examine the effects of the City of Santa Monica's plastic bag ban (implemented September 1, 2011 with a ten cent fee per paper bag) on consumer bag choice. Spanning ten months prior to the bag ban and 12 months after, we observed a total of 50,400 grocery store patrons exiting five Santa Monica grocery stores to visually estimate their age, gender, and carryout bag type (plastic, reusable, paper, or no bag). We performed separate analyses for both "eco-friendly" stores (Whole Foods and Trader Joes), which used few if any plastic bags prior to the ban, and "regular" stores, which used primarily plastic bags prior to the ban. The results show that at regular grocery stores, mean plastic bag usage went from 69% pre-ban to 0% post-ban, with reusable, paper, and no bag usage increasing from 10%, 5%, and 15% pre-ban to 41%, 23%, and 36% post-ban, respectively. At eco-friendly grocery stores, the ban not only eliminated plastic bags and increased reusable and no bag options, paper bag usage dropped by 23 percentage points. Our results also indicate the oldest age group was the most inclined to use plastic bags pre-ban and reusable bags post-ban, while the youngest patrons used more paper bags and no bags. Furthermore, at both eco-friendly and regular stores, a higher percentage of females used reusable bags than males, while males were inclined to use more paper bags or no bag than females.

Methods and Materials

We posed five questions before conducting our investigation:

1. Will the ban be effective getting rid of plastic bags?
2. Will the ban be effective in increasing reusable bag usage?
3. Will the post-ban ten cent fee on paper bags[9] be effective in decreasing paper bag usage?
4. Does patron age affect bag choice? Which age group is more eco-friendly/unfriendly?
5. Does patron gender affect bag choice? Which sex is more eco-friendly/unfriendly?

To answer these questions, we placed observers at five grocery stores in Santa Monica. For each store, we attempted to collect data eight times per month. During each round of data collection, we observed a minimum

of 100 patrons exiting the store. On a data sheet, each patron was placed into age, gender, and bag type categories. As much as possible, we sought to perform observations during the middle two weeks of every month to provide a gap between months. Peer training and group calibration tests were conducted for age and bag type variables to help reduce observer bias.

Results and Discussion

The results indicate that the ban was effective in getting rid of plastic bags at regular stores, reducing plastic bag use from ~70% to 0%. Contrary to statements by pro-plastic bag groups[6], paper bags did not replace plastic bags as the predominant bag type. Rather, between pre- and post-ban, reusable bags increased by 31 percentage points, followed by no bag (21 points), and paper (18 points) (Fig. 1). At eco-stores, reusable bag and no bag usage rose 24 and 2 percentage points, respectively, while paper bag use decreased by 23 points (Fig. 2). Accordingly, given the plastic bag ban's targets were regular stores, there was thus a notable "spillover effect" at eco-stores. These combined results suggest that the post-ban ten cent fee per paper bag was an effective incentive to increase reusable and no bag selections. Furthermore, while this study did not assess patron volume per store or the number of bags used per costumer, it is conceivable that the increased use of paper bags at regular stores is being countered by the decreased use of paper bags at eco-stores. A more comprehensive answer to this question could arise through examination of the purchase order history of paper bags at each store.

Figures 1 and 2 indicate the city's plastic bag ban with ten-cent fee has been effective overall, further supported by the time graph for eco-stores (Fig. 3). Here, one year after the ban, reusable bag use remained steady around 47%. Conversely, at regular stores (Fig. 4), reusable bag use appears to be waning while paper bag use increasing. Preliminary statistical analyses show that the observed patterns cannot be easily explained by chance, with statistical significance at the 0.01 level ($p < 0.01$). The upward drift in paper bag use at regular stores in 2012 warrants further investigation. Specifically, it would be of interest to ensure grocery stores, one year after the ban, are following the law; are they continuing to disincentivize paper bag use by charging 10 cents per paper bag? Other variables could be contributing as well, including patron apathy, regulars stores undercharging for the number of paper bags used, and stores prematurely removing strategic parking lot and store signage reminding customers to bring in their reusable bags. A study comparing the number of paper bag sold to the volume purchased should establish if any undercharging is occurring, and ultimately, whether regular stores are obeying the law. If undercharging is not occurring, a steeper fee of more than 10 cents may need to be considered.

The present study found that age affects carryout bag selection (Figs. 5, 6, 7, and 8), although it is difficult to identify the most "eco-friendly/unfriendly" age group. The age graphs for both eco- and regular stores reveal that the youngest generation is more inclined to use no bag than older generations, while the oldest generation is more likely to use reusable bags than the youngest generation. The former result was an expected outcome; the youngest customers presumably use fewer bags since they are less likely to shop for the entire household. In other words, young people likely purchase fewer items, which can be carried out in their hands. Interestingly, while the oldest age group used the most plastic bags at regular stores prior to the ban (Fig. 7), it used more reusable bags post-ban (Fig. 8). This apparent flip in behavior is surprising, as stereotypes often portray older generations as resistant to change. Another noteworthy result involves paper bag use at eco-stores (Figs. 5 and 6). Prior to the ban, the youngest age group appeared to use significantly fewer paper bags than the older generations, whereas after the ban, it appeared to use more paper bags than any other age group. Overall, the results suggest that more educational outreach to the 0-19, and perhaps the 20-39 age groups, may be needed to encourage an increase in reusable bag use.

The present study found that gender affects bag choice, but establishing a more "eco-friendly/unfriendly" gender is also difficult. The gender graphs (Figs. 9 and 10) show that at both eco- and regular stores, more females used reusable bags than males, while males used more no bag than females. At eco-stores, males also used more paper bags than females. Graphical analyses thus suggest that more outreach is needed to encourage males to use reusable bags and decrease their use of paper bags.

It should be noted that during the pre-ban months, we attempted to collect data from a third eco-friendly grocery store (Santa Monica Co-Opportunity) (Table 1), but we had to throw out this data due to short staffing. For some months, we also fell short of our goal of eight observations per store or could not obtain data at all (Table 1), also due to short staffing. Despite these gaps in the data set, a total of 504 visual surveys were conducted, amounting to 50,400 patrons observed in the study (Table 1).

It is our hope that these data will not only enhance understanding about the impacts of plastic bag bans, but similar prospective policy changes. The interpretations herein may be refined by additional statistical analyses (in progress) and during the peer review process prior to journal publication.

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Until formal publication this document may be cited:

http://www.teammarine.org/wp-content/uploads/2013/03/Grocery-Store-Bag-Research_Press-Release-12-13.pdf, 2013.

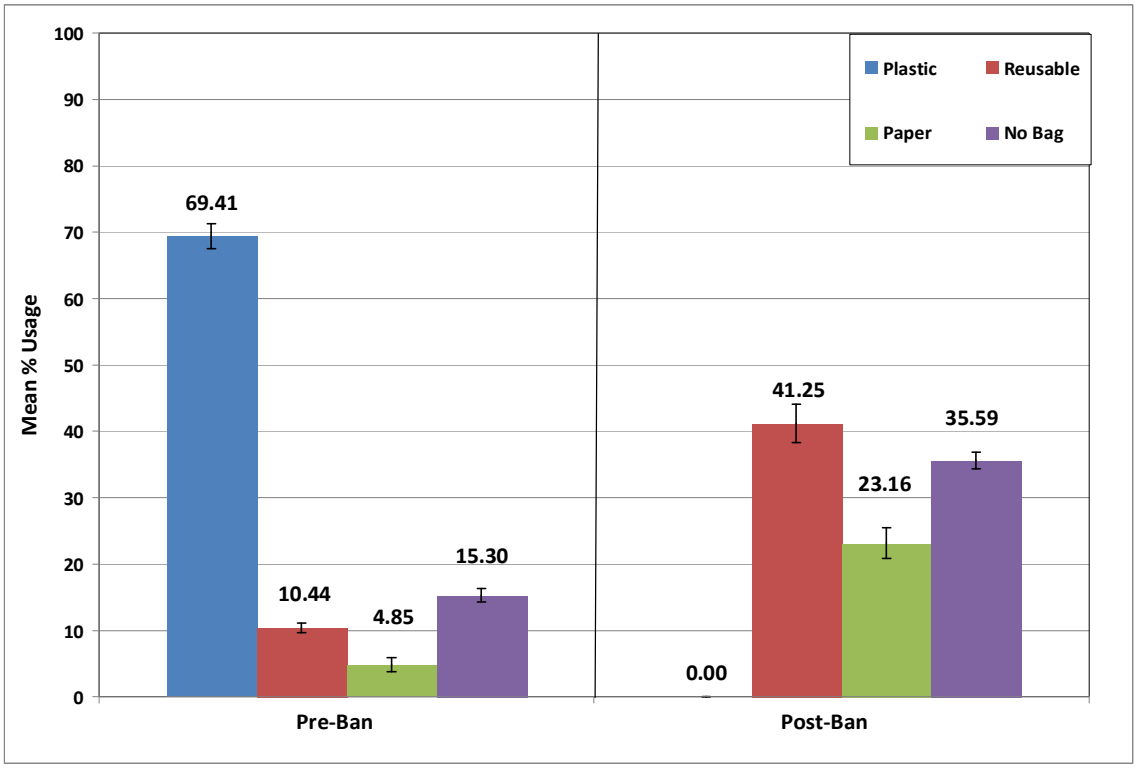

Figure 1. Mean percent usage (±SE) of different bag choices (regular stores and months pooled) before and after the plastic bag ban.

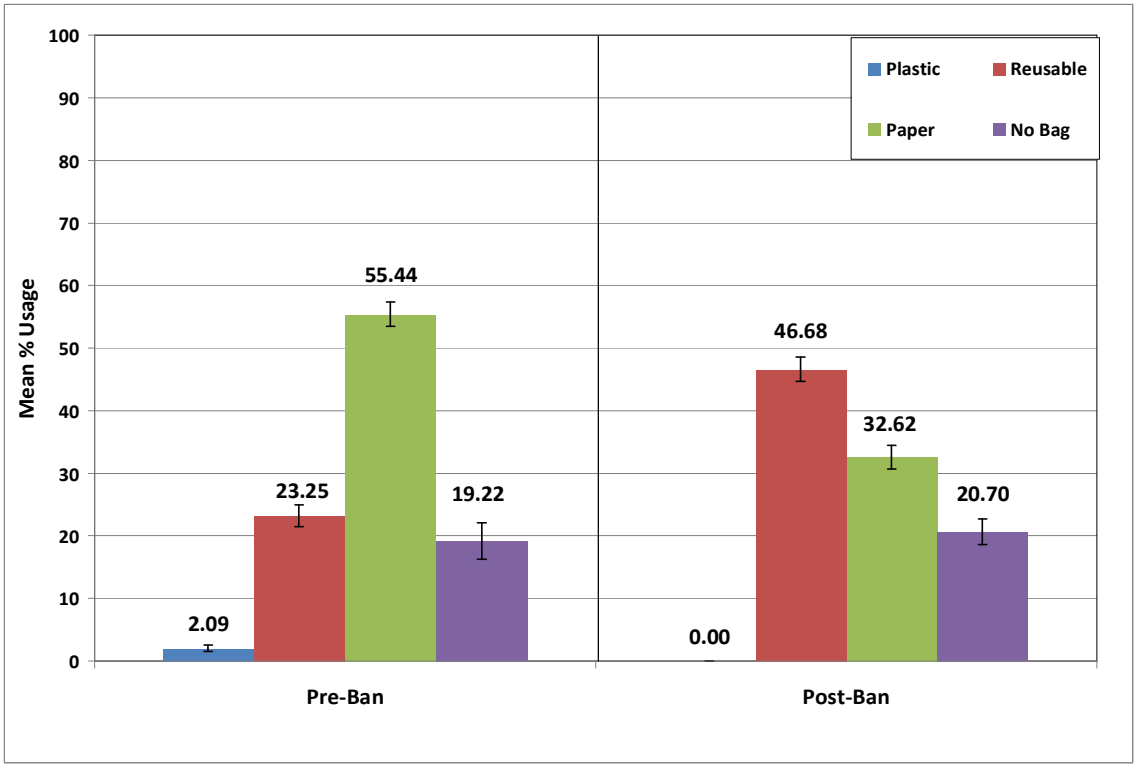

Figure 2. Mean percent usage (±SE) of different bag choices (eco-friendly stores and months pooled) before and after the plastic bag ban.

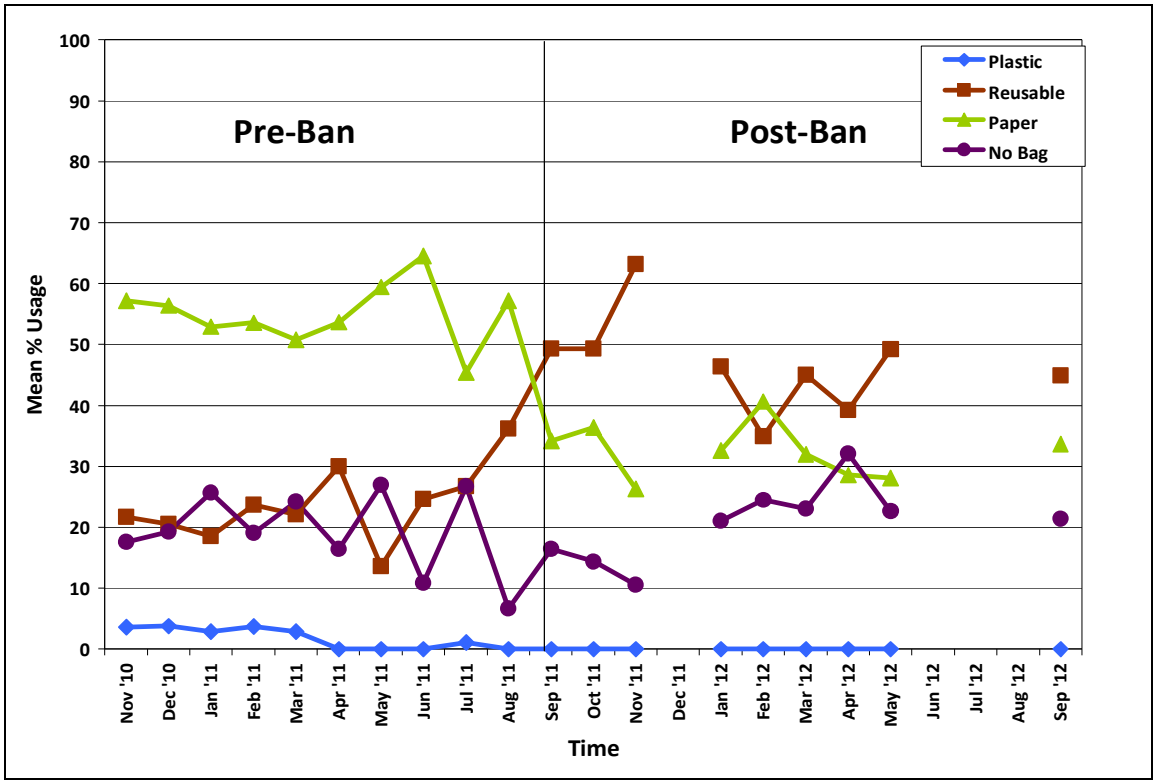

Figure 3. Mean percent usage of different bag choices per month (eco-friendly stores pooled) before and after the plastic bag ban. Gaps represent months no data were collected (see Table 1 below).

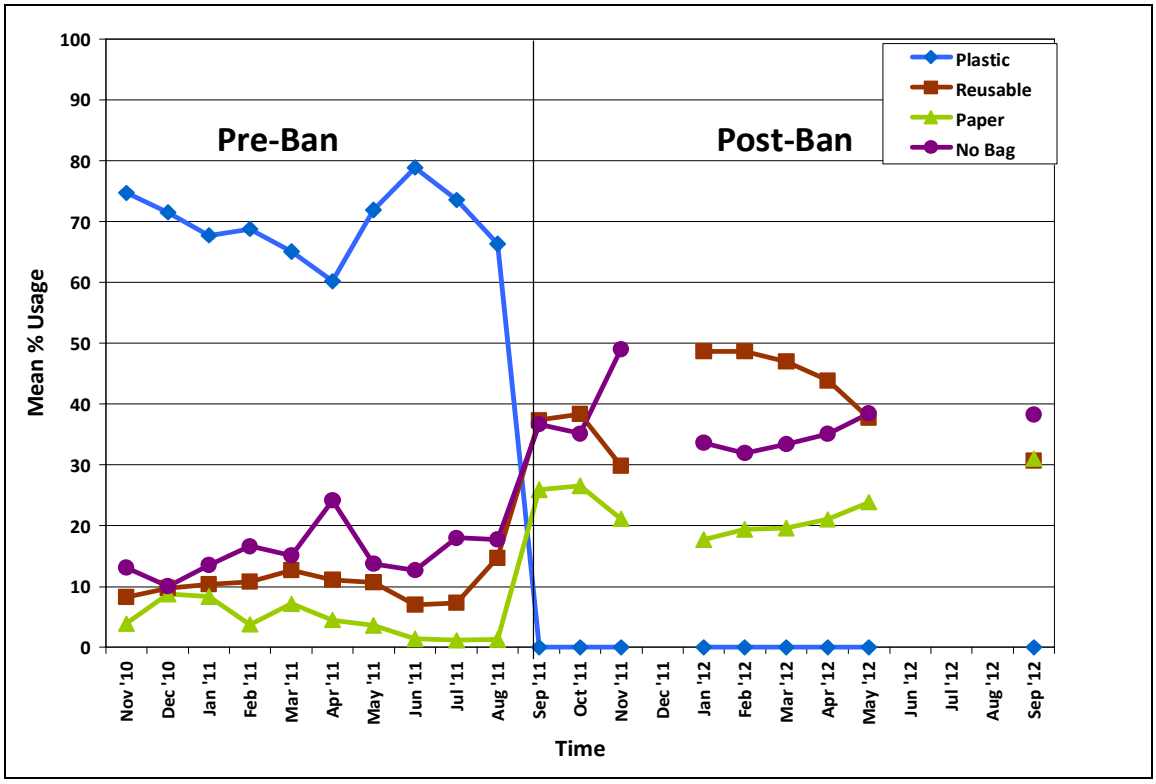

Figure 4. Mean percent usage of different bag choices per month (regular stores pooled) before and after the plastic bag ban. Gaps represent months no data were collected (see Table 1 below).

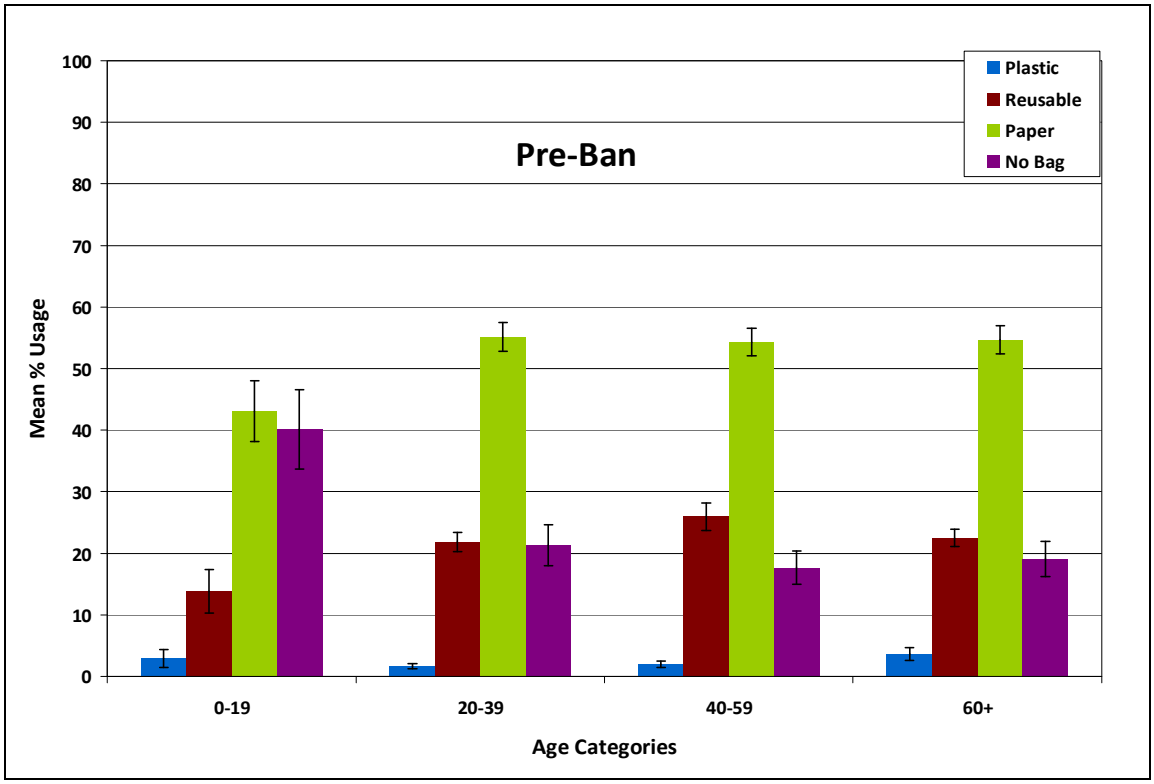

Figure 5. Mean percent usage (±SE) of different bag choices in different age categories (eco-friendly stores and months pooled) before the plastic bag ban.

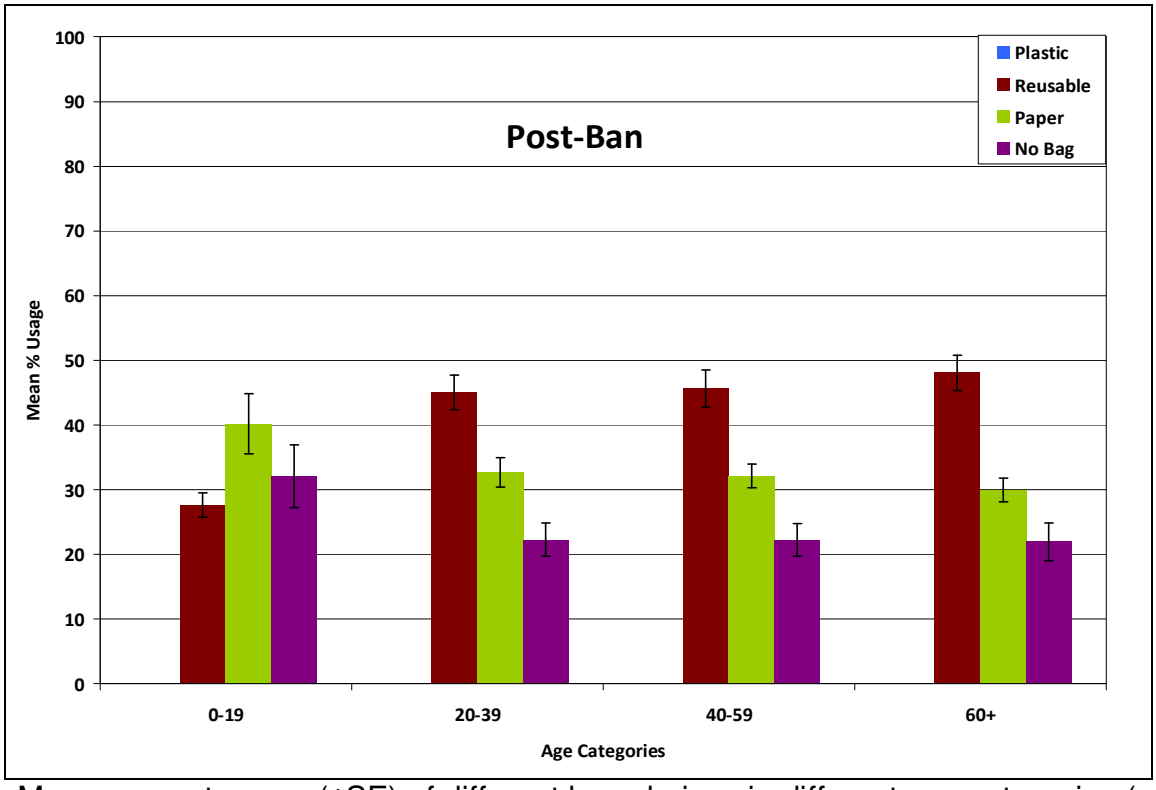

Figure 6. Mean percent usage (±SE) of different bag choices in different age categories (eco-friendly stores and months pooled) after the plastic bag ban.

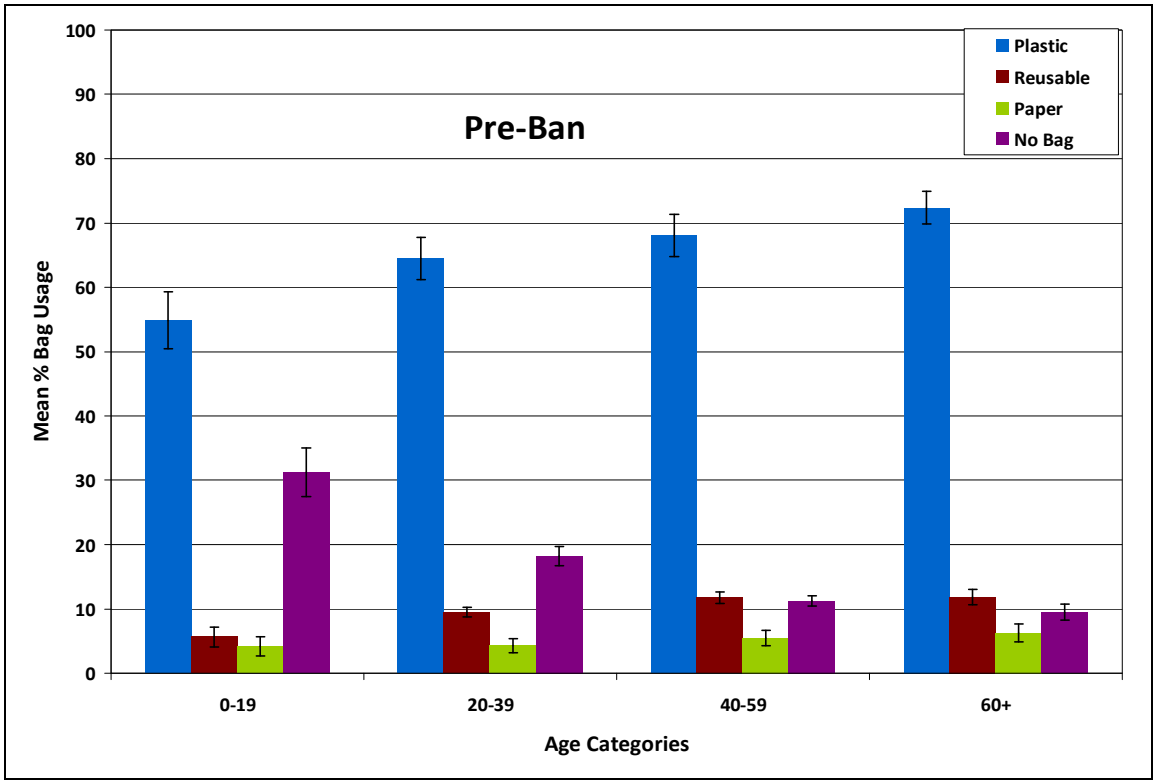

Figure 7. Mean percent usage (±SE) of different bag choices in different age categories (regular stores and months pooled) before the plastic bag ban.

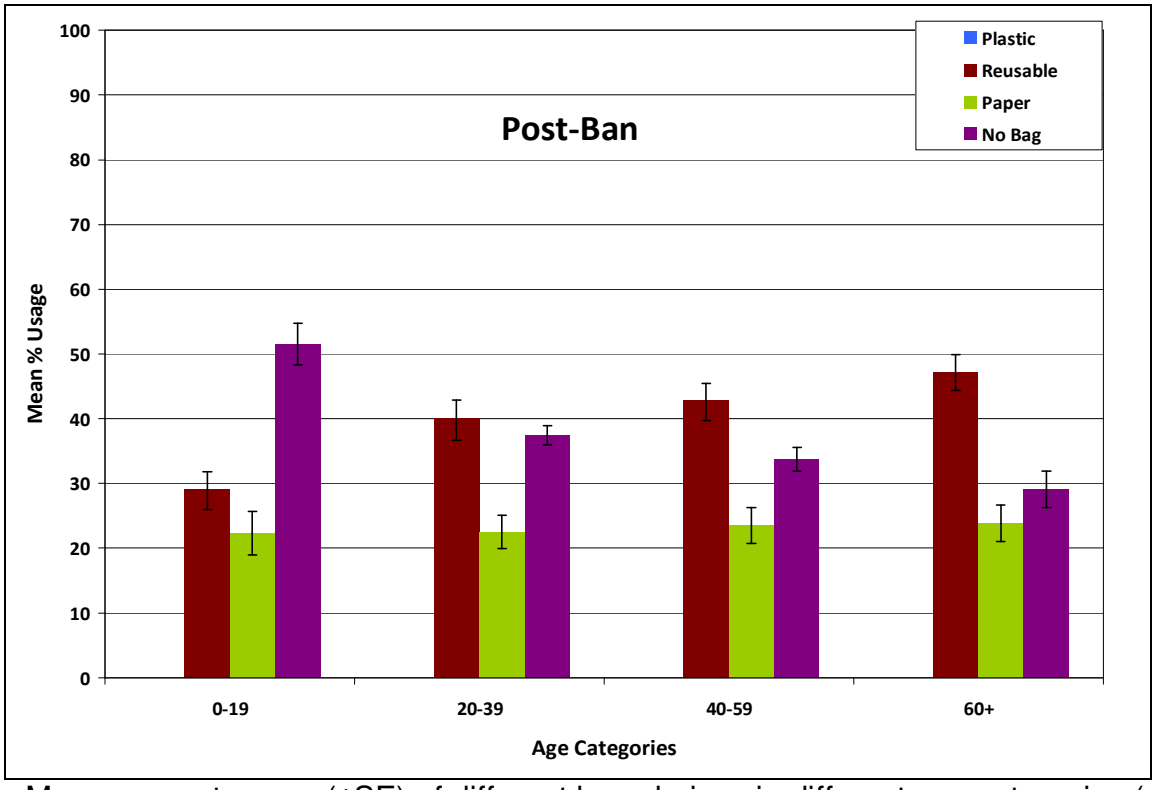

Figure 8. Mean percent usage (±SE) of different bag choices in different age categories (regular stores and months pooled) after the plastic bag ban.

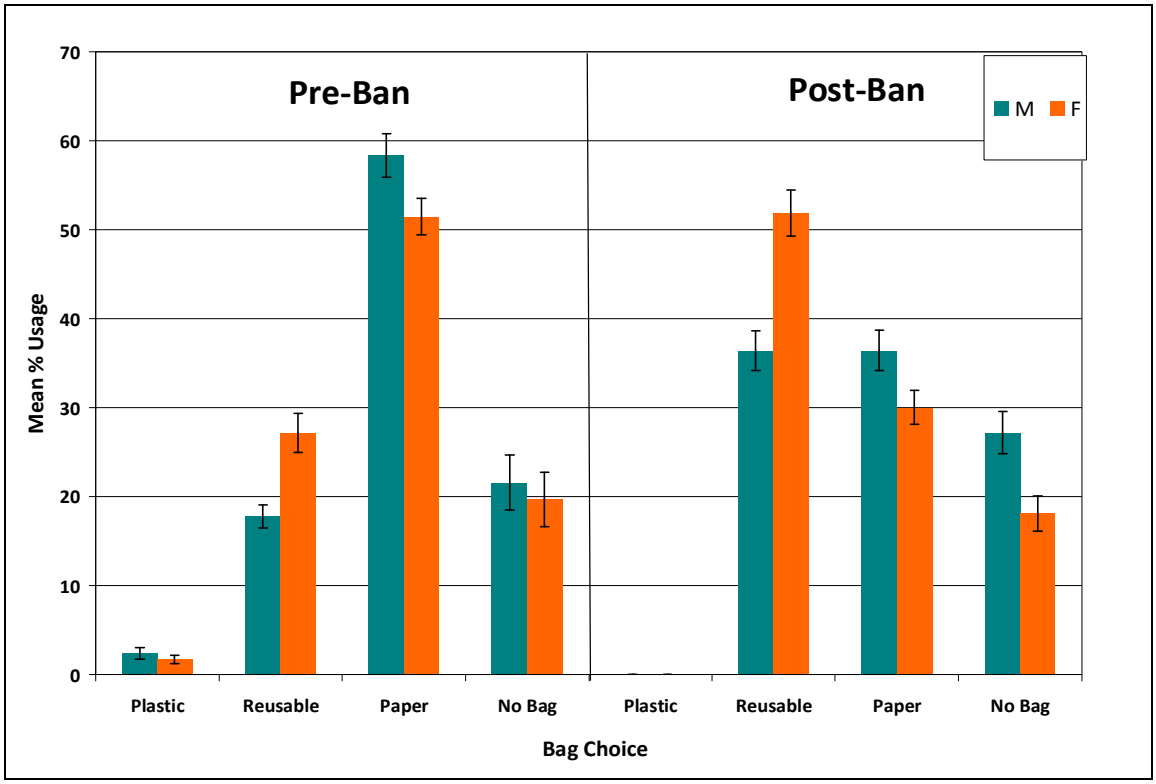

Figure 9. Mean percent usage (±SE) of different bag choices in different gender categories (eco-friendly stores and months pooled) before and after the plastic bag ban.

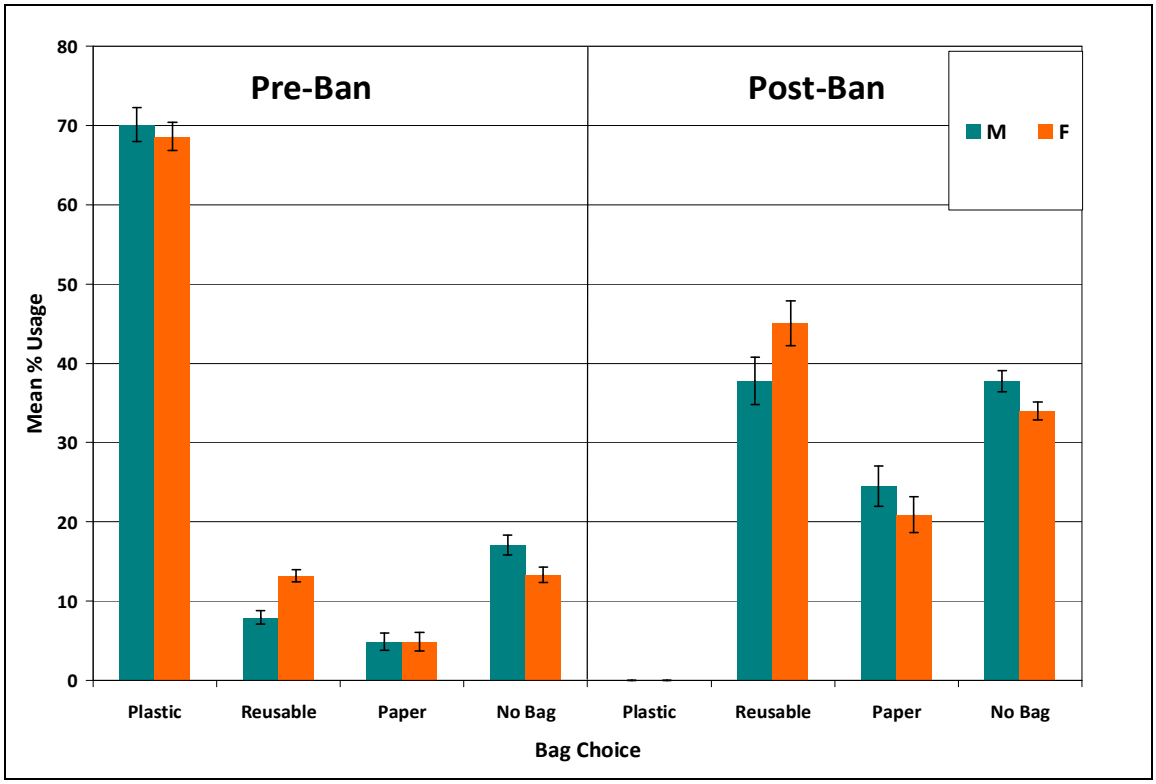

Figure 10. Mean percent usage (±SE) of different bag choices in different gender categories (regular stores and months pooled) before and after the plastic bag ban.

Table 1. The number of visual surveys conducted each month at regular and eco-friendly stores before and after the ban. Co-Opportunity data discarded due to short staffing.

	"REGULAR STORES"			"ECO-FRIENDLY STORES"		
Month	**Albertsons**	**Vons**	**Ralphs**	**Co-Opportunity**	**Whole Foods**	**Trader Joes**
Nov 2010	10	10	10	10	10	10
Dec 2010	10	9	10	10	10	10
Jan 2011	10	9	7	10	10	10
Feb 2011	10	7	X	10	10	10
Mar 2011	8	5	6	7	8	6
Apr 2011	10	3	9	8	10	6
May 2011	8	X	6	4	4	8
Jun 2011	10	X	X	X	X	4
Jul 2011	3	X	X	X	1	7
Aug 2011	8	X	X	X	X	1
TOTAL PRE-BAN	**87**	**43**	**48**	**59**	**63**	**72**
		178			**135**	
Sep 2011	8	X	3	X	X	3
Oct 2011	6	X	3	X	X	2
Nov 2011	X	X	X	X	X	1
Dec 2011	X	X	X	X	X	X
Jan 2012	8	X	6	X	8	4
Feb 2012	5	5	5	X	8	4
Mar 2012	6	6	5	X	7	4
Apr 2012	8	5	5	X	2	4
May 2012	8	5	4	X	3	4
Sep 2012	6	6	8	X	8	8
TOTAL POST-BAN	**55**	**27**	**39**	**0**	**36**	**34**
		121			**70**	

ORDINANCE NO. 182604

An ordinance adding Article 2 to Chapter XIX of the Los Angeles Municipal Code to regulate the use of plastic and paper single-use carryout bags and to promote the use of reusable bags.

THE PEOPLE OF THE CITY OF LOS ANGELES
DO ORDAIN AS FOLLOWS:

Section 1. Billions of plastic single-use carryout bags are consumed in the City of Los Angeles each year, most of which end up in the litter stream or in landfills. These bags negatively impact the environment and create a blight of litter that is pervasive in the public landscape, including parks, streams, beaches and streets. The City of Los Angeles spends millions of dollars annually on prevention, cleanup, and other activities to abate litter, and it has a significant interest in protecting its residents from the negative impacts caused by plastic single-use carryout bags. Through this Ordinance, the City of Los Angeles seeks to increase waste diversion from landfills, promote recycling, and reduce litter.

Sec. 2. Article 2 is added to Chapter XIX of the Los Angeles Municipal Code to read as follows:

ARTICLE 2
CARRYOUT BAGS

SEC. 195.01. DEFINITIONS.

The following definitions apply to this Article:

A. **Customer** means any person purchasing goods from a Store.

B. **Operator** means the person in control of, or having the responsibility for, the operation of a Store, including, but not limited to, the owner of the Store.

C. **Paper Single-Use Carryout Bag** means any bag made predominantly of paper materials, including, but not limited to, virgin, recycled or recyclable paper materials, which is provided to a Customer at the point of sale. Paper Single-Use Carryout Bag does not include Reusable Bags, Produce Bags, or Product Bags.

D. **Person** means any natural person, firm, corporation, partnership, or other organization or group however organized.

E. **Plastic Single-Use Carryout Bag** means any bag made predominantly of plastic derived from petroleum, natural gas, or a biologically-based source, such as corn or other plant sources, which is provided to a customer at the point of sale. Plastic

Single-Use Carryout Bag includes compostable and biodegradable bags, but does not include Reusable Bags, Produce Bags, or Product Bags.

F. **Postconsumer Recycled Material** means a material that would otherwise be destined for solid waste disposal, having completed its intended end use and product life cycle. Postconsumer Recycled Material does not include materials and by-products generated from, and commonly reused within, an original manufacturing and fabrication process.

G. **Produce Bag and Product Bag** mean any bag without handles used exclusively to carry produce, meats, or other food items to the point of sale inside a store or to prevent such food items from coming into direct contact with other purchased items.

H. **Recyclable** means material that can be sorted, cleansed, and reconstituted using available recycling collection programs for the purpose of using the altered form in the manufacture of a new product.

I. **Recyclable Paper Single-Use Carryout Bag** means a Paper Single-Use Carryout Bag that meets all of the following requirements:

(1) is one hundred percent (100%) recyclable overall and contains a minimum of forty percent (40%) Postconsumer Recycled Material;

(2) has printed on the bag the name of the manufacturer, the country where the bag was manufactured, and the percentage of Postconsumer Recycled Material used in making the bag;

(3) displays the word "Recyclable" in a minimum 14-point type size; and

(4) contains no old growth fiber.

J. **Reusable Bag** means a bag with handles that is specifically designed and manufactured for multiple reuse and meets all of the following requirements:

(1) has a minimum lifetime of 125 uses, which for purposes of this Article means the capability of carrying a minimum of 22 pounds, 125 times over a distance of at least 175 feet;

(2) has a minimum volume of 15 liters;

(3) is machine washable or is made of a material that can be cleaned or disinfected;

(4) does not contain lead in an amount greater than 89 ppm, nor contain total heavy metals (lead, hexavalent chromium, cadmium, and mercury) in an

amount greater than 99 ppm, unless lower heavy metal limits are imposed by applicable state or federal law, in which case such standards shall apply;

(5) has printed on the bag, or on a tag that is permanently affixed to the bag, (i) the name of the manufacturer, (ii) the country where the bag was manufactured, (iii) a statement that the bag does not contain lead, cadmium, or any other heavy metal in toxic amounts, (iv) the percentage of Postconsumer Recycled Material used, if any, and (v) bag care and washing instructions; and

(6) if made of plastic, is a minimum of at least 2.25 mils thick.

K. **Store** means any of the following retail establishments located within the City of Los Angeles:

(1) a full-line, self-service retail store with gross annual sales of two million dollars ($2,000,000.00), or more, that sells a line of dry grocery, canned goods, or nonfood items and some perishable items;

(2) a store of at least 10,000 square feet of retail space that generates sales or use tax pursuant to the Bradley-Burns Uniform Local Sales and Use Tax Law (Part 1.5 (commencing with Section 7200) of Division 2 of the Revenue and Taxation Code) and that has a pharmacy licensed pursuant to Chapter 9 (commencing with Section 4000) of Division 2 of the Business and Professions Code; or

(3) a drug store, pharmacy, supermarket, grocery store, convenience food store, foodmart, or other entity engaged in the retail sale of a limited line of goods that includes milk, bread, soda, and snack foods, including those stores with a Type 20 or 21 license issued by the Department of Alcoholic Beverage Control.

SEC. 195.02. PROHIBITED CARRYOUT BAGS.

A. No Store shall provide to any Customer a Plastic Single-Use Carryout Bag for the purpose of carrying away goods or other materials from the point of sale.

B. No Store shall provide to any Customer a Paper Single-Use Carryout Bag for the purpose of carrying away goods or other materials from the point of sale, except as otherwise provided in this Article.

SEC. 195.03. PERMITTED CARRYOUT BAGS.

A. All Stores shall provide or make available to a Customer only Recyclable Paper Single-Use Carryout Bags or Reusable Bags for the purpose of carrying away goods or other materials from the point of sale, subject to the terms of this Article. Nothing in this Article prohibits Customers from using bags of any type that they bring to

the Store themselves or from carrying away goods that are not placed in a bag, in lieu of using bags provided by the Store.

B. Beginning January 1, 2014, for all Stores defined in Subsections K(1) and (2) of Section 195.01, and beginning July 1, 2014, for all Stores defined in Subsection K(3) of Section 195.01, Stores may provide to their Customers Recyclable Paper Single-Use Carryout Bags for the purpose of carrying away goods or other materials from the point of sale, subject to the following requirements:

(1) Customers shall be charged ten cents ($0.10) for each Recyclable Paper Single-Use Carryout Bag provided; and

(2) Every Customer receipt must specify the number of Recyclable Paper Single-Use Carryout Bags provided to that Customer and the total amount charged to the Customer for those bags.

C. All monies collected by a Store pursuant to Subsection C of this Section will be retained by the Store and may only be used for any of the following purposes:

(1) costs associated with complying with the requirements of this Article;

(2) actual costs of providing Recyclable Paper Single-Use Carryout Bags; and

(3) costs associated with a Store's educational materials or education campaign encouraging the use of Reusable Bags.

D. All Stores must report to the Department of Public Works, on a quarterly basis, the total number of Recyclable Paper Single-Use Carryout Bags provided, the total amount of monies collected for providing Recyclable Paper Single-Use Carryout Bags, if applicable, and a summary of any efforts the Store has undertaken to promote the use of Reusable Bags by Customers in the prior quarter. Such reporting must be done on a form prescribed by the Department of Public Works, and must be signed by a responsible agent or officer of the Store confirming that the information provided on the form is accurate and complete. Quarterly reports must be submitted no later than thirty (30) days following the end of the quarter for which the report is made.

SEC. 195.04. USE OF REUSABLE BAGS.

A. All stores shall provide Reusable Bags to Customers, either for sale or at no charge.

B. All Stores are urged to educate Store staff to promote Reusable Bags and to post signs encouraging Customers to use and maintain Reusable Bags.

SEC. 195.05. EXEMPTIONS.

Stores that provide Recyclable Paper Single-Use Carryout Bags pursuant to Section 195.03 of this Article shall provide such bags or Reusable Carryout Bags or both, at the Store's option, free of charge to any Customer participating either in the California Special Supplemental Food Program for Women, Infants, and Children pursuant to Article 2 (commencing with Section 123275) of Chapter 1 of Part 2 of Division 106 of the Health and Safety Code or in the Supplemental Food Program pursuant to Chapter 10 (commencing with Section 15500) of Part 3 of Division 9 of the Welfare and Institutions Code.

SEC. 195.06. ENFORCEMENT.

A. The Department of Public Works has primary responsibility for enforcement of this Article. The Department of Public Works is authorized to promulgate regulations and to take any and all other actions reasonable and necessary to enforce this Article, including but not limited to, investigating violations, issuing fines and entering the premises of any store during business hours.

B. If the Department of Public Works determines that a violation of this Article has occurred, it will issue a written notice to the Operator of the Store that a violation has occurred and the potential penalties that will apply for future violations.

C. If a Store violates any of the requirements of this Article after a written notice has been issued pursuant to Subsection B of this Section for that violation, the following penalties will be imposed and shall be payable by the Operator of the Store:

(1) A fine not exceeding one hundred dollars ($100.00) for the first violation that occurs following written notice pursuant to Subsection B of this Section;

(2) A fine not exceeding two hundred dollars ($200.00) for the second violation that occurs following written notice pursuant to Subsection B of this Section;

(3) A fine not exceeding five hundred dollars ($500.00) for the third and any subsequent violation(s) that occurs following written notice pursuant to Subsection B of this Section.

D. A fine shall be imposed for each day a violation occurs or is allowed to continue.

E. All fines collected pursuant to this Article shall be deposited into the Citywide Recycling Trust Fund (CRTF) of the Department of Public Works to assist the department with its costs of implementing and enforcing the requirements of this Article.

F. Any Operator who receives a written notice or fine pursuant to this section may request an administrative review of the accuracy of the determination or the propriety of any fine issued by filing a written notice of appeal with the Board of Public Works no later than thirty (30) days after receipt of a written notice or fine, as applicable. The notice of appeal must include all facts supporting the appeal and any supporting documentation, including copies of all photos, statements and other documents that the appellant wishes to be considered in connection with the appeal. The appeal will be heard by the Board of Public Works. The Board of Public Works will conduct a publicly noticed hearing concerning the appeal within forty-five (45) days from the date that the notice of appeal is filed, or on a later date if agreed upon by the appellant and the Board of Public Works, and will give the appellant at least ten (10) days prior written notice of the date of the hearing. The Board of Public Works may sustain, rescind, or modify the written notice or fine, as applicable. The Board of Public Works will have the power to waive any portion of the fine in a manner consistent with its decision. The decision of the Board of Public Works is final and effective on the date of the Board hearing where its decision is made.

SEC. 195.07. SEVERABILITY.

If any section, subsection, sentence, clause, or phrase of this Article is for any reason held to be invalid by a decision of any court of competent jurisdiction, that decision will not affect the validity of the remaining portions of the Article. The Los Angeles City Council hereby declares that it would have adopted this Article and each and every section, subsection, sentence, clause, or phrase not declared invalid or unconstitutional without regard to whether any portion of this Article would be subsequently declared invalid.

SEC. 195.08. NO CONFLICT WITH FEDERAL OR STATE LAW.

Nothing in this Article is intended to create any requirement, power or duty that is in conflict with any federal or state law.

Sec. 3. This Article shall become operative on January 1, 2014, for all Stores defined in Subsections K(1) and (2) of Section 195.01 of the Los Angeles Municipal Code. This Article shall become operative on July 1, 2014, for all Stores defined in Subsection K(3) of Section 195.01 of the Los Angeles Municipal Code.

Sec. 4. The City Clerk shall certify to the passage of this Ordinance and have it published in accordance with Council policy, either in a daily newspaper circulated in the City of Los Angeles or by posting for ten days in three public places in the City of Los Angeles: one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall; one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall East; and one copy on the bulletin board located at the Temple Street entrance to the Los Angeles County Hall of Records.

I hereby certify that the foregoing ordinance was introduced at the meeting of the Council of the City of Los Angeles: JUN 18 2013, and was passed at its meeting of JUN 25 2013.

JUNE LAGMAY, City Clerk

By _____ Deputy

Approved JUN 26 2013

_____ Mayor

Approved as to Form and Legality

CARMEN A. TRUTANICH, City Attorney

By _____

JOHN A. CARVALHO
Deputy City Attorney

Date 6/12/13

File No. CF 11-1531

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2014 SAN DIEGO FAST FACTS

TOURISM AUTHORITY

ABOUT SAN DIEGO TOURISM AUTHORITY

The San Diego Tourism Authority (SDTA) is the sales and marketing engine for San Diego's tourism industry. Our program of work is built to stimulate inbound travel and demand for San Diego.

TOURISM AUTHORITY

750 B ST, SUITE 1500
SAN DIEGO, CA 92101
TEL / 619.232.3101
SANDIEGO.ORG
CORPORATE BLOG: CONNECT.SANDIEGO.ORG

MARCH 2014

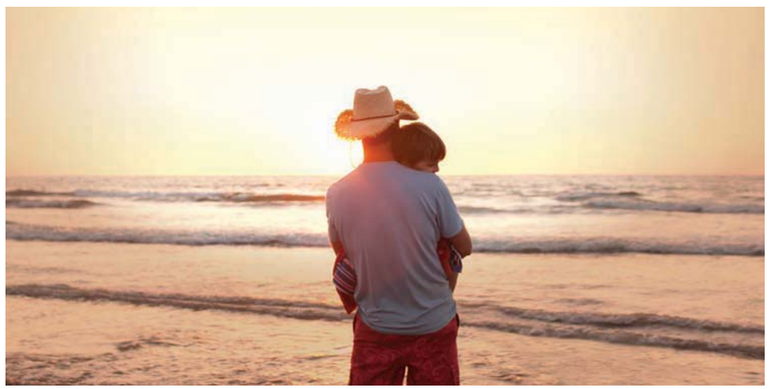
Incorporated in 1954, SDTA is a private not-for-profit 501C6 corporation that is governed by a 30-member board of directors comprised of industry and non-industry representatives. Recognized as one of the nation's leading Destination Marketing Organizations, the SDTA has received numerous industry awards and is accredited through Destination Management Association International.

FOR INDUSTRY REPORTING, VISIT SANDIEGO.ORG/RESEARCH

Funded in part by our members, the San Diego Tourism Promotion Corporation with City of San Diego Tourism Marketing District Assessment Funds, the County and Port of San Diego.

MISSION
TO DRIVE VISITOR DEMAND TO ECONOMICALLY BENEFIT THE SAN DIEGO REGION.

VISION
LEADING SAN DIEGO TO BECOME THE MOST DESIRABLE DESTINATION.



SAN DIEGO VISITOR INDUSTRY STATISTICS

	2013 Calendar Year
Total # of Visitors	33.1 Million
Total Overnight Visitors	16.4 Million
Hotel or Motel	8.9 Million
Private Home Guests	6.6 Million
Camp / RV / Other	862,000
Total Day Visitors	16.7 Million
Day Visitors (Excl. Mex.)	12.6 Million
Mexican Day Visitors	4.0 Million
Overall Economic Impact	$18.7 Billion
Direct Spending	$8.4 Billion
Average Amount Spent By Each Hotel Visitor Per Day	$208
Hotel Room Nights Available	21.4 Million
Hotel Room Nights Sold	15.3 Million
Average Hotel Occupancy	71.6%
Average Daily Rate	$134.20
FY13 Transient Occupancy Tax	$203 Million
San Diego City Only	$157 Million

WHY TRAVEL MATTERS

Tourism is one of the world's largest industries and one of the fastest growing. According to the World Travel & Tourism Council (WTTC), travel generated over $6.6 trillion in GDP, $760 billion in investment and $1.2 trillion in exports during 2012.

Here in the United States, Travel & Tourism generates $2 trillion in economic output annually (2.8% of nation's GDP) and supports 14.6 million U.S. jobs (1 in 8 jobs). Within the U.S., California is the No. 1 travel destination. Travelers spend $106.4 billion at California businesses, which directly supports jobs for 917,000 Californians, and generates $6.6 billion in state and local tax revenues.

The impact is just as great in San Diego. Tourism is San Diego's second largest traded industry (behind Research/Technology/Innovation), employing over 165,000 people—13% of the jobs in our county. Travelers to our county spend $8.4 billion at San Diego businesses and produce $203 million in transient occupancy tax revenues that directly support San Diegans' quality of life—from police and fire to maintaining parks and recreation.

The impact of travel is felt by a large cross-section of industry sectors including accommodations, transportation, attractions, museums, restaurants, and retail.

TOURISM AUTHORITY PROGRAMS DELIVER TOURISM REVENUES

DELIVERING RETURN ON INVESTMENT

With a FY 13 operating budget of $25.5 million, SDTA sales and marketing generated over 2.7 million room nights for the San Diego region

RETURN ON INVESTMENT*

$24 TO $1

* Based on lodging revenue generated for the San Diego Tourism Marketing District

FY 2014 KPIs (KEY PERFORMANCE INDICATORS)

GOALS

- Deliver maximum hotel room nights to the Tourism Marketing District hotels.
- Produce over 900 million paid advertising gross impressions.
- Generate an estimated 8 million visitor inquiries through the website, social media, e-mail and phone.
- Deliver over $15 million in unpaid media exposure through earned media (unpaid editorial), unpaid media promotions and co-operative advertising partners.
- Elevate the San Diego brand and broaden context of San Diego's diverse travel product.
- Leverage all SDTA's marketing assets across Bought + Earned + Owned in order to increase San Diego's share of voice.
- Focus on developing new markets and audiences for the destination.
- Align programs with Visit California and Brand USA in order to maximize efficiency.
- Deliver strong return on investment for all major programs.
- Support the membership by providing value and opportunity to effectively reach the marketplace.

SEVEN GUIDING PRINCIPLES

- Act as the collective voice of the destination and do what individual organizations can't do by themselves.

REGIONAL ECONOMY IS DEPENDENT UPON STRONG TOURISM DEMAND

SAN DIEGO TOURISM INFRASTRUCTURE

Market Composition	89% Leisure, 11% Business (all visitors)
Number of Hotels	464
Number of Hotel Rooms	56,629
Number of Hotel Rooms in the City of San Diego Tourism Marketing District	40,158
Hotel Room Nights Mix	74% Leisure/Transient, 25% Group
Annual Airline Passengers	8.8 Million
Annual Attendance at Major Attractions	14.7 Million
Total Food & Beverage Establishments	12,405
Total Indian Gaming Properties	10 Casinos
Cruise Embarkations	203,775 passengers total, 73,809 embarking passengers
Number of Golf Courses	93
Number of Arts Institutions	89
Number of Craft Breweries	85

SAN DIEGO CONVENTION CENTER (2013)

- 75 Primary Conventions
- 524,448 Attendees
- 704,029 Contracted Room Nights
- $560M in Attendee Spending

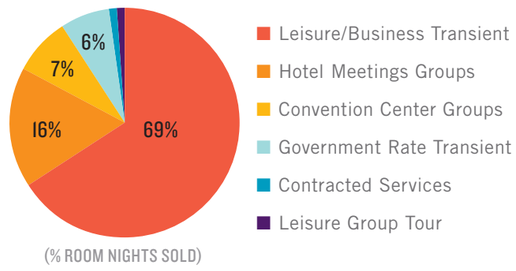
THE POWER OF THE SAN DIEGO BRAND

SAN DIEGO: The San Diego Brand is built on a foundation of inspired optimism and positivity. Our unique blend of great weather, outdoor lifestyle and friendly people infuse our region with an upbeat, anything's possible attitude. San Diego's good vibes are combined with scenic splendor, diverse product and an abundance of activities. This blend of **people + place + climate** is what elevates our customers' mood and makes us a destination like no other.

BRAND PLATFORM—SAN DIEGO OWNS A SUNNY OUTLOOK

THE PEOPLE + THE PLACE + THE CLIMATE = INSPIRED OPTIMISM

SAN DIEGO COUNTY HOTEL ROOM NIGHT MARKET MIX



(% ROOM NIGHTS SOLD)

California Independent Grocers Association

● REPRESENTING INDEPENDENT GROCERS IN CALIFORNIA ●

1425 River Park Dr., Ste. 226 ● Sacramento, California 95815 ● (916) 929-9741 ● Fax (916) 929-0301
Jeff Snadow, President

June 17, 2013

City of Los Angeles
City Council
200 N. Spring Street
Los Angeles, CA 90012

OBJECTIONS TO REQUIREMENT THAT STORES PROVIDE PAPER OR REUSABLE BAGS TO FOOD STAMP AND WIC CUSTOMERS FREE OF CHARGE WITHOUT GOVERNMENTAL COMPENSATION

The California Independent Grocers Association ("CIGA") objects to the requirement that stores provide costly paper bags free of charge to customers who receive benefits under the SNAP (food stamp) or WIC programs, if the store is not compensated by the government. Many independent grocery stores are located in economically challenged areas and are heavily impacted by this requirement.

Section 12.85.060 of the existing LA County carryout bag ordinance states:

> All stores must provide at point of sale, **free of charge**, either reusable bags or recyclable paper carryout bags or both, at the store's option, to any customer participating either in the California Special Supplemental Food Program for Women, Infants, and Children...or in the Supplemental Food Program....

Section 195.05 of the proposed City of LA carryout bag ordinance states:

> Stores that provide Recyclable Paper Single-Use Carryout Bags…shall provide such bags or Reusable Carryout Bags or both, at the Store's option, **free of charge** to any Customer participating either in the California Special Supplemental Food Program for Women, Infants, and Children...or in the Supplemental Food Program….

A store in South LA in unincorporated LA County. At some stores, 80% to 90% of customers are on food stamps or WIC. All such food stamp and WIC customers are entitled to free paper bags – at the storeowner's expense. Paper bags cost the storeowner about five times more than banned plastic bags. In contrast, Whole Foods and stores in affluent areas are able to charge virtually all of their customers for paper bags as they have few if any food stamp or WIC customers.

A plastic bag costs a store about 1 or 2 cents. A paper bag costs at least 10 cents. A reusable bag costs more. Stores subject to plastic bag bansare being forced to give away millions of costly paper bags each year without any governmental compensation.

CIGA supports exempting struggling persons and families who receive food stamp and WIC benefits from being required to pay for paper bags. The LA Times reports that the average benefit is $134 a month per person, which is $1.48 per meal. It would be unconscionable to require such people to pay for paper bags.

http://www.latimes.com/business/la-fi-hiltzik-20130616,0,1949780.column
http://foodstampguide.org/maximum-food-stamp-allotment-levels/

If the County and the City of LA wish to ban plastic bags and require that stores provide food stamp and WIC customers with free paper bags that cost about five times more than plastic bags, **then the County and the City of LA should bear the cost of providing those costly paper bags to such customers.** Storeowners should not be required to bear this cost, just because they are serving parts of LA with high levels of economically challenged customers. **Storeowners (including many independent small family-owned businesses) are being penalized for serving low-income communities.**

How many bags are Whole Foods and other high-end stores in Santa Monica, Malibu, Brentwood, or West Hollywood forced to give away each month to food stamp and WIC customers without governmental compensation? Probably none. The free bag requirement **discriminates** against stores in economically challenged areas.

The federal government has launched a drive to get more people into the food stamp program. As a result, the number of food stamp recipients increased from 33 million in 2009 to 46.6 million in 2012, a 41% increase. This heavily impacts stores that must give away paper bags free of charge to food stamp and WIC customers without government compensation.

http://www.fns.usda.gov/pd/SNAPsummary.htm

The LA Times reports:

> More than 1.7 million L.A. County residents were at risk of hunger in 2009, more than in any other county in America, according to research published recently by Feeding America, the country's largest network of food banks.
>
> Nearly 1 million county residents receive food stamps, but participation in California has lagged behind most other states. Just half the eligible Californians were receiving the benefit in 2008, the most recent year for which federal estimates are available….

http://articles.latimes.com/2011/apr/27/local/la-me-food-stamps-20110427

> [LA County] has more than three-times the amount of income-eligible individuals than any other county in California, totaling an estimated 1,627,843 people.

http://www.neontommy.com/news/2011/04/food-stamps-la-underutilized-due-fear-misinformation

The LA Times reports that the LA County Department of Public Social Services ("DPSS") is trying to **double** the number of food stamp participants in LA County from one million to two million, which will make the free paper bag requirement even more financially onerous for storeowners.

> "What we're trying to do is to make sure that everyone knows the benefits to which they're entitled," [LA County DPSS director] told the [LA County Board of Supervisors]. "If we increase the participation to what we think it should be, there would be an additional 1 million individuals in Los Angeles County…."

http://articles.latimes.com/2011/apr/27/local/la-me-food-stamps-20110427
See also: http://money.cnn.com/2012/06/25/news/economy/food-stamps-ads/index.htm

The California Grocers Association ("CGA") says that it supports banning plastic bags and imposing a 10-cent fee on paper bags. However, independent stores in economically challenged areas have no reason to support a law that forces them to give away costly paper bags free of charge without compensation.

LA County and the City of LA have given no consideration whatsoever to the impact of the cost of the food stamp and WIC paper bag charge exemption on the owners of stores in economically challenged areas, including small family-owned businesses. If the LA County and the City of LA wish to ban plastic bags, they must compensate the storeowners for the cost of this exemption.

In a letter to the City Council dated June 3, 2013, the CGA says "grocery stores operate on less than 1% profit margins so every penny counts." On a $10 transaction, if the 10-cent paper bag fee cannot be charged, the entire profit margin is lost. (10 cents is 1% of $10.)

Members of the LA Board of Supervisors and the LA City Council would protest loudly and file lawsuits if each of them, as individuals,was required to purchase 100,000 paper bags at a cost of $10,000 from their own pockets and give them to economically challenged members of the public, without government compensation. They have no right to expect owners of stores in economically challenged areas to act any differently.

CIGA strongly urges Council to reconsider this requirement of the ordinance that require that stores provide paper or reusable bags free of charge to food stamp or WIC customers without government compensation. Thank you for your consideration of our viewpoint.

Sincerely,

John Handley
Vice President, Government Relations

Executive Department

State of California

EXECUTIVE ORDER B-29-15

WHEREAS on January 17, 2014, I proclaimed a State of Emergency to exist throughout the State of California due to severe drought conditions; and

WHEREAS on April 25, 2014, I proclaimed a Continued State of Emergency to exist throughout the State of California due to the ongoing drought; and

WHEREAS California's water supplies continue to be severely depleted despite a limited amount of rain and snowfall this winter, with record low snowpack in the Sierra Nevada mountains, decreased water levels in most of California's reservoirs, reduced flows in the state's rivers and shrinking supplies in underground water basins; and

WHEREAS the severe drought conditions continue to present urgent challenges including: drinking water shortages in communities across the state, diminished water for agricultural production, degraded habitat for many fish and wildlife species, increased wildfire risk, and the threat of saltwater contamination to fresh water supplies in the Sacramento-San Joaquin Bay Delta; and

WHEREAS a distinct possibility exists that the current drought will stretch into a fifth straight year in 2016 and beyond; and

WHEREAS new expedited actions are needed to reduce the harmful impacts from water shortages and other impacts of the drought; and

WHEREAS the magnitude of the severe drought conditions continues to present threats beyond the control of the services, personnel, equipment, and facilities of any single local government and require the combined forces of a mutual aid region or regions to combat; and

WHEREAS under the provisions of section 8558(b) of the Government Code, I find that conditions of extreme peril to the safety of persons and property continue to exist in California due to water shortage and drought conditions with which local authority is unable to cope; and

WHEREAS under the provisions of section 8571 of the California Government Code, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay the mitigation of the effects of the drought.

NOW, THEREFORE, I, EDMUND G. BROWN JR., Governor of the State of California, in accordance with the authority vested in me by the Constitution and statutes of the State of California, in particular Government Code sections 8567 and 8571 of the California Government Code, do hereby issue this Executive Order, effective immediately.

IT IS HEREBY ORDERED THAT:

1. The orders and provisions contained in my January 17, 2014 Proclamation, my April 25, 2014 Proclamation, and Executive Orders B-26-14 and B-28-14 remain in full force and effect except as modified herein.

SAVE WATER

2. The State Water Resources Control Board (Water Board) shall impose restrictions to achieve a statewide 25% reduction in potable urban water usage through February 28, 2016. These restrictions will require water suppliers to California's cities and towns to reduce usage as compared to the amount used in 2013. These restrictions should consider the relative per capita water usage of each water suppliers' service area, and require that those areas with high per capita use achieve proportionally greater reductions than those with low use. The California Public Utilities Commission is requested to take similar action with respect to investor-owned utilities providing water services.

3. The Department of Water Resources (the Department) shall lead a statewide initiative, in partnership with local agencies, to collectively replace 50 million square feet of lawns and ornamental turf with drought tolerant landscapes. The Department shall provide funding to allow for lawn replacement programs in underserved communities, which will complement local programs already underway across the state.

4. The California Energy Commission, jointly with the Department and the Water Board, shall implement a time-limited statewide appliance rebate program to provide monetary incentives for the replacement of inefficient household devices.

5. The Water Board shall impose restrictions to require that commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, immediately implement water efficiency measures to reduce potable water usage in an amount consistent with the reduction targets mandated by Directive 2 of this Executive Order.

6. The Water Board shall prohibit irrigation with potable water of ornamental turf on public street medians.

7. The Water Board shall prohibit irrigation with potable water outside of newly constructed homes and buildings that is not delivered by drip or microspray systems.

8. The Water Board shall direct urban water suppliers to develop rate structures and other pricing mechanisms, including but not limited to surcharges, fees, and penalties, to maximize water conservation consistent with statewide water restrictions. The Water Board is directed to adopt emergency regulations, as it deems necessary, pursuant to Water Code section 1058.5 to implement this directive. The Water Board is further directed to work with state agencies and water suppliers to identify mechanisms that would encourage and facilitate the adoption of rate structures and other pricing mechanisms that promote water conservation. The California Public Utilities Commission is requested to take similar action with respect to investor-owned utilities providing water services.

INCREASE ENFORCEMENT AGAINST WATER WASTE

9. The Water Board shall require urban water suppliers to provide monthly information on water usage, conservation, and enforcement on a permanent basis.

10. The Water Board shall require frequent reporting of water diversion and use by water right holders, conduct inspections to determine whether illegal diversions or wasteful and unreasonable use of water are occurring, and bring enforcement actions against illegal diverters and those engaging in the wasteful and unreasonable use of water. Pursuant to Government Code sections 8570 and 8627, the Water Board is granted authority to inspect property or diversion facilities to ascertain compliance with water rights laws and regulations where there is cause to believe such laws and regulations have been violated. When access is not granted by a property owner, the Water Board may obtain an inspection warrant pursuant to the procedures set forth in Title 13 (commencing with section 1822.50) of Part 3 of the Code of Civil Procedure for the purposes of conducting an inspection pursuant to this directive.

11. The Department shall update the State Model Water Efficient Landscape Ordinance through expedited regulation. This updated Ordinance shall increase water efficiency standards for new and existing landscapes through more efficient irrigation systems, greywater usage, onsite storm water capture, and by limiting the portion of landscapes that can be covered in turf. It will also require reporting on the implementation and enforcement of local ordinances, with required reports due by December 31, 2015. The Department shall provide information on local compliance to the Water Board, which shall consider adopting regulations or taking appropriate enforcement actions to promote compliance. The Department shall provide technical assistance and give priority in grant funding to public agencies for actions necessary to comply with local ordinances.

12. Agricultural water suppliers that supply water to more than 25,000 acres shall include in their required 2015 Agricultural Water Management Plans a detailed drought management plan that describes the actions and measures the supplier will take to manage water demand during drought. The Department shall require those plans to include quantification of water supplies and demands for 2013, 2014, and 2015 to the extent data is available. The Department will provide technical assistance to water suppliers in preparing the plans.

13. Agricultural water suppliers that supply water to 10,000 to 25,000 acres of irrigated lands shall develop Agricultural Water Management Plans and submit the plans to the Department by July 1, 2016. These plans shall include a detailed drought management plan and quantification of water supplies and demands in 2013, 2014, and 2015, to the extent that data is available. The Department shall give priority in grant funding to agricultural water suppliers that supply water to 10,000 to 25,000 acres of land for development and implementation of Agricultural Water Management Plans.

14. The Department shall report to Water Board on the status of the Agricultural Water Management Plan submittals within one month of receipt of those reports.

15. Local water agencies in high and medium priority groundwater basins shall immediately implement all requirements of the California Statewide Groundwater Elevation Monitoring Program pursuant to Water Code section 10933. The Department shall refer noncompliant local water agencies within high and medium priority groundwater basins to the Water Board by December 31, 2015, which shall consider adopting regulations or taking appropriate enforcement to promote compliance.

16. The California Energy Commission shall adopt emergency regulations establishing standards that improve the efficiency of water appliances, including toilets, urinals, and faucets available for sale and installation in new and existing buildings.

INVEST IN NEW TECHNOLOGIES

17. The California Energy Commission, jointly with the Department and the Water Board, shall implement a Water Energy Technology (WET) program to deploy innovative water management technologies for businesses, residents, industries, and agriculture. This program will achieve water and energy savings and greenhouse gas reductions by accelerating use of cutting-edge technologies such as renewable energy-powered desalination, integrated on-site reuse systems, water-use monitoring software, irrigation system timing and precision technology, and on-farm precision technology.

STREAMLINE GOVERNMENT RESPONSE

18. The Office of Emergency Services and the Department of Housing and Community Development shall work jointly with counties to provide temporary assistance for persons moving from housing units due to a lack of potable water who are served by a private well or water utility with less than 15 connections, and where all reasonable attempts to find a potable water source have been exhausted.

19. State permitting agencies shall prioritize review and approval of water infrastructure projects and programs that increase local water supplies, including water recycling facilities, reservoir improvement projects, surface water treatment plants, desalination plants, stormwater capture, and greywater systems. Agencies shall report to the Governor's Office on applications that have been pending for longer than 90 days.

20. The Department shall take actions required to plan and, if necessary, implement Emergency Drought Salinity Barriers in coordination and consultation with the Water Board and the Department of Fish and Wildlife at locations within the Sacramento - San Joaquin delta estuary. These barriers will be designed to conserve water for use later in the year to meet state and federal Endangered Species Act requirements, preserve to the extent possible water quality in the Delta, and retain water supply for essential human health and safety uses in 2015 and in the future.

21. The Water Board and the Department of Fish and Wildlife shall immediately consider any necessary regulatory approvals for the purpose of installation of the Emergency Drought Salinity Barriers.

22. The Department shall immediately consider voluntary crop idling water transfer and water exchange proposals of one year or less in duration that are initiated by local public agencies and approved in 2015 by the Department subject to the criteria set forth in Water Code section 1810.

23. The Water Board will prioritize new and amended safe drinking water permits that enhance water supply and reliability for community water systems facing water shortages or that expand service connections to include existing residences facing water shortages. As the Department of Public Health's drinking water program was transferred to the Water Board, any reference to the Department of Public Health in any prior Proclamation or Executive Order listed in Paragraph 1 is deemed to refer to the Water Board.

24. The California Department of Forestry and Fire Protection shall launch a public information campaign to educate the public on actions they can take to help to prevent wildfires including the proper treatment of dead and dying trees. Pursuant to Government Code section 8645, $1.2 million from the State Responsibility Area Fire Prevention Fund (Fund 3063) shall be allocated to the California Department of Forestry and Fire Protection to carry out this directive.

25. The Energy Commission shall expedite the processing of all applications or petitions for amendments to power plant certifications issued by the Energy Commission for the purpose of securing alternate water supply necessary for continued power plant operation. Title 20, section 1769 of the California Code of Regulations is hereby waived for any such petition, and the Energy Commission is authorized to create and implement an alternative process to consider such petitions. This process may delegate amendment approval authority, as appropriate, to the Energy Commission Executive Director. The Energy Commission shall give timely notice to all relevant local, regional, and state agencies of any petition subject to this directive, and shall post on its website any such petition.

26. For purposes of carrying out directives 2–9, 11, 16–17, 20–23, and 25, Division 13 (commencing with section 21000) of the Public Resources Code and regulations adopted pursuant to that Division are hereby suspended. This suspension applies to any actions taken by state agencies, and for actions taken by local agencies where the state agency with primary responsibility for implementing the directive concurs that local action is required, as well as for any necessary permits or approvals required to complete these actions. This suspension, and those specified in paragraph 9 of the January 17, 2014 Proclamation, paragraph 19 of the April 25, 2014 proclamation, and paragraph 4 of Executive Order B-26-14, shall remain in effect until May 31, 2016. Drought relief actions taken pursuant to these paragraphs that are started prior to May 31, 2016, but not completed, shall not be subject to Division 13 (commencing with section 21000) of the Public Resources Code for the time required to complete them.

27. For purposes of carrying out directives 20 and 21, section 13247 and Chapter 3 of Part 3 (commencing with section 85225) of the Water Code are suspended.

28. For actions called for in this proclamation in directive 20, the Department shall exercise any authority vested in the Central Valley Flood Protection Board, as codified in Water Code section 8521, et seq., that is necessary to enable these urgent actions to be taken more quickly than otherwise possible. The Director of the Department of Water Resources is specifically authorized, on behalf of the State of California, to request that the Secretary of the Army, on the recommendation of the Chief of Engineers of the Army Corps of Engineers, grant any permission required pursuant to section 14 of the Rivers and Harbors Act of 1899 and codified in section 48 of title 33 of the United States Code.

29. The Department is directed to enter into agreements with landowners for the purposes of planning and installation of the Emergency Drought Barriers in 2015 to the extent necessary to accommodate access to barrier locations, land-side and water-side construction, and materials staging in proximity to barrier locations. Where the Department is unable to reach an agreement with landowners, the Department may exercise the full authority of Government Code section 8572.

30. For purposes of this Executive Order, chapter 3.5 (commencing with section 11340) of part 1 of division 3 of the Government Code and chapter 5 (commencing with section 25400) of division 15 of the Public Resources Code are suspended for the development and adoption of regulations or guidelines needed to carry out the provisions in this Order. Any entity issuing regulations or guidelines pursuant to this directive shall conduct a public meeting on the regulations and guidelines prior to adopting them.

31. In order to ensure that equipment and services necessary for drought response can be procured quickly, the provisions of the Government Code and the Public Contract Code applicable to state contracts, including, but not limited to, advertising and competitive bidding requirements, are hereby suspended for directives 17, 20, and 24. Approval by the Department of Finance is required prior to the execution of any contract entered into pursuant to these directives.

This Executive Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

I FURTHER DIRECT that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given to this Order.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 1st day of April 2015.

EDMUND G. BROWN JR.
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State

CLIMATE CENTRAL

Researching and reporting the science and impacts of climate change

Pacific Northwest's 'Wet Drought' Possible Sign of Future

Published: April 28th, 2015
By Andrea Thompson

The desiccated soils and barren slopes of California have grabbed news headlines for months on end as the state is in its fourth year of a crippling drought that has forced unprecedented statewide water restrictions and billions of dollars in agricultural losses.

Unusually low snow levels seen at Oregon's Crater Lake on April 21, 2015.
Click image to enlarge. *Credit: NPS*

But while most eyes have been trained on the plight of the Golden State, its neighbors to the north are also facing a dearth of water, victims of some of the same atmospheric forces that have left California parched.

Oregon and Washington aren't currently in the same dire straits as California, having at least received a fair bit of rain this winter, but the warm, snowless conditions could be a harbinger of the future in an overall warming world. Some experts and officials are hoping the region can learn from today's situation to better prepare for an altered climate later in the century.

"We have an opportunity here to start thinking about our future," Kathie Dello, deputy director of the Oregon Climate Service at Oregon State University, said.

Wet Drought

The drought in California is one of both heat and dryness, as a persistent ridge of high pressure that parked itself over the western U.S. over the past two winters blocked much-needed storms and drove up temperatures to spring and summer levels.

Oregon and Washington, on the other hand, are stuck in a seemingly oxymoronic wet drought. The storms that were prevented from hitting California did provide rains to the Pacific Northwest, with winter precipitation in Oregon only about 30 percent below average, not even in the bottom 10 years historically, said Philip Mote, director of the Oregon Climate Service.

RELATED
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But the sky-high temperatures that marked the warmest winter on record for Washington and the second warmest for Oregon meant that much of the precipitation fell as rain, and not snow. Like California, parts of both these states depend on melting snowfall to fill their reservoirs, leaving them with potential shortages this year. Elevated temperatures also meant that what snow there was melted much earlier than normal.

Three-fourths of snow survey sites in Oregon had record-low snow measurements as of April 1, and fewer than half of them had any snow on the ground, according to a report by the Natural Resources Conservation Service. The snowpack across much of the Cascades Range in Washington was less than 25 percent, while the Olympic Mountains checked in at only 3 percent on April 1, an "unbelievably low" amount, Karin Bumbaco, assistant state climatologist in Washington, said.

Water and Wildfires

Those numbers, along with expectations that the drought conditions will persist if not intensify, have officials bracing for impacts this spring and summer.

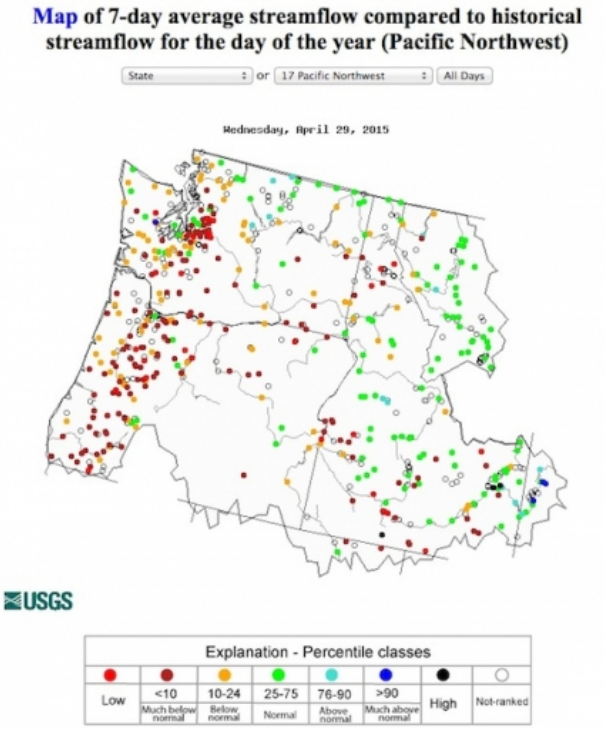
“The two themes that keep coming up are summertime water supply and wildfires,” Dello said.

The water shortage concerns aren’t as widespread as in California because the western parts of Oregon and Washington tend to depend solely on rain, and so their supplies are fairly healthy. But in eastern areas that do depend on the snowpack to keep reservoirs topped up, residents and officials “are really concerned about what’s going to happen,” Dello said.

In eastern Oregon, there is concern that a lack of water to irrigate pastures for cattle grazing could further drive up the price of beef, and many farmers are already planning to let fields lie fallow, The Oregonian reported. In Washington, junior water users will get only 60 percent of their water allocations, Bumbaco said. The numbers could be worse, she added, but reservoir managers stored more rain than they typically would, anticipating the poor snow runoff.

The poor spring and summer runoff could also impact local wildlife. The Department of Fish and Wildlife is concerned about the ability of fish, like salmon, to be able to make it down streams to the ocean and is requesting money from the state to truck them to the sea, Bumbaco said.

Come June and July, the National Interagency Fire Center expects “increasing to above normal” potential for wildfires in a broad swath of the drought-stricken West, including all of Oregon and most of Washington, which could put homes, businesses and ecosystems at risk.



Streamflow levels compared to normal across the Pacific Northwest in late April 2015. Click image to enlarge. Credit: USGS

Warm Western Future

While the scarcity of snow poses immediate challenges for Pacific Northwest communities, it also presents an opportunity to better prepare the region for a warmer world.

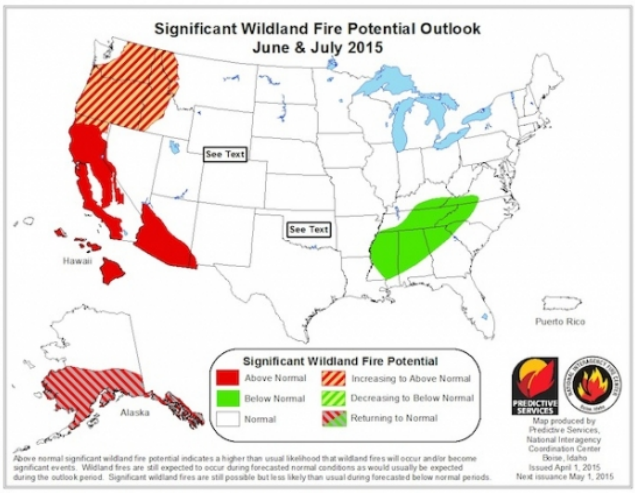
The Pacific Northwest has already warmed by 1.3°F since 1895, and is expected to have warmed by 3° to 10°F by the end of the century (compared to the 1970-1999 average), according to the National Climate Assessment. And while heavy downpours there are expected to rise because of the greater water-holding capacity of the warmer atmosphere, less of that precipitation will fall as snow at all but the highest elevations. The warmer temperatures also mean a likely earlier spring snowmelt, changing the equations for calculating water supplies during the dry season.

Given those expectations, this winter stands as an example of what the average winter in Oregon or Washington could be like by the end of the century.

“There’s been a lot of talk about that in the community,” Bumbaco said. “I don’t’ want to say to anyone that this is climate change right now,” she cautioned, but said that it’s a fair statement that it could be a glimpse of the future.

Just as the drought is forcing some hard reckoning in California in terms of thinking about how water is stored, transported and used — including for watering lush suburban lawns and water-thirsty crops in an arid landscape — it could spur changes to be made in the Pacific Northwest.

Previous droughts contributed to changes in Seattle’s water system, as well as land-use rules that have contained urban development



The National Interagency Fire Center's outlook for wildfire conditions across the country during June and July 2015. Conditions from California through Washington are elevated during that time period due to the drought in the region.
Click image to enlarge. *Credit: NIFC*

CLIMATE CENTRAL

and prevented the kind of sprawl that has strained water resources in California, Dello said.

Exactly what form new changes might take is still very much up in the air, but officials have already floated ideas to increase water storage, use recycled water for activities like watering lawns and flushing toilets, modernizing irrigation and encouraging efficient water fixtures in houses to reduce water use, and perhaps even making changes to the century-old system of parceling out water rights in the West.

“I don’t see that changing easily; it’s such an institution,” Dello said. But, she added, “people are certainly studying this.”

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EQUINOX CENTER

HEALTHY ENVIRONMENT STRONG ECONOMY VIBRANT COMMUNITIES



Plastic Bag Bans: Analysis of Economic and Environmental Impacts

October 2013

Updated: October 23, 2013

TABLE OF CONTENTS

ABBREVIATIONS

Bag-Use Profile	Proportion of bag types used at retail venues
HDPE	High-density polyethylene
LCA	Life cycle assessment
MJ	Megajoule
PBB	Plastic Bag Ban
PBB + Fee	Plastic Bag Ban + Fee on paper bags
Re-PE	Reusable polyethylene bag
SUPB	Single-use plastic bag

EXECUTIVE SUMMARY

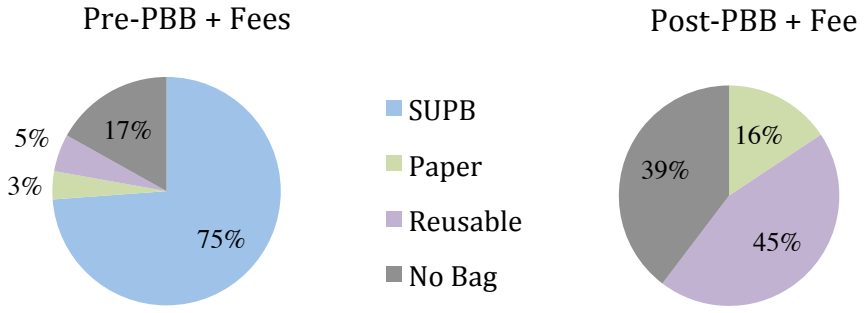
Single-use plastic bags (SUPBs) emerged as a popular product in the 1970's and continue to be a popular bag choice for consumers. For example, more SUPBs were produced in the first decade of the 21st century than the entire 20th century combined. The popularity of single-use bags can be traced to their convenience, lightweight and ability to be reused for other purposes, among other reasons. However, concerns have been raised about the environmental and economic problems they pose. In response, municipalities have increasingly turned to plastic bag bans (PBBs) as a way to phase out SUPBs and encourage a transition to reusable bags. In California, there are currently 64 PBB ordinances covering 85 municipalities, with many including a fee on single-use paper bags (PBB + Fee) to discourage the replacement of SUPBs with single-use paper bags. Together, **these ordinances cover approximately 44% of the state's population**. Equinox Center presents this report in an attempt to examine the potential environmental and economic impacts that a PBB could have in San Diego, in hopes that stakeholders will be armed with a realistic assessment of PBBs.

The Problem with Plastic Bags in San Diego

- **Plastic bags in the waste stream.** Roughly 95 percent of the 500 million SUPBs used annually in the City of San Diego end up in a landfill.
- **Litter cleanup is costly**. The City of San Diego spends approximately $160,000 per year to clean up plastic bag litter, mostly at Miramar Landfill.
- **No curbside recycling of plastic bags.** SUPBs are not listed as recyclables because they have a tendency to jam sorting equipment and are therefore difficult to recycle.
- **Space in landfill is limited.** The Miramar Landfill is projected to close by 2022 if the quantity of waste it receives per year does not decline significantly.

What Have Plastic Bag Bans Achieved in Comparable Locations?

The charts below summarize pre- and post-ban data based on surveys conducted by the Cities of San Jose and Santa Monica, as well as the County of Los Angeles.



In these jurisdictions, plastic bag bans increased reusable bag usage by 40 percent. However, the elimination of plastic bags also led to an increase in paper bag usage (3% to 16%).

Environmental Impact

The resulting change in the Bag-Use Profile is **better overall for the environment** than the current profile.

1. *A PBB + Fee successfully reduces the volume of single-use bags deployed.* A PBB + 10 cent fee in San Diego could achieve an 86 percent reduction of single-use bags,which could amount to a decrease of 348 million single-use bags per year.

2. *Less energy is required, more water is required, less solid waste is generated, and fewer GHG's are emitted from the life cycles of Bag-Use Profiles achieved with PBB + Fees.*

Energy: 74 million MJ reduction
CO_2 eq. emissions: 6,418-ton reduction
Solid waste: 270,000 kg reduction
Water Consumption: 30 million gallon increase

Economic Impact

Local **economies**, comprised of affected retailers and their customers, **are not negatively impacted in the long-term**.

- *Retailers:* short-term increase in baggage costs due to increased paper bag usage. These costs should be mitigated over time as consumers transition to reusable bags. San Jose and San Francisco have reported "no sustained negative impact to retailers."
- *Consumers:* estimated cost of $7.70 per household in the first year after the ban to purchase reusable bags and to account for any fees associated with paper bag usage. Recurring costs should decrease over time due to the long lifespan of reusable bags.
- *Cities:* the City of San Diego will most likely experience savings through litter abatement. The City spends approximately $160,000 per year cleaning up plastic bag litter.
- *Plastics manufacturers:* Although it is possible that job losses may occur in this sector, Equinox Center was unable to find studies that quantify job loss in the plastics industry due to PBBs. If plastics manufacturers are negatively impacted, they have opportunities to expand production to reusable bags, since most reusable bags use a polyethylene derivative.

Despite some claims that a PBB would have only a negligible positive impact, the precedent set by an ordinance in San Diego could pave the way for additional waste reduction measures aimed at other trash types, and to alert residents that the region is taking active measures to reduce the environmental impacts of SUPBs. As municipalities continue to enact PBB ordinances, it is recommended that records be kept not only to measure their effectiveness in promoting reusable bag usage, but also to see how these ordinances impact local businesses. To this point, a lack of research on the economic impacts of PBBs threatens their objectivity and credibility when presented to business leaders and elected officials. This data, while costly to collect, is essential to understand whether or not a PBB is achieving its desired goals.

INTRODUCTION

Ordinances that limit the use of single use plastic bags (SUPBs) and encourage their replacement by reusable shopping bags have become increasingly popular in California and worldwide. Supporters of such efforts frequently cite the need to reduce pollutants associated with plastic bag litter and production. While many municipalities have been successful at implementing either plastic bag bans (PBBs) or mandatory fees on single use bags, opposition has been substantial and efforts to impede such ordinances have been common. Those who oppose plastic bag reduction measures frequently: cite negative economic impacts on the plastics industry and impacted retailers and consumers affected by fees or bans, question the ability of such ordinances to achieve the desired goals put forth by supporters, challenge the magnitude of plastic pollution in affected municipalities, argue that consumers will default to alternative behaviors which are environmentally worse than the status quo, and suggest that reused bags carry bacteria that could harm consumers.

Both advocates and critics of PBBs have been outspoken, fueling the debate around the ability of PBBs to achieve desired goals. Both sides of the debate have accused the other of obscuring facts, often making objective evaluation of the pros and cons of PBBs difficult.

Since the issue of a plastic bag reduction ordinance came forward at the City of San Diego's Rules & Economic Development Committee on September 11, 2013, a number of questions have arisen regarding how an ordinance in San Diego may affect the environment as well as local businesses. Additionally, a statewide PBB that would include San Diego was recently rejected, but may be put forward again. Equinox Center presents this report in an attempt to examine the potential environmental and economic impacts that a PBB could have in San Diego, in hopes that stakeholders will be armed with a realistic assessment of PBBs. Our analyses are based on studies of other regions that have imposed bans, a literature review to assess the merit of supporting and opposing arguments, and consider factors unique to the San Diego region.

BACKGROUND

THE ISSUE

The Rise of Plastics

Plastics have become increasingly popular for industrial and consumer uses since their emergence in the 1940s. The volume of plastic manufactured each year continues to rise rapidly, with the quantity produced in the first decade of the 21st century approaching the total produced during the entire century prior. Today, approximately 260 million tons of plastics are produced for various purposes worldwide on an annual basis.[1]

The Rise of Single-Use Plastic Bags

SUPBs are defined in the literature as recyclable high-density polyethylene (HDPE) bags designed to be used once.[2] SUPBs rose to popularity for use in retail venues in the 1970s and remain the most popular grocery bag choice for American consumers where bans are not in place.[3] Today, 500 billion to 1.5 trillion SUPBs are used annually around the world, with at least 100 billion of those

used in the United States.[4] Note that the US figure is for single-use plastic *shopping* bags, which PBBs are largely designed to mitigate; the total number of plastic bags consumed in the US is closer to380 billion annually.[5] Of these, an estimated 20 billion were consumed annually in California in the early 2000s,[6] with that number declining to roughly 14 billion in 2012 estimates.[7] The average number of SUPBs used by each Californian who resides in municipalities without PBBs is 550 per year.[8]

The Life Cycle of Plastic Bags

A SUPB's life cycle begins with the conversion of fossil fuels (crude oil or natural gas) into polymers used to manufacture all plastics, including plastic bags.[9] Around 4 percent of world oil production is, in turn, used as a feedstock to make plastics while a similar amount is consumed as energy in the process. 12 million barrels of oil are required to produce the SUPBs consumed annually in the US.[10] The window of consumer use for SUPBs averages only 20 minutes. End of life scenarios are consistent with the very properties that make plastic bags popular: exceptional durability and strength. The thin plastics that most SUPBs are composed of take between 400 and 1000 years to break down, leaving them to persist in their disposed environment. A portion of SUPBs are indeed recycled, but this fraction averages only 5% in the US.[11] A national survey found that 92% of polled consumers reuse plastic shopping bags at least once. However, this fraction is generally not recycled, and is instead diverted to landfills.[12] A Los Angeles study found that the majority of bags diverted towards recycling processes are ultimately taken to landfills due to the high contamination rate of SUPBs used as bin liners, the propensity for SUPBs to get caught in recycling machinery, and the lack of markets for recycled HDPE bags.[13]

The Problem with Plastics

Primary concerns with the global prevalence of plastic bags include:

- **Plastic bags persist for a long time.** Plastic bags can last for up to 1000 years. The vast majority of this life cycle is spent in the end-of-life phase, either in a landfill or as litter in the environment. A plastic bag's extensive lifespan is the direct result of plastic's immunity to biodegradation. Plastics instead photodegrade[1] over time, releasing any toxic additives they contain. In a landfill, these can leach out over time. In the environment, these can harm ecosystems.[14]
- **Plastic bags in the waste stream.** A study performed by the California Integrated Waste Management Board found that plastics of all types comprise nearly 10 percent of California's disposed waste stream. Of this, plastic bags account for 0.3 percent of the total waste stream. Plastic grocery bags specifically make up 0.13 percent of the total waste stream.[15]
- **Plastic bag litter.** While figures vary depending on the study, proportions of litter comprised of plastic bags are found to fall between 0.9 and 5 percent.[16] If the US consumes 100 billion SUPBs per year, these figures indicate that as much as 50 million plastic bags become litter during that time period, nationwide.
- **Plastic bags are manufactured from fossil fuels.** Plastic bag life cycles are greenhouse-gas intensive on the front end due primarily to the use of fossil fuels in their production.

[1] Photodegradation is the decomposition of a compound by radiant energy, such as natural sunlight.

- **Plastic bag marine pollution**. 80 percent of marine debris originates from land sources, 60-80 percent of which are plastics, according to a major assessment by the United Nations Environment Programme.[17] UNEP noted that plastic marine debris dispelled almost anywhere poses a global pollution problem due to its portability in ocean currents and long lifespan. Plastics have been reported to negatively impact between 180 and 660 species of animals, including birds, fish, turtles, and marine mammals, with a portion of these plastics presumably comprised of plastic bags.[18,19] Marine animals confuse plastic bags for food, which can lead to blocked digestive tracts and eventual death. For example, one in three dead leatherback turtles were found in San Francisco Bay with some form of plastic in their stomachs, 'most often a plastic bag,' according to a study of 370 autopsies.[20]

Plastic Bags in San Diego

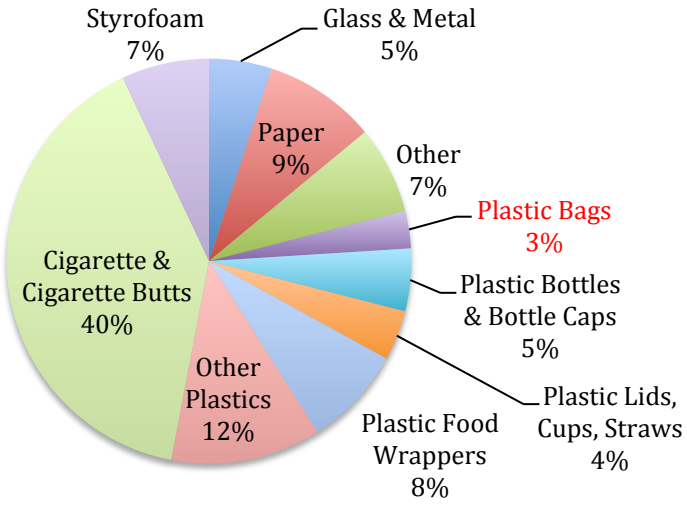
The state's average per capita SUPB consumption has fallen recently, presumably due to the number of PBBs imposed in the last few years. But in CA municipalities *without* bans, the average annual SUPB consumption is approximately 550 per person.[21] The City of San Diego's Environmental Service Department estimates that 500 million SUPBs are distributed annually in the City.[22] This amounts to approximately 375 SUPBs used per resident each year.

The Problem with Plastic Bags in San Diego

Primary concerns with plastics in San Diego are described here:

- **Plastic bags in the waste stream.** The most recent survey of the city's waste stream, performed in 2000, found that film plastic comprised 2.8 percent of San Diego's waste stream by weight.[23] Plastic bags fall within that category, although the fraction of SUPBs was not delineated. According to state recycling statistics, however, roughly 95 percent of the 500 million SUPBs used in the City of San Diego annually end up in the landfill.[24]
- **Litter cleanup is costly**. A 2012 study prepared for the EPA found that West Coast communities spend approximately $13 per resident annually to clean up litter that would otherwise likely become marine debris.[25] The City of San Diego spends approximately $160,000 per year to clean up plastic bag litter.[26]
- **Plastic bags as litter.** This graph documents the volume by weight of debris types gathered in 2012 during beach cleanups by the non-profit organization San Diego Coastkeeper.[27] Three percent of litter by weight was plastic bags, equaling 7,500 bags for a total of 228 pounds.

Debris From 2012 San Diego Beach Cleanup



Source: San Diego Coastkeeper

- **No curbside recycling of plastic bags.** SUPBs are not listed as recyclables, according to San Diego's Environmental Services Department, due to the fact that plastic bags have a tendency to jam sorting equipment and are therefore difficult to recycle.[28] This has contributed to the lack of curbside recycling available for plastic bags in San Diego.[29,30] However, consumers can return used plastic bags back to their supermarket for proper recycling and handling.
- **Space in landfill is limited.** The Miramar Landfill, where San Diego's trash goes, is cited for closure by 2022 if the quantity of waste entering it per year does not decline significantly.[31] Eliminating plastic bags could help extend the lifespan of this landfill.

PLASTIC BAG BANS

History

Due to the undesirable factors associated with the widespread use of SUPBs described above, efforts to reduce the consumption of SUPBs have taken various forms worldwide in the last two decades. Studies have shown that consumer education alone does not achieve significant reductions in single-use bag consumption, with an average decrease in single-use bag consumption of only 5 percent where consumer education campaigns have attempted to induce voluntary bag decreases.[32,33] As a result, a rise in mandatory ordinances has occurred. 17 states currently have some ordinance in place to limit paper or plastic bag use, mostly bans. Some foreign countries and states other than California have chosen to place a tax or fee on plastic and/or paper bags, but CA's AB 2449, passed in 2006, prohibited the state from placing any sort of fee on plastic bags (*not* paper, however) through January 2013.[34]

California's 64 ordinances covering 85 municipalities take the form of bans, with many including a fee on single-use paper bags (PBB + Fee) to discourage replacement of SUPBs with single-use paper bags instead of reusables.[35] Major players thus far include the City of Los Angeles (2013), Los

Angeles County (2012), San Francisco (2007), San Jose (2011), and San Diego County's own Solana Beach (2012).[36] Statewide efforts to place fees on SUPBs before AB 2449 were rejected. AB 1998, a California-wide bag ban bill, was on the horizon in 2012 but was also rejected. Another attempt at a statewide bag ban followed in 2013 under the proposed SB 405, but also failed.[37]

What are Plastic Bag Bans?

Plastic bag bans have been designed in various ways, taking into account: the ban's effectiveness in reducing plastic bag use, consumer behavior once the ordinance is enforced, the ordinance's ability to limit overall environmental damage associated with single use bags, and the negative economic impact bans might have on affected consumers and retailers.

Variables include:

- **Types of bags banned**
  - Thin HDPE bags only, thin HDPE + thicker non-recyclable plastic (at least 2.25 mil[2] thick), or all types of plastic including biodegradable and compostable plastics
- **Inclusion of a fee** on the other popular single-use bag alternative (paper)
- **Amount of the attached fee** on paper bags
  - Between 10 and 25 cents in CA, 5 cents to 30 cents worldwide
- **Characteristics of the alternative single-use bags offered for a fee**
- **Type of reusable bag promoted**
  - Cotton, thick plastic, non-woven polypropylene, or non-woven polyethylene
- **Sizes and types of retail venues affected**
  - From large retailers and grocery outlets only, to all retail venues including small convenience stores and restaurants
- **Incentives to enforce ordinance**
  - Fines and fees for non-compliance
- **Ordinance exemptions**
  - Pharmacy bags and bags for meat and produce
  - Customers on food assistance programs

What did the Proposed State Ban Look Like?

The most popular construction of a PBB in CA, which the statewide ban proposed in 2013, contained the following elements:[38]

- Prohibits any provision of SUPBs provided at the point of sale by affected retail venues.
  - **Exemptions** were included for single-use bag (paper or plastic) applications that reusable bag use couldn't replace, including: plastic produce bags, bags provided by pharmacies for prescription medications, and plastic bags used for separating items which could contaminate or damage other items, such as meat. Restaurants, non-profits, and farmers markets were also exempted.
- Prohibits the free offering of ALL single-use carryout bags by affected retail venues, including compostable and biodegradable single-use bags, except in jurisdictions where a majority of residents have access to curbside collection of food waste and compostables.

[2] A mil = one-thousandth of an inch.

- Allows for a 10 cent purchase of a paper bag made of at least 40% post-consumer recycled material.
- Allows for the sale of reusable bags that meet a set of criteria. The criteria for offered reusable bags are critical for ensuring that reusable bags are capable of being used in a manner that make their more resource-intensive manufacturing and production processes fall below the comparable impacts of single-use bags. These criteria include:
    - Ability for the bag to withstand a minimum of 125 uses
    - A minimum carrying capacity of 22 pounds per bag,
    - Ability for the bag to withstand machine washing and disinfection regularly,
    - The exclusion of any toxins including heavy metals in bag content,
    - If a plastic material comprises the base of the *reusable* bag, it must be at least 20 percent post-consumer recycled, and must meet the above criteria.
- Retail venues would be impacted in different phases. Retail grocery stores with annual sales of $2 million or more, or retail space of over 10,000 square feet, would be affected first with the extension of the ordinance onto smaller convenience stores, food stores, and other such venues to follow a year later. All stores would be given time before the ordinance takes effect, and smaller stores without franchises in other municipalities would also be given more time, so that adequate customer education, logistical transition activities, and most importantly the existing stocks of SUPBs could be used up before the ban took effect.
- Enforcement of bag bans relies on fines for violators, with fines ranging from $500 to $2,000 based on the magnitude of the infraction and previous bag ban violations.

Bag Alternatives

As discussed, most California bag ordinances are PBB + Fees. Authorities recognize the utility bags provide to consumers and therefore don't expect consumers to completely *forego* using bags. The goal of PBB + Fees rather is to *alter* the composition of what is referred to as the "Bag-Use Profile": the proportion of bag-types used at retail venues. Bag-Use Profiles are typically comprised of a mix of SUPBs, single-use paper bags, reusable bags, or no bag. The following table presents the standard variety of bag types, describing some relevant attributes associated with these bag types. It also reports the composition of bag types used in retail venues without bag-limiting ordinances:

Table 1. Characteristics of Bag Alternatives

	A[39]	B[40]	C[41]	D[42]	E[43]
Bag Type	$/Bag	Weight/Bag (grams)	% Recycled in CA	# of Intended Uses	Observed Bag-Use Profile at Grocery Retailer (No Ban)
SUPB	$0.01	7	5%	1	75%
Paper	$0.15	40	21%	1	3%
Reusable	$1.00	44	N/A	125	5%
No Bag	-	-	-	-	17%

Table 1 Notes:

(Bag Type)

- SUPBs are standard HDPE single-use plastic bags
- Reusable bag type characteristics are for 40 percent post-consumer recycled content recycled polyethylene bags, which have been deemed the most low-impact reusable bag type from an environmental perspective[44]
- No Bag represents transactions where no bag is used to carry a customer's purchase.

(A) Prices are based on the average of price ranges observed in the literature.
(C) The statistics for recycling of reusable bag types are too variable to estimate, although the reusable bag type represented above can be made of 20-100 percent post-consumer recycled material, and is itself recyclable.
(D) This figure represents the average number of uses bags are actually designed to withstand, thus representing the *intended* number of uses.
(E) This represents the average Bag-Use profile found in Los Angeles County, San Jose, and Santa Monica grocery retail venues before reduction ordinances were implemented.

Biodegradable bags are another bag type that is becoming increasingly popular as a way to reduce waste from plastic bag use. This bag type is made of natural polymers, either starch or a blend of bacteria-based polyesters, which are water soluble or photodegradable.[45] The City of San Francisco, for example, selected BioBag – a leading brand which produces certified compostable bags – to provide 100,000 rolls of biodegradable bags to residents within the county as a way to promote the importance of reducing waste.[46]

However, biodegradable bags, such as the BioBag, have their limitations. For example, if these bags are placed in an anaerobic (air-locked) landfill, they will be deprived of oxygen and micro-organisms which feed on the biodegradable materials, severely limiting their ability to decompose. This is also true for paper, yard waste and food waste. According to BioBag, *the majority of US landfills are in fact air-locked landfills*, including San Diego's Miramar landfill.[47] As such, BioBag products require appropriate composting facilities. Currently, there are eight composting facilities in San Diego County:[48]

- El Corazon Compost Facility—Oceanside
- Ennis Inc. Materials Division—Lakeside
- Evergreen Nursery—Oceanside
- Evergreen Nursery—San Diego
- Inland Pacific Resource Recovery—Lakeside
- Miramar Greenery—San Diego
- San Pasqual Valley Soils—Escondido
- Slaughterhouse Recycling—Lakeside

Of these, Evergreen Nursery (Carmel Valley) and Miramar Greenery (Miramar) are within the City of San Diego's jurisdiction.

Grocery Bag Needs in San Diego

Table 2.Grocery bag needs at potentially affected retail venues in San Diego based on 2013 estimated population:

	A	B
	# bags needed to carry all groceries per person (1 year)	Millions of bags needed to carry all groceries in City of SD (1 year)
SUPB	375	525
Paper	250	350
Reusable	5	7

Table 2 Notes:

(A) This figure represents the equivalent number of each bag type needed to carry allpurchases in *affected* retail outlets in a year, based on lifespan and carrying capacity of each bag type. Los Angeles County estimated[49] that 68 percent of bags used were in retail venues affected by their ordinance, a statistic we've extended as an estimate for our own example.

(B) Values from column A multiplied by the population of the City of San Diego (~1.4 million).[50]

ANALYSIS: THE IMPACT OF PBBS

The notion that PBBs effectively mitigate the problems that result from SUPBs without adversely impacting the local economy in the long-term rests on a number of previously observed post-ban trends, including:

1. PBBs + Fees are successful in converting baggage behavior, so that **Bag-Use Profiles change** from single-use bags to reusable bags, or the use of no bag for small purchases**.**
2. The resulting composition of the Bag-Use Profile is **better for the environment** than the current profile, from a life-cycle perspective.
3. Local **economies**, comprised of affected retailers and their customers, **are not negatively impacted in the long-term**.

IMPACT OF PBBS ON BAG USE

Have Single-Use Bags Declined Under PBB+Fees?

Municipalities that have implemented a mandatory plastic bag reduction ordinance have reported successful reductions in the volume of single-use bags distributed by affected retail venues. Methods for determining the reduction in single-use bag distributions have varied, but generally involve either: feedback from retail venues, feedback from consumers, observational studies at

retail venues, analyses of baggage records reported by retail venues, or analyses of the disposition of waste streams pre- and post-ordinance.

Domestic plastic bag reduction ordinances have been reportedly successful. In Washington DC where retailers must charge customers for paper and plastic bags, there was a combined 60 percent reduction.[51] In a Seattle survey study, 80 percent of retailers reported a 'significant reduction' in single-use bags after Seattle instated PBB + Fee.[52] Portland Oregon's PBB + Fee, which was supported by the state's largest grocer coalition (members include Safeway and Fred Meyer), resulted in roughly 100 million fewer SUPBs in the region during the first six months after the ordinance took effect.[53]

Internationally, reported results of SUPB reduction measures include: 90 percent reduction in Ireland where a national bag fee was instated, 66 percent reduction in Denmark under a bag fee, 79 percent reduction in Australia under a bag fee, and a 92 percent reduction at international IKEA locations where the corporation voluntarily charged customers for plastic bags.[54]

Bag-Use Profile Changes in Comparable Locations

Analyses on the economic and environmental impacts of PBBs require observations of post-ordinance changes in Bag-Use Profiles, not just the reduction in SUPBs. To accurately assess how a Bag-Use Profile changes under a PBB + Fee, customer behavior must be known both pre- and post-ordinance. Although data from CA jurisdictions with PBB + Fees is limited, evaluations were performed for the City of San Jose, the City of Santa Monica, and the County of Los Angeles.

All three are coastal Californian regions with PBB + Fees, all post-ban results were reported at least six months after ordinances took effect, and the ordinances in all three regions closely mirror the ordinance being discussed in the City of San Diego. Santa Monica's fee on paper bags is 10 cents, San Jose's fee will be 10 cents until 2014 (after which it will rise to 25 cents), and Los Angeles County's fee is at the discretion of the retailer, although the minimum is 10 cents. Below are reported pre-ban and post-ban Bag-Use Profiles in the three regions, followed by a bag profile representing their respective averages.

Table 3. The measured percentage changes in Bag-Use Profiles observed in San Jose, Santa Monica, and Los Angeles County.

	PRE - BAN				POST - BAN			
	SUPB	Paper	Reusable	No Bag	SUPB	Paper	Reusable	No Bag
San Jose[55]	75	3	3	19	0	22	35	43
Santa Monica[56]	69	5	10	15	0	23	41	36
LA County[57,58]	82	2	2	17	0	2	58	40
Average:	**75**	**3**	**5**	**17**	**0**	**16**	**45**	**40**

Figure 1. Change in Bag Use Profiles (as a Percentage)

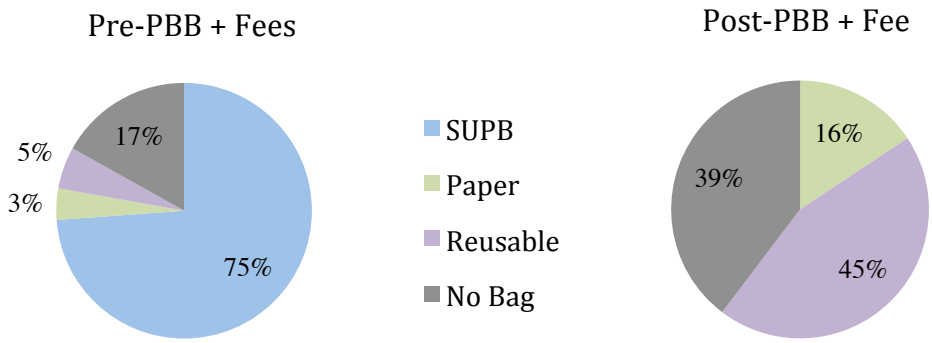


Figure 1Notes:
These figures are constructed from the derived "average" values from Table 3.

How Could SD Grocery Bag Needs Change with a PBB + Fee?

It would be difficult to quantify the exact impact of a PBB + Fee on the City of San Diego's Bag Use Profile. Such an effort would require the creation of an economic model that considers variables such as demographics and consumer behavior specific to the region. However, a hypothetical calculation using the average pre- and post-ban data from San Jose, Santa Monica and Los Angeles County can quantify what that impact *may* look like.

Table 4. Calculation of the Pre- and Post-PBB+Fee Bag-Use Profiles in San Diego

	Millions of bags needed to carry all groceries in City of SD per year	PRE - BAN		POST - BAN	
		SD Bag Use Profile (%)	SD Bag Use Profile (Millions of Bags)	SD Bag Use Profile (%)	SD Bag Use Profile (Millions of Bags)
SUPB	525	75	393.8	0	0
Paper	350	3	10.5	16	56
Reusable	7	5	0.4	45	3.15
No Bag	-	17	-	40	-

As projected, a PBB + Fee could significantly lower the use of both single-use plastic and paper bags in San Diego. The estimated reduction as presented in Table 4 and Figure 2 represents an **86 percent reduction** in the quantity of single-use bags consumed in a year in San Diego, which translates to **approximately 348 million single-use bags**. The increase in reusable bags in the Bag-Use Profile from **5 percent pre-ban to 45 percent post-ban would result in an increase of approximately 2.75 million reusable bags**. The 100 percent reduction of SUPBs rests on the assumption that retailers comply with the ban-behavior that has typically been observed in the municipalities whose data was used in this assessment. It also measures the elimination of SUPBs at point-of-sale, and therefore does not reflect the SUPBs such as produce and meat bags that would most likely be exempted under a bag reduction ordinance.

ENVIRONMENTAL IMPACT OF PBBS

The environmental impact of a PBB + Fee in San Diego must be considered from multiple angles to estimate if the impact would be positive or negative. To assess the environmental impact, the following was assessed:

- Bag life cycles that comprise the derived pre- and post-ban Bag-Use Profiles as measured by previously performed Life Cycle Assessments (LCA). These impacts include life cycle contributions to greenhouse gas (GHG) emissions, fresh water consumption, solid waste generation, and total energy use.
- The decrease in single-use bag litter achieved in other regions with PBB + Fees.

What is an LCA?

Life Cycle Assessments (LCA) are a common tool, used to quantify the environmental impacts of products throughout their life cycle. Product life cycles include all stages of a product's existence: from raw material extraction, to manufacturing, to consumer-use, to disposal.

Do PBB + Fees lower environmental impacts from a life cycle perspective?

The Environmental Impacts of SUPB, Paper Bags and Reusable Bags

To assess this, we have reviewed LCAs previously performed by other organizations that compare life cycle impacts of each bag type, and have applied these findings to projected Bag-Use Profiles in San Diego, pre- and post-ban. Many LCAs have been performed with the goal of comparing the environmental impacts of various bag types, in hopes of determining which bags create the least amount of environmental impact considering each bag's unique life cycle attributes. After reviewing many such LCAs, we present the findings of what we consider to be the most thorough comparative LCA available.

Life Cycle Assessment of Reusable and Single-use Plastic Bags in California[59] is a "cradle-to-gate" assessment published in 2011 by California State University, Chico, which means it considers life cycle stages only up to the consumer-use phase. It includes a comprehensive literature review on bag-comparing LCAs, along with a critical vetting of their assumptions. The strength of this study is the inclusion of important variables, including: the water used in washing reusable bags, the recycled content of various bag types, and importantly, the number of uses each bag is capable of sustaining.

What did the study do?

This study compares SUPBs and various reusable bag types. Reusable bags with the lowest environmental impact– a reusable, low density polyethylene bag composed of 40 percent post-consumer recycled material (Re-PE) –are commonly found and can meet the standards required in PBB + Fee legislation. This bag type is therefore considered synonymous with 'reusable bag' for the remainder of this analysis. Multiple domestic bag manufacturers produce this type of bag.

What did the study find?

Table 5. Environmental Impact Per-Bag

Environmental Impact	SUPB	Paper	Re-PE
Total energy (MJ)	0.50867	2.62000	2.94500
GHG emissions (tons CO2 equiv.)	0.00003	0.00008	0.00018
Solid waste (kg)	0.00467	0.03400	0.03410
Fresh water consumption (gallons)	0.03867	1.00000	0.25000

How does this apply to expected change in San Diego Bag-Use Profile?

Here, we multiply the per-bag environmental impact by the quantity of bags used in San Diego as projected, both pre- and post-ban. This is intended to serve as an approximation for what the environmental impact *could* look like.

Table 7. Environmental Impact of San Diego Bag-Use Profile, Pre- and Post-Ban

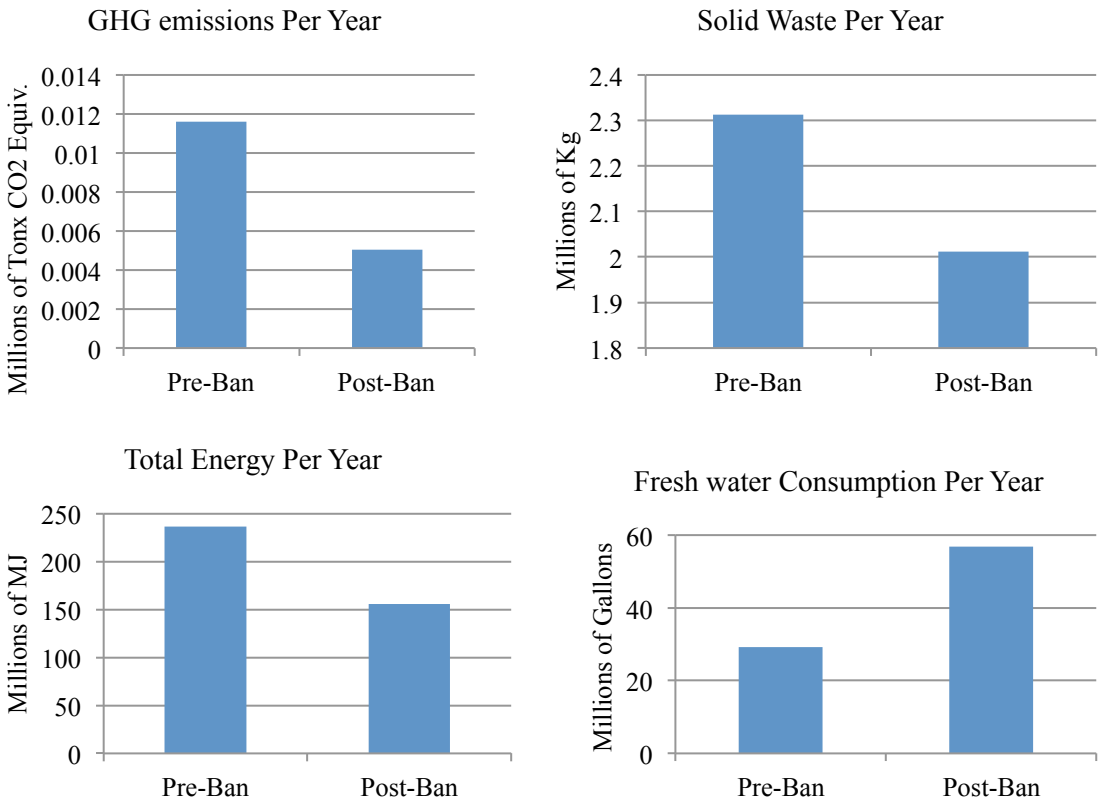
	Environmental Impact	SUPB	Paper	Re-PE	SUM
PRE-BAN	Total energy (million MJ[3])	200.3129	27.5100	2.0615	**229.8844**
	GHG emissions (million tons CO2 equiv.)	0.0105	0.0008	0.0001	**0.0114**
	Solid waste (million kg)	1.8377	0.357	0.0239	**2.2186**
	Fresh water consumption (million gallons)	15.0220	10.5000	0.1750	**25.9019**
POST-BAN	Total energy (million MJ)	0.0000	146.7200	9.2768	**155.9967**
	GHG emissions (million tons CO2 equiv.)	0.0000	0.0045	0.0006	**0.0051**
	Solid waste (million kg)	0.0000	1.9040	0.1074	**2.0114**
	Fresh water consumption (million gallons)	0.0000	56.0000	0.7875	**56.7875**

Table 7 Notes:

- The SUM category represents the total environmental impact from bags *used* in San Diego. Impacts from GHG emissions and energy consumption will be largely felt outside of the region due to the lack of plastic or paper manufacturers in San Diego. The same can be said for paper bag production, which increases the consumption of fresh water as indicated in the pre to post-ban numbers.

[3] MJ = Megajoule

Figure 3. Change in environmental impacts of Pre- and Post-Ban Bag-Use Profiles needed to fulfill one year of baggage needs for City of San Diego.[60]



If San Diego implements a PBB + Fee, the environmental impacts of a year's worth of bag use could result in approximately the following changes in environmental impact from the cradle-to-gate life cycle of the City's grocery bags:

- 56 percent reduction of GHG emissions
- 9 percent reduction of solid waste generation
- 32 percent reduction in total energy use
- 119 percent increase in fresh water consumption
  **Note: The increase in fresh water consumption from pre- to post-ban Bag-Use Profiles is largely a result of the water required in paper bag production, but also considers the water needed to wash reusable bags.

How would the GHG reductions impact SD's overall emissions?

It was estimated that the city emitted 17 million tons of CO_2 in 2010. If the decrease in GHG under a PBB+ Fee were achieved, the avoided GHG emissions would equate to almost 7,000 tons of CO_2 for a year of baggage needs under the post-ban Bag-Use Profile, eliminating 0.04 percent of the City's GHG emissions. Using the US government's estimated cost of $33 per metric ton of CO_2, this would amount to $231,000 in avoided costs each year for the City.

What if single-use paper bags were *also* eliminated in San Diego's Bag-Use Profile?

The majority of environmental impacts that result from San Diego's post-ban Bag-Use Profile are from the projected increase in the single use of *paper bags* by customers who choose to pay the fee instead of using reusable bags or not utilizing bags at all. In looking at the pre- and post-ban data, a significant increase in paper bag usage occurred in San Jose and Santa Monica, an increase from an average of 4% pre-ban to 23% post-ban. The fee on paper bags in each city is $0.10 per bag. This can be contrasted with Los Angeles County, where paper bags comprised two percent of the Bag-Use Profile both before and after the ordinance. The difference in behavior may be attributed to the fact that the fee in Los Angeles County is a minimum of $0.10, allowing retailers to set a price point at their own discretion.

If all single-use bags were eliminated, both plastic and paper, and if all baggage needs were fulfilled by the estimated 40% "no bag" transactions with the remaining 60% by Re-PE bags, then the environmental impacts of a year's worth of bag use could result **in a 93 to 96 percent reduction in all four reported environmental impacts** from the cradle-to-gate life cycle of the City's grocery bags.

The goal of any PBB + Fee is to transition consumers from single use bags to reusable bags. Although this calculation is purely hypothetical, it demonstrates the significant environmental impacts that are mitigated if consumers transition from paper bags to reusable bags after a PBB + Fee is implemented. As mentioned earlier, the City of San Jose will be increasing its fee on paper bags from $0.10 to $0.25 per bag starting January 1, 2014. It would be useful for cities evaluating PBBs to examine the City's data once the fee has been increased in order to evaluate the effect this may have on promoting greater adoption of reusable bags.

Do PBB + Fees decrease single-use bag litter and waste?

Few municipalities have performed before-and-after litter and waste-stream composition studies to assess the effectiveness of bag reduction ordinances in reducing litter and solid waste. However, the following should be considered when determining the impact of PBB + Fee on bag litter and waste:

1. **The documented success of PBB + Fees in promoting a transition towards Bag-Use Profiles that utilize far fewer single-use bags has demonstrated declining quantities of bag litter and bags in the waste stream.** For example, the City of San Jose performed litter surveys, before and 1 year after their PBB + Fee was implemented. Survey results reflected an 89 percent reduction of SUPBs in storm drains, a 60 percent reduction in creeks, and a 59 percent reduction on city streets. The proportion of creek litter comprised of plastic bags declined from 8 to 4 percent during the same time period.[61]
2. **Municipalities have observed increased rates of paper bag use after a PBB + Fee has been implemented.** This is a legitimate concern due to questions about the biodegradability of paper bags in landfills, and the water usage associated with paper bag production.

CONCLUSIONS: ENVIRONMENTAL IMPACTS OF PBBS

1. *PBB + Fees successfully reduce the volume of single-use bags deployed from affected retailers.* A PBB + 10 cent fee in San Diego could achieve an 86 percent reduction of single-use bags deployed from affected retailers, which could amount to a decrease of 348 million single-use bags per year.

2. *Less energy is required, more water is required, less solid waste is generated, and fewer GHG's are emitted from the life cycles of Bag-Use Profiles achieved with PBB + Fees.* The environmental impacts from life cycles of a year's worth of bags used in San Diego under PBB + Fee (10 cents):

   Energy: 74 million MJ reduction
   CO_2 eq. emissions: 6,418-ton reduction
   Solid waste: 270,000 kg reduction
   Water Consumption: 30 million gallon increase

   Were all paper bags avoided and replaced by reusable bags, which could require a higher fee, the change in environmental impacts could be:

   Energy: 224 million MJ reduction
   CO_2 eq. emissions: 10,800-ton reduction
   Solid waste: 2.2 million kg reduction
   Water Consumption: 28 million gallon reduction

3. *PBB + Fees have achieved reductions in litter and solid waste in some municipalities, but most have not measured the impacts.* Post-ban surveys in San Jose reflect an 89 percent reduction of SUPBs in storm drains, a 60 percent reduction in creeks, and a 59 percent reduction on city streets. However, most cities do not track this data, most likely due to the costs associated with collecting such data.

ECONOMIC IMPACTS OF PBBs

PBBs work by directly limiting SUPB consumption with a ban, and by charging the consumer a fee on alternative bag types if a PBB + Fee is enforced. The economic effects of this transition are seen in the change in bag-type consumption (plastic vs. paper or reusable bags), which can impact bag manufacturers, the change in who receives the direct cost associated with the bag purchase, and the impact on local services responsible for municipal waste streams. As a result, PBBs chiefly impact four sectors:

(1) Retailers
(2) Consumers
(3) Cities
(4) Plastics manufacturers

Based on studies of PBBs in other regions, we assess the impacts that a PBB + Fee in San Diego may have on each of these sectors.

Impact on Retailers Affected by PBBs

Do Retailers Save Money on Bag Costs?
In San Diego, retailers currently offer plastic carryout bags to customers at no charge. Retailers, however, must purchase these bags, and their associated costs are an expense they must account for. As a result of a PBB + Fee ordinance, it is expected that retailers will purchase significantly fewer plastic bags and replace them with paper bags, as reflected in the Bag-Use Profile mentioned earlier. Despite not having to pay the previous cost associated with plastic bags, the per unit purchasing cost for paper bags is significantly greater for retailers (approximately 1 cent for plastic and 15 cents for paper).

Under the proposed ordinance, retailers will retain fees collected for paper bags and will use them to partially recover the cost of purchasing paper bags. Although the ordinance may lead to increased baggage costs for retailers in the short-term due to the increase in paper bag usage, this can be mitigated in the long run if customers pay for their own reusable bags. This takes into account concerns that retailers will actually incur more costs by switching to a paper bag if the proposed fee is only 10 cents, given that paper bags can average 15 cents per bag.[62] In addition, some cities such as San Jose have implemented a phased-in fee, which allows the initial fee of 10 cents to increase to 25 cents after two years. In this scenario, retailers could actually profit from the fee once increased to 25 cents per bag.

San Francisco's Office of Economic Analysis released an assessment of projected economic impacts on the local economy of the SF ban with proposed increases in restrictions (inclusion of restaurants).[63] Their models predicted a "slight positive impact on the local economy" due to the overall decrease in bag-related costs post-ordinance, and to the economic multiplier effects that could occur alongside the projected increase in consumer spending associated with decreasing product costs passed on by retailers. The same study reported that impacted San Francisco retailers would enjoy a savings of $3 million over the course of a year under the strengthened ban, due to the forgone purchasing costs of single-use bags.

In Seattle, a third of respondents to a survey of affected retailers reported that their bag costs rose, while a third reported that their bag costs were the same, and a fifth reported a decrease in bag costs. However, the report didn't consider revenues from paper bags, for which customers are charged $0.10.[64]

Do Affected Retailers Lose Business?

The economic concern more widely echoed with regard to retailers affected by bans is the potential for customers to take their business outside of bag-banned regions. However, few studies have been done to examine this issue. California jurisdictions with bag bans in place, including San Jose[65] and San Francisco,[66] have reported "no sustained negative impacts on local retailers." Los Angeles County reported that several local reusable bag businesses emerged post-ban to meet the demands of the new market for reusable bags.[67]

One existing study attempts to correlate PBBs with substantial economic harm to retailers.[68] The study, released in August 2012, was performed by the National Center for Policy Analysis (NCPA). This study has been cited repeatedly by campaigns opposing PBBs, and forms the basis for what many PBB critics substantiate as economic harm from bag bans. The authors stated that stores within the boundaries of the Los Angeles County PBB+Fee ordinance reported a decrease in sales of 3.3 percent, while those outside of the impacted zone enjoyed an increase in sales of 3.4 percent based on before-and-after sales comparisons.

However, limitations in the NCPA's methodology must be considered when examining its claims. Conclusions of the economic analysis were reportedly based on (1) a sample size of only three percent of impacted retailers, (2) standard deviations of reported sales changes were not included, and (3) no attempt was made to ensure that the changes in sales weren't due to an external factor. Other PBB supporters have questioned the methodology used by the NCPA in compiling this study, bringing to light a segment that claims PBB's are bad for the environment, because "plastic bags are better for the environment than reusable or paper bags." As argued in the environmental analysis section of this report, LCAs, after considering the number of uses of each bag type, demonstrate that reusable bags impact the environment to a lesser degree than SUPBs.

Impacts on Consumers Affected by PBBs

As mentioned above, while single-use bags are free to consumers, they come at a cost for retailers. Therefore, to assess the actual cost of a PBB on consumers, the cost of bags now paid directly by retailers must be considered in the consumer cost calculations. A 2005 study by the United Nations Environmental Programme found that the average 'hidden' cost of SUPBs per household is $10-15 per year - a price which is embedded in grocery costs whether customers use free carryout bags or not.[69] But to accurately project how consumer baggage costs would be impacted, consideration of the price for paper and reusable bags must be included.

Here, we assess how the projected shift in Bag-Use Profiles would affect baggage costs for San Diego consumers. Using the estimated quantities of each bag type needed for a year of baggage needs considering the pre-and post-ban Bag-Use Profiles generated in Table 3**,** and the average cost per bag type, we project the pre- and post-ban consumer baggage costs in Table 8 on the next page.

Table 8. Consumer baggage costs for 1-year of San Diego baggage needs at potentially affected retailers, pre- and post- PBB + Fee.

	A SUPB	B Paper	C Re-PE	SUM
PRE-BAN	$3,838,000	$1,050,000	$400,000	**$5,288,000**
POST-BAN	$0	$5,600,000	$3,150,000	**$8,750,000**

Table 8 Notes:

(A) The calculation assumes retailers pass the cost of plastic bags (~$0.01) on to consumers.
(B) The calculation assumes consumers pay $0.10 per bag.
(C) The calculation assumes consumers pay an average of $1 per reusable bag.

As seen, baggage costs actually increase by $3.5 million in the first year after the ban, or roughly **$7.68 per household**.[4] However, it is important to note that this calculation reflects the costs for the first year only, as consumers start to transition towards reusable bags, which are initially more costly per unit than paper bags. Despite this, switching to reusable bags could actually save consumer dollars in the long run because reusable bags are designed for multiple uses, and it is therefore unlikely that consumers will completely replace their reusable stock on a yearly basis. In other words, consumers save money by purchasing reusable bags once per year rather than paying a recurring fee for paper bags.

Impacts on Cities

Savings from a PBB

The City of San Diego would likely experience long-term economic benefits from a PBB + Fee. The $13 per resident that coastal cities have been estimated to spend yearly on litter cleanup costs and waste management operations will likely decline as the portion SUPBs contribute to litter and the waste stream decline under a bag ordinance. The City of San Diego's Environmental Services Department currently spends approximately $160,000 per year cleaning up plastic bag litter.[70] Although SUPBs represent a small fraction of litter and disposed waste streams in San Diego, the same has been true for other communities who have reported the economic benefits from an SUPB reduction.

San Francisco estimated an annual savings of $100,000 for avoided plastic bag cleanup costs, and $600,000 in savings from avoided SUPB waste processing costs. Because San Francisco also experienced a substantial decline in paper bag use after imposing a 10 cent fee on single-use paper bags alongside their PBB, they estimated to have saved $2.4 million in annual paper bag recycling costs, and $100,000 in paper bag cleanup costs.[71] New York City, which sends 100,000 tons of plastic bags to out-of-state landfills per year, estimated a cost savings of $10 million.[72]

Potential costs associated with a PBB

- ***Litigation*.** Some proposed bag ordinances in other cities have failed due to the high costs of litigation, or threat of litigation from PBB opposition. The most common litigation threats in California aim to require jurisdictions to perform an Environmental Impact Report (EIR) in

[4] Based on 450,691 households, as reported in the 2010 Census.

conjunction with a proposed bag reduction, under the California Environmental Quality Act (CEQA).[73] This has served as a tool by industry opposition to slow down or halt bag bans, due to the cost of completing an EIR. A group called Save the Plastic Bag Coalition (STPBC) is one opposition group that has threatened litigation if an EIR were not done before implementing a PBB. As a result, STPBC and other coalitions have successfully thwarted, or prolonged the passage of bans in Long Beach, Carpinteria, Oakland, and Chico. They were however unsuccessful against Los Angeles County, San Luis Obispo, Marin County, and Manhattan Beach. The 2011 failure of STPBC v. Manhattan Beach was significant in the precedent it set for other jurisdictions hoping to avoid performing EIRs in conjunction with bag ordinances. The state Supreme Court ruled that an EIR was not necessary for the City of Manhattan Beach to prepare, nor for any jurisdiction of similar size or smaller, stating that the plaintiff's logic pertaining to the negative environmental impact of using plastic bag alternatives was based on the false premise that PBBs aim to replace SUPBs with paper, while in reality, PBB + Fees aims to discourage the use of both.[74]

Despite this expense, the City Attorney of San Diego recently stated that an EIR on plastic bag bans for San Diego will be commissioned, which points to both the hurdles of implementing such a ban, and the city's commitment to moving forward with banning plastic bags.

- ***Bag Give-Aways.*** Some communities have held bag give-away events to ensure that economically underprivileged citizens do not face any burden of increased baggage costs. Los Angeles County, for example, cited plans to hand out one million reusable bags to low income residents in areas affected by the PBB + Fee.[75] Additionally, because most ordinances don't require consumers on food assistance programs to pay the cost for reusable or paper bag alternatives offered at retail venues with PBB + Fees, the responsibility of covering that cost could fall onto the city. The decision for San Diego to take on such costs, if it were to implement a bag reduction ordinance, would be one made by policymakers.

Impacts on Plastics Manufacturers

Any substantial economic impacts of PBBs are most likely to fall on the plastics manufacturers who make SUPBs, a significant quantity of which are domestic operations. Plastics manufacturers accordingly represent the bulk of organized opposition towards PBB efforts, forming a number of coalitions such as the American Progressive Bag Alliance (APBA),[76] Save the Plastic Bag Coalition,[77] and the American Chemistry Council, whose members reportedly include Exxon, Dow, and plastic bag manufacturers.[78]

The APBA website argues that PBBs threaten the jobs of 30,000 Americans working in the plastic bag manufacturing industry.[79] Of these, a reported 1,800 are located in California. Senator Padilla, author of the recently failed California statewide PBB ordinance SB 405, noted that only three plastic bag manufacturers are located in Southern California.[80] Of these three, only one had registered in organized opposition to the statewide ban, with the other registered five being located out-of-state. Arguably, the concern displayed by the national plastics industry relates to the precedent that California has set in leading other states towards progressive legislation. But according to Padilla, like other industries, plastics manufacturers generally produce a diverse array of products and are generally capable of transition.[81]

PBBs that eliminate SUPBs in CA communities may hinder manufacturers' revenue streams currently captured by a portion of HDPE bag sales. But, considering that the reusable bag type recommended here and by others is comprised of a polythehylene plastic derivative, plastics manufacturers can mitigate some of the negative impact to their business by switching to greater Re-PE bag production to meet new reusable bag demands.

However, further quantitative analysis would need to be done to forecast the actual losses and gains for plastics manufacturers (i.e. the economic tradeoff) from a plastic bag ban. A PBB in San Diego will at least temporarily lower revenue streams for the plastics manufacturers who previously supplied San Diego retailers with their product.

COMMON ARGUMENTS AGAINST PBBS

1. *PBBs will result in public health issues due to bacteria harbored in reusable bags.*

Concern surrounding the capacity for reusable shopping bags to harbor food-borne illnesses has been a concern among some. This arose primarily from two studies: one relating a food-borne illness incidence to San Francisco's PBB,[82] and the other from a bacterial survey of reusable bags. The first, an unpublished study, compared emergency room food-borne illness data within the affected SF region before and after the ban. The authors reported an increase in 5.5 food borne-illness related deaths per year after the ban, implying correlation between that statistic and the bag ordinance. A San Francisco Medical Epidemiologist Health Officer later fully examined the study's methodologies.[83] The Health Officer reported that the conclusions made by the authors were unwarranted due to methodological limitations, including the authors' inclusion of admissions data from patients with diseases not possibly carried by bags, the failure to mention that the same trend had been observed nationally over the few years prior, and no robust correlation study to control for other possible explanations.

The second, an American Chemistry Council-funded study from the University of Arizona, surveyed 84 reusable bags for Coliform bacteria including E. Coli, and Salmonella, noting that none of these bags had ever been washed, and most had contained meat products which had not been isolated by any form of plastic or separation from bag surfaces.[84] The authors found that about half of the bags did harbor some variety of Coliform, but only a small fraction was of a variety that could infect humans. No other bacteria known to cause foodborne illnesses were identified at a significant level. They also found that >99.99 percent of all identified bacteria types were eliminated after a standard machine washing.

2. *PBBs discriminate against low-income communities.*

The slight increase in yearly consumer baggage costs under a PBB + Fee projected in Table 8 (Page 22) arises primarily from consumers who choose to pay the fee for single-use paper bags. Recognizing the financial burden that purchasing bags or paying fees may have on low-income communities, cities have taken steps to ensure bags are made available to these communities free of cost. This has commonly occurred through exempting those on food assistance programs (WIC) from paying fees and/or providing reusable bags for free through outreach events, which occurred in Los Angeles County.

An ordinance in the City of San Diego is likely to follow the model of other cities in California, including the most recent statewide measure. In examining the language of the ordinances studied in this report, the following provisions are included for participants in the WIC program:

- City of San Jose: provides one or more recycled paper bags for free through December 31, 2013[85]
- City of Santa Monica: provides a reusable or recycled paper bag at no cost at the point of sale[86]
- County of Los Angeles: retailers have discretion to provide either free reusable bags, free recycled paper bags, or both[87]
- State of California: provides a reusable or recycled paper bag at no cost at the point of sale[88]

Although these measures differ in the type of bag offered, they are all designed to ensure low-income communities are not disproportionately affected by a PBB + Fee. As the City of San Diego crafts its bag reduction ordinance, it should examine the ordinances in other cities to determine what types of bags it will exempt and the impact this may have on retailers.

3. The portion of waste streams and litter comprised of plastic bags is too small to justify action.

While plastic bags comprise a small fraction of local waste streams and litter content, the long-term impacts of SUPBs are large. Plastic's extensive lifespan of up to 1000 years makes what was previously a small fraction much larger and more significant for a city's waste stream and litter content over time. Taken in a more global context, the proliferation of SUPBs comprises a majority of trash in the Great Pacific Garbage Patch, which is a collection of marine debris in the Pacific Ocean.[89] National Geographic reports approximately 1.9 million bits of plastic per square mile in this space.[90]

As a result, the significant ecological litter impacts, lack of curbside recycling, the potential for SUPB replacement by other suitable materials and methods, a commensurate level of community concern, and the unqualified use of highly durable material for single-use applications are just a subset of factors that combine to justify questioning the continued use of SUPBs. Additionally, because SUPBs are given away at defined locations, for defined purposes, the option to target this waste type for elimination is arguably less onerous than others. The precedent set by a PBB in San Diego may pave the way for additional waste reduction measures aimed at other specific trash types later, and to alert citizens that the region is taking active measures to reduce the environmental impacts of SUPBs.

4. PBBs will result in job losses.

It is possible that job losses may occur within the plastics manufacturing industry. However, there is a lack of studies that have been done which quantify the percentage of job loss in the sector that can be traced to reduction ordinances**.** As a result, it is difficult to quantify the degree to which plastic manufacturers would be impacted by an ordinance.

If plastics manufacturers are significantly impacted by the PBB, they could transition to greater Re-PE bag production to meet new reusable bag demand, considering that the reusable bag type

recommended here and by others is partially comprised of a polythehylene plastic derivative. Alternatively, local business may emerge to meet new demands for reusable bags. In Los Angeles, for example, Green Vets is a non-profit that employs local veterans to create reusable bags which are sold in zones impacted by local PBBs. Santa Monica purchased 26,000 Green Vets bags when their bag ordinance passed.[91]

RECOMMENDATIONS

It is recommended that San Diego begin constructing a PBB ordinance. Based on analysis, the benefits of a bag reduction ordinance in San Diego would outweigh the potential consequences. The following are recommended steps to include in implementing a plastic bag ban ordinance that takes into account the potential environmental and economic impacts:

1. Eliminate all high-density polyethylene (HDPE) single-use plastic bags at point of sale.
2. Charge a fee of at least 10 cents for single-use paper bags and require the bags contain a minimum of 40 percent post-consumer recycled material.
3. Require that the reusable bag type, if made of polyethylene, be made of at least 20 percent post-consumer recycled material, and encourage bag give-away events and outreach programs to offer/recommend reusable bags of the same variety.
4. Follow language in recently proposed state ban (SB405) with respect to affected retail venues and bag types that should be exempted from the ban.
5. The City of San Diego should examine plastic bag ban ordinances implemented in other cities to determine what types of bags it will exempt for those on food assistance programs and the impact this may have on retailers in low-income communities.
6. Perform outreach and education before the ordinance takes effect in order to:
    - Educate consumers about the ordinance.
    - Educate retailers about the ordinance.
    - Educate consumers to use reusable bags for the extent of their durable lifespan.
    - Educate consumers that washing their reusable bags is important for avoiding bag contamination.
    - Educate consumers on water conservation as it relates to paper bag production and washing reusable bags.
7. Perform an impact study: gather data on pre-and post-ban litter composition and Bag-Use-Profiles at affected venues to assess ordinance performance.

CONCLUSION

In California, there are currently 64 PBB ordinances covering 85 municipalities, with many including a fee on single-use paper bags (PBB + Fee) to discourage the replacement of SUPBs with single-use paper bags. These ordinances have often been controversial, due in part to litigation brought forward by groups which support plastic bags. Equinox Center presents this report in an attempt to examine the potential environmental and economic impacts that a PBB could have in San Diego, in hopes that stakeholders will be armed with a realistic assessment of PBBs.

Based on pre- and post-ban bag usage data from San Jose, Santa Monica, and Los Angeles County, a PBB in San Diego has the potential to eliminate close to 350 million plastic bags per year. This decline would lead to reductions in GHG emissions, energy consumption, and solid waste generated during the life cycle of a plastic bag. Water usage, however, is projected to increase significantly due to the water needed to create paper bags and wash reusables. Furthermore, a PBB should improve the cleanliness of our waters and beaches, considering that 80 percent of marine debris originates from land sources, 60-80 percent of which are plastics.

While there is substantial literature available on the environmental impacts of PBBs, determining the economic impacts can be more challenging. Due in part to the number of variables affecting consumer behavior, it is difficult to quantify how manufacturers, retailers, and consumers may be affected. Based on reports from jurisdictions with PBBs in effect, there has been no substantial negative long-term impact to retailers, as well as no demonstrated migration of consumers to jurisdictions without PBBs. Retailers may be negatively impacted in the short-term due to increased baggage costs associated with increased paper bag usage, but this is projected to decrease over time as consumers transition to reusable bags.

Furthermore, while it is logical that the plastics industry would be negatively impacted, a lack of research on the topic makes it difficult to estimate what this impact may look like. If the impact is significant, plastics manufacturers could begin producing reusable bags as well, considering the reusable bag type recommended in this report can include plastics as long as it is at least 20 percent post-consumer recycled polyethylene and meets the criteria for reusable bags. The City of San Diego should experience savings through litter abatement, considering the City spends approximately $160,000 per year to clean up plastic bag litter. Cost savings realized by the City could be used to purchase reusable bags for giveaways, which would promote reusable bag adoption in low-income communities.

Ultimately, a PBB has the capacity to mitigate most environmental impacts associated with the life cycle of plastic bags, without causing substantial long-term economic harm to consumers and retailers. While some may argue that a PBB would have only a negligible positive impact, the precedent set by an ordinance in San Diego could allow for future waste reduction measures aimed at other trash types, and to alert residents that the region is taking active measures to reduce the environmental impacts of SUPBs. If the City of San Diego moves forward with a PBB, it is recommended that retailers keep records regarding their distribution of different bag types and what financial impact this may have on their business. This information could then be reviewed by elected officials to determine if the ordinance is meeting its goals, allowing for any adjustments to be made in the process.

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Number of overseas visitors to California rises 11% in 2014

By HUGO MARTIN

JUNE 1, 2015, 3:51 PM

California hosted 7.2 million overseas visitors last year, an 11% increase over 2013, according to the U.S. Department of Commerce.

The Golden State came in third in the nation in drawing overseas visitors, behind New York with 9.98 million and Florida with 8.5 million, according to the agency.

Although California also draws millions of visitors from Mexico and Canada, overseas visitors are highly sought after by tourism-related businesses such as hotels and theme parks because they typically stay longer and spend more money.

Although New York has held the position of most visited state by overseas travelers for 14 consecutive years, total visits increased only 2% last year, and the state's share of all overseas travelers slipped slightly from 30.6% to 29%, according to the Department of Commerce.

Among cities, Los Angeles came in third in hosting overseas visitors, behind New York and Miami, the department said. The largest increases took place in Atlanta (25%) and San Diego (24%), data showed.

The average length of stay by an overseas visitor was 18.4 nights in 2014, up from 17.5 nights in 2013.

To read more about travel, tourism and the airline industry, follow me on Twitter at @hugomartin.

BOUSTEAD CONSULTING & ASSOCIATES

"FINAL REPORT"

Life Cycle Assessment for Three Types of Grocery Bags - Recyclable Plastic; Compostable, Biodegradable Plastic; and Recycled, Recyclable Paper

Prepared for the Progressive Bag Alliance

Chet Chaffee and Bernard R. Yaros
Boustead Consulting & Associates Ltd.

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EXECUTIVE SUMMARY

In the pursuit to eliminate all that is not green, plastic seems to be a natural target. Its widespread use in products and packaging, some say, has contributed to environmental conditions ranging from increased pollution to overloaded landfills to the country's dependence on oil. In response, some cities have adopted legislation that bans plastic grocery bags made from polyethylene in favor of bags made from materials such as cloth, compostable plastics, or paper.

But will switching from grocery bags made from polyethylene to bags made from some other material guarantee the elimination of unfavorable environmental conditions? We know that every product—through its production, use, and disposal—has an environmental impact. This is due to the use of raw materials and energy during the production process and the emission of air pollutants, water effluents, and solid wastes.

More specifically, are grocery bags made other materials such as paper or compostable plastics really better for the environment than traditional plastic grocery bags? Currently, there is no conclusive evidence supporting the argument that banning single use plastic bags in favor of paper bags will reduce litter, decrease the country's dependence on oil, or lower the quantities of solid waste going to landfills. In addition, there is limited information on the environmental attributes of compostable plastics and how they fare against traditional plastic grocery bags or paper bags.

To help inform the debate about the environmental impacts of grocery bags, the Progressive Bag Alliance contracted with Boustead Consulting & Associates (BCAL) to conduct a life cycle assessment (LCA) on three types of grocery bags: a traditional grocery bag made from polyethylene, a grocery bag made from compostable plastics (a blend of 65% EcoFlex, 10% polylactic acid or PLA, and 25% calcium carbonate), and a paper grocery bag made using at least 30% recycled fibers. The life cycle assessment factored in every step of the manufacturing, distribution, and disposal stages of these grocery bags. It was recognized that a single traditional plastic grocery bag may not have the same carrying capacity as a paper bag, so to examine the effect of carrying capacity, calculations were performed both on a 1:1 basis as well as an adjusted basis (1:1.5) paper to plastic.

BCAL compiled life cycle data on the manufacture of polyethylene plastic bags and compostable plastic bags from the Progressive Bag Alliance. In addition, BCAL information on the compostable plastic resin EcoFlex from the resin manufacturer BASF. BCAL completed the data sets necessary for conducting life cycle assessments using information extracted from The Boustead Model and Database as well as the technical literature. BCAL used the Boustead Model for LCA to calculate the life cycle of each grocery bag, producing results on energy use, raw material use, water use, air emissions, water effluents, and solid wastes.

The results show that single use plastic bags made from polyethylene have many advantages over both compostable plastic bags made from EcoFlex and paper bags made with a minimum of 30% recycled fiber.

	Impact Summary of Various Bag Types (Carrying Capacity Equivalent to 1000 Paper Bags)		
	Paper (30% Recycled Fiber)	**Compostable Plastic**	**Polyethylene**
Total Enegy Usage (MJ)	2622	2070	763
Fossil Fuel Use (kg)	23.2	41.5	14.9
Municipal Solid Waste (kg)	33.9	19.2	7.0
Greenhouse Gas Emissions (CO_2 Equiv. Tons)	0.08	0.18	0.04
Fresh Water Usage (Gal)	1004	1017	58

When compared to 30% recycled fiber paper bags, polyethylene grocery bags use less energy in terms of fuels for manufacturing, less oil, and less potable water. In addition, polyethylene plastic grocery bags emit fewer global warming gases, less acid rain emissions, and less solid wastes. The same trend exists when comparing the typical polyethylene grocery bag to grocery bags made with compostable plastic resins—traditional plastic grocery bags use less energy in terms of fuels for manufacturing, less oil, and less potable water, and emit fewer global warming gases, less acid rain emissions, and less solid wastes.

The findings of this study were peer reviewed by an independent third party with significant experience in life cycle assessments to ensure that the results are reliable and repeatable. The results support the conclusion that any decision to ban traditional polyethylene plastic grocery bags in favor of bags made from alternative materials (compostable plastic or recycled paper) will result in a significant increase in environmental impacts across a number of categories from global warming effects to the use of precious potable water resources. As a result, consumers and legislators should re-evaluate banning traditional plastic grocery bags, as the unintended consequences can be significant and long-lasting.

Introduction

In the national effort to go green, several states, counties, and cities are turning their attention to plastic grocery bags made from polyethylene because of the perception that plastic bags contribute to local and global litter problems that affect marine life, occupy the much needed landfill space with solid waste, and increase U.S. dependence on oil.

To address these environmental issues, and perhaps in seeking to follow the example of other countries such as Australia and Ireland, legislators in several cities across the United States have proposed or have already passed ordinances banning single use polyethylene plastic grocery bags in favor of bags made from alternative materials such as cloth, paper, or compostable plastic. Legislators state that they believe that these new laws and proposals will reduce litter, reduce the use of fossil fuels, and improve the overall environmental impacts associated with packaging used to transport groceries.

Before we examine whether plastic bags cause more environmental impacts than the alternative materials proposed, we should first consider the most commonly proposed alternatives, which tend to include: cloth bags, compostable plastic bags, and paper bags.

Reusable cloth bags may be the preferred alternative, but in reality, there is no evidence that most, or even a majority of, customers will reliably bring reusable bags each time they go shopping.

Compostable plastic bags, although available, are in short supply as the technology still is new, and therefore cannot currently meet market demand. So it appears that the proposed laws banning plastic grocery bags may simply cause a shift from plastic bags to the only alternative that can immediately supply the demand—paper bags.

Therefore, is legislation that mandates one packaging material over another environmentally responsible given that all materials, products, and packaging have environmental impacts? The issue is whether the chosen alternatives will reduce one or several of the identified environmental impacts, and whether there are any trade-offs resulting in other, potentially worse, environmental impacts.

To help inform the debate on the environmental impacts of grocery bags, and identify the types and magnitudes of environmental impacts associated with each type of bag, the Progressive Bag Alliance contracted Boustead Consulting & Associates (BCAL) to conduct a life cycle assessment (LCA) on single use plastic bags as well as the two most commonly proposed alternatives: the recyclable paper bag made in part from recycled fiber and the compostable plastic bag.

Life cycle assessment is the method being used in this study because it provides a systems approach to examining environmental factors. By using a systems approach to analyzing environmental impacts, one can examine all aspects of the system used to produce, use, and dispose of a product. This is known as examining a product from cradle (the extraction of raw materials necessary for producing a product) to grave (final

disposal of the product). LCA has been practiced since the early 1970s, and standardized through several organizations including SETAC (Society of Environmental Toxicology and Chemistry) and ISO (International Standards Organization). LCA studies examine the inputs (resources and energy) and outputs (air emissions, water effluents, and solid wastes) of each system and thus identifies and quantifies the effects of each system, providing insights into potential environmental impacts at local, regional, and global levels.

To compile all the information and make the calculations, BCAL uses the Boustead Model and Database. The Boustead Model and Database is an LCA software model with a database built over the past 25 years, containing a wide variety of data relevant to the proposed study. Dr. Boustead has pioneered the use of life-cycle methods and has conducted hundreds of studies, including those for the plastics industry; which have been reviewed by US and European industry as well as life-cycle practitioners.

Study Goal

According to ISO 14040, the first steps in a life cycle project are defining the goal and scope of the project to ensure that the final results meet the specific needs of the user. The purpose of this study is to inform the debate on the environmental impacts of grocery bags, and identify the types and magnitudes of environmental impacts associated with each type of bag. In addition, the study results aim to inform the reader about the potential for any environmental trade-offs in switching from grocery bags made from one material, plastic, to another, paper.

The life cycle assessment was conducted on three types of grocery bags: a traditional grocery bag made from polyethylene, a grocery bag made from compostable plastics (a blend of 65% EcoFlex, 10% polylactic acid or PLA, and 25% calcium carbonate), and a paper grocery bag made using at least 30% recycled fibers. It is important to note that the study looked at only one type of degradable plastic used in making grocery bags, which is the bag being studied by members of the Progressive Bag Alliance. Since this is only one of a number of potential blends of plastic that are marketed as degradable or compostable, the results of this study cannot be used to imply that all compostable bags have the same environmental profile.

Scope

The scope of the study is a cradle to grave life cycle assessment which begins with the extraction of all raw materials used in each of the bags through to the ultimate disposal of the bags after consumer use, including all the transport associated with the delivery of raw materials and the shipping and disposal of final product.

The function of the product system under study is the consumer use and disposal of a grocery bag. The functional unit is the capacity of the grocery bag to carry consumer purchases. A 1/6 BBL (Barrel) size bag was selected for all three bags in this study because that is the commonly used bag in grocery stores. Although the bags are of equal size, previous studies (Franklin, 1990) pointed out that the use of plastic bags in grocery

stores was not equal to the use of paper bags. According to Franklin (1990), bagging behavior showed that plastic to paper use ranged from 1:1 all the way to 3:1, depending on the situation. In contrast, data collected by the Progressive Bag Alliance shows that plastic and paper bags are somewhat equal in use once the baggers have been properly trained. In this study BCAL used both 1:1 and 1.5:1 plastic to paper ratios, allowing for the possibility that it still takes more plastic bags to carry the same amount of groceries as a paper bag. The 1.5:1 ratio equates to 1500 plastic bags for every 1000 paper bags.

BCAL prepared LCA's for the three types of grocery bags. The data requirements for BCAL and for the Progressive Bag Alliance are outlined below.

1. *Recyclable Paper Bag LCA……..The following operations are to be included in the analysis:* To start, BCAL provided data on the extraction of fuels and feedstocks from the earth, including tree growing, harvesting, and transport of all materials. BCAL added process operations in an integrated unbleached kraft pulp & paper mill including recycling facility for old corrugated containers; paper converting into bags; closed-loop recycling of converting bag waste; packaging and transport to distribution and grocery stores; consumer use; and final disposal. Data for most of the above operations in one form or another are in the Boustead Model and Database. Weyerhaeuser reported that its unbleached kraft grocery bag contains about 30% post consumer recycled content and the use of water-based inks[1]. Therefore, in this study BCAL used 30% recycled material. This is also somewhat reflective of current legislation where minimum recycled content in paper bags is required (see Oakland City Council Ordinance requiring 40% recycled material). In the operations leading to final disposal BCAL estimated data for curbside collection and generation and recovery of materials in MSW from government agencies and EPA data, which for 2005 showed paper bag recycling at 21%, paper bag MSW for combustion with energy recovery at 13.6%, resulting in 65.4% to landfill[2]. The following final disposal options will also be considered: composting and two landfill scenarios.

2. *Recyclable Plastic Bag LCA……T*he *following operations are to be included in the analysis:* The extraction of fuels and feedstocks from the earth; transport of materials; all process and materials operations in the production of high and low density polyethylene resin[3]; converting PE resin into bags; packaging and transport of bags to distribution centers and grocery stores; consumer use; and final disposal. In the operations leading to final disposal, BCAL estimated data for curbside collection and generation and recovery of materials in MSW from government agencies and EPA data, which for 2005 showed plastic bag recycling at 5.2 %, plastic bag MSW for combustion with energy recovery at 13.6%, resulting in 81.2% to landfill[2]. The following final disposal options will also consider two landfill scenarios.

   Data for the converting operation was collected specifically from a member of the Progressive Bag Alliance that makes only plastic grocery bags. The data obtained, represents the entire annual production for 2006. All waste is

reprocessed on site, so that is how the calculations were conducted. All inks are water-based, and the formulas provided. The production and supply of all PE resin is based on materials produced and transported from a Houston based supplier. The corrugated boxes were included as made from recycled material to reflect the fact that the supplier to the PBA member reported using between 30% and 40% post consumer recycled fiber[1].

3. *Degradable Plastic Bag (EcoFlex and PLA mix) LCA……The following operations are to be included in the analysis:* The extraction of fuels and feedstocks from the earth; production and transport of materials for all process and materials operations in the production of polylactide resin; EcoFlex from BASF (data provided by BASF)[4]; and calcium carbonate, converting the EcoFlex/PLA resin mixture into bags; packaging and transport of bags to distribution centers and grocery stores; consumer use; and final disposal. Again, most of the above operations are contained in the Boustead Model and Database. The production data for PLA was obtained from NatureWorks[5] and the data for EcoFlex was obtained from BASF[4]. Both NatureWorks and BASF use the Boustead Model for their LCA calculations, so the data BCAL requested and received was compatible with other data used in the study. In addition, BCAL sent its calculated results to BASF for confirmation that the data and the calculations on bags made from the EcoFlex compostable resin was accurate. BASF engineers confirmed that BCAL's use of the data and the calculated results were appropriate. In the operations leading to final disposal, BCAL estimated data for curbside collection and generation and recovery of materials in MSW from government agencies and EPA data[3], which for 2005 showed plastic bag recycling at 5.2 %, plastic bag MSW for combustion with energy recovery at 13.6%, resulting in 81.2% to landfill[2]. The following final disposal options will be also be considered: composting and two landfill scenarios.

   Data for the converting operation of the EcoFlex/PLA resin mixture was collected at the same PBA member facility during a two-week period at the end of May 2007. The production and supply of the PLA polymer is from Blair, NE. The production and supply of Ecoflex polymer is from a BASF plant in Germany. The trial operations at the PBA member's facility indicate that the overall energy required to produce a kilogram of EcoFlex/PLA bags may be lower than the overall energy required to produce a kilogram of PE bags, based on preliminary in-line electrical measurements conducted by plant engineers. However, these results still are preliminary, and need to be confirmed when full scale operations are implemented. As a result, this study will assume that the overall energy required to produce a kilogram of EcoFlex/PLA bags is the same as the overall energy required to produce a kilogram of PE bags. The plastic bag recycling at 5.2 %, will be assumed to go to composting. The inherent energy of the degradable bags has been estimated from NatureWorks and BASF sources.

The following are some detailed specifications for the LCA study:

	Recyclable Plastic	Degradable Plastic	Recyclable Paper
Size/type	1/6 BBL	1/6 BBL	1/6 BBL
Length (inches)	21.625	22.375	17
Width (inches)	12	11.5	12
Gusset (inches)	7.25	7.25	6.75
Gauge (Mil)	0.51	0.75	20 lb /1000 sq ft
Film Color	White	White	Kraft
Material	HDPE (film grade blend)	Degradable Film Compound (EcoFlex/PLA mix)	Unbleached Kraft Paper
Jog Test (strokes)	45	20	n/a
Tensile Strength (lb)	50	35	n/a
Weight per 1000 bags in lbs	13.15 (5.78 kg)	34.71 (15.78 kg)	114 (51.82 kg)

Human energy and capital equipment will not be included in the LCA; detailed arguments for this decision are presented in the proposal appendix.

Methodological Approach

BCAL followed the sound scientific practices as described in ISO 14040, 14041, and 14042 to produce the project results. BCAL is well versed in the requirements of the ISO standards as Dr. Ian Boustead has and continues to be one of the leading experts participating in the formation of the ISO standards. The procedures outlined below are consistent with the ISO standards and reflect BCAL's approach to this project.

Calculations of LCAs

The Boustead database contains over 6000 unit operations on the processes required to extract raw materials from the earth, process those materials into useable form, and manufacture products. These operations provide data on energy requirements, emissions and wastes.

The "Boustead Model" software was used to calculate the consumption of energy, fuels, and raw materials, and generation of solid, liquid, and gaseous wastes starting from the extraction of primary raw materials. The model consists of a calculating engine that was developed 25 years ago and has been updated regularly based on client needs and technical innovations. One important consequence of the modeling is that a mass balance for the entries system is calculated. Therefore, the resource use and the solid waste production are automatically calculated.

Fuel producing industry data are available for all of the OECD countries and some non-OECD countries. The United States and Canada are further analyzed by region; the US is

divided into 9 regions and Canada is sub-divided in 5 regions, corresponding to the Electric Reliability Council. For both the US and Canada, there also is a national average. Since the whole of the Model database can be switched from one country to another, any operation with data from outside the US can be adjusted for energy from non-US energy inputs to "USA adjusted" energy inputs. Assuming that the technology is the same, or very similar, this allows BCAL to fill any data gaps with data from similar operations in non-US locations.

Another important aspect of calculating LCAs is the use of allocation procedures when differentiating the use of energy and raw materials associated with individual products within a single system. In many cases, allocation methods that defy or at the very least, ignore sound scientific practice (such as economics) have been used when they benefit clients. These types of errors or biases are important to avoid as they are easily discovered by peer reviewers or technical experts seeking to use the results in subsequent studies (such as building applications), which unfortunately can cause the rest of the work to be discounted due to unreliability. BCAL has considerable experience in this arena having published several technical papers on the appropriate allocation principles in the plastics industry. Utilizing sound scientific principles and objective measures to the greatest extent possible, BCAL has been able to avoid most problems associated with allocation decisions and produce accurate and reliable LCA data for a wide variety of plastics. Proof of this is the widespread use of PlasticsEurope data (produced by Boustead Consulting) in almost every life cycle database available worldwide as well as in life cycle studies in numerous product and building applications.

Calculated data are readily aggregated and used to produce the final LCA data set which includes the impact assessment step of LCA. These resulting data sets address specific environmental problems.

Using LCA data….BCAL scientific viewpoint

Life cycle assessment modeling allows an examination of specific problems as well as comparisons between systems to determine if there are any serious trade-offs between systems. In every system there are multiple environmental parameters to be addressed scaling from global to local issues. No single solution is likely to address all of the issues simultaneously. More importantly, whenever choices are being made to alter a system or to utilize an alternative system, there are potential trade-offs. Understanding those trade-offs is important when trying to identify the best possible environmental solution. Hopefully, decisions to implement a change to an existing system will consider the potential trade-offs and compromises. While LCA can identify the environmental factors and trade-offs, choosing the solution that is optimal is often subjective and political. Science can only help by providing good quality data from which decisions can be made. The strength of the proposed LCA assessment system is that these unwanted side effects can be identified and quantified.

A life cycle assessment can:

1. Quantify those parameters likely to be responsible for environmental effects (the inventory component of life cycle analysis).

2. Identify which parameters are likely to contribute to a specific environmental problem (characterization or interpretation phase of impact assessment). An example would be identifying that carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are greenhouse gases.
3. Aggregate the parameters relating to a specific problem (the valuation or interpretation phase of impact assessment). An example would be producing carbon dioxide equivalents for the components of greenhouse gases.

LCA derived data provide a compilation of information from which the user can address specific problems, while also examining potential trade-offs. For example, if interested in addressing specific conservation issues such as the conservation of fossil fuels, the user would examine the mass and energy data for only coal, oil, and natural gas; and ignore the other information. If the user would like to examine the potential impacts the grocery bag system has on global warming, acid rain, and municipal solid waste one can address these issues both individually and cooperatively by examining the specific parameters which are likely to contribute to each. In so doing, the user can strive to achieve the optimum reduction in each parameter because of a better understanding of how these parameters change in association with the grocery bag system as a whole and each other individually.

Data Sources and Data Quality

As noted above, data sources included published reports on similar materials, technical publications dealing with manufacturing processes, and data incorporated into the Boustead Model and Database, most of which has been generated through 30 years of industrial studies on a wide range of products and processes.

ISO standards 14040, 14041, and 14042 each discuss aspects of data quality as it pertains to life cycle assessments. In general, data quality can be evaluated using expert judgment, statistics, or sensitivity analysis. In LCA studies, much of the data do not lend itself to statistical analyses as the data are not collected randomly or as groups of data for each input variable. Instead, most LCA data are collected as single point estimates (i.e., fuel input, electricity input, product output, waste output, etc). Single point estimates are therefore only able to be evaluated through either expert judgment or sensitivity analysis. Since the reliability of data inevitably depends upon the quality of the information supplied by individual operators, BCAL used its expert judgment to carry out a number of elementary checks on quality. BCAL checked mass and energy balances to ensure that the data did not violate any of the basic physical laws. In addition, BCAL checked data from each source against data from other sources in the Boustead Model and Database to determine if any data fell outside the normal range for similar products or processes.

Data reporting

To enhance the comparability and understanding of the results of this study, the detailed LCA results are presented in the same presentation format that was used for the series of eco-profile reports published by the Association of Plastics Manufacturers in Europe

(APME). A set of eight tables, each describing some aspect of the behavior of the system, shows the results of the study. Five tables in the data set are useful in conservation arguments and three tables are indications of the potential pollution effects of the system.

The performance of the grocery bag systems is described by quantifying the inputs and outputs to the system. The calculation of input energy and raw materials quantifies the demand for primary inputs to the system and these parameters are important in conservation arguments because they are a measure of the resources that must be extracted from the earth in order to support the system.

Calculation of the outputs is an indication of the potential pollution effects of the system. Note that the analysis is concerned with quantifying the emissions; it does not make any judgments about deleterious or beneficial properties.

The inputs and outputs depend on the definition of the system—they are interrelated. Therefore, any changes to the components of the system means that the inputs and outputs will likely change as well. One common misconception is that it is possible to change a single input or output while leaving all other parameters unchanged. In fact, the reverse is true; because a new system has been defined by changing one input or output, all of the inputs and outputs are expected to change. If they happen to remain the same, it is a coincidence. This again illustrates the fact that common perceptions about environmental gains from simple changes may be misleading at best, and detrimental to the environment at worst.

Increasingly there is a demand to have the results of eco-profile analyses broken down into a number of categories, identifying the type of operation that gives rise to them. The five categories that have been identified are:

1. Fuel production
2. Fuel use
3. Transport
4. Biomass
5. Process

Fuel production operations are defined as those processing operations which result in the delivery of fuel, or energy; to a final consumer whether domestic or industrial. For such operations all inputs, with the sole exception of transport, are included as part of the fuel production function.

Fuel use is defined as the use of energy delivered by the fuel producing industries. Thus fuel used to generate steam at a production plant and electricity used in electrolysis would be treated as fuel use operations. Only the fuel used in transport is kept separate.

Transport operations are easily identified and so the direct energy consumption of transport and its associated emissions are always separated.

Biomass refers to the inputs and outputs associated with the use of biological materials such as wood or wood fiber.

LCA RESULTS TABLES

RECYCLABLE PAPER BAG SYSTEM

The results of the LCA for the recyclable paper bag system are presented below, each describing some aspect of the behavior of the systems examined. In all cases, the following tables refer to the gross or cumulative totals when all operations are traced back to the extraction of raw materials from the earth and are based on the consumer use and collection of 1000 bags. The subsequent disposal operations of recycling, composting, incineration with energy recovery and landfill are not included in these results tables and will be discussed separately.

Table 1. Gross energy (in MJ), required for the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Fuel type	Fuel prod'n & delivery	Energy content of fuel	Transport energy	Feedstock energy	Total energy
Electricity	461	185	3	0	649
Oil	17	143	30	1	191
Other	15	777	1	990	1783
Total	493	1105	34	991	2622

Table 2. Gross primary fossil fuels and feedstocks, expressed as energy (in MJ), required for the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Feedstock	Total
Coal	229	94	1	0	324
Oil	23	150	33	1	207
Gas	113	278	0	0	391
Hydro	15	6	0	-	21
Nuclear	90	36	0	-	127
Lignite	0	0	0	-	0
Wood	0	533	0	988	1521
Sulfur	0	0	0	2	2
Hydrogen	0	0	0	0	0
Biomass (solid)	18	7	0	0	24
Recovered energy	0	-1	0	-	-1
Geothermal	0	0	0	-	0
Unspecified	0	0	0	-	0
Solar	0	0	0	-	0
Biomass (liqd/gas)	1	0	0	-	1
Industrial waste	1	0	0	-	1
Municipal Waste	3	1	0	-	4
Wind	0	0	0	-	0
Totals	493	1105	34	991	2622

Table 3. Gross primary fossil fuels and feedstocks, expressed as mass (in milligrams), the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Crude oil……..	4,591,000
Gas/condensate……	7,432,000
Coal…….	11,210,000
Metallurgical coal…..	25,900
Lignite …….	79
Peat …….	444
Wood (50% water)…..	274,000,000
Biomass (incl. water)…	2,880,000

Table 4. Gross water resources (in milligrams) required for the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Source	Use in process	Use in cooling	Totals
Public supply	3,895,000,000	-	3,895,000,000
River/canal	5,260	1,920	7,190
Sea	8,490	1,092,000	1,100,000
Unspecified	14,600,000	2,910,000	17,500,000
Well	200	50	250
Totals	3,909,000,000	4,000,000	3,913,000,000

Note: total cooling water reported in recirculating systems = 404.

Table 5. Gross other raw materials (in milligrams required for the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Raw material	Input in mg
Air	4,080,000
Animal matter	0
Barites	211
Bauxite	469
Bentonite	51
Biomass (including water)	0
Calcium sulphate (CaSO4)	0
Chalk (CaCO3)	0
Clay	46,300
Cr	31
Cu	0
Dolomite	792
Fe	64,800
Feldspar	0
Ferromanganese	59
Fluorspar	9
Granite	0
Gravel	239
Hg	0
Limestone (CaCO3)	385,000
Mg	0
N2	6,050
Ni	0
O2	1,180
Olivine	608
Pb	395
Phosphate as P205	147,000
Potassium chloride (KCl)	7
Quartz (SiO2)	0
Rutile	0
S (bonded)	1
S (elemental)	233,000
Sand (SiO2)	101,600
Shale	1
Sodium chloride (NaCl)	712,000
Sodium nitrate (NaNO3)	0
Talc	0
Unspecified	0
Zn	14

Table 6. Gross air emissions (in milligrams) resulting from the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Air emissions/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Fugitive	Total
Dust	32,900	4,440	1,930	89,000	-	-	128,000
CO	59,500	16,300	23,000	21,900	-	-	121,000
CO2	43,100,000	22,600,000	2,330,000	1,066,000	-63,600,000	-	5,507,000
SOX	168,000	166,000	6,030	239,000	-	-	579,000
NOX	151,000	86,400	26,500	600	-	-	264,000
N2O	<1	<1	-	-	-		<1
Hydrocarbons	49,000	16,000	7,300	60	-		72,300
Methane	266,000	16,200	10	3,500	-		286,000
H2S	<1	-	<1	2,750	-	-	2,750
Aromatic HC	6	-	98	1	-	-	105
HCl	6,440	42	4	622	-		7,110
Cl2	<1	-	<1	<1	-		<1
HF	242	2	<1	<1	-		244
Lead	<1	<1	<1	<1	-		<1
Metals	25	105	-	<1	-		131
F2	<1	-	<1	<1	-		<1
Mercaptans	<1	<1	<1	802	-	-	802
H2	124	<1	<1	91	-	-	215
Organo-chlorine	<1	-	<1	<1	-		<1
Other organics	<1	<1	<1	<1	-		1
Aldehydes (CHO)	-	-	-	13	-		13
Hydrogen (H2)	152	-	-	3,130	-		3,280
NMVOC	2	-	<1	<1	-		2

Table 6B. Carbon dioxide equivalents corresponding to the gross air emissions (in milligrams) resulting from the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Type/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Total
20 year equiv	59,850,000	23,690,000	2,400,000	1,330,000	-63,560,000	23,710,000
100 year equiv	49,460,000	23,060,000	2,400,000	1,190,000	-63,560,000	12,550,000
500 year equiv	45,200,000	22,800,000	2,400,000	1,130,000	-63,560,000	7,970,000

Table 7. Gross water emissions (in milligrams), resulting from the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags.. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Process	Total
COD	55	-	35	396,000	396,000
BOD	14	-	<1	75,000	75,000
Acid (H+)	11	-	<1	1	13
Al+compounds as Al	<1	-	<1	<1	<1
Ammonium compounds as NH4	19	-	2	<1	22
AOX	<1	-	<1	<1	<1
As+compounds as As	-	-	<1	<1	<1
BrO3--	<1	-	<1	<1	<1
Ca+compounds as Ca	<1	-	<1	19	20
Cd+compounds as Cd	-	-	<1	-	<1
Cl-	25	-	35	10,400	10,400
ClO3--	<1	-	<1	97	97
CN-	<1	-	<1	<1	<1
CO3--	-	-	3	30	34
Cr+compounds as Cr	<1	-	<1	<1	<1
Cu+compounds as Cu	<1	-	<1	<1	<1
Detergent/oil	<1	-	2	3	6
Dichloroethane (DCE)	<1	-	<1	<1	<1
Dioxin/furan as Teq	-	-	<1	-	<1
Dissolved chlorine	<1	-	<1	<1	<1
Dissolved organics (non-HC)	23	-	<1	<1	23
Dissolved solids not specified	1	-	9	3,700	3,710
F-	<1	-	<1	<1	<1
Fe+compounds as Fe	<1	-	2	<1	3
Hg+compounds as Hg	<1	-	<1	<1	<1
Hydrocarbons not specified	<1	<1	2	<1	3
K+compounds as K	<1	-	<1	<1	<1
Metals not specified elsewhere	3	-	<1	3,060	3,060
Mg+compounds as Mg	<1	-	<1	<1	<1
Mn+compounds as Mn	-	-	<1	<1	<1
Na+compounds as Na	10	-	22	7,510	7,540
Ni+compounds as Ni	<1	-	<1	<1	<1
NO3-	1	-	<1	76	78
Organo-chlorine not specified	<1	-	<1	6	6
Organo-tin as Sn	-	-	<1	-	<1
Other nitrogen as N	3	-	<1	7,950	7,950
Other organics not specified	<1	-	<1	<1	<1
P+compounds as P	<1	-	<1	879	880
Pb+compounds as PB	<1	-	<1	<1	<1
Phenols	<1	-	<1	<1	<1
S+sulphides as S	<1	-	<1	344	344
SO4--	<1	-	8	1536	1,544
Sr+compounds as Sr	-	-	<1	<1	<1
Suspended solids	2,850	-	3,870	219,800	226,500
TOC	<1	-	<1	<1	<1
Vinyl chloride monomer	<1	-	<1	<1	<1
Zn+compounds as Zn	<1	-	<1	<1	<1

Table 8. Generation of solid waste (in milligrams resulting from the recyclable PAPER bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Solid waste (mg)	Fuel prod'n	Fuel use	Transport	Process	Total
Construction waste	<1	-	<1	<1	<1
Inert chemical	<1	-	<1	275	276
Metals	<1	-	<1	1,350	1,350
Mineral waste	2,590	-	38,500	1889,000	230,000
Mixed industrial	-26,300	-	1,550	22,900	-1,860
Municipal solid waste	-383,000	-	-	-	-383,000
Paper	<1	-	<1	<1	<1
Plastic containers	<1	-	<1	-	<1
Plastics	<1	-	<1	389	390
Putrescibles	<1	-	11	<1	11
Regulated chemicals	67,500	-	3	85	67,600
Slags/ash	921,000	5,290	15,000	5,380	947,000
Tailings	81	-	1,290	4	1,380
Unregulated chemicals	51,200	-	51	820	52,040
Unspecified refuse	55,300	-	<1	282,000	337,000
Waste returned to mine	2,202,000	-	1,420	345	2,203,000
Waste to compost	-	-	-	1,290,000	1,290,000
Waste to incinerator	1	-	18	16	35
Waste to recycle	<1	-	<1	2,544,000	2,544,000
Wood waste	<1	-	<1	306,000	306,000
Wood pallets to recycle	<1	-	<1	-	<1

RECYCLABLE PLASTIC BAG SYSTEM

The results of the LCA for the recyclable plastic bag system are presented below, each describing some aspect of the behavior of the systems examined. In all cases, the following tables refer to the gross or cumulative totals when all operations are traced back to the extraction of raw materials from the earth and are based on the consumer use and collection of 1000 bags and 1500 bags. The subsequent disposal operations of recycling, composting, incineration with energy recovery and landfill are not included in these results tables and will be discussed separately.

Table 9A. Gross energy (in MJ), required for the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Fuel type	Fuel prod'n & delivery	Energy content of fuel	Transport energy	Feedstock energy	Total energy
Electricity	103	42	3	0	148
Oil	2	35	7	156	199
Other	2	37	0	123	162
Total	106	114	11	279	509

Table 9B. Gross energy (in MJ), required for the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Fuel type	Fuel prod'n & delivery	Energy content of fuel	Transport energy	Feedstock energy	Total energy
Electricity	154	63	5	0	222
Oil	3	53	11	233	299
Other	2	55	1	185	242
Total	159	171	16	418	763

Table 10A. Gross primary fossil fuels and feedstocks, expressed as energy (in MJ), required for the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Feedstock	Total
Coal	43	21	1	0	65
Oil	5	37	8	155	206
Gas	23	46	1	116	186
Hydro	4	2	0	-	6
Nuclear	26	11	1	-	38
Lignite	0	0	0	-	0
Wood	0	3	0	7	9
Sulfur	0	0	0	0	0
Hydrogen	0	0	0	-	0
Biomass (solid)	3	1	0	0	4
Recovered energy	0	-7	0	-	-7
Geothermal	0	0	0	-	0
Unspecified	0	0	0	-	0
Solar	0	0	0	-	0
Biomass (liqd/gas)	0	0	0	-	0
Industrial waste	0	0	0	0	0
Municipal Waste	1	0	0	-	1
Wind	0	0	0	-	0
Totals	106	114	11	279	509

Table 10B. Gross primary fossil fuels and feedstocks, expressed as energy (in MJ), required for the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Feedstock	Total
Coal	65	31	2	0	98
Oil	8	56	12	233	309
Gas	35	69	2	175	279
Hydro	6	3	0	-	9
39	16	1	1	-	57
Lignite	0	0	0	-	0
Wood	0	4	0	10	14
Sulfur	0	0	0	0	0
Hydrogen	0	0	0	-	0
Biomass (solid)	4	2	0	0	6
Recovered energy	0	-11	0	-	-11
Geothermal	0	0	0	-	0
Unspecified	0	0	0	-	0
Solar	0	0	0	-	0
Biomass (liqd/gas)	0	0	0	-	0
Industrial waste	0	0	0	0	0
Municipal Waste	1	0	0	-	1
Wind	0	0	0	-	0
Totals	159	171	16	418	763

Table 11A. Gross primary fossil fuels and feedstocks, expressed as mass (in milligrams), required the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Crude oil……..	4,571,000
Gas/condensate……	3,065,000
Coal…….	2,259,000
Metallurgical coal…..	6,060
Lignite …….	670
Peat …….	7,920
Wood (50% water)…..	809,000
Biomass (incl. water)…	498,000

Table 11B. Gross primary fossil fuels and feedstocks, expressed as mass (in milligrams), required the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Crude oil……..	6,857,000
Gas/condensate……	4,598,000
Coal…….	3,388,000
Metallurgical coal…..	9,100
Lignite …….	1,010
Peat …….	11,900
Wood (50% water)…..	1,212,000
Biomass (incl. water)…	746,000

Table 12A. Gross water resources (in milligrams) required for the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Source	Use in process	Use in cooling	Totals
Public supply	31,900,000	1,230,000	33,150,000
River/canal	4,970,000	2,520,000	7,480,000
Sea	819,000	58,600,000	59,400,000
Unspecified	5,120,000	105,400,000	110,600,000
Well	425,000	66,000	138,000
Total	43,250,000	167,800,000	211,100,000

Table 12B. Gross water resources (in milligrams) required for the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Source	Use in process	Use in cooling	Totals
Public supply	47,900,000	1,850,000	49,700,000
River/canal	7,460,000	3,780,000	11,200,000
Sea	1,230,000	87,900,000	89,100,000
Unspecified	7,680,000	158,000,000	166,000,000
Well	638,000	99,000	207,000
Total	64,900,000	252,000,000	317,000,000

Table 13A. Gross other raw materials (in milligrams required for the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Raw material	Input in mg
Air	1,436,000
Animal matter	<1
Barites	343
Bauxite	111
Bentonite	231
Calcium sulphate (CaSO4)	22
Clay	235
Cr	7
Cu	<1
Dolomite	184
Fe	15,000
Feldspar	<1
Ferromanganese	14
Fluorspar	3
Granite	<1
Gravel	56
Hg	<1
Limestone (CaCO3)	542,000
Mg	<1
N2	823,000
Ni	<1
O2	110,000
Olivine	141
Pb	87
Phosphate as P205	743
Potassium chloride (KCl)	252
Quartz (SiO2)	0
Rutile	272,000
S (bonded)	13
S (elemental)	1,520
Sand (SiO2)	935
Shale	63
Sodium chloride (NaCl)	51,200
Sodium nitrate (NaNO3)	0
Talc	<1
Unspecified	<1
Zn	266

Table 13B. Gross other raw materials (in milligrams required for the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Raw material	Input in mg
Air	2,154,000
Animal matter	<1
Barites	515
Bauxite	166
Bentonite	347
Calcium sulphate (CaSO4)	33
Clay	353
Cr	10
Cu	<1
Dolomite	276
Fe	22,600
Feldspar	<1
Ferromanganese	21
Fluorspar	4
Granite	<1
Gravel	83
Hg	<1
Limestone (CaCO3)	812,000
Mg	<1
N2	1,235,000
Ni	<1
O2	165,000
Olivine	212
Pb	131
Phosphate as P205	1,120
Potassium chloride (KCl)	379
Quartz (SiO2)	0
Rutile	408,000
S (bonded)	20
S (elemental)	2,270
Sand (SiO2)	1,400
Shale	94
Sodium chloride (NaCl)	76,700
Sodium nitrate (NaNO3)	0
Talc	<1
Unspecified	<1
Zn	399

Table 14A. Gross air emissions (in milligrams) resulting from the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Air emissions/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Fugitive	Total
Dust (PM10)	6,340	540	430	7,000	-	-	14,300
CO	10,800	48,900	5,110	2,570	-	-	67,400
CO2	8,570,000	5,390,000	551,000	953,000	-427,000	-	15,030,000
SOX as SO2	35,700	9,130	2,000	3,640	-	-	50,500
H2S	<1	-	<1	14	-	-	14
Mercaptan	<1	<1	-	4	-		4
NOX as NO2	28,500	10,000	6,060	870	-	-	45,400
Aledhyde (-CHO)	<1	-	<1	<1	-	-	<1
Aromatic HC not spec	1	-	22	380	-	-	403
Cd+compounds as Cd	<1	-	<1	-	-		<1
CH4	40,900	1,660	3	20,700	-	-	63,300
Cl2	<1	-	<1	29	-	-	29
Cr+compounds as Cr	<1	-	<1	-	-	-	<1
CS2	<1	-	<1	<1	-		<1
Cu+compounds as Cu	<1	-	<1	-	-	-	<1
Dichlorethane (DCE)	<1	-	<1	<1	-	<1	<1
Ethylene C2H4	-	-	<1	-	-	-	<1
F2	<1	-	<1	<1	-	-	<1
H2	68	2	<1	754	-	-	824
H2SO4	<1	-	<1	<1	-	-	<1
HCl	1,220	95	<1	3	-	-	1,320
HCN	<1	-	<1	<1	-	-	<1
HF	46	1	<1	<1	-	-	47
Hg+compounds as Hg	<1	-	<1	<1	--	-	<1
Hydrocarbons not spec	7,430	920	1,670	13,100	-	-	23,100
Metals not specified	6	5	<1	3	-	-	14
Methylene chloride CH2	<1	-	<1	<1	-	-	<1
N2O	<1	<1	<1	-	-	-	<1
NH3	<1	-	<1	8	-	-	8
Ni compounds as Ni	<1	-	<1	-	-	-	<1
NMVOC	<1	-	<1	993	-	-	994
Organics	<1	<1	<1	367	-	-	367
Organo-chlorine not spec	<1	-	<1	<1	-	-	<1
Pb+compounds as Pb	<1	<1	<1	<1	-	-	<1
Polycyclic hydrocarbon	<1	-	<1	<1	-	-	<1
Sb+compounds as Sb	-	-	<1	-	-	-	<1
Vinyl chloride monomer	<1	-	<1	<1	-	<1	<1
Zn+compounds as Zn	<1	-	<1	<1	-	-	<1

Table 14B. Carbon dioxide equivalents corresponding to the gross air emissions (in milligrams) resulting from the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Type/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Total
20 year equiv	11,100,000	5,590,000	566,000	2,280,000	-427,000	19,200,000
100 year equiv	9,550,000	5,530,000	566,000	1,470,000	-427,000	16,700,000
500 year equiv	8,900,000	5,500,000	566,000	1,140,000	-427,000	15,700,000

Table 14C. Gross air emissions (in milligrams) resulting from the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Air emissions/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Fugitive	Total
Dust (PM10)	9,500	811	644	10,500	-	-	21,500
CO	16,100	73,400	7,670	3,850	-	-	101,000
CO2	12,900,000	8,082,000	826,000	1,429,000	-640,000	-	22,550,000
SOX as SO2	53,500	13,700	3,000	5,460	-	-	75,700
H2S	<1	-	<1	21	-	-	22
Mercaptan	<1	<1	-	6	-		6
NOX as NO2	42,700	15,100	9,090	1,310	-	-	68,100
Aledhyde (-CHO)	<1	-	<1	<1	-	-	<1
Aromatic HC not spec	2	-	33	570	-	-	604
Cd+compounds as Cd	<1	-	<1	-	-		<1
CH4	61,400	2,490	4	31,090	-	-	95,000
Cl2	<1	-	<1	43	-	-	43
Cr+compounds as Cr	<1	-	<1	-	-	-	<1
CS2	<1	-	<1	<1	-		<1
Cu+compounds as Cu	<1	-	<1	-	-	-	<1
Dichlorethane (DCE)	<1	-	<1	<1	-	<1	<1
Ethylene C2H4	-	-	<1	-	-	-	<1
F2	<1	-	<1	<1	-	-	<1
H2	102	2	<1	1,130	-	-	1,240
H2SO4	<1	-	<1	<1	-	-	<1
HCl	1,830	142	1	5	-	-	1,980
HCN	<1	-	<1	<1	-	-	<1
HF	69	2	<1	<1	-	-	71
Hg+compounds as Hg	<1	-	<1	<1	--	-	<1
Hydrocarbons not spec	11,100	1,380	2,510	19,700	-	-	34,700
Metals not specified	9	7	<1	5	-	-	21
Methylene chloride CH2	<1	-	<1	<1	-	-	<1
N2O	<1	<1	<1	-	-	-	<1
NH3	<1	-	<1	12	-	-	12
Ni compounds as Ni	<1	-	<1	-	-	-	<1
NMVOC	<1	-	<1	1,490	-	-	1,490
Organics	<1	<1	<1	551	-	-	551
Organo-chlorine not spec	<1	-	<1	<1	-	-	<1
Pb+compounds as Pb	<1	<1	<1	<1	-	-	<1
Polycyclic hydrocarbon	<1	-	<1	<1	-	-	<1
Sb+compounds as Sb	-	-	<1	-	-	-	<1
Vinyl chloride monomer	<1	-	<1	<1	-	<1	<1
Zn+compounds as Zn	<1	-	<1	<1	-	-	<1

Table 14D. Carbon dioxide equivalents corresponding to the gross air emissions (in milligrams) resulting from the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Type/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Total
20 year equiv	16,700,000	8,390,000	849,000	3,420,000	-641,000	28,800,000
100 year equiv	14,300,000	8,300,000	849,000	2,210,000	-641,000	25,100,000
500 year equiv	13,400,000	8,250,000	849,000	1,710,000	-641,000	23,600,000

Table 15A. Gross water emissions (in milligrams), resulting from the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Process	Total
COD	9	-	8	5390	5,410
BOD	2	-	<1	543	545
Acid (H+)	4	-	<1	9	13
Al+compounds as Al	<1	-	<1	4	4
Ammonium compounds as NH4	5	-	<1	11	17
AOX	<1	-	<1	<1	<1
As+compounds as As	-	-	<1	<1	<1
BrO3--	<1	-	<1	<1	<1
Ca+compounds as Ca	<1	-	<1	20	20
Cd+compounds as Cd	-	-	<1	-	<1
Cl-	3	-	8	3,060	3,070
ClO3--	<1	-	<1	15	15
CN-	<1	-	<1	<1	<1
CO3--	-	-	<1	181	182
Cr+compounds as Cr	<1	-	<1	<1	<1
Cu+compounds as Cu	<1	-	<1	1	1
Detergent/oil	<1	-	<1	39	40
Dichloroethane (DCE)	<1	-	<1	<1	<1
Dioxin/furan as Teq	-	-	<1	-	<1
Dissolved chlorine	<1	-	<1	<1	<1
Dissolved organics (non-HC)	3	-	<1	44	47
Dissolved solids not specified	2	-	2	947	952
F-	<1	-	<1	<1	<1
Fe+compounds as Fe	<1	-	<1	<1	<1
Hg+compounds as Hg	<1	-	<1	<1	<1
Hydrocarbons not specified	26	<1	<1	3	30
K+compounds as K	<1	-	<1	11	11
Metals not specified elsewhere	<1	-	<1	54	55
Mg+compounds as Mg	<1	-	<1	<1	<1
Mn+compounds as Mn	-	-	<1	<1	<1
Na+compounds as Na	2	-	5	3,136	3,143
Ni+compounds as Ni	<1	-	<1	<1	<1
NO3-	1	-	<1	13	13
Organo-chlorine not specified	<1	-	<1	<1	<1
Organo-tin as Sn	-	-	<1	-	<1
Other nitrogen as N	<1	-	<1	46	47
Other organics not specified	<1	-	<1	<1	<1
P+compounds as P	<1	-	<1	7	7
Pb+compounds as PB	<1	-	<1	<1	<1
Phenols	<1	-	<1	10	10
S+sulphides as S	<1	-	<1	2	2
SO4--	<1	-	2	4,097	4,098
Sr+compounds as Sr	-	-	<1	<1	<1
Suspended solids	573	-	861	78,300	79,800
TOC	<1	-	<1	60	60
Vinyl chloride monomer	<1	-	<1	<1	<1
Zn+compounds as Zn	<1	-	<1	<1	<1

Table 15B. Gross water emissions (in milligrams), resulting from the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Process	Total
COD	14	-	12	8,080	8,110
BOD	3	-	<1	814	817
Acid (H+)	6	-	<1	13	19
Al+compounds as Al	<1	-	<1	5	5
Ammonium compounds as NH4	7	-	<1	17	25
AOX	<1	-	<1	<1	<1
As+compounds as As	-	-	<1	<1	<1
BrO3--	<1	-	<1	<1	<1
Ca+compounds as Ca	<1	-	<1	30	30
Cd+compounds as Cd	-	-	<1	-	<1
Cl-	5	-	11	4,590	4,610
ClO3--	<1	-	<1	22	22
CN-	<1	-	<1	<1	<1
CO3--	-	-	1	272	273
Cr+compounds as Cr	<1	-	<1	<1	<1
Cu+compounds as Cu	<1	-	<1	2	2
Detergent/oil	<1	-	<1	59	60
Dichloroethane (DCE)	<1	-	<1	<1	<1
Dioxin/furan as Teq	-	-	<1	-	<1
Dissolved chlorine	<1	-	<1	1	1
Dissolved organics (non-HC)	4	-	<1	66	70
Dissolved solids not specified	3	-	3	1,420	1,430
F-	<1	-	<1	<1	<1
Fe+compounds as Fe	<1	-	<1	<1	<1
Hg+compounds as Hg	<1	-	<1	<1	<1
Hydrocarbons not specified	39	<1	<1	4	45
K+compounds as K	<1	-	<1	16	16
Metals not specified elsewhere	1	-	<1	81	83
Mg+compounds as Mg	<1	-	<1	<1	<1
Mn+compounds as Mn	-	-	<1	<1	<1
Na+compounds as Na	3	-	8	4,700	4,710
Ni+compounds as Ni	<1	-	<1	<1	<1
NO3-	<1	-	<1	19	19
Organo-chlorine not specified	<1	-	<1	<1	<1
Organo-tin as Sn	-	-	<1	-	<1
Other nitrogen as N	1	-	<1	69	70
Other organics not specified	<1	-	<1	<1	<1
P+compounds as P	<1	-	<1	10	10
Pb+compounds as PB	<1	-	<1	<1	<1
Phenols	<1	-	<1	15	15
S+sulphides as S	<1	-	<1	3	3
SO4--	<1	-	3	6,150	6,150
Sr+compounds as Sr	-	-	<1	<1	<1
Suspended solids	860	-	1,290	117,500	119,600
TOC	<1	-	<1	90	90
Vinyl chloride monomer	<1	-	<1	<1	<1
Zn+compounds as Zn	<1	-	<1	1	1

Table 16A. Generation of solid waste (in milligrams resulting from the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Solid waste (mg)	Fuel prod'n	Fuel use	Transport	Process	Total
Construction waste	<1	-	<1	<1	<1
Inert chemical	<1	-	<1	3,446	3,446
Metals	<1	-	<1	301	301
Mineral waste	974	-	8,564	324,200	333,700
Mixed industrial	-11,800	-	345	5,520	-5,950
Municipal solid waste	-79,800	-	-	22,500	-57,300
Paper	<1	-	<1	<1	<1
Plastic containers	<1	-	<1	-	<1
Plastics	<1	-	<1	53,600	53,600
Putrescibles	<1	-	2	7	10
Regulated chemicals	9,040	-	<1	4,720	13,800
Slags/ash	180,000	4,460	3,330	1,660	189,000
Tailings	16	-	287	1,048	1,350
Unregulated chemicals	6,810	-	11	7,190	14,000
Unspecified refuse	7,350	-	<1	62,900	70,200
Waste returned to mine	443,000	-	316	872	444,400
Waste to compost	-	-	-	9,290	9,290
Waste to incinerator	<1	-	4	4,370	4,380
Waste to recycle	<1	-	<1	33,200	33,200
Wood waste	<1	-	<1	2,330	2,330
Wood pallets to recycle	<1	-	<1	298,000	298,000

Table 16B. Generation of solid waste (in milligrams resulting from the recyclable PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Solid waste (mg)	Fuel prod'n	Fuel use	Transport	Process	Total
Construction waste	<1	-	<1	<1	<1
Inert chemical	<1	-	<1	5,170	5,170
Metals	<1	-	<1	452	452
Mineral waste	1,460	-	12,800	486,000	501,000
Mixed industrial	-17,700	-	517	8,280	-8,930
Municipal solid waste	1119,700	-	-	33,800	-85,900
Paper	<1	-	<1	<1	<1
Plastic containers	<1	-	<1	-	<1
Plastics	<1	-	<1	80,400	80,400
Putrescibles	<1	-	4	11	14
Regulated chemicals	13,600	-	<1	7,080	20,600
Slags/ash	270,000	6,680	4,990	2,480	284,000
Tailings	24	-	430	1,570	2,030
Unregulated chemicals	10,200	-	17	10,800	21,000
Unspecified refuse	11,030	-	<1	94,300	105,400
Waste returned to mine	665,000	-	475	1,310	667,000
Waste to compost	-	-	-	13,900	13,900
Waste to incinerator	<1	-	6	6,560	6,560
Waste to recycle	<1	-	<1	49,800	49,800
Wood waste	<1	-	<1	3,500	3,500
Wood pallets to recycle	<1	-	<1	447,000	447,000

THE COMPOSTABLE PLASTIC BAG SYSTEM

The results of the LCA for the compostable plastic bag system are presented below, each describing some aspect of the behavior of the systems examined. In all cases, the following tables refer to the gross or cumulative totals when all operations are traced back to the extraction of raw materials from the earth and are based on the consumer use and collection of 1000 bags and 1500 bags. The subsequent disposal operations of recycling, composting, incineration with energy recovery and landfill are not included in these results tables and will be discussed separately.

Table 17A. Gross energy (in MJ), required for the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Fuel type	Fuel prod'n & delivery	Energy content of fuel	Transport energy	Feedstock energy	Total energy
Electricity	221	103	1	0	325
Oil	29	279	36	1	345
Other	15	277	1	417	710
Total	265	659	38	418	1380

Table 17B. Gross energy (in MJ), required for the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Fuel type	Fuel prod'n & delivery	Energy content of fuel	Transport energy	Feedstock energy	Total energy
Electricity	331	154	2	0	487
Oil	44	418	54	1	518
Other	22	416	2	625	1065
Total	398	988	57	627	2070

Table 18A. Gross primary fossil fuels and feedstocks, expressed as energy (in MJ), required for the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Feedstock	Total
Coal	113	48	1	0	161
Oil	34	281	37	1	353
Gas	44	301	1	360	705
Hydro	7	2	0	-	9
Nuclear	62	11	0	-	74
Lignite	0	0	0	-	0
Wood	0	7	0	18	26
Sulfur	0	0	0	0	0
Hydrogen	0	0	0	0	0
Biomass (solid)	6	2	0	39	47
Recovered energy	-2	-5	0	-	-8
Geothermal	0	0	0	-	0
Unspecified	0	0	0	-	0
Solar	0	0	0	-	0
Biomass (liqd/gas)	0	0	0	-	0
Industrial waste	1	0	0	-	1
Municipal Waste	1	0	0	-	1
Wind	0	11	0	-	11
Totals	265	659	38	418	1,380

Table 18B. Gross primary fossil fuels and feedstocks, expressed as energy (in MJ), required for the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Feedstock	Total
Coal	169	72	1	0	241
Oil	51	422	55	1	529
Gas	65	451	1	540	1,057
Hydro	11	3	0	-	14
Nuclear	94	17	0	-	111
Lignite	0	0	0	-	0
Wood	0	11	0	27	38
Sulfur	0	0	0	0	0
Hydrogen	0	0	0	0	0
Biomass (solid)	9	4	0	58	71
Recovered energy	-4	-8	0	-	-11
Geothermal	0	0	0	-	0
Unspecified	0	0	0	-	0
Solar	0	0	0	-	0
Biomass (liqd/gas)	0	0	0	-	0
Industrial waste	1	0	0	-	1
Municipal Waste	1	1	0	-	2
Wind	0	16	0	-	16
Totals	398	988	57	627	2,070

Table 19A. Gross primary fossil fuels and feedstocks, expressed as mass (in milligrams), required the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Crude oil……..	7,840,000
Gas/condensate……	14,020,000
Coal…….	5,760,000
Metallurgical coal…..	17,000
Lignite …….	0
Peat …….	7
Wood (50% water)…..	2,210,000
Biomass (incl. water)…	986,000

Table 19B. Gross primary fossil fuels and feedstocks, expressed as mass (in milligrams), required the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Crude oil……..	11,760,000
Gas/condensate……	21,030,000
Coal…….	8,630,000
Metallurgical coal…..	25,000
Lignite …….	0
Peat …….	10
Wood (50% water)…..	3,310,000
Biomass (incl. water)…	1,480,000

Table 20A. Gross water resources (in milligrams) required for the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Source	Use in process	Use in cooling	Totals
Public supply	2,540,000,000	19,200,000	2,560,000,000
River/canal	3,870	1,690,000	1,700,000
Sea	13,100	2,710,000	2,720,000
Unspecified	36,600,000	6,270,000	42,900,000
Well	564,000	49	564,000
Totals	2,580,000,000	29,900,000	2,607,000,000

Table 20B. Gross water resources (in milligrams) required for the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Source	Use in process	Use in cooling	Totals
Public supply	3,810,000,000	28,800,000	3,840,000,000
River/canal	5,810	2,540,000	2,550,000
Sea	19,650	4,065,000	4,080,000
Unspecified	54,900,000	9,410,000	64,350,000
Well	846,000	74	846,000
Totals	3,870,000,000	44,900,000	3,910,000,000

Table 21A. Gross other raw materials (in milligrams) required for the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Raw material	Input in mg
Air	1,460,000
Animal matter	0
Barites	1,700
Bauxite	4,000
Bentonite	99
Calcium sulphate (CaSO4)	<1
Clay	34,200
Cr	19
Cu	0
Dolomite	513
Fe	47,300
Feldspar	0
Ferromanganese	38
Fluorspar	3
Granite	0
Gravel	155
Hg	0
Limestone (CaCO3)	4,230,000
Mg	0
N2 for reaction	17,900
Ni	0
O2 for reaction	1,030
Olivine	394
Pb	260
Phosphate as P205	12,300
Potassium chloride (KCl)	23,000
Quartz (SiO2)	0
Rutile	0
S (bonded)	401,000
S (elemental)	23,700
Sand (SiO2)	22,400
Shale	2
Sodium chloride (NaCl)	261,000
Sodium nitrate (NaNO3)	0
Talc	0
Unspecified	0
Zn	9

Table 21B. Gross other raw materials (in milligrams) required for the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Raw material	Input in mg
Air	2,190,000
Animal matter	0
Barites	2,550
Bauxite	6,010
Bentonite	148
Calcium sulphate (CaSO4)	<1
Clay	51,300
Cr	28
Cu	0
Dolomite	769
Fe	71,000
Feldspar	0
Ferromanganese	57
Fluorspar	5
Granite	0
Gravel	232
Hg	0
Limestone (CaCO3)	6,350,000
Mg	0
N2 for reaction	26,800
Ni	0
O2 for reaction	1,550
Olivine	591
Pb	390
Phosphate as P205	18,400
Potassium chloride (KCl)	34,500
Quartz (SiO2)	0
Rutile	0
S (bonded)	602,000
S (elemental)	35,500
Sand (SiO2)	33,600
Shale	3
Sodium chloride (NaCl)	392,000
Sodium nitrate (NaNO3)	0
Talc	0
Unspecified	0
Zn	14

Table 22A. Gross air emissions (in milligrams) resulting from the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Air emissions/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Fugitive	Total
Dust (PM10)	9,120	520	1,500	42,200	-	-	53,400
CO	16,000	4,900	16,900	4,100	-	-	41,900
CO2	13,860,000	2,620,000	2,580,000	41,800,000	-4,230,000	-	56,600,000
SOX as SO2	54,900	7,210	21,100	192,000	-	-	275,000
H2S	0	0	1	40	-	-	41
Mercaptan	0	0	0	11	-		11
NOX as NO2	50,000	8,260	24,500	221,500	-	-	304,000
Aledhyde (-CHO)	0	0	0	0	-	-	0
Aromatic HC not spec	2	-	67	4	-	-	74
Cd+compounds as Cd	0	-	0	-	-		0
CFC/HCFC/HFC not sp	0	-	0	0	-		0
CH4	59,600	1,060	98	224,000	-	-	284,000
Cl2	0	-	0	0	-	-	0
Cr+compounds as Cr	0	-	0	-	-	-	0
CS2	0	-	0	0	-		0
Cu+compounds as Cu	0	-	0	-	-	-	0
Dichlorethane (DCE)	0	-	0	0	-	0	0
Ethylene C2H4	-	-	0	-	-	-	0
F2	0	-	0	0	-	-	0
H2	38	0	0	226	-	-	264
H2SO4	0	-	0	0	-	-	0
HCl	2,140	6	3	871	-	-	3,020
HCN	0	-	0	0	-	-	0
HF	81	0	0	0	-	-	81
Hg+compounds as Hg	0	-	0	0	--	-	0
Hydrocarbons not spec	13,800	1,720	6,400	100	-	-	22,000
Metals not specified	8	4	0	0	0	-	12
Molybdenum	-	-	-	1	-	-	1
N2O	0	0	0	53,100	-	-	53,100
NH3	0	-	0	39	-	-	39
Ni compounds as Ni	0	-	0	-	-	-	0
NMVOC	0	72	410	46,400	-	-	46,900
Organics	0	0	0	119	-	-	119
Organo-chlorine not spec	0	-	0	16	-	-	16
Pb+compounds as Pb	0	0	0	0	-	-	0
Polycyclic hydrocarbon	0	-	0	0	-	-	0
Titanium	-	-	-	119	-	-	119
Vinyl chloride monomer	0	-	0	0	-	-	0
Zn+compounds as Zn	0	-	0	0	-	-	0

Table 22B. Carbon dioxide equivalents corresponding to the gross air emissions (in milligrams) from the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Type/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Total
20 year equiv	17,630,000	2,700,000	2,640,000	70,200,000	-4,230,000	89,000,000
100 year equiv	15,300,000	2,660,000	2,640,000	62,640,000	-4,230,000	79,000,000
500 year equiv	14,300,000	2,640,000	2,400,000	51,600,000	-4,230,000	67,000,000

Table 22C. Gross air emissions (in milligrams) resulting from the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Air emissions/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Fugitive	Total
Dust (PM10)	13,700	780	2,260	63,400	-	-	80,100
CO	24,000	7,360	25,300	6,150	-	-	62,900
CO2	20,800,000	3,930,000	3,880,000	62,700,000	-6,340,000	-	84,900,000
SOX as SO2	82,400	10,800	31,600	288,000	-	-	413,000
H2S	0	0	2	60	-	-	62
Mercaptan	0	0	0	17	-		17
NOX as NO2	74,900	12,400	36,700	332,000	-	-	456,000
Aledhyde (-CHO)	0	0	0	0	-	-	0
Aromatic HC not spec	3	-	101	7	-	-	111
Cd+compounds as Cd	0	-	0	-	-		0
CFC/HCFC/HFC not sp	0	-	0	0	-		0
CH4	89,500	1,590	147	335,000	-	-	426,000
Cl2	0	-	0	0	-	-	0
Cr+compounds as Cr	0	-	0	-	-	-	0
CS2	0	-	0	0	-		0
Cu+compounds as Cu	0	-	0	-	-	-	0
Dichlorethane (DCE)	0	-	0	0	-	-	0
Ethylene C2H4	-	-	0	-	-	-	0
F2	0	-	0	0	-	-	0
H2	57	0	0	339	-	-	397
H2SO4	0	-	0	0	-	-	0
HCl	3,220	8	5	1,310	-	-	4,540
HCN	0	-	0	0	-	-	0
HF	121	0	0	0	-	-	122
Hg+compounds as Hg	0	-	0	0	--	-	0
Hydrocarbons not spec	20,600	2,580	9,590	150	-	-	33,000
Metals not specified	13	5	0	0	0	-	18
Molybdenum	-	-	-	2	-	-	2
N2O	0	0	0	79,600	-	-	79,600
NH3	0	-	0	59	-	-	59
Ni compounds as Ni	0	-	0	-	-	-	0
NMVOC	1	108	615	69,600	-	-	70,300
Organics	0	0	0	178	-	-	178
Organo-chlorine not spec	0	-	0	24	-	-	24
Pb+compounds as Pb	0	0	0	0	-	-	0
Polycyclic hydrocarbon	0	-	0	0	-	-	0
Titanium	-	-	-	178	-	-	178
Vinyl chloride monomer	0	-	0	0	-	-	0
Zn+compounds as Zn	0	-	0	0	-	-	0

Table 22D. Carbon dioxide equivalents corresponding to the gross air emissions (in milligrams) from the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Type/mg	Fuel prod'n	Fuel use	Transport	Process	Biomass	Total
20 year equiv	26,400,000	4,050,000	3,960,000	105,300,000	-6,350,000	134,000,000
100 year equiv	23,000,000	3,990,000	3,960,000	94,000,000	-6,350,000	119,000,000
500 year equiv	21,500,000	3,960,000	3,600,000	77,400,000	-6,350,000	101,000,000

Table 23A. Gross water emissions (in milligrams), resulting from the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Process	Total
COD	15	2	57	59,700	59,800
BOD	4	-	4	3,190	3,200
Acid (H+)	2	-	0	0	4
Al+compounds as Al	0	-	0	2	2
Ammonium compounds as NH4	5	-	2	0	7
AOX	0	-	0	10	10
As+compounds as As	-	-	0	0	0
BrO3--	0	-	0	0	0
Ca+compounds as Ca	0	-	0	201	201
Cd+compounds as Cd	-	-	0	-	0
Cl-	7	-	670	27,500	28,100
ClO3--	0	-	0	2	2
CN-	0	-	0	0	0
CO3--	-	-	2	5	7
Cr+compounds as Cr	0	-	0	0	0
Cu+compounds as Cu	0	-	0	0	0
Detergent/oil	0	-	2	3	5
Dichloroethane (DCE)	0	-	0	0	0
Dioxin/furan as Teq	-	-	0	-	0
Dissolved chlorine	0	-	0	0	0
Dissolved organics (non-HC)	6	-	0	0	6
Dissolved solids not specified	2	-	6	59	67
F-	0	-	6	0	6
Fe+compounds as Fe	0	-	1	20	22
Hg+compounds as Hg	0	-	0	0	0
Hydrocarbons not specified	0	0	1	334	337
K+compounds as K	0	-	0	2	2
Metals not specified elsewhere	0	-	0	52	52
Mg+compounds as Mg	0	-	0	2	2
Mn+compounds as Mn	-	-	0	0	0
Na+compounds as Na	3	-	15	1,270	1,290
Ni+compounds as Ni	0	-	0	0	0
NO3-	0	-	0	1,910	1,910
Organo-chlorine not specified	0	-	0	0	0
Organo-tin as Sn	-	-	0	-	0
Other nitrogen as N	0	-	0	4,300	4,300
Other organics not specified	0	-	0	0	0
P+compounds as P	0	-	0	41	41
Pb+compounds as PB	0	-	0	0	0
Phenols	0	-	0	0	0
S+sulphides as S	0	-	0	5	5
SO4--	0	-	5	6,287	6,290
Sr+compounds as Sr	-	-	0	0	0
Suspended solids	945	-	2,660	396,000	399,000
TOC	0	-	15	2,460	2,480
Vinyl chloride monomer	0	-	0	0	0
Zn+compounds as Zn	0	-	0	0	0

Table 23B. Gross water emissions (in milligrams), resulting from the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

	Fuel prod'n	Fuel use	Transport	Process	Total
COD	22	2	86	89,500	89,600
BOD	6	-	6	4,790	4,800
Acid (H+)	4	-	0	1	5
Al+compounds as Al	0	-	0	3	3
Ammonium compounds as NH4	7	-	2	1	11
AOX	0	-	0	15	15
As+compounds as As	-	-	0	0	0
BrO3--	0	-	0	0	0
Ca+compounds as Ca	0	-	0	302	302
Cd+compounds as Cd	-	-	0	-	0
Cl-	10	-	1,010	41,200	42,200
ClO3--	0	-	0	2	2
CN-	0	-	0	0	0
CO3--	-	-	3	7	10
Cr+compounds as Cr	0	-	0	0	0
Cu+compounds as Cu	0	-	0	0	0
Detergent/oil	0	-	2	4	7
Dichloroethane (DCE)	0	-	0	0	0
Dioxin/furan as Teq	-	-	0	-	0
Dissolved chlorine	0	-	0	0	0
Dissolved organics (non-HC)	9	-	0	1	10
Dissolved solids not specified	2	-	10	89	101
F-	0	-	9	0	9
Fe+compounds as Fe	0	-	2	31	33
Hg+compounds as Hg	0	-	0	0	0
Hydrocarbons not specified	1	1	2	501	505
K+compounds as K	0	-	0	3	3
Metals not specified elsewhere	0	-	0	76	76
Mg+compounds as Mg	0	-	0	3	3
Mn+compounds as Mn	-	-	0	0	0
Na+compounds as Na	4	-	23	1,900	1,930
Ni+compounds as Ni	0	-	0	0	0
NO3-	0	-	0	2,860	2,860
Organo-chlorine not specified	0	-	0	0	0
Organo-tin as Sn	-	-	0	-	0
Other nitrogen as N	0	-	0	6,440	6,440
Other organics not specified	0	-	0	0	0
P+compounds as P	0	-	0	62	62
Pb+compounds as PB	0	-	0	0	0
Phenols	0	-	0	0	0
S+sulphides as S	0	-	0	7	7
SO4--	0	-	8	9,430	9,440
Sr+compounds as Sr	-	-	0	0	0
Suspended solids	1,420	-	3,990	594,000	599,000
TOC	0	-	23	3,690	3,710
Vinyl chloride monomer	0	-	0	0	0
Zn+compounds as Zn	0	-	0	0	0

Table 24A. Generation of solid waste (in milligrams) resulting from the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1000 bags. Totals may not agree because of rounding.

Solid waste (mg)	Fuel prod'n	Fuel use	Transport	Process	Total
Construction waste	0	-	0	0	0
Inert chemical	0	-	0	5	5
Metals	0	-	0	822	822
Mineral waste	1,110	-	26,500	405,000	433,000
Mixed industrial	-12,800	-	1,100	2,620	-9,080
Municipal solid waste	-130,000	-	-	205,000	75,000
Paper	0	-	0	0	0
Plastic containers	0	-	0	-	0
Plastics	0	-	0	1,580	1,580
Putrescibles	0	-	7	1	8
Regulated chemicals	18,400	-	4,830	133	23,400
Slags/ash	308,000	660	10,300	2,690,000	3,009,000
Tailings	27	-	15,900	284	16,300
Unregulated chemicals	14,000	-	0	82,400	96,400
Unspecified refuse	15,100	-	0	171,700	186,800
Waste returned to mine	731,000	-	980	108	732,100
Waste to compost	-	-	-	25,400	25,400
Waste to incinerator	0	-	12	67	80
Waste to recycle	0	-	0	32,500	32,500
Wood waste	0	-	0	6,370	6,370
Wood pallets to recycling	0	-	0	812,700	812,700

Table 24B. Generation of solid waste (in milligrams) resulting from the COMPOSTABLE PLASTIC bag LCA. Based on consumer use & collection of 1500 bags. Totals may not agree because of rounding.

Solid waste (mg)	Fuel prod'n	Fuel use	Transport	Process	Total
Construction waste	0	-	0	0	0
Inert chemical	0	-	0	6	6
Metals	0	-	0	1,230	1,230
Mineral waste	1,660	-	39,800	608,000	649,000
Mixed industrial	-19,200	-	1,650	3,940	-13,600
Municipal solid waste	-195,000	-	-	308,000	113,000
Paper	0	-	0	0	0
Plastic containers	0	-	0	-	0
Plastics	0	-	0	2,380	2,380
Putrescibles	0	-	11	<1	11
Regulated chemicals	27,600	-	7,250	199	35,100
Slags/ash	462,000	985	15,500	4,035,000	4,510,000
Tailings	40	-	23,900	427	24,400
Unregulated chemicals	20,900	-	52	124,000	145,000
Unspecified refuse	22,600	-	0	258,000	280,000
Waste returned to mine	1,097,000	-	1,470	162	1,098,000
Waste to compost	-	-	-	38,000	38,000
Waste to incinerator	0	-	18	101	120
Waste to recycle	0	-	0	48,800	48,800
Wood waste	0	-	0	9,550	9,550
Wood pallets to recycling	0	-	0	1,220,000	1,220,000

Final Disposal Solid Waste Options: Recycling, Combustion with Energy Recovery, Landfill and Composting

Recycling

A major goal of recycling is to reduce the generation of solid waste. The bag making process for grocery bags generates paper and plastic waste. The majority of this waste, known as mill waste, is recycled internally. Therefore, in this study BCAL treated mill waste as a closed loop recycling effort that returned the waste to the production process.

All of the grocery bags are recyclable to other paper and plastic products. EPA data from 2005 show that 21% of the kraft paper grocery bags are recycled and 5.2 % of the plastic grocery bags are recycled. The allocation decision for these recycled materials is that the recycled materials are not burdened with any inputs or outputs associated with their previous manufacture, use, disposal prior to recycling.

BCAL used this allocation approach, and treated the recycled materials as diverted waste. Diverted waste, like raw materials, are burdened with their intrinsic feedstock value and are subsequently burdened with the resource use, energy consumption, and environmental releases associated with their collection, cleaning and reprocessing, use, and disposal. Therefore, the inherent feedstock energy value of the recycled material is assigned to the diverted waste.

With respect to the degradable plastic bags, BCAL assumed that initially the same rate that applies to recycling of standard plastic bags (5.2%) would be appropriate for the rate sent to composting. This reflects a conservative approach using only data that currently reflect consumer behavior with regard to plastic bags. It is expected that the percentage of degradable plastic bags sent to composting will actually be higher once they are made available and collection can occur within municipalities, making it easier for the general consumer to send these bags through a different route of disposal. Recycling of plastic bags is currently low. This may be for a number of reasons, not the least of which appears to be the lack of infrastructure and poor consumer awareness about the inherent recycleability of plastic bags.

Solid Waste Combustion With Energy Recovery

In previous years, a controlled burning process called combustion or incineration was used solely to reduce volume of solid waste. However, energy recovery became more prevalent in the 1980s. Therefore, today, most of the municipal solid waste combustion in the US incorporates recovery of energy. EPA data from 2005 show that 13.6% of MSW was combusted with energy recovery.

The gross calorific values for the various grocery bags are estimated as follows:

For kraft paper bags	17.7 MJ/kg
For recyclable plastic bag	40.0 MJ//kg
For degradable plastic bag	19.6 MJ/kg

These materials are used as fuels in the waste to energy plants, however the thermal efficiencies for mass-burn WTE plants varies from 15% to 23% in the newer plants.[6] This study used 23% thermal efficiency for energy recovery.

Assuming complete combustion, the resulting estimated CO2 emissions are:
For kraft paper bags 1,650,000 mg/kg paper bag
For recyclable plastic bags 3,150,000 mg/kg recyclable plastic bag
For degradable plastic bags 1,360,000 mg/kg degradable plastic bag

The recovered energy (23% thermal efficiency) is as follows:
For kraft paper bags 4.07 MJ/kg paper bag
For recyclable plastic bags 9.20 MJ/kg recyclable plastic bag
For degradable plastic bags 4.51 MJ/kg degradable plastic bag

Therefore, using the above information, the following table is prepared on the basis of 1000 grocery bags and shows the recovered energy and resulting carbon dioxide emissions when 13.6% of the 1000 grocery bags are combusted with energy recovery.

Table 25. Recovered energy (MJ) and resulting carbon dioxide emissions (mg) when 13.6% of the 1000 grocery bags are combusted with energy recovery.

	Kraft Paper Bag	Recyclable Plastic Bag	Degradable Plastic Bag
Recovered energy	28.7 MJ	7.2 MJ	9.7 MJ
CO2 emissions	11,640,000 mg	2,150,000 mg	2,920,000 mg

Table 25 shows that the kraft paper bag has the highest recovered energy and the highest CO2 emissions. The recyclable and compostable plastic bags have significantly lower recovered energy and CO2 emissions.

Solid Waste to Landfill

A landfill has various phases of decomposition. Initially, aerobic decomposition will take place where oxygen is consumed to produce carbon dioxide gas and other by-products. During the first phase of anaerobic decomposition, carbon dioxide is the principal gas generated. As anaerobic decomposition proceeds toward the second phase, the quantity of methane generated increases until the methane concentration reaches 50% to 60%. The landfill will continue to generate methane at these concentrations for 10 or 20 years, and possibly longer[7].

Methane emissions from landfills in the United States were estimated at 8.0 million metric tons in 2001. In addition, 2.5 million tons were recovered for energy use and 2.4 million tons were recovered and flared. Therefore, more than 60% of the methane produced in landfills is not recovered.[8]

The precise fate of paper deposited in a landfill site is unknown. Paper may decompose entirely in a short space of time or it may remain intact for long periods.[9] This depends on a variety of factors such as temperature, pH, the presence of bacteria and nutrients, the composition of the waste and the form of the paper-shredded paper is much more likely to decompose than is a whole telephone book. To account for this variability, two scenarios were used to calculate emissions associated with the disposal of paper bags (both adjustment for 40% of the recovered methane noted above). The first scenario is a worst-case scenario that follows the basic decomposition reaction for cellulose and the second scenario is one that estimates carbon sequestration for paper in MSW landfills.

Scenario 1 for Paper Bags

The basic decomposition reaction for cellulose is well known and follows the form of:

$$C_6H_{10}O_5 + H_2O = 3CH_4 + 3CO_2 \quad (1)$$

It is therefore expected that only one half of the carbon present in kraft paper bags will result in methane formation during decomposition. Typically carbon represents 45% of the mass of paper. Thus, the carbon content of 1 kg of paper will be 0.45 kg. That proportion giving rise to methane, assuming 100 % decomposition, would then be 0.225 kg. Based on this, the mass of methane produced would be 0.30 kg and the corresponding mass of the coproduct carbon dioxide would be 0.83 kg.

Scenario 2 for Paper Bags

Although cellulose decomposition in landfill is well documented, there remains significant uncertainty in the maximum extent of cellulose decomposition that can be realized under landfill conditions. Several studies indicate that significant carbon sequestration occurs in landfills because of the limited degradation of wood products. In one study[10 a] carbon storage factor (CSF) was calculated that represented the mass of carbon stored (not degraded) per initial carbon mass of the component. For the following MSW paper refuse components the CSF was calculated: old newsprint = 0.42 kg C sequestered, coated paper = 0.34 kg C sequestered, and old corrugated = 0.26 kg C sequestered.

For this scenario the partial decomposition that the paper bags go through is assumed to be aerobic or the initial anaerobic phase, resulting principally in carbon dioxide emissions. In this scenario, we have assumed that the paper bags are similar to old corrugated, and therefore have assigned the same value of 0.26 kg C sequestered. Given that 0.26 kg of the kraft paper bag is assumed to be sequestered, 0.74 kg of the kraft paper bag results in carbon dioxide emissions of 1.23 kg.

Recyclable plastic bags are not considered to degrade in landfills, suggesting that all the inherent feedstock energy and emissions will be sequestered. Therefore, there are no carbon dioxide or methane emissions associated with the recyclable plastic bags sent to landfills.

Many types of biodegradable polymers are available to degrade in a variety of environments, including soil, air, or compost. The biodegradable products degrade under aerobic conditions to carbon dioxide and water in the presence of oxygen. The biodegradable, compostable plastic bags in this study are made from a blend of Ecoflex and PLA. Ecoflex is made from aliphatic-aromatic copolyester blended with equal amounts of starch. According to information provided by BASF, Ecoflex meets the requirements for biodegradable polymer classification based on European, US, and Japanese standards because Ecoflex can be degraded by micro-organisms.[11] PLA is a biodegradable polymer made from corn and is converted completely to carbon dioxide and water by micro-organisms. In addition, compostable plastic bags have been found to degrade as designed within an allowable timeframe in appropriate composting facilities[13]. In composting facilities, decomposition of biodegradable plastic bags made from a blend of Ecoflex and PLA are expected to release primarily carbon dioxide emissions and water. However, if sent to a landfill, biodegradable plastic will either not degrade at all, or may follow similar pathways as paper bags (a combination of both aerobic and anaerobic degradation). BCAL treated these bags in both ways in this study to examine all possibilities.

Solid Waste Composting

The biodegradable, compostable plastic bags in this study have demonstrated biodegradation in several standardized tests in several countries. Ecoflex and PLA meet US, European, Australian, and Japanese standards by degrading in 12 weeks under aerobic conditions in a compost environment and by breaking down to carbon dioxide and water. The extent of the degradation for Ecoflex was 2 to 6 months in compost depending upon temperature, and for PLA was 1 to 3 months in compost depending upon temperature. [11] Therefore, in the composting environment, decomposition of biodegradable plastic bags made from a blend of Ecoflex and PLA is expected to degrade over time with the release primarily of carbon dioxide emissions and water.

LCA Calculations of Environmental Impacts

As noted under the section on LCA methodology, life cycle assessment modeling allows an examination of specific problems as well as comparisons to determine if there are any serious side effects to any of the systems under study. In every system there are multiple environmental parameters to be addressed scaling from global to local issues, and no single solution is likely to address all of the issues simultaneously. In addition, almost every change to a system creates trade-offs, and it is the identification of these trade-offs that is important when trying to determine the best solution for any given problem.

To reiterate, a life cycle assessment can:

1. Quantify those parameters likely to be responsible for environmental effects (the inventory component of life cycle analysis).
2. Identify which parameters are likely to contribute to a specific environmental problem (characterization or interpretation phase of impact assessment). An

example would be identifying that carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are greenhouse gases.

3. Aggregate the parameters relating to a specific problem (the valuation or interpretation phase of impact assessment). An example would be producing carbon dioxide equivalents for the components of greenhouse gases.

The LCA calculations provide a compilation of information from which the user can address specific problems such as the conservation of fossil fuels, global warming, acid rain, and municipal solid waste. In addition, the user also is able to determine what trade-offs exist between systems and to examine the specific parameters which are likely to contribute to these problems. In so doing, the user can strive to achieve the optimum reduction in each parameter because of a better understanding of how these parameters change in association with each grocery bag system.

GLOBAL WARMING

One important issue that is currently being addressed using LCA studies is an examination of the contribution that industrial systems make to climate change. The work of the Intergovernmental Panel on Climate Change (IPCC)[12] provides a framework for aggregating data on those air emissions that are thought to be significant contributors to global warming. The aggregated effect of any system can be summarized as a parameter known as Global Warming Potential (GWP) or carbon dioxide equivalent. Any gaseous emission that is thought to contribute to global warming is assigned a value equal to the equivalent amount of CO_2 that would be needed to produce the same effect. Multiplying each gaseous emission by its CO_2 equivalent allows the separate effects of different emissions to be summed to give an overall measure of global warming potentials.

The major greenhouse gases of importance in this eco-profile are carbon dioxide, methane and nitrous oxide. The results tables provided previously (see Section on LCA Results) showed the global warming impacts (with carbon dioxide equivalents) up to the collection of the grocery bags.

The following table estimates the global warming impacts just from the collection and disposal of the grocery bags.

As discussed previously, two scenarios will be considered for the kraft paper bags, the first is a worst-case scenario that follows the basic decomposition reaction for cellulose and the second scenario is one that estimates carbon sequestration for paper in MSW landfills.

The recyclable plastic bags will not degrade in the landfill; all the inherent feedstock energy and emissions will be sequestered. Therefore, there are no carbon dioxide emissions from recyclable plastic bags in landfills.

In the landfill, decomposition of biodegradable plastic bags made from a blend of Ecoflex and PLA is expected to degrade over time with the release primarily of carbon dioxide emissions and water.

Table 26A. Greenhouse gas emissions. 20-year carbon dioxide equivalents (in milligrams) resulting from the disposal of 1000 grocery bags.

Disposal process	Paper bag with "worst case scenario" of methane emissions	Paper bag with "sequestered scenario" of carbon dioxide emissions	Recyclable plastic bag	Degradable plastic bag With 100% aerobic decomposition in landfill	Degradable plastic bag with 50% aerobic & 50% anaerobic decomposition in landfill (using the same pathway as described for paper bags)
Recycling	21% recycled & burden is transferred	21% recycled & burden is transferred	5.2% recycled & burden is transferred	5.2% recycled to composting & burden is transferred	5.2% recycled to composting & burden is transferred
Incineration with energy recovery 13.6%	11,640,000	11,640,000	2,150,000	2,920,000	2,920,000
Landfill 65.4% paper, 81.2% plastic	412,000,000	41,300,000	0	17,400,000	129,400,000
Total disposal related emissions	423,640,000	52,940,000	2,150,000	20,320,000	132,320,000

Table 26A shows that after disposal, the recyclable plastic bag has the lowest greenhouse gas emissions. The paper bag with the "sequestered scenario" has more than 15 times the greenhouse gas emissions of the recyclable plastic bag. The paper bag with the "worst-case scenario" has more than 200 times the greenhouse gas emissions of the recyclable plastic bag. The degradable plastic bag has more than 9 times the greenhouse gas emissions of the recyclable plastic bag.

Table 26B. Greenhouse gas emissions. 20-year carbon dioxide equivalents (in milligrams) resulting from the disposal of 1000 kraft paper grocery bags and 1500 recyclable plastic and degradable plastic grocery bags.

Disposal process	Paper bag with "worst case scenario" of methane emissions	Paper bag with "sequestered scenario" of carbon dioxide emissions	Recyclable plastic bag	Degradable plastic bag With 100% aerobic decomposition in landfill	Degradable plastic bag with 50% aerobic & 50% anaerobic decomposition in landfill
Recycling	21% recycled & burden is transferred	21% recycled & burden is transferred	5.2% recycled & burden is transferred	5.2% recycled to composting & burden is transferred	5.2% recycled to composting & burden is transferred
Incineration with energy recovery 13.6%	11,640,000	11,640,000	3,230,000	4,380,000	4,380,000
Landfill 65.4% paper, 81.2% plastic	412,000,000	41,300,000	0	26,100,000	194,000,000
Total disposal related emissions	423,640,000	52,940,000	3,230,000	30,500,000	198,000,000

Table 26B shows that even using 1.5 plastic bags to 1 paper bag, after disposal, the recyclable plastic bag has the lowest greenhouse gas emissions. The paper bag at a 1 to 1.5 use ratio, with the "sequestered scenario," has more than 10 times the greenhouse gas emissions of the recyclable plastic bag. The paper bag with the "worst-case scenario" has more than 130 times the greenhouse gas emissions of the recyclable plastic bag. The degradable plastic bag has more than 9 times the greenhouse gas emissions of the recyclable plastic bag with the 100% aerobic decomposition and more than 60 times the greenhouse gas emissions of the recyclable plastic bag with the 50% aerobic decomposition/50% anaerobic decomposition.

Table 27A. Carbon dioxide equivalents (in milligrams) resulting from all operations just prior to the disposal of 1000 grocery bags.

	Recyclable and Recycled Paper bag* (from Table 6B)	Recyclable plastic bag (from Table 14B)	Degradable plastic bag (from Table 22B)
20 year CO2 eq.	23,710,000 mg	19,200,000 mg	89,000,000 mg

*It should be noted that these emissions include the "credit" when carbon dioxide was absorbed during tree growing.

Table 27A shows that from all operations just prior to disposal, the resulting CO2 equivalents are more than 20% greater for the paper bag compared to the recyclable plastic bag. From all operations just prior to disposal, the resulting CO2 equivalents for the degradable plastic bag are the highest about 4 times greater than the recyclable plastic bag.

Table 27B Carbon dioxide equivalents (in milligrams) resulting from all operations just prior to the disposal of 1000 kraft paper grocery bags and 1500 recyclable plastic and degradable plastic grocery bags.

	Recyclable and Recycled Paper bag* (from Table 6B)	Recyclable plastic bag (from Table 14B)	Degradable plastic bag (from Table 22B)
20 year CO2 eq.	23,710,000 mg	28,800,000 mg	134,000,000 mg

*It should be noted that these emissions include the "credit" when carbon dioxide was absorbed during tree growing.

Table 27B shows that from all operations just prior to disposal, the resulting CO2 equivalents are more than 20% greater for the recyclable plastic bag compared to the paper bag. From all operations just prior to disposal, the resulting CO2 equivalents for the degradable plastic bag are the highest about 4 times greater than the recyclable plastic bag and 5 times greater than the paper bag.

Now, adding the greenhouse gas emissions from tables 26 and 27 the total LCA cradle-to-grave greenhouse gas emissions for the production, use, and disposal of 1000 grocery bags are given in Table 28.

Table 28A. Total LCA cradle-to-grave CO2 equivalents (in milligrams) for the production, use, and disposal of 1000 grocery bags:

	Paper bag with "worst-case scenario" of methane emissions	Paper bag with "sequestered scenario" of carbon dioxide emissions	Recyclable plastic bag	Degradable plastic bag With 100% aerobic decomposition in landfill	Degradable plastic bag with 50% aerobic & 50% anaerobic decomposition in landfill
20 year CO2 eq	447,350,000	76,650,000	21,350,000	109,300,000	221,300,000
100 year CO2 eq	202,200,000	65,490,000	18,850,000	99,300,000	134,800,000
500 year CO2 eq	90,410,000	60,910,000	17,850,000	87,320,000	92,100,000

Table 28A shows that the recyclable plastic bag has the lowest the total cradle-to-grave CO2 equivalents. The paper bag with the "sequestered scenario" has more than 3.5 times the total cradle-to-grave CO2 equivalents of the recyclable plastic bag. The paper bag with the "worst-case scenario" has more than 20 times the total cradle-to-grave CO2 equivalents of the recyclable plastic bag. The degradable plastic bag has more than 5 times the total cradle-to-grave CO2 equivalents of the recyclable plastic bag.

Table 28B. Total LCA cradle-to-grave CO2 equivalents (in milligrams) for the production, use, and disposal of 1000 kraft paper grocery bags and 1500 recyclable plastic and degradable plastic grocery bags.

	Paper bag with "worst-case scenario" of methane emissions	Paper bag with "sequestered scenario" of carbon dioxide emissions	Recyclable plastic bag	Degradable plastic bag With 100% aerobic decomposition in landfill	Degradable plastic bag with 50% aerobic & 50% anaerobic decomposition in landfill
20 year CO2 eq	447,350,000	76,650,000	32,030,000	164,000,000	332,000,000
100 year CO2 eq	202,200,000	65,490,000	28,300,000	149,000,000	202,000,000
500 year CO2 eq	90,410,000	60,910,000	26,800,000	131,000,000	138,000,000

Table 28B shows that even using 1.5 plastic bags to 1 paper bag, the recyclable plastic bag has the lowest the total cradle-to-grave CO2 equivalents. The paper bag, at a 1 to 1.5 use ratio, with the "sequestered scenario," has about 2.3 times more total cradle-to-grave CO2 equivalents of the recyclable plastic bag, depending upon the time horizon. The paper bag with the "worst-case scenario" has more than 20 times the total cradle-to-grave CO2 equivalents of the recyclable plastic bag. The degradable plastic bag has more than 5 times the total cradle-to-grave CO2 equivalents of the recyclable plastic bag.

STRATOSPHERIC OZONE DEPLETION

The stratospheric ozone layer occurs at an altitude of between 10-40 km. The maximum generation of ozone (O3) occurs at the outer layer, where oxygen molecules (O2) react with atomic oxygen. The presence of other compounds, particularly halogenated compounds, promotes the decomposition of this ozone in the presence of strong ultra-violet radiation.

In this study there were no identified ozone depleting chemicals associated with the bag systems studied, and therefore no contributions to stratospheric ozone depletion.

ACID RAIN

The production of acid rain in the northeastern United States is recognized as a regional problem. Acid rain results when sulfur and nitrogen oxides and their transformation

products return from the atmosphere to the earth's surface. The major source of acid rain is the emission of these pollutants from coal powered electricity generating plants.

The following data were extracted from the results tables. There are no data available for SOX and NOX emissions after disposal.

Table 29A. Acid rain emissions (in milligrams of SO_2 and NO_2) resulting from all operations just prior to disposal 1000 grocery bags.

Acid rain emissions mg	Paper bag	Recyclable plastic bag	Degradable plastic bag
SOX	579,000 mg	50,500 mg	275,000 mg
NOX	264,000 mg	45,400 mg	304,000 mg

Table 29A shows that the recyclable plastic bag has the least SOX and NOX emissions. The paper bag has more than 10 times the SOX emissions compared with the recyclable plastic bag and more than 5 times the NOX emissions compared with the recyclable plastic bag. The degradable plastic bag has more than 5 times the SOX and NOX emissions compared with the recyclable plastic bag.

Table 29B. Acid rain emissions (in milligrams of SO_2 and NO_2) resulting from all operations just prior to disposal for 1500 recyclable plastic bags and degradable plastic grocery bags.

Acid rain emissions mg	Paper bag	Recyclable plastic bag	Degradable plastic bag
SOX	579,000 mg	75,800 mg	413,000 mg
NOX	264,000 mg	68,100 mg	456,000 mg

Table 29B shows that even using 1.5 plastic bags to 1 paper bag, the recyclable plastic bag has the least SOX and NOX emissions. The paper bag, at a 1 to 1.5 use ratio, has more than 7 times the SOX emissions compared with the recyclable plastic bag and almost 4 times the NOX emissions compared with the recyclable plastic bag. The degradable plastic bag has more than 5 times the SOX and NOX emissions compared with the recyclable plastic bag.

MUNICIPAL SOLID WASTE

Another widespread environmental issue concerns the generation and disposal of municipal solid waste. The mineral wastes from mining, the slags and ash wastes from oil and gas production and utility coal combustion, and regulated chemical wastes are generally managed by regulation and permits that exclude these wastes from the municipal solid waste stream. The type of wastes in mixed industrial wastes can contribute to the municipal solid waste problem. If, as in this study, there is an interest in focusing on the municipal solid waste problem, the results on mineral wastes, slags & ash, and regulated chemicals can be ignored. Selecting only the solid waste resulting from just the disposal of grocery bags in landfill, one can prepare the following table 30A considering disposal of 1000 grocery bags and table 30B considering disposal of 1000

kraft paper grocery bags and 1500 recyclable plastic and degradable plastic grocery bags. The table reflects the waste that is landfilled as 65.4% paper bags and 81.2% plastic bags.

Table 30A. The municipal solid waste (in mg) resulting from just the disposal of grocery bags in landfill. Based on 1000 grocery bags but only 65.4% of paper bags are landfilled and 81.2% of plastic bags are landfilled.

	Paper bag	Recyclable plastic bag	Degradable plastic bag
Municipal solid waste mg	33,900,000	4,690,000	12,800,000

Table 30A shows that the recyclable plastic bag has the least municipal solid waste. The paper bag has more than 7 times the municipal solid waste compared with the recyclable plastic bag. The degradable plastic bag has almost 3 times the municipal solid waste compared with the recyclable plastic bag.

Table 30B. The municipal solid waste (in mg) resulting from just the disposal of grocery bags in landfill. Based on 1000 kraft paper grocery bags but only 65.4% of paper bags are landfilled and 1500 plastic grocery bags of which 81.2% of plastic bags are landfilled.

	Paper bag	Recyclable plastic bag	Degradable plastic bag
Municipal solid waste mg	33,900,000	7,035,000	19,200,000

Table 30B shows that even using 1.5 plastic bags to 1 paper bag, the recyclable plastic bag has the least municipal solid waste. The paper bag, at a 1 to 1.5 use ratio, has almost 5 times the municipal solid waste compared with the recyclable plastic bag. The degradable plastic bag has almost 3 times the municipal solid waste compared with the recyclable plastic bag.

CONSERVATION OF FOSSIL FUELS

Conservation problems are concerned with the depletion and possible exhaustion of raw materials and fuels. With continued use, the finite supply of raw materials, and especially fossil fuels will one day be exhausted. The conservation of fossil fuels: coal, oil ,and natural gas is an important global environmental issue. It is therefore important to ensure that these resources are used with the maximum efficiency and the minimum of waste.

Table 31A. The gross fossil fuels and feedstocks, expressed as energy (MJ) required for the production, use, and disposal of 1000 grocery bags.

Energy in MJ	Paper bag	Recyclable plastic bag	Degradable plastic bag
Coal	324	65	161
Oil	207	206	353
Gas	391	186	705
Totals	922	457	1,219

Table 31A shows that the recyclable plastic bag uses the least fossil fuels and feedstocks. The paper bag uses more than 2 times the fossil fuels and feedstocks compared with the recyclable plastic bag. The degradable plastic bag used more than 2 1/2 times the fossil fuels and feedstocks compared with the recyclable plastic bag.

Table 31B. The gross fossil fuels and feedstocks, expressed as energy (MJ) required for the production, use, and disposal of 1000 kraft paper grocery bags and 1500 recyclable plastic and degradable plastic grocery bags.

Energy in MJ	Paper bag	Recyclable plastic bag	Degradable plastic bag
Coal	324	98	242
Oil	207	309	530
Gas	391	279	1,058
Totals	922	686	1,830

Table 31B shows that even using 1.5 plastic bags to 1 paper bag, the recyclable plastic bag uses the least fossil fuels and feedstocks. The paper bag, at a 1 to 1.5 use ratio, uses 34% more fossil fuels and feedstocks compared with the recyclable plastic bag. The degradable plastic bag used more than 2 1/2 times the fossil fuels and feedstocks compared with the recyclable plastic bag.

LOCAL & REGIONAL GRID ELECTRICITY USE

The US recently has experienced severe problems related to its local and regional grid electricity. Because of these recent “blackouts,” “brownouts,” and electricity interruptions, the need for appropriate conservation measures can be argued.

Table 32A. The electrical energy (MJ) required for the production, use, and disposal of 1000 grocery bags.

	Paper bag	Recyclable plastic bag	Degradable plastic bag
Electrical energy MJ	649	148	325

Table 32A shows that the recyclable plastic bag uses the least electrical energy. The paper bag uses more than 4 times the electrical energy compared to the recyclable plastic bag. The degradable plastic bag used more than 2 times the electrical energy compared with the recyclable plastic bag.

Table 32B. The electrical energy (MJ) required for the production, use, and disposal of 1000 kraft paper grocery bags and 1500 recyclable plastic and degradable plastic grocery bags.

	Paper bag	Recyclable plastic bag	Degradable plastic bag
Electrical energy MJ	649	222	488

Table 32B shows that even using 1.5 plastic bags to 1 paper bag, the recyclable plastic bag uses the least electrical energy. The paper bag, at a 1 to 1.5 use ratio, uses almost 3 times the electrical energy compared with the recyclable plastic bag. The degradable plastic bag used more than 2 times the electrical energy compared with the recyclable plastic bag.

WATER USE & PUBLIC SUPPLY

Parts of the US continue to be plagued by periodic drought conditions. During these times, laws and regulations concerning water conservation are enforced. Since public water supply issues have been identified as a problem, the following table has been prepared to compare public water supply used for the production, use, and disposal of 1000 grocery bags.

Table 33A. Public water supply (in mg) used for the production, use, and disposal of 1000 grocery bags.

	Paper bag	Recyclable plastic bag	Degradable plastic bag
Public water supply (in mg)	3,895,000,000	31,150,000	2,560,000,000

Table 33A shows that the recyclable plastic bag uses the least public water supply. The paper bag uses more than 125 times the public water supply compared with the recyclable plastic bag. The degradable plastic bag used more than 80 times the public water supply compared with the recyclable plastic bag.

Table 33B. Public water supply (in mg) used for the production, use, and disposal of 1000 kraft paper grocery bags and 1500 recyclable plastic and degradable plastic grocery bags.

	Paper bag	Recyclable plastic bag	Degradable plastic bag
Public water supply	3,895,000,000	46,700,000	3,840,000,000

(in mg)			

Table 33B shows that even using 1.5 plastic bags to 1 paper bag, the recyclable plastic bag uses the least public water supply. The paper bag, at a 1 to 1.5 use ratio, uses more than 80 times the public water supply compared with the recyclable plastic bag. The degradable plastic bag used more than 80 times the public water supply compared with the recyclable plastic bag.

SUMMARY AND CONCLUSIONS

Recent efforts by legislators to ban traditional plastic bags on the basis of environmental impact have reignited the debate surrounding single-use grocery bags, and whether there are any environmental trade-offs in switching from bags made with polyethylene to bags made from alternative materials.

This life cycle assessment was commissioned to examine the overall environmental impacts associated with the typical single-use polyethylene plastic grocery bag, compared with grocery bags made from compostable plastic resin and grocery bags made from 30% recycled paper.

Life cycle assessment is a useful analytical tool because it allows for the examination of an entire production system from cradle to grave, thus examining the full range (global, regional, and local impacts) of environmental issues at once rather than examining individual components of a system or individual products or processes. This broad picture analysis is important because environmental effects range from global (greenhouse gases), to regional (acid rain/solid waste) or local (toxic releases) impacts. And while there often is excellent information on local environmental effects, few complete data sets are available to understand the contributions production systems are making to global and regional environmental problems.

These study results confirm that the standard polyethylene grocery bag has significantly lower environmental impacts than a 30% recycled content paper bag. This supports conclusions drawn from a number of other studies looking at similar systems.[14, 15, 16] In addition, this report also shows that the typical polyethylene grocery bag has fewer environmental impacts than a compostable plastic grocery bag made from a blend of EcoFlex (BASF), polylactic acid, and calcium carbonate, when compared on a 1:1 basis, as well as when the number of bags is adjusted for carrying capacity so that the comparison is 1.5:1. Surprisingly, the trend is the same for most of the individual categories of environmental impacts. No one category showed environmental impacts lower for either the compostable plastic bag or the paper bag.

This study did not examine the impacts associated with reusable cloth bags, so no comparison was made between the cloth bags and single-use polyethylene plastic bags. In other studies, however, cloth bags were shown to reduce environmental impacts if consumers can be convinced to switch. The problem is that there are few examples where entire cities, counties, or countries have been successful in changing consumer behavior

from the convenience of using bags provided by retail establishments to bringing their own bags to the store each time they shop. There is no question that a percentage of consumers do, and will use reusable cloth grocery bags, but the vast majority of consumers still appear to use the freely available bags provided by retail establishments. So, if consumer behaviors are not appearing to change, banning one type of single-use bag will simply mean that it is replaced by another type of single-use bag.

Given the above-stated assumption, it is clear that the replacement bags will either be compostable plastic bags or paper bags, as proposed legislation tends to stipulate these as the preferred alternatives. But can these alternative materials meet the legislative objectives, which often include: the reduction of litter, the need to reduce dependence on fossil fuels, and the need to reduce solid wastes? Taking the latter two objectives first, one can use the LCA results in this report to see if the above stated objectives are being met.

In the case of reducing dependence on overall energy, it is clear (see Table 34) that neither the life cycle of compostable bag nor paper bag provides a reduction in overall energy use. The standard polyethylene plastic grocery bag uses between 1.8 and 3.4 times less energy than the compostable and paper bag systems, respectively.

Table 34. Gross Energy by Activity (MJ)

	Fuel prod'n (total)	Fuel use (total)	Transport (total)	Feedstock (total)	Total
Paper Bag (1000 bags)	493	1105	34	991	2622
Compostable Plastic Bag (1000 bags)	265	659	38	418	1380
Compostable Plastic Bag (1500 bags)	398	988	57	627	2070
Polyethylene Plastic Bag (1000 bags)	106	114	11	279	509
Polyethylene Plastic Bag (1500 bags)	159	171	16	418	763

Table 35 demonstrates that in terms of fossil fuel use, including oil, the compostable plastic bag system does not provide any benefit. The compostable plastic bag system appears to use more oil than either of the other two bag systems, varying from 1.7 to 2.57 times more oil than either the plastic bag or paper bag systems, respectively. The paper bag system would appear to be able to provide a slight improvement, but only if the plastic bag system actually uses 1.5 bags for every 1 bag in the paper system. If this assumption cannot be supported, then the paper bag system would not provide even a slight advantage.

Table 35. Gross Fossil Fuel Use (kg)					
	Paper Bag (1000 bags)	Compostable Plastic Bag (1000 bags)	Compostable Plastic Bag (1500 bags)	Polyethylene Plastic Bag (1000 bags)	Polyethylene Plastic Bag (1500 bags)
Coal	11.2	5.8	8.7	2.3	3.4
Oil	4.6	7.8	11.8	4.6	6.9
Gas	7.4	14.0	21.0	3.1	4.6

These results may appear to some to be counterintuitive, but both compostable plastic and paper bags require more material per bag in their manufacture. This results in greater use of fuels in the extraction and transport of raw materials for the manufacture of the bags, as well as greater energy in bag manufacturing and greater fuel use in the transport of the finished product from the manufacturer to retail establishments. Although standard polyethylene plastic bags are made from oil, the added requirements of manufacturing energy and transport for the compostable and paper bag systems far exceed the raw material use in the standard plastic bag system.

The results of this study also show that the standard polyethylene single-use plastic grocery bag's contribution to the solid waste stream is far lower than either the paper bag system or the compostable bag system. This is not surprising considering both the compostable bag and paper bag systems require more material per bag. The increase in solid wastes has become an important global issue as populations multiply and developing countries become wealthier, consuming more material goods. Currently, more land is being devoted to the disposing of solid wastes, and the lack of proper containment in solid waste facilities is causing problems in terms of soil contamination and water pollution.

Table 36. Municipal Solid Waste (kg)				
Paper Bag (1000 bags)	Compostable Plastic Bag (1000 bags)	Compostable Plastic Bag (1500 bags)	Polyethylene Plastic Bag (1000 bags)	Polyethylene Plastic Bag (1500 bags)
33.9	12.8	19.2	4.7	7.0

This study was not designed to address the issue of litter, so no specific calculations were conducted on the effect of the various bag systems on litter. However, there are some interesting points that can be made with regard to meeting the objective of reducing litter by switching to alternative materials in the grocery bag system. The summary of results discussed above on energy use and solid waste already illustrate that reducing litter through a change in the grocery bag system will lead to greater use in energy and greater amounts of solid wastes. Those who believe that this is an acceptable trade-off must also understand that there are additional, and perhaps far more serious, environmental impacts that will result if plastic bags are supplanted by either compostable plastic bags or paper.

One of these serious environmental impacts is global warming. The study showed that switching from single-use polyethylene plastic grocery bags to either paper or compostable plastic grocery bags may increase the emission of greenhouse gases and therefore contribute to global warming (See Table 37). Based on these results, it appears that the trade-off for reducing litter is an increase in global warming, which if not curbed, is expected to cause problems for decades and to affect marine, freshwater, and terrestrial habitats, and species globally. If one of the major concerns about litter is its accumulation in marine habitats and its negative effect on sea life, it would hardly seem justified to address the effects of litter with a grocery bag system that can cause significant harm to not only the same habitats, but to all other habitats as well.

Table 37. Global Warming Potential
(CO2 Equivalents in tons)

	Paper bag with "sequestered scenario" of carbon dioxide emissions (1000 bags)	Compostable plastic bag With 100% aerobic decomposition in landfill (1500 bags)	Compostable plastic bag with 50% aerobic & 50% anaerobic decomposition in landfill (1500 bags)	Polyethylene Plastic Bag (1500 bags)
Production	0.03	0.15	0.15	0.03
Disposal	0.05	0.03	0.22	0.00
Total	0.08	0.18	0.37	0.04

Another increasingly important issue is the protection of water sources around the globe. Concerns have been raised over the long-term availability of water to support the expanding population's need for drinking, manufacturing, and agriculture. Table 38 shows the use of freshwater resources for each of the grocery bag systems studied. The standard polyethylene plastic bag uses significantly less water, compared with the paper or compostable grocery bag systems. Paper grocery bags use approximately 1 gallon of water for every bag, compared with the plastic bag system, which uses only .008 gallons per bag or 1 gallon for every 116 bags. Compostable grocery bags do not appear to provide any improvement over paper bags, and use far more water than the standard polyethylene plastic bag. It appears, therefore, that in switching to a paper bag or compostable plastic bag system to combat a litter problem, consumers will have to accept another significant trade-off—the increase in use of valuable water resources.

Table 38. Gross Freshwater Resources (gallons)

	Paper Bag (1000 bags)	Compostable Plastic Bag (1000 bags)	Compostable Plastic Bag (1500 bags)	Polyethylene Plastic Bag (1000 bags)	Polyethylene Plastic Bag (1500 bags)
Public Supply	1000	660	1000	8	13
Other	4	12	17	32	45

Other environmental factors that show similar trends are the emission of acid rain gases and water pollutants. In both cases, paper bag and compostable bag systems show larger amounts of pollutants emitted into the environment than those emitted by the plastic grocery bag system. Similarly, there are other environmental matters that are important to

consider when making a decision on which systems to implement. Paper bag systems use a completely different resource base—wood fiber—than the plastic bag system. If the wood fiber does not come from sustainably managed forest systems or from agricultural wastes, it may cause a trade-off that is unacceptable to consumers. Forests are important ecosystems that support a wide variety of life, and disrupting these ecosystems in the name of reducing litter is an effect that deserves further contemplation.

The study results support the conclusion that any decision to ban traditional polyethylene plastic grocery bags in favor of bags made from alternative materials (compostable plastic or recycled paper) will be counterproductive and result in a significant increase in environmental impacts across a number of categories from global warming effects to the use of precious potable water resources.

Addressing the issue of increasing litter with bans on plastic grocery bags may be counterproductive as this study has not considered many other mitigating circumstances that may lead to even greater differentials between plastic grocery bags and those made from either paper or compostable plastics.

Increased recycling rates for plastic bags, better bagging techniques at retail, and secondary uses of plastic grocery bags such as waste disposal could all further reduce the environmental impacts of plastic grocery bags. In addition, getting consumers to change their behavior so that plastic bags are kept out of the litter stream would appear to be more productive in reducing the overall environmental impact of plastic bags including litter.

This study supports the conclusion that the standard polyethylene grocery bag has significantly lower environmental impacts than a 30% recycled content paper bag and a compostable plastic bag. An LCA report and its findings can be used to demonstrate that an environmental impact analysis needs to take into account the entire picture, and when dealing with a product that is likely to be replaced by another, the trade-offs in the environmental impact of the replaced alternative should also be given a critical analysis.

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APPENDIX 1 – PEER REVIEW

Background

Dr. Overcash conducted the peer review and is a Professor of Chemical Engineering, as well as a Professor of Biological and Agricultural Engineering at North Carolina State University. Dr. Overcash has developed an in-depth national research program in life cycle research, developing the new areas for utilization of the life cycle tools. Dr. Overcash has led the effort in life cycle inventory techniques for manufacturing improvement and product change. Dr. Overcash has contributed to life cycle studies in energy production, electroplating, solvent selection, pharmaceutical processes, life cycle assessment comparisons, paper industry, and textiles. He has been active in European life cycle efforts and reviews of research in this field.

All of the suggestions and recommendations made by Dr. Overcash have been reviewed and incorporated in this report. Below is the Peer Review Report provided by Dr. Overcash.

Review of Draft Report
Life cycle assessment for three types of grocery bags – recyclable plastic; compostable, biodegradable plastic; and recycled, recyclable paper

By Dr. Michael Overcash
September 2, 2007

This report provides both a sound technical descriptions of the grocery bag products and the processes of life cycle use. The functional unit has a range to accommodate differences in customer use found to exist. These differences did not prove to change the resulting low environmental impact choice. The discussion of the limitations of the life cycle impact assessment is very important and the readers should use these observations. The following detailed review is divided into technical and editorial segments.

The conclusions regarding the relative environmental impact when using a life cycle view are consistent with previous studies and need to be reinforced in the policy arena. The policies to discourage plastic bags may have more to do with litter than the overall environment. Whatever the goals of the policy makers, these need to be far more explicit than general environmental improvement, since the life cycle story is consistent in favor of recyclable plastic bags. It is possible that the emphasis of another report might be that the full benefit of plastic bags is even higher when large recycling is in place.

Technical

1) p.3 last paragraph BBL is not defined
2) Table 3 at 5.78 kg functional unit this mass reflects the 50% water in wood. However this wood is lignin and cellulose and so only about 50% of the solid material ends up in paper bag, so this should be 274,000,000 mg

3) Table 5 These occur in all the raw material Tables
    a. Biomass is double counted as it appears also in Table 3 while wood does not appear both places
    b. Limestone is listed twice, here and as chalk
    c. N2 and O2 are listed twice as air and constituents of air
4) Table 7 This is an unusually high COD:BOD ratio, it might need to be checked
5) Table 9B Elec = 103 This did not change from Table 9A, while all the other values did change reflecting the differences in number of bags.
6) p.34 line 4 under Solid Waste This identifies steam or electricity as possible energy recovery mechanisms, but Table 25 is only electricity. Steam would have a much higher recovery value
7) p.41 2nd line From the data in Table 28A this ratio is more like 3.5 and not 2.5
8) p. 42 3rd line From the data in Table 28B it is hard to see any ratio as high as 13

Editorial

1) p1 2nd line world for governments
2) p4 last para, 3rd line represent
3) whole document the conventional style is that data are plural, but throughout this documents that is mostly not followed. A search for the word data and inserting the correct verb will fix this.

Water Use

Share This

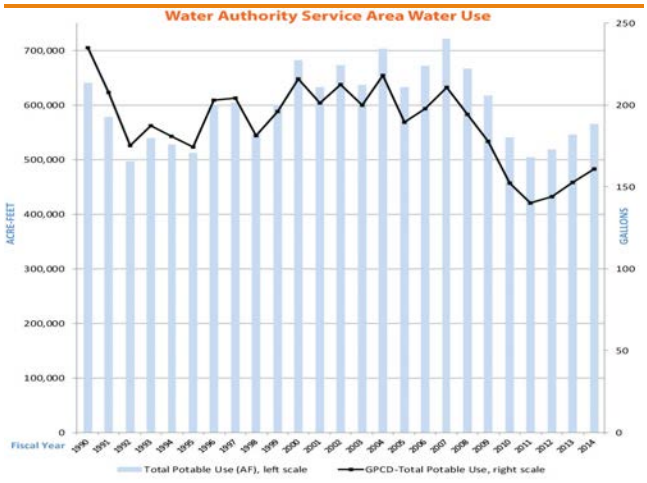
Potable water use by the San Diego County Water Authority's 24 member agencies has decreased more than 20 percent since 2007, but high temperatures in recent months have made it challenging to reduce water use compared to the same months a year earlier.

Average Daily Maximum Temperature – Departure from Normal (°F) >

Member Agency Total Potable Monthly Water Use (acre-feet) >

Water Use Totals

Per capita water use in the Water Authority's service area has fallen from more than 200 gallons per person/day to about 150 gpcd over the past decade, as shown in the chart to the right. In 2014 total regional use of potable water was less than it was in 1990, even with a population increase of approximately 30 percent over that period.



Click image to enlarge

The table below details regional water use (excluding recycled water) by month and year. It shows that total potable water use for the Water Authority service area for the 12 months ended March 2015 was down 3.3 percent compared to the year-earlier period. Urban (municipal and industrial) potable use for the same period was down 3.0 percent. For March 2015, total potable water use was up 9.6 percent over the same month a year earlier.

Calendar Years 2007-2014 (acre-feet)

Date	Total Water Use[1]	M&I Water Use (Adjusted)[2]
Jan-07	50,449.4	44,790.0

WATER SUPPLIES

Enhancing Water Supply Reliability
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Local Supplies
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Regional Water Use
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State Mandates, Desalination

Feb-07	33,494.8	31,397.5
Mar-07	49,106.6	44,151.3
Apr-07	53,876.8	48,039.7
May-07	65,470.1	57,627.3
Jun-07	70,605.8	62,931.3
Jul-07	79,205.8	70,574.4
Aug-07	77,999.5	68,610.3
Sep-07	70,260.0	62,425.4
Oct-07	64,435.2	57,011.6
Nov-07	53,724.2	48,136.7
Dec-07	33,925.9	32,357.6
Jan-Dec 2007	**702,554.1**	**628,053.1**
Jan-08	31,850.4	31,261.3
Feb-08	28,412.2	28,099.4
Mar-08	45,399.2	43,502.6
Apr-08	56,454.6	52,726.6
May-08	59,862.0	56,505.6
Jun-08	64,986.9	60.986.7
Jul-08	70,053.1	65,328.1
Aug-08	69,044.6	64,498.8
Sep-08	69,921.8	58,435.2
Oct-08	63,030.8	58,277.2
Nov-08	49,346.1	45,854.1
Dec-08	32,480.9	31,265.1
Jan-Dec 2008	**633,842.6**	**596,722.7**
Jan-09	38,998.5	36,590.2
Feb-09	30,739.4	29,407.6
Mar-09	44,220.4	40,925.8
Apr-09	49,517.4	44,953.4
May-09	55,955.3	50,511.1

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Jun-09	51,236.4	46,751.1
Jul-09	60,204.0	53,967.5
Aug-09	61,909.4	55,325.0
Sep-09	60,049.9	53,269.2
Oct-09	53,265.7	47,945.3
Nov-09	46,740.5	42,228.5
Dec-09	30,449.7	29,045.1
Jan-Dec 2009	**583,286.6**	**530,919.8**
Jan-10	31,491.1	30,195.1
Feb-10	23,521.9	23,277.7
Mar-10	34,205.6	33,180.0
Apr-10	35,132.2	33,241.6
May-10	49,777.1	46,081.2
Jun-10	54,121.6	49,662.9
Jul-10	56,846.5	51,874.6
Aug-10	59,099.4	53,724.3
Sep-10	54,768.3	49,556.2
Oct-10	38,434.6	35,687.0
Nov-10	36,025.5	33,947.6
Dec-10	30,767.3	29,304.4
Jan-Dec 2010	**504,191.1**	**469,732.5**
Jan-11	31,785.1	30,836.3
Feb-11	29,209.6	27,871.5
Mar-11	29,814.5	29,106.5
Apr-11	38,031.5	35,971.1
May-11	47,790.5	44,530.1
Jun-11	51,242.7	47,372.8
Jul-11	58,808.3	53,673.7
Aug-11	59,434.2	54,080.2
Sep-11	52,979.6	48,127.2

Oct-11	46,666.7	42,969.1
Nov-11	30,826.8	29,281.5
Dec-11	32,972.6	31,191.5
Jan-Dec 2011	**509,562.1**	**475,011.5**
Jan-12	35,653.3	33,213.9
Feb-12	31,716.3	29,642.2
Mar-12	33,327.1	31,481.8
Apr-12	34,351.1	32,629.8
May-12	47,683.1	44,366.6
Jun-12	53,873.4	49,320.3
Jul-12	58,640.2	53,509.1
Aug-12	61,458.7	55,582.9
Sep-12	57,136.7	51,689.8
Oct-12	50,025.2	45,606.7
Nov-12	41,304.0	38,026.2
Dec-12	29,177.8	27,874.4
Jan-Dec 2012	**534,346.9**	**492,943.7**
Jan-13	30,715.8	29,439.1
Feb-13	28,832.9	27,390.0
Mar-13	37,868.3	35,494.5
Apr-13	44,788.4	40,970.2
May-13	51,155.8	46,959.8
Jun-13	55,406.9	50,645.4
Jul-13	57,994.2	52,797.8
Aug-13	58,625.9	53,413.2
Sep-13	56,018.2	50,779.6
Oct-13	48,028.9	44,194.1
Nov-13	39,227.0	36,292.7
Dec-13	36,660.1	33,952.3

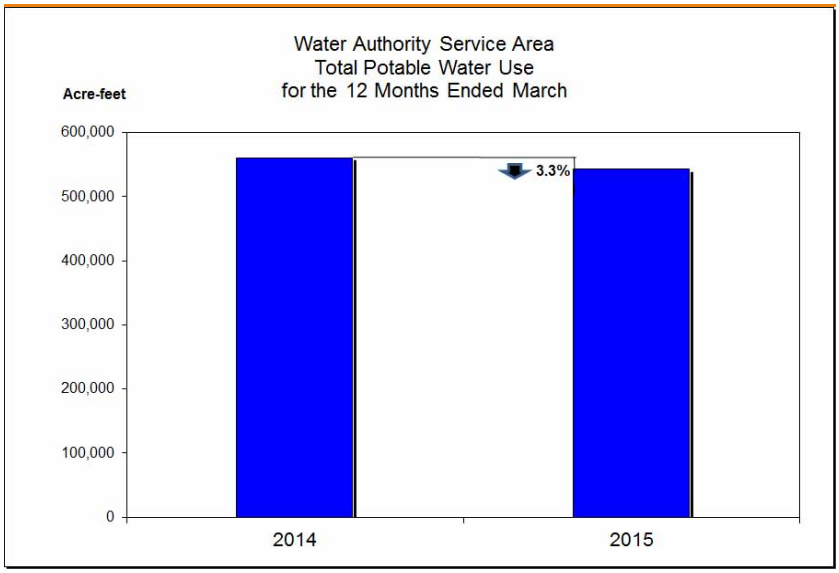
Jan-Dec 2013	**545,322.4**	**502,328.7**
Jan-14	42,950.1	39,060.3
Feb-14	34,426.7	31,542.2
Mar-14	36,137.5	34,004.3
Apr-14	44,050.6	40,358.4
May-14	56,413.7	51,048.1
Jun-14	55,293.1	50,420.4
Jul-14	58,492.4	53,365.9
Aug-14	54,837.8	49,701.4
Sep-14	53,597.0	48,295.9
Oct-14	50,871.2	45,880.2
Nov-14	39,883.9	36,622.7
Dec-14	25,923.3	24,996.1
Jan-Dec 2014	**552,877.3**	**505,295.9**
Jan-15	30,935.7	29,632.7
Feb-15	33,153.6	30,685.4
Mar-15	39,599.3	38,017.7
Jan-Dec 2015	**103,688.6**	**98,335.8**

Footnotes:

[1] Excludes reclaimed water.

[2] In order to provide for a meaningful comparison, 2007 M&I water use was adjusted for 2009-2011 IAWP and SAWR opt-out volumes that convert to M&I water use.

Note: Tables reflect most current data.



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Water Science Activity Center

Opinion Surveys:

- Biggest water problem in the future?
- Vote for your favorite water body!
- How serious are these environmental problems?
- Water Shortage! How would you fix it?
- Where does the water cycle begin?

Challenge Questions:

- How much water falls during a storm?
- How much water does a dripping faucet waste?
- How much water does it take to grow a hamburger?

True/False Quizzes:

- Water properties
- Groundwater

Questionnaires:

- How does your home drinking water taste?
- What is your daily home water use?

Per capita water use: How much water do you use in your home?

We computed you might be using up to about 0 gallons per day

From your responses, using "non-conservation" measures, we computed you might be using up to about 0 gallons per day. Realize this is an estimate, but it gives you an idea of how the little things you do in your house add up to larger amounts of water being used. If you have newer water-saving devices in your home you will probably be using a good bit less than this number.

You probably realize that the number is only an estimate. First, we're not taking into account everything you use water for, such as cooking and dog washing and other outdoor water use. Nor are we accounting for leaks in your toilet and faucets (you can check on how much water a leaking faucet wastes by using our handy Water Leak Calculator. And, water use for all activities vary by individual. You might take a 30-second shower but your sister could take 10 minutes. You might leave the water running when you brush your teeth, but your wife might not. And, the age of your house and devices makes a huge difference in water use—there is a large push to install modern, water-efficient toilets, faucets, and dishwashers across the Nation. These new water-efficient devices save significant amounts of water and electricity.

Typical water use at home

Bath	A "full tub" varies, of course, but 36 gallons is good average amount. **Tip:** Taking a shower instead of a bath should save a good bit of water.
Shower	Old showers used to use up to 5 gallons of water per minute. Water-saving shower heads produce about 2 gallons per minute. **Tip:** Taking a shorter shower using a low-flow showerhead saves lots of water.
Teeth	<1 gallon. Newer bath faucets use about

brushing	1 gallon per minute, whereas older models use over 2 gallons. **Tip:** Simply turn the faucet off when brushing teeth.
Hands/face washing	1 gallon **Tip:** Simply turn the faucet off before drying your hands and face. If you don't mind a brisk wash, don't run the faucet until it gets hot before using it. Installing a faucet-head aerator will also reduce the water flow rate.
Face/leg shaving	1 gallon **Tip:** Simply turn the faucet off when shaving.
Dishwasher	6-16 gallons. Newer, EnergyStar models use 6 gallons or less per wash cycle, whereas older diswashers might use up to 16 gallons per cycle. **Tip:** EnergyStar dishwashers not only save a lot of water but also save electricity.
Dishwashing by hand:	About 8-27 gallons. This all depends on how efficent you are at hand-washing dishes. Newer kitchen faucets use about 1.5-2 gallons per minutes, whereas older faucets use more. **Tip:**Efficient hand-washing techniques in clide installing an aerator in your faucet head and scraping food off, soaking dishes in a basin of soapy water before getting started, and not letting the water run while you wash every dish. And it's best to have two basins to work in--one filled with hot, soapy water, the other with warm water for a rinse.
Clothes washer	25 gallons/load for newer washers. Older models might use about 40 gallons per load. **Tip:** EnergyStar clothes washers not only save a lot of water but also save electricity.
Toilet flush	3 gallons. Most all new toilets use 1.6 gallons per flush, but many older toilets used about 4 gallons. **Tip:** Check for toilet leaks! Adjust the water level in your tank. But, best to install a new low-flow toilet.
Glasses of water drunk	8 oz. per glass (not counting water for Fido or your cats)

Single-Use Carryout Bag Ordinance

CEQA PUBLIC SCOPING MEETING

JUNE 3, 2015

Purpose and Need

- At least 500 million bags distributed annually in San Diego
- Approximately 3% recycled in CA
- Plastic bags comprise between 2-11% of the litter in local canyons, waterways, and beaches
- Environmental Services Department spends approximately $160,000 cleaning up plastic bag litter (largely at the Miramar Landfill)
- City of San Diego ordinance modeled after other successful California ordinances (110)

Project Description

- Stores subject to ordinance
  - Retail stores with annual sales of $2 million selling food and non-food goods, and a line of dry grocery, canned goods, or nonfood items and some perishable items
  - Stores with at least 10,000 square feet of retail space with a pharmacy
  - Drug stores, pharmacies, supermarkets, grocery stores, convenience food stores, foodmarts, or other entities selling a limited line of goods that includes milk, bread, soda, and snack foods

Project Description
(continued)

- Ordinance would:
  - Preclude stores from providing single-use plastic bags and non-recycled content paper bags
  - Mandate charge of $0.10 per recyclable paper bag and at least $0.10 per reusable bag provided

Project Description
(continued)

- Ordinance would not regulate:
  - bags without a handle used to carry produce, meat, or bulk foods to the point of sale inside a store
  - bags holding prescription medicine dispensed from a pharmacy
  - dry cleaner bags
  - restaurants
  - WIC and Supplemental Food Program recipients

Project Description
(continued)

- Requires paper bags be:
  - 100% recyclable
  - made from 40% post-consumer content material
  - and be labeled with:
    - Name of bag manufacturer
    - Country of bag manufacture
    - Percentage of post-consumer recycled material in the bag

Project Description
(continued)

- Requires reusable bags be:
  - Minimum life of 125 uses (carry 22 lbs over a distance of 175 feet 125 times)
  - > 15 liter volume
  - Machine washable or made of material that can be disinfected
  - Does not contain minimum level of heavy metals
  - If made of plastic is 2.25 mils thick and contains at least 20% post-consumer content recycled material
  - Has descriptive label

Project Description
(continued)

- Stores required to keep records, no reporting
- Ordinance would initially cover larger grocery stores and pharmacies
- Implementation in smaller stores 6 months later