2017 Refuse Rate Application
Summary of Assumptions

Recology San Francisco

February 10, 2017

This summary describes the projected revenues and expenses for Recology San Francisco ("RSF"), as well as the assumptions underlying those projections, and describes the calculation of the tip charge.

I. Overview

RSF operates material processing facilities at the Tunnel Avenue facility, as well as at Piers 94 and 96 in San Francisco.

At the Tunnel Avenue facility, RSF operates a Transfer Station, a construction and demolition debris recovery facility (*i*MRF), an enclosed Public Reuse and Recycling Area (PRRA) with an adjacent covered sort line (known as the Ptarmigan line), a compostables transfer area (Organics Annex), a household hazardous waste facility, a buyback center, and scales.

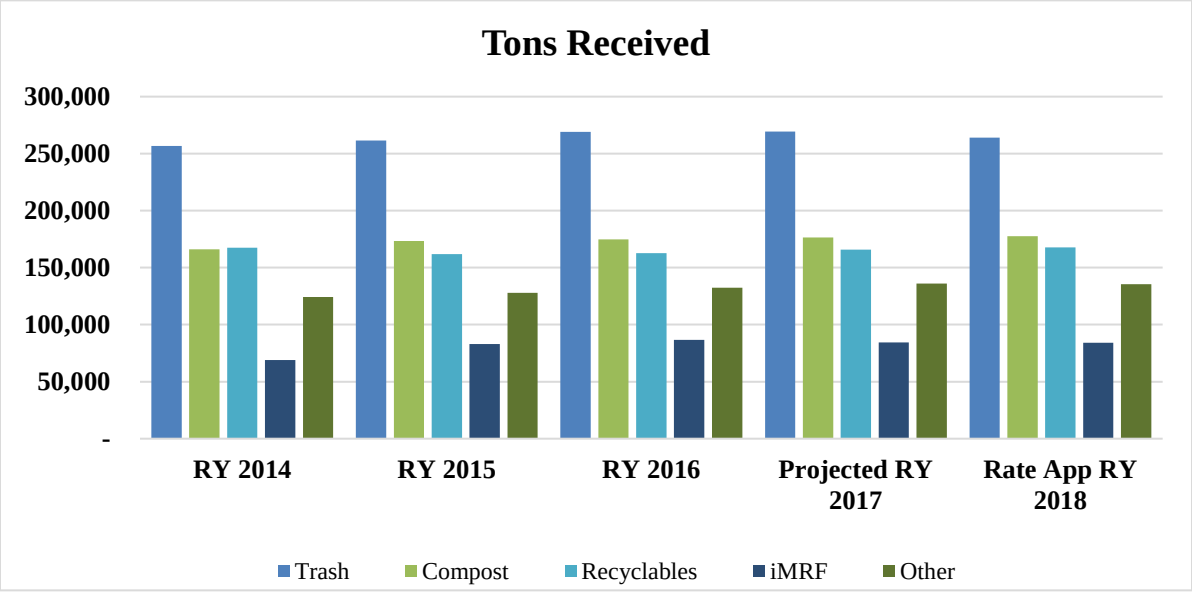
RSF recycles concrete and asphalt at Pier 94.

At Pier 96, RSF operates a large-scale material recovery facility (Recycle Central) that processes residential and commercial recyclables.

II. Tonnage

A. Incoming Tons

Total tonnage is based on incoming tons for the 12 months ending June 30, 2016, adjusted for the number of days in the period. Detailed tonnage projections are provided in Schedule E. Overall, total tons in all material streams are increasing annually, driven by one of the largest economic booms in the history of San Francisco. Since customers are also making greater use of Recology's diversion services, the total volume of recyclables and compostables continues to rise as well.



Recycle Central is experiencing changes in the tonnages of various recyclable materials received. Changes in container manufacturing practices (such as the development of lighter-weight plastic bottles and cans), movement from glass containers to plastic, and consumer spending habits (such as the increased consumption of digital media and online shopping) will continue to reduce the newspaper and mixed paper content of the recyclables, while increasing the amount of cardboard.

RSF is improving its existing infrastructure to accommodate increases in recycling volumes. These improvements include a recently completed $11.3 million investment in upgraded sort lines at Recycle Central. Details on these capital improvements are provided in Section III: Diversion Programs.

Tonnage shifts are also expected at the Tunnel Avenue facility. Today, incoming organic tons have surpassed 650 tons per day (TPD), outgrowing the capacity of the Organics Annex. As additional compostables are diverted through enhanced outreach, new subscriptions, and trash processing efforts, the compostables tonnage is expected to grow. RSF is therefore proposing to invest approximately $19 million in the West Wing construction project at Tunnel Avenue, building a facility that will better accommodate growing volumes of compostable material. Details on these capital improvements are provided in Section III: Diversion Programs.

Some material, including material from public bins and street sweeping, is excluded from the revenue tonnage base used for rate setting, and is therefore not included in the calculation for projected revenue derived from tons.

B. Disposal Tons

Disposal tons are defined as the tons of material delivered to landfill and a small amount that goes to municipal solid waste (MSW) incineration. Disposal tons are weighed, but can also be calculated by subtracting diverted tons from the total incoming tonnage.

Projected disposal tons for the 12 months ending June 30, 2018 reflects an adjustment for the anticipated reduction in disposal due to proposed adjustments in collection services.

C. Diverted Tons

Diverted tons are defined as incoming tons that are diverted from disposal. Diverted tons include commodities recovered at Recycle Central and the Tunnel Avenue facility. Diverted tons have been adjusted to reflect the facility improvements completed at Recycle Central during RY 2017 as well as planned selective trash processing.

III. Diversion Programs

A. The Recycle Central MRF at Pier 96

Recycle Central processes material collected under the Fantastic 3 and commercial recycling programs. Recycle Central has undergone a major $11.3 million upgrade to its processing equipment, designed to increase the facility's processing capacity and recover additional commodities. The previous Recycle Central equipment, which was the most advanced of its

time when it was installed in 2002, had a processing capacity of 143,000 tons annually, but was unable to continue to meet growing service demands. The recent improvement was mostly funded with unearned Tier 3 and 4 Zero Waste Incentive (ZWI) funds that were not earned in RY 2014, 2015 and 2016, and Recology asks as part of this application that the balance of the cost be paid with ZWI funds that Recology does not expect to earn for RY 2017. Apart from that request, Recycle Central improvements are not part of this rate application.

The renovated Recycle Central facility has 14.5% increased capacity, processing 45 tons per hour, or approximately 163,800 tons annually, excluding buy back operations. The upgraded system can now target and separate new materials, including cartons, bagged textiles, wood, metal, and bagged film plastic. Installation was completed on September 30, 2016, and the equipment became fully operational in October of 2016.

An overview of the upgraded processing system at Recycle Central is described below:

1. Comingled Recyclables Processing (Fantastic 3 and Mixed Commercial)
Materials collected under the Fantastic 3 and the mixed commercial recycling programs are processed through the upgraded system, which includes the following operations:

a. Drum fed charge hopper: This hopper helps material flow at a consistent rate to the presort conveyor and material separation screens, improving sorting efficiency.

b. Extended manual sorting capabilities: The presort conveyor was significantly extended, and now provides space for a maximum of 14 sorting positions. This increase allows RSF to target new commodities for diversion, such as cartons, aseptic containers, bagged textiles, wood, metal, bagged film plastic, and bulky rigid plastics. Four new sorting positions have been added in the following areas:
    i. Up to four dedicated sorter positions per shift for textiles, metal, and wood (for a total of eight sorters over two shifts).
    ii. All sorters working the new line now assist in removing plastic film from the conveyor.

c. Film plastic recovery system: This vacuum-based system transports film plastic that is manually removed by sorters. All film plastics captured through the system are collected and compacted into a plastic casing.

d. Material screens: Three new material screens were added to improve material separation, including:
    i. One old corrugated cardboard (OCC) screen. OCC accounts for approximately 20% of the entire recycling stream.
    ii. Two fiber screens, to enhance the dimensional separation and yield cleaner paper/container outputs.

e. Glass cleaning system: This feature removes dimensionally smaller and lighter contaminants, as well as glass fines. The screen minimizes downstream contamination and the amount of glass in the residual stream.

f. Two additional optical sorters: Recycle Central previously used two optical sorters to sort plastics. As part of the upgrade, two additional optical sorters were added: one to automatically identify aseptic containers and gable top cartons (Grade 52) and 3-7 plastics missed by the existing optical units, and another to reprocess residual materials and identify fiber and containers for reintroduction into the system.

2. Mixed Paper Processing

The mixed paper sort line continues to process dry loads with high paper content for customers on a co-collection program. This material is sorted by discarding the bagged trash so that the remaining dry paper and cardboard can be sorted and sent to a baler for recycling.

3. Source Separated Processing

The source separated program handles material that has been pre-sorted by the customer, as well as buyback and drop-off material. These materials require no sorting and are ready to bale or store in bunkers for shipment with similar commodities. Volumes for source separated materials are projected to remain relatively constant during the upcoming rate period.

B. Integrated Materials Recovery Facility

Construction and Demolition (C&D) debris (and sometimes other material) is currently processed for recovery at the Integrated Material Recovery Facility (*i*MRF) at the Tunnel Avenue facility. The *i*MRF has been in operation since July 1, 2003.

During RY 2018, RSF plans to operate the *i*MRF with two shifts Monday through Friday and one shift on Saturday. Occasionally, a Sunday shift will be added to process material during unusually heavy periods.

Throughput is expected to remain at over 600 tons per day (TPD), with consistent recovery and diversion. Metal, wood, and fines comprise the largest volume of diverted material. Metal, plastics, and wood provide commodity revenues, while almost all other recovered materials require a disposal or processing fee.

C. The West Wing

In the previous 2013 rate application, Recology proposed to expand the Tunnel Avenue facility by constructing a new West Wing for onsite testing and development of processing technologies. The construction cost was estimated at $6.6 million based on a conceptual design. Due to delays in the project schedule and then changes in the proposed design and planned use of the West Wing, this capital project was deferred, and the 2013 contingent fee schedule was never triggered. In this rate application, Recology presents a substantially different design and proposed use for the West Wing and seeks approval of $18.9 million to fund the construction.

The original 2013 proposal was simply to enlarge the floor space of the Transfer Station by about 11,500 square feet to accommodate research and development activities as well as new or expanded operations as the need might arise. Since that proposal, however, the need for a new building to accommodate the tipping and processing of a growing organics operation has become a critical priority. The current space for handling compostables, called the Organics Annex, is inadequate. It is a structure that has had many uses since it was built in 1970, and is only 7,500 square feet. Moving 600 to 700 tons a day through a building of this size poses several challenges, including safety concerns, odor, and traffic congestion. With the growing participation in the City's compostables program, as required by the 2009 Mandatory Recycling and Composting Ordinance, these challenges have become acute. Unless a new structure is built, Recology will not be able to collect and process all of the compostable material that City residents and businesses now separate for collection.

In this application, therefore, Recology proposes a redesigned West Wing building to replace the Organics Annex. The proposed redesign of the West Wing is 14,546 square feet in size, and includes a large tip floor, a load-out design to reduce traffic congestion and potential safety risks, a state-of-the art odor management system, and a liquid processing and storage tank. The design will provide the space and equipment necessary to handle both current and anticipated future volumes of San Francisco food scraps, plant trimmings, soiled paper and other compostables.

After completion of the current West Wing redesign, Recology solicited cost estimates. Recology began the cost estimating process by meeting with the City Architect from San Francisco Public Works for advice on appropriate bidding procedures.. Based on that conversation, Recology did the following:

- Recology distributed an RFQ/P to San Francisco general contractors requesting proposals on the construction management and general contracting work for the West Wing project.
- Recology received responses from the following three firms:
    - Hathaway Dinwiddie Construction Co.
    - Nibbi Brothers General Contractors
    - Lathrop Construction Associates, Inc.
- On October 25, 2016, Recology selected Nibbi to provide the general contracting services for the West Wing project. The reasons for selecting Nibbi included the completeness of their proposal, their knowledge of the project needs, comparable construction experience, competitive pricing for the project's general conditions, and the lowest proposed pricing for the preconstruction work and contractor's fee.
- Recology engaged both Nibbi and TBD Consultants, a third party cost estimator, to develop construction cost estimates for the redesigned West Wing project. Both parties independently developed their project cost estimates using the 100% Design Development drawings provided by the project's architect, Fee Munson Ebert, and the project's engineering firm, Arup. Both Nibbi and TBD submitted multiple rounds of cost estimates and ultimately submitted their final estimates on November 4 and 21, 2016, respectively. Nibbi's estimate for construction came in at $17,031,167 and TBD's estimate for construction came in at $16,963,548. With only a $67,619 difference, Recology concluded that Nibbi's construction bid was reasonable. As further assurance,

Nibbi will also competitively bid all aspects of the subcontracting work. This phase of the bidding is scheduled to conclude by April 2017.

- To reach the full redesigned West Wing project budget, the costs for design & engineering, permitting, and inspections were added to the construction costs to equal a total of $18,857,170.

If approved for inclusion in the rates, construction is expected to begin mid-summer 2017 and is targeted for completion by September 2018. The cost for this project is included as a depreciation expense reflected in Schedule H.3.

D. Public Reuse and Recycling Area (PRRA)

Materials delivered by public and commercial customers in vehicles not suited for the Transfer Station's main tip floor or the *i*MRF are accepted at the PRRA seven days per week. RSF operates a covered sorting line at the PRRA six days a week, 10 hours per day (with frequent overtime). Materials accepted at the PRRA include self-hauled C&D debris and related materials totaling about 52,000 tons a year.

E. Trash Processing

As the City works toward its goal of zero waste by 2020, it has become necessary to identify new ways to recover material that customers place in their black bins for disposal. To maximize resource recovery at the Tunnel Avenue facility, RSF has begun a test program that processes a portion of trash (black bin) material on the west side of the existing facility.

As part of the test program, black bin loads identified to have high organic content are unloaded onto the Transfer Station floor and then loaded into a shredder to open any bags and reduce the size of the material to 12 inches or less. From the shredder, the material is fed to a rotating disk screen and sorted by a four-inch screen. Material too large to pass through the screen (overs) are sorted for recovery (e.g., metals, glass, paper, plastic containers). Small material that passes through the screen (unders) are loaded into the OREX Press, a specialized piece of equipment that separates organic matter from the other material through compression.

Material sent through the OREX Press is placed in an extrusion chamber under high pressure, extracting an organic-rich paste suitable for anaerobic digestion and/or composting. The press achieves approximately 10% recovery on gross tonnage input. The organic paste is transported to the East Bay Municipal Utility District (EBMUD) for conversion into energy and digestate through anaerobic digestion. The resulting digestate product is used as a soil amendment and alternative daily cover (ADC).

Following completion of the test program, and if approved and made fully operational, RSF expects to run the OREX Press for one shift a day (totaling 8 hours), five days a week, with the goal of processing 100 tons per day to capture and divert 10 tons per day of organic-rich paste suitable for anaerobic digestion. The personnel required include one Loader Operator, one Equipment Operator, and one Material Handler, totaling three additional full-time employees.

Approximately half of the 100 tons per day of trash (unders) would cycle through the OREX Press. The remaining half (overs) would be transported to Recycle Central. While the diversion

rate for the transferred material is presently unknown, Recology hopes to recover about 15 tons per day of marketable materials such as plastic, bottles, cans, and paper. This effort, in conjunction with paste extracted by the press, would yield an additional 25 tons per day of diverted material that is currently landfilled.

In order to sort the overs from the screen, RSF will have to implement a two-fold equipment enhancement to first capture the material and then process it. The screen would need a new conveyor system installed to collect and direct the overs onto the floor of the Transfer Station; the overs would then be sent to Recycle Central for further processing.

RSF would also need to modify the screen to include a bypass to the press, making it possible for RSF to run the Single Shaft Shredder (SSI) and the screen independently of the press. This modification would grant RSF flexibility to generate more overs if needed, or to respond to a malfunction of the press.

At Recycle Central, new dedicated sorting equipment would be needed to process the material recovered at the Transfer Station from the black trash bins. Recology proposes to install the equipment in the southeast corner of Recycle Central at Pier 96. Upon arrival at Recycle Central, material will be loaded by an excavator onto a vibrating feeder to ensure that no large items make their way into the equipment. The vibrating feeder will move material into an optical unit programmed to eject plastics. The plastics will travel to the ballistic sorter for separation into 2D (film) and 3D (containers) before baling. The non-plastic stream will be diverted through a cross belt magnet and eddy current to remove metals for recovery. The residuals will then go through a second optical sorter to eject fiber. This processing is expected to divert 25 tons per day in total, eliminating one transfer trip per day to the landfill

This sorting system will require two new employees to perform quality control and one equipment operator to load the material, for a total of three new full-time employees. Quality control will take place on the non-plastic stream from an observation point at the first optical sorter, on the residual stream from the second optical sorter, and on the outgoing fiber stream. These observation positions will help ensure that the recovered materials have minimum contamination to meet market standards.

F. Contingent Schedule 1: New *i*MRF

The City is undergoing one of the largest construction booms in its history. As a result, the *i*MRF has experienced extraordinary increases in tonnage, resulting in regular overtime and assistance from third party processors. The capacity of the *i*MRF is 400 TPD; however, the current incoming tonnage often exceeds 600 TPD. To meet the demands for C&D recycling, RSF is proposing a contingent schedule for development of a new *i*MRF facility.

RSF is proposing to construct a state-of-the art *i*MRF recycling system on permitted industrial land in the City. In addition to C&D loads, some material from the PRRA at Tunnel Avenue would also be hauled to this facility for recycling or reuse. The facility would operate five to six days per week, using an innovative dual stream design to accommodate up to 1,000 TPD of C&D and PRRA material.

In the event that Recology pursues this Contingent Schedule, the PRRA Ptarmigan line operation at the Tunnel Avenue facility would be discontinued and the existing line would be used to load the material into transfer trailers for processing at the new *i*MRF. This move would consolidate all C&D material sorting and hauling operations. The employees who currently work on the Ptarmigan line would be reassigned to the new *i*MRF.

The projected cost to build this facility is $63.4 million and is included in the contingent schedule. Construction of this new *i*MRF is anticipated to take up to 18 months, and could begin June 2018. There will be no interruption of C&D or PRRA processing during the construction. The new facility would be operational by about October 2019. Recovery and diversion of materials is estimated to increase from current levels of more than 50% to approximately 70%.

***i*MRF**	**Capacity (TPD)**	**Receiving (TPD)**	**Diversion**
Current	400	600	51%
Proposed	1,000	600+	70%

G. Contingent Schedule 2: Trash Processing

Once the *i*MRF project is completed, and if the trash processing pilot program or other advancing technologicals show that large-scale trash processing is feasible, RSF is proposing to repurpose the nearly 45,000 square foot space currently occupied by the *i*MRF at the Tunnel Avenue facility into a trash processing facility designed to recover material from landfill-bound loads. The proposed facility would be capable of handling 1,100 TPD of black bin material generated by residential and commercial customers.

The facility would use the existing Tunnel Avenue Transfer Station pit to receive material seven days per week. Material would be processed six days per week. Design work on a new facility is now underway. The projected cost to build this facility is $19 million and is included in the contingent schedule. If approved, construction can begin around November 2019, following the completion of the new *i*MRF (described above in Contingent Schedule 1) and could be operational by September 2020.

The new facility would reduce the amount of trash sent to landfill, with the goal of dramatically decreasing the City's per capita disposal rates.

IV. Hazardous Waste Programs

The Household Hazardous Waste Collection Facility (HHWCF) operates six days per week (Monday through Saturday). It is open to the public three days per week (Thursday through Saturday) for residential waste and two to four times a month for Conditionally Exempt Small Quantity Generator businesses.

The facility accepts paint, batteries, used motor oil, solvents, household cleaners, pesticides and other hazardous wastes. Activities at the facility include customer service, bulking, lab packing, laboratory analysis to identify unknown waste materials, recordkeeping, manifesting and hazardous waste shipments. The projections for the base program costs are based on current expenses and volumes at the facility.

A. Increased Availability of Household Hazardous Waste Pickup Programs

The City and RSF have worked together for the past 25 years to develop innovative and convenient programs that properly dispose of hazardous wastes generated by City residents and small businesses. These programs include:

- Resident drop off at the HHWCF
- Home pickup service for household hazardous waste ("Home Collection Program")
- Resident drop-off at over 150 local stores for batteries, fluorescent tubes & bulbs, and paint ("Retail Take-Back Program")
- Curbside and Apartment Building Battery Collection
- Business drop-off at the HHWCF for qualifying small business generators

Together these programs collected 1.3 million pounds of hazardous waste from residents and businesses in FY 2016. An additional one million pounds of hazardous electronic waste (computers, TVs, and other electronic products) was collected by RSF at the PRRA and through the Bulky Item Recycling program.

Despite these efforts, current estimates suggest that less than 50% of household and small business hazardous waste is being properly disposed. Furthermore, the City's population is growing and is expected to rise by 1% to 2% per year through the end of this decade.

To support the City's zero waste goals, the Department of the Environment's Toxics Reduction Program is expanding outreach programs to inform residents and small businesses about products classified as hazardous. Outreach efforts will also inform residents of the household hazardous waste (HHW) programs available to them, with the goal of maximizing diversion from landfill.

Through these efforts, the City and RSF hope to:

- Increase the collection weight for household batteries by 10% by the end of FY 2019;
- Increase the number of home collections by 20% by the end of FY 2020; and
- Increase the overall collection of all non-electronic HHW by 25%, to 1.625 million pounds, by the end of FY 2021.

In FY 2016, about 19% of household hazardous waste was collected through the Retail Take-Back Program and 17% of household hazardous waste was collected through the Home Collection Program. Federal, State and local laws require household hazardous wastes to be specially packaged and handled for public safety and protection of the environment. Compaction equipment cannot be used to collect hazardous wastes.

RSF currently uses three dedicated delivery van-style vehicles and three hazardous waste certified driver/technicians to collect and transport waste from both the Retail Drop-off and Home Collection Programs four days per week (Wednesday through Saturday). In FY 2016, the three RSF HHW drivers averaged:

- 6.4 pickups per operating day, with an average weight of 194 pounds per pickup at Retail Drop-off locations

- 19.6 Home Collection pickups per operating day, with an average weight of 56 pounds per pickup, based on a standard pickup of 15 gallons

This averages to a little under nine pickups per driver per operating day. Both programs provide service, on average, within ten calendar days of a request. Due to storage space considerations at the retail take-back locations and residential service expectations, the goal is to provide service within seven days of a request.

With the anticipated increases under both programs due to expanded outreach efforts, RSF proposes to add one new HHW collection vehicle and one new driver/technician position. Assuming an overall increase of 25% by weight in the amount of HHW collected, and assuming that the percentage by program and weight per pickup remains the same, RSF will need to service an additional 1,308 pickup requests per year, or 6.67 pickups per day assuming a four day operating week and 49 operating weeks per year.

The remaining two to three pickups per operating day, which the additional vehicle and driver would be available to service, will be used for one or more of the following:

- Implementation of a Pilot Program to collect hazardous waste from qualifying small businesses, if variance from California manifest requirements can be obtained. Over 95% of San Francisco's businesses are small to medium size and could qualify for such a service.
- Increased use of the Home Collection Program by SF Housing Authority residents as they relocate due to Housing Authority property renovations.
- Increased use of both programs due to San Francisco population increases.

A fourth HHW collection vehicle and driver will also provide back-up service in the event of equipment maintenance and/or HHW staffing schedules.

B. Paint Product Stewardship Revenue for Residential Paint Management Activities

PaintCare Inc. is a non-profit 501(c) (3) organization that represents paint manufacturers (paint producers) and operates a Paint Product Stewardship Program in California. Product Stewardship is a policy approach established by San Francisco Environment and endorsed by the San Francisco Board of Supervisors.

Product Stewardship, sometimes called Extended Producer Responsibility or EPR, requires producers of difficult-to-dispose products to fund and operate collection and disposal programs to reduce the health and environmental impacts of their product and to reduce ratepayer costs associated with disposal.

Approximately 50% of all non-electronic HHW collected in the City consists of latex and oil-based paint. The PaintCare program was approved by the California Department of Resources Recycling and Recovery (CalRecycle) in July of 2012.

The City, through San Francisco Environment, started contracting with PaintCare in June of 2014 to enable PaintCare to utilize the City's well-developed infrastructure for waste paint management. In order to provide for a more streamlined system and to help offset the costs of

waste paint management, RSF proposes to contract directly with PaintCare to receive payment for certain paint recycling and disposal services at the HHWCF, effective July 1, 2017.

Paint collected through the Home Collection Program, the Retail Drop-off Program, and residential drop-off at the HHWCF will continue to be processed for reuse and donated, or packaged for shipment to off-site recycling. RSF manages all paint according to a policy of "highest and best use," with the goal of reusing as much paint as possible.

The paint management funds received from PaintCare will be on a per-unit basis (per gallon or per drum) and are expected to be around $349,000 per year. These funds will provide a new source of revenue to help offset the cost of HHWCF paint handling activities and to reduce HHWCF operating expenses by covering the costs of paint transportation, recycling, and drums and other shipping supplies.

C. Waste Acceptance Control Program

The Waste Acceptance Control Program (WACP) ensures that all material received at the Tunnel Avenue Transfer Station and Recycle Central contains no hazardous or otherwise prohibited waste. The WACP is incorporated by reference into the Landfill Disposal Agreement between the City and RSF. Loads at the various processing locations system-wide, including the *i*MRF, PRRA, Organics Annex, and Recycle Central, are inspected for materials not allowed in the landfill. Any material identified is properly sequestered and disposed of in accordance with local, state and federal regulations. Projections for the program costs are based on current expenses.

D. Safe Needle Disposal Program

The Safe Needle Program is designed to encourage the proper disposal by residents of hypodermic needles, syringes, and sharps. Convenient disposal options and containers are provided at more than 80 participating pharmacies and drop-off locations. Projections for program costs are based on current expenses, with a modest increase forecast of two new pharmacies to be added to the program per year.

V. Other Programs

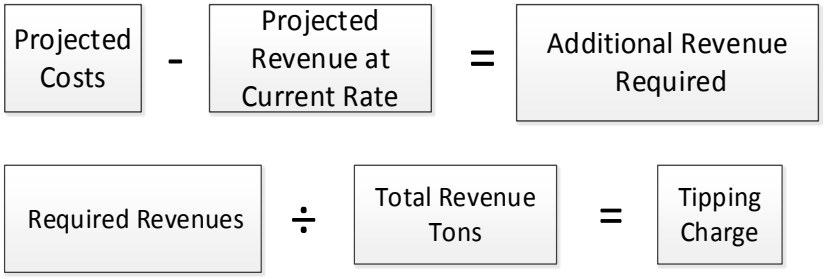
A. Solar Energy at the West Wing, Transfer Station, and *i*MRF

As a part of the proposed West Wing project, RSF proposes to install photovoltaic cells on the roof of the new West Wing and the existing Transfer Station and *i*MRF.

The cells will generate approximately 640 kW of energy at their peak. RSF intends to enter into a Power Purchase Agreement (PPA) to install the photovoltaic panels. The PPA is a financial arrangement whereby a solar power provider designs, permits, finances, installs, and maintains a solar energy system on the property at little or no additional cost to the property owner. Solar power generated onsite offsets demand for electricity from the grid. The PPA provider recoups its investment by selling the power generated to the host customer at a fixed rate that is typically lower than the utility retail rate. The PPA agreement will not have any significant impact on the current refuse rates but could potentially provide savings in the future to the extent electricity costs increase.

VI. Rate-Setting Methodology

The figure below illustrates the process for calculating the charge by Recology San Francisco for materials disposed of at the Tunnel Avenue facility. Each component in the rate calculation is described in greater detail in the following sections.



VII. Expenses

A. Wages

Union wages included in the rate application reflect a $0.50 per hour increase, effective as of July 1, 2017. Future increases will be factored into the Cost of Living Adjustment (COLA) formula described in the Narrative Summary.

Payroll expenses are computed based on the projected employee count and wage increases, as described above. The employee count assumes changes to operations to meet the City's disposal targets, such as adding employees to the Tunnel Avenue facility to accommodate the proposed trash processing initiative.

Hauling to the landfill is based on projected outgoing tons, and recyclables and compostables hauling are based on increasing diversion volumes sent to end-market processors.

B. Payroll Taxes

Payroll taxes are projected based on current city, state, and federal tax rates.

C. Health and Welfare (including post-retirement)

Health and welfare programs are offered to Recology employees through several service providers. Programs include medical, prescription drug, dental, and vision coverage, as well as long-term disability and life insurance.

During the last several years, RSF has experienced significant increases in the cost of health care coverage. The current cost of coverage is over $2,023 per employee per month and is expected to be $2,102 per employee per month in RY 2018.

RSF has implemented changes to health benefits provided to non-union employees in an effort to control costs, including increased co-payments and benefit reductions. Union programs are governed by collective bargaining agreements.

The projected health and welfare benefit costs contained in this rate application are based on anticipated calendar year 2017 costs, inflated by 2.8% for the second half of the year (health insurance rates are set on a calendar year basis and adjusted for the rate years). The inflation factor was developed by RSF's outside actuaries and is based on historical cost increases.

Post-retirement costs in this rate application reflect the cost of participation in the Retirement Security Plan (RSP), sponsored by the Teamsters Benefit Trust. The RSP provides post-retirement medical benefits to union members who qualify under the terms of the applicable collective bargaining agreements. The RSP cost is paid monthly for each eligible employee. These costs have increased approximately 8.2% per year over the last few years. The current monthly cost of the base program is $677 per eligible employee per month, and is expected to increase 8.2% to $733 per eligible employee per month as of July 1, 2017.

D. Pension

Pension costs are based on projected contributions required to meet Employee Retirement Income Security Act (ERISA) pension plan funding requirements, as determined by RSF's pension plan actuary.

RSF's contributions are expected to be $4,988,500 in RY 2017 and $5,539,000 in RY 2018. Based on analysis from RSF's third-party actuaries, future contributions are projected to be stable at approximately $5,500,000 per year based on current expectations for discount rates, returns on assets, and relatively static employment levels.

RSF also provides pension benefits for employees represented by the Operating Engineers Local 3 under a separate union-sponsored plan. The plan is funded as a cost per hour for each participating employee. The contribution per hour for that plan is expected to increase 6% in calendar year 2018, based on historical increases.

E. Workers' Compensation

See Summary of Assumptions for Sunset Scavenger/Golden Gate for review of cost controls and expenses.

F. Property Rent

Property rent reflects lease payments to the Port of San Francisco for Recycle Central at Pier 96, as well as the concrete and asphalt recycling operations at Pier 94. The monthly lease rates are determined by the terms of the lease. The lease rates are adjusted annually by a cost of living index and also adjusted every five years to fair market rate.

During RY 2018, the costs of RSF's lease with the Port of San Francisco for Pier 96 is increasing by 93% from $148,333 to $285,696 per month.

G. Liability Insurance

RSF participates in a risk pool with all other Recology operating companies to manage premium costs. Liability insurance premium projections are based on information provided by RSF's insurance brokers and actuaries, along with projected claims costs associated with fleet operations. Claims costs are allocated to RSF based on its individual claims experience. Other

costs are allocated based on a series of measures developed to reflect the company's relative size and risk profile.

H. Hauling and Disposal Costs

The disposal costs for RY 2017 and RY 2018 are projected based on estimated tonnage and the disposal rates set forth in the City's disposal agreement with Recology's Hay Road Landfill. Disposal tonnage includes residual from Recycle Central, as well as tonnage from the Tunnel Avenue Transfer Station. Disposal is generally hauled by RSF as is compostable material.

The hauling costs for Recycle Central operations for RY 2017 and RY 2018 are projected based on estimated recycled commodity tonnage. Certain recyclables are hauled by RSF's long-haul fleet; most recycled commodities are hauled to market by outside trucking companies. Costs associated with hauling to recycling markets are based on current haul prices, adjusted for expected chassis surcharges applied by the shippers that RSF uses.

I. Other Processing Costs

Compostables require a processing charge determined by third party processors. Such charges are included in the processing costs and are based on tip charges by the composting facilities used by RSF, including Recology Blossom Valley Organics and Jepson Prairie Organics. Tip charges by these composting processors are set at market rates.

J. Equipment and Vehicle Parts

Costs related to equipment and vehicle repairs are based on the costs incurred since the transition to Hay Road Landfill, adjusted for inflation. Parts for equipment are expected to remain consistent with previous years, adjusted for inflation.

K. Fuel and Oil

Fuel and oil costs are projected based on total tonnage volume and miles driven for the transfer fleet. Cost projections for support equipment are based on historical usage. Fuel costs are based on $2.64 per gallon for diesel, $2.60 per gallon for off-road diesel, $2.67 per gallon for unleaded gasoline, $1.23 per gallon equivalent for liquefied natural gas (LNG), and $3.3 per gallon for propane.

L. Maintenance Costs

Maintenance costs at Recycle Central and the Tunnel Avenue facility are projected based on RY 2017 year-to-date actuals, adjusted for inflation.

M. Utilities

Utility costs at Recycle Central and the Tunnel Avenue facility are projected based on historical usage, adjusted for new equipment.

N. Operating and Office Supplies

Costs for operating and office supplies at Recycle Central and the Tunnel Avenue facility are projected based on RY 2017 year-to-date actuals with an adjustment for inflation.

O. Tax, Licenses, and Permits

Costs for taxes, licenses, and permits are based on existing fees or agreed-upon fees. Existing fees have been adjusted for inflation at 2.5% and 3.0% for RY 2017 and RY 2018, respectively. For agreed-upon fees, the actual cost has been used for both RY 2017 and RY 2018.

P. Professional and Contract Services

Cost projections for professional and contract services are based on current experience and expected future needs for services during the next rate period. Engineering costs have been adjusted for anticipated costs associated with facility development projects including permitting for an anaerobic digestion facility and trash processing.

Q. Corporate Services

RSF is a subsidiary of Recology Inc. The parent company provides various services to all of its subsidiaries, including RSF. As appropriate, a portion of those corporate expenses are allocated to RSF as described in this section.

Human Resources (HR) provides benefits, employment law, employee training, and employee management support services. The cost projections are based on RY 2016 costs associated with Recology Inc.'s HR Department, adjusted for inflation. These costs are allocated to RSF based on the percentage of its employees relative to the total Recology employee count.

Corporate Management provides general operations and corporate support services. Corporate Management cost projections are based on RY 2016 costs of management services provided by the Corporate Office, adjusted for inflation. These costs are allocated to RSF based on its percentage of Recology Inc.'s total revenue.

Environmental Compliance provides planning, permitting, and compliance support services. Environmental Compliance costs are based on RY 2016 costs of Recology Inc.'s Environmental Compliance Department, adjusted for inflation. These costs are allocated to RSF based on its percentage of Recology Inc.'s total revenue.

Information Technology (IT) provides systems development support for all technologies, including computers, phones, etc. IT costs are based on the RY 2016 costs of Recology Inc.'s IT Department, adjusted for inflation. These costs are allocated to RSF based on a series of measures that approximate computer usage: the percentage of Recology Inc.'s checks written and customer counts that are attributable to RSF.

Corporate Accounting provides audit, internal audit, treasury, and other financial services. Accounting costs are based on RY 2016 costs of Recology Inc.'s Finance Department, adjusted for inflation. These costs are allocated to RSF based on its percentage of Recology Inc.'s total revenue.

Technology provides support for sustainability issues, including emerging technologies, green energy, and water initiatives, and regulatory support related to sustainability and air, water, and land issues. Sustainability costs are based on RY 2016 costs, adjusted for inflation. These costs are allocated to RSF based on its percentage of Recology Inc.'s total revenue.

R. Office, Telephone, and Supplies Expense

Costs related to telephone and office expenses are based on the RY 2017 year-to-date actual costs, adjusted for inflation at 3% for RY 2018.

S. Other Expenses

Other expenses include repairs, equipment rentals, security, janitorial services, facility repairs, utilities, and miscellaneous expenses. RY 2017 and RY 2016 are reduced by reimbursements from the new Special Reserve Fund for increased disposal and transportation costs associated with the Hay Road Landfill Agreement. RY 2017 is calculated as cost incurred to date plus anticipated expenditures for the remainder of the rate year. RY 2018 assumes recurring costs will increase by 3.0%.

T. Capital Expenses

Capital requirements for trucks, equipment, and leasehold improvements are projected over the rate period. Costs are added as equipment is acquired and leased over specified lease years. Generally, lease terms are assigned as follows:

Trucks and rolling equipment:	7 years
Stationary equipment:	10 years
Furniture and fixtures	8 years
Facility improvements:	15 years or shorter

The lease rates are calculated based on the asset lives shown above utilizing an implicit interest rate of 1.7%. The interest rate is reset on a monthly basis, based on the cost of Recology Inc.'s capital. RSF believes adequate financing will be available for all capital expenditures from Recology Inc.'s line of credit, lease lines with third party lessors, and/or California Pollution Control Financing Authority financing.

U. Operating Ratio

The rate application uses a base operating ratio (OR) of 91%, along with Zero Waste Incentives up to 2% OR.

VIII. Revenues

A. Recycling Revenues

The recycling commodity price assumptions for materials processed at Recycle Central are based on the average of the actual prices received for the previous five years. All market risks for the price variances will be borne by RSF. Recycling revenue is calculated based on the projected tons of each commodity, multiplied by the assumed price per ton based on the five-year average for each commodity. Recycling revenues offset a portion of operating costs.

Additional beverage container revenue derived from the State of California Bottle Bill is included in the revenue calculation. CalRecycle, the California State Agency that administers the Bottle Bill, is proposing to restructure the program. Should changes in funding occur,

Recology proposes to include any adjustments as part of the annual compensation adjustment process.

IX. Proposed Rates

A. Tip Charges

Tip charges for processing, hauling, and disposal of materials delivered by Recology Sunset Scavenger and Recology Golden Gate, as well as other customers are determined by dividing the total revenue requirement by total revenue tons.

A system-wide tip charge is used for all of RSF's operations, including all operations at the Tunnel Avenue facility and Recycle Central. The current tip fee for RSF is $156.62. The proposed tip fee is $186.85 per ton, an increase of 19.3%. Contingent Schedule 1 would increase the tip fee by $7.49 to $194.34. Contingent Schedule 2 would increase the tip fee by $13.45 to $200.30. Recology proposes that the tip charge be adjusted by a COLA mechanism, as described in the Narrative Summary, in the years following RY 2018, until a new rate application is filed.

	RY 2017	RY 2018	Contingent 1	Contingent 2
Revenue Requirement	NA	136,746,729	5,247,194	9,899,289
Revenue Tons	NA	734,587	733,494	733,494
Tip Charge	$156.62	$186.15	$193.64	$199.65
Difference			$7.15	$13.50
% Change		18.85%	3.84%	7.25%

X. Rate Schedules

See Section K, Supporting Documents for an overview of the linkages between the rate schedules.