

# Brush Chipping Phase II

## MISSION

Island Green Living Association's mission is to move the territory toward net zero waste and carbon neutrality in order to protect the environment and ensure the health, welfare and economic security of the USVI. As St. John is the smallest and least developed of the three islands, it is the organization's primary focus. The aim is for St. John to become the model for the territory, the Caribbean and beyond.

Island Green endeavors to achieve this through promoting sustainable waste management including recycling and composting, food resiliency, responsible business, community & government practices, green building and sustainable development. Key is education and engagement. Island Green believes that a holistic, multi-prong approach can help preserve and protect the spectacular beauty and natural diversity that provides ecological health, a sense of community and the unique quality of life on St John and within the territory. Tourism is vital to the territory's economic well-being but the challenge is to protect the natural treasures that bring visitors to our shores while continuing to welcome and engage these guests. We are committed to establishing St. John and the territory as an eco-destination.

Island Green's driving principles are cooperation, community involvement/support and education. Its approach focuses on improving conditions, setting new protocols, and promoting awareness and understanding. Trash disposal has long been a major issue that threatens the fragile ecosystem. There are ways to mitigate however, especially considering the volume of valuable materials that are routinely sent to the landfills including brown & green debris, recyclable materials, and reusable/fixable items. We must be creative about minimizing the waste stream and recapturing and diverting the valuable resources it currently contains. Responsible zero-waste island living must become the goal. Island Green sees the following as key to this effort:

1. Promote concept of "Rethinking" before one purchases an item. Do I want it? Or do I need it? What do I already have that could serve this purpose?
2. Reduce consumption which will contribute to waste reduction. Avoid use of items that are toxic to the environment.
3. Encourage Reuse and Recycling along with clean energy & composting.
4. Practice: Rethink, Reduce, Reuse, Recycle.

In order to support this practice, Island Green sees the following as vital components:

- Promote partnership and coordination between various government agencies/departments along with environmental/civic organizations, the community and the private sector. The idea is to pool resources and work together.
- Accelerate the adoption of aggressive solid waste reduction, reuse, composting, recycling as well as clean energy and avoidance of harmful products.
- Advocate establishment of a Vocational Job Training Center that emphasizes Sustainable Materials Management (SMM) and related job creation activities.

- Educate including school curriculum to teach benefits of recycling, composting and environmentally responsible practices as well as the devastating environmental impact without such practices.
- Build excitement and engagement of all residents and visitors, including youth -- instilling ownership and pride in the initiatives and progress.

If we all work together as ONE, we can accomplish and preserve our islands from economic and environmental collapse.

## **ORGANIZATIONAL HISTORY**

Island Green Living Association is a St. John non-profit that got its start 16 years ago as Island Green Building Association with the mandate to promote green building and sustainable development. Its scope was expanded to encompass all aspects of sustainable living on its tenth anniversary in 2014 when it became Island Green Living Association.

Below is a timeline of Island Green milestones:

2004: Island Green Building Association founded. Promote green building & sustainable development. Educate public on pollution to oceans, etc. caused by irresponsible development.

2005: Produced Guidelines of Sustainable Green Building Design and Construction

2008: Established “Tropical Residential Green Building Certification Program”

2008: National Oceanic Atmospheric Administration (NOAA) Community Service Award

2008-2017: Monthly “Green Thursdays” Island Sustainability Series – over 50 public seminars, environmental film showings and vegan potluck dinners. (These have been on hold since the destruction of its headquarters during Hurricanes Irma & Maria in Fall 2017 but will resume with the launch of the new building)

2012: Received EPA Environmental Quality Award for Region 2.

2012 -2013: NOAA Grants -VI Green Construction Rewards Program I & II, Produced three PSA videos on environmentally friendly design, construction & living. Conducted Green Building & Site Design Training Seminars.

2012-Present: Established ReSource Depot, a recycling facility and thrift store for building and home goods. To date, 300,000+ lbs. of valuable items kept from the overflowing landfills. Accept donations, sell items at very reasonable prices.

2014: 10th Anniversary, expanded the scope of work from building to living and rebranded as the ISLAND GREEN LIVING ASSOCIATION.

2014: Began collection and recycling Aluminum Beverage Cans in partnership with the St. John Community Foundation. Purchased aluminum can compactor to crush and bale used

beverage cans for shipment to U.S. aluminum manufacturer. Initiated “Preserve St. John” campaign.

2015: Established the Green Villa Certification Program, to provide guidelines for environmentally responsible villa operations and use. St. John has more than 1,000 rental villas that have major impact on water, energy and waste production and use.

2016: Worked with legislators on single-use Plastic Bag Ban legislation. Signed into law in October 2016.

2016 – 2020: Began work with legislators on efforts to ban the importation and sale of sunscreen containing toxic ingredients, which is devastating to coral reefs and marine life. Became law in March 2020.

2017: Established the Green Restaurant Program to promote elimination of single use disposable plastic and to promote composting and glass and aluminum recycling.

2017: Worked with legislators on Source Separation/Composting legislation.

2017-2018: Lead efforts to Ban the Burn of hurricane debris following Irma & Maria.

2018: Worked with legislators on ban of Plastic Straws. It was signed into law and went into effect in October 2019.

2018 - 2019: Establishment and launch of Solarize St. John with a Town Hall in January 2019 and a \$100,000 donor grant from Brad and Juli Camrud.

2019: Sponsorship of Giffit Hill School’s composting programming whereby students are engaged/instructed and can then take part in demos to teach other students. Establishment of arrangement whereby Giffit Hill students use community service hours toward Island Green can collection/crushing.

2019-2020: Capstone project with Iowa State University EARTH Program to launch Chipping Pilot Program on St. John in cooperation with VI Waste Management Authority. Funded through a CFVI grant (\$100,000) with the remainder of capital coming from private donations (\$87,000). The aim is to keep a vital resource – vegetative debris – from filling the territory’s already overflowing landfills while cutting the island’s carbon footprint. Earned Clinton Global Initiative Call to Action designation.

2019 – 2020: Spearheaded marathon aluminum can crushing operation with the help of volunteers, with nearly 800,000 cans sent to Puerto Rico for recycling to date. Secured complimentary transport via Stevenson Formel Freight Services and locals Michael Marsh and Bloomberg’s Steve DeBlasio lent their equipment and manpower.

2020: Awarded an EPA grant to expand sustainable construction and demolition materials diversion management through education and training beginning in Fall 2020. The project engages all three islands and partners with government agencies including Public Works and Waste Management.

2020-2021: Island Green sponsors aquaponics program at Giff Hill School, a teaching and vocational education.

## **ACHIEVEMENTS**

Please provide two examples of past achievements that best represent the entity

### **ReSource Depot**

Over the years Island Green has been a trailblazer in bringing about meaningful change on St. John. Among the initiatives the organization is most proud of is its ReSource Depot. The ReSource Depot is a "Habitat for Humanity" ReStore-style thrift shop that has kept more than 310,000 lbs. of building and other material from the overburdened landfill on St. Thomas. It is the only facility of its kind on St. John.

The ReSource Depot was established in 2012. The founders of Island Green made excellent inroads encouraging sustainable building and development practices and took it to the next level by providing a clearing house for used materials that still have value to others. The proceeds go toward furthering Island Green's sustainability mission. Although it was badly damaged during the 2017 hurricanes, it reopened again earlier in 2020. The ReSource Depot serves the community of St. John and provides the following benefits:

- Facilitates the reuse of construction waste and keeps building salvage out of the transfer station and the territory's overflowing landfills.
- Recycles and repurposes building materials and provides contractors with a place to donate these materials.
- Contributes to island resiliency. Building materials are always in short supply and they are desperately needed when hurricanes occur. The ReSource Depot is an on-island source that can quickly supply some of those needed materials.
- Household materials are particularly expensive and difficult to find on St. John. The ReSource Depot provides a low-cost alternative and keeps these items out of the landfill while at the same time saving shoppers a trip to St. Thomas.

### **Aluminum Can Recycling**

Island Green operates a vital Recycling Center for the St. John community. Established in 2014 with the purchase of a compactor, nearly 800,000 aluminum cans have been sent to the recycler in the last 18 months alone, breathing new life into this valuable resource while keeping it out of our overflowing landfills. The cans were shipped off with the help of partners such as local Michael Marsh and Stevenson Formel Freight Services, which donated use of the M/V Norma H II to transport the pallets on a deadheaded return trip to Puerto Rico, thus minimizing the carbon footprint. Island Green serves as the central location for island-wide recycling of aluminum cans with plans to include plastics and glass in the near future.

Our aluminum recycling program operates as a drop-off program and collection via bins in Cruz Bay to accommodate those without cars and the restaurants in town. Volunteers collect discarded cans left behind on beaches, roadsides, etc. as well.

Once the cans are brought to our yard, they are sorted to remove any plastics and trash from the aluminum recycling stream and then loaded into our compacting machine. The crushing

process is handled largely by volunteers who donated more than 200 hours in 2019. Our volunteers include both locals and tourists and they have been pivotal to our success.

The Recycling Center serves the community of St. John and provides the following benefits:

- Decrease in waste destined for an overburdened landfill in St. Thomas
- Decrease in barge trips to haul waste to St. Thomas
- Decrease in virgin materials being mined
- Material put back into the production stream furthering the circular economy model of consumption
- Proceeds from the sale of aluminum fund Island Green's further recycling efforts

### **PROJECT SUMMARY:**

Island Green Living Association (Island Green) is proposing a Phase 2 launch of its Brush Chipping Pilot Program with a Community Foundation of the Virgin Island (CFVI) Friends and Family Fund for USVI Renewal grant. This will not only provide a sustainable solution for continuing to turn brown and green debris into a valuable resource but also provide feed stock for a one year compost demonstration project with Sustainable Generation (SG) and Gore-Tex that could fundamentally change the way the entire territory handles organic waste while providing valuable vocational training, explained below.

The idea is not only to reduce the volume of St. John's organic waste heading for the landfill by up to 60% but to also showcase the technology and provide proof of the concept so St. Thomas and St. Croix can adopt the same technology. Hence the CFVI grant will be a game changer in how the islands manage solid waste.

Phase 2 will include a continuation and expansion of the initial project, which was named a Clinton Global Initiative "Call to Action." With funding from CFVI's Island Spirit Fund, which was awarded in 2019, Island Green purchased a brush chipper and track loader and hired staff and volunteers to get the program started. Phase 1 of the Brush Chipping Pilot Program was in effect through September 2020. With new grant funds, Island Green will continue to process (chip) vegetative debris brought to the Susannaberg Transfer Station (STS) and begin a process to make the program financially self-sufficient.

Phase 2 will also create a huge, unprecedented ripple effect by providing critical feed stock for Island Green's project with SG and Gore-Tex to host a commercial compost demonstration of their product from January to December 2021. Included as an integral part of this project is a vocational training program whereby SC/Gore-Tex will provide weekly training workshops and jobs for two locals. This is in addition to the three workers brought on for the Brush Chipping Pilot Program.

The SG/Gore-Tex project will require a carbon and nitrogen feed stock as part of the mix needed to generate compost/soil.

The objective of this partnership is to demonstrate to the Government of the Virgin Islands this technology, which has proven results creating useable compost from municipalities' organic waste. This could potentially lead to turning 60% of USVI's waste, the amount identified in a 2019 waste analysis done by the University of the Virgin Islands as

compostable, into a valuable resource rather than filling the territory's landfills. Our objective is to enact change not just on St. John, but on St. Thomas and St. Croix as well.

Prior to the start of the Brush Chipping Pilot Program, green and brown debris was either barged to Bovoni landfill or was pushed over the ravine at the back of the Susannaberg Transfer Station (STS) on St. John. This action continues to impact our storm water runoff and increases bacteria levels, thereby polluting marine life and the community. The Brush Chipping Program has allowed Island Green to capture this resource and instead turn it into a useable product for the community.

With the continuation of this program, Island Green will be able to increase the volume of material brought to the STS from 30% to over 50% through education aimed at landscapers about the pre-sorting of debris material prior to delivery. The additional time will also allow the organization to move to the next phase: creating two sellable products, commercial compost and mulch from the processed debris to generate revenue for the program. We will create, market, and sell back to the public both mulch wood chips and compost. This will help fund the continuation of the project so that it eventually becomes completely self-sufficient. And finally, we will use processed wood chips and green vegetation as a feed stock for the separate commercial compost pilot program we are working on with SG and Gore-Tex.

This commercial compost pilot will utilize the SG Mobile™ System with GORE® Covers. The project is a sustainable and expandable solution that can process a wide variety of organic materials. The GORE® Cover technology is recognized for delivering in-vessel performance for:

- Reducing Odors and VOC Emissions
- Achieving Pathogen (PFRP & VAR) Reduction
- Clear Separation of Process Water from Storm Water
- Small Footprint • Low Energy Requirement
- Modular, Expandable Customized Designs
- Feasible for All-Feed Stocks (SSO, BS and MSW) operating in most Varied Climate Conditions
- Simple to Operate – Lowest Operating Cost
- Produces a Consistent Stable Compost in shortest treatment time

With over 300 systems worldwide already using this technology, Island Green is excited to bring this opportunity to the Virgin Islands. This will keep a source of carbon right here on island that can be used by home gardeners, farmers, and landscapers to repair or amend soil.

The continuation of the brush chipping program is essential to obtain the 25:1 carbon to nitrogen ratio needed for this system.

## **PROJECT BACKGROUND**

In 2019 Island Green was awarded a grant from CFVI to address recovery after the 2017 hurricanes ravaged the islands. Island Green successfully launched a Brush Chipping Pilot Program to address the overwhelming amount of vegetative debris that was left behind from the storms. The groundbreaking program was among the distinguished projects deemed a Clinton Global Initiative “Commitment to Action.” The first initiative of its kind, it was recognized for its excellence in finding a sustainable solution to handling everyday green and brown debris as well as its value in disaster relief following future storms.

The development of this project began in late summer 2019 with the purchase of a Vermeer BCXL 1800 brush chipper capable of handling logs up to 18” in diameter. Island Green experienced unforeseeable challenges that delayed the start of chipping and made a grant extension request necessary. These challenges included the length of time it took to secure a Memorandum of Understanding (MOU) with Virgin Island Waste Management Authority (VIWMA) which allowed Island Green access to their property to develop a chipping yard in the area where debris is delivered by local landscapers. VIWMA signed this agreement late in December 2019. Once Island Green was allowed access to this area, they were able to begin land grading to make it suitable to process debris, which was completed in January 2020.

Next, a safety and operations training with Vermeer was coordinated in February 2020 to which personnel from both VIWMA and Virgin Islands Territorial Emergency Management Agency (VITEMA) were also included to maximize effectiveness for future hurricane recovery. Upon completion of training Island Green officially began sorting and creating debris piles for processing in March. Once enough piles were created, chipping began in April.

Many of the initial loads of debris came mixed with metals, wires, rubble, and vines. To address this, Island Green created signage in both English and Spanish educating landscapers on the program and how to pre-sort material on the job site so efficiency at the chipping yard could improve. The mixed loads have steadily declined in recent months and Island Green expects this will result in an increased percentage of material processed and available for reuse.

Unfortunately, due to COVID-19, the project experienced further delays. In late May, there was an equipment failure in the newly purchased track loader. Due to the virus, a certified Bobcat technician was unable to travel to St. John to service the machine, which is their normal repair procedure under warranty. Instead the machine had to be shipped back to Florida where it could be serviced and then re-shipped back to St. John. This process slowed the chipping in the STS Chipping Yard for the month of June. However, Island Green was able to secure an off-site chipping job from the new owners at Cinnamon Bay, processing hurricane debris on the property, which had been not been touched since the storms. This job allowed Island Green to develop a mobile chipping business plan which has helped bring revenue to the program.

With the Bobcat back on island, the brush chipping program had its most productive and efficient interval in the last 6 weeks of the grant period. It is critical to understand the unplanned and unforeseeable challenges faced throughout the grant period. However, despite these setbacks, Island Green has had considerable success. This is the main impetus for Island

Green seeking additional funding to continue the program. Island Green believes between mobile chipping and revenue created from mulch; the program can generate enough income to sustain itself. With everything now moving smoothly, the opportunity to continue the program for another year will allow the development of revenue streams and pursue the partnership with SC and Gore-Tex as explained in the Project Summary.

## **PROJECT GOALS**

Now that the brush chipping and handling equipment has been acquired, the 10,000 sqft brush chipping yard has been established, and a three-month trial period has proven feasibility, the new goals are to:

1. Develop a sustainability plan for chipping and composting that increases wood chip and compost product yield, develops markets, and generates revenue.
2. Quantify, the amount of brush taken to Susannaberg Transfer Station, the amount processed into reusable mulch or compost, and the amount dumped into the landfill and/or pushed over the ravine. In 2019 100% of the brush delivered to STS ended up in the landfill, which was reduced to 70% during the 2020 VICF grant period, and the new target is to reclaim 50% during 2021, with an ultimate goal of recycling 80-100% of all brush delivered to STS.
3. Increase awareness of organics recycling and to engage commercial landscapers, schools, and the community in compost education.
4. Provide feed stock for the separate commercial compost pilot program Island Green is partnering on with SG and Gore-Tex, which including the opportunity for vocational training.

The information gathered in this proposal (mulch and compost yields, revenue generated, reduced organics in the landfill, methane gas reduction) will be used to influence government decisions on organics management for the territory. The specific activities listed below will be implemented to reach these goals:

- Continue weekly processing and chipping of material brought to STS
- Increase the amount of “clean loads” delivered to STS
  - Reduction in brush loads contaminated with wire, metal, rubble, and boards.
- Increase the volume percentage of vegetative debris recovered and processed at STS to over 50%
- Collect Data to answer the following for revenue development:
  - Selling mulch:
    - Calculate projected annual mulch production from STS in cubic yards.
    - Calculate how many cubic yards of wood chips are made from “log brush” (greater than 1 in diameter). Chip known volumes and measure yield to determine volume reduction factor.
    - Calculate how many cubic yards of chipped brush are created from “stick brush” (1 in diameter or less). Chip known volumes and measure yield to determine volume reduction factor.
    - Yields from log brush and stick brush will be combined to make total annual mulch production.

- Determine conversion factor from volume to tons for each feed stock
  - Determine market price for wood chips if sold in VI. Consult landscape companies to see if they could use STS mulch product in their business and what would they pay for it.
  - Determine mulch production costs to compare with market value to determine profitability.
  - Determine vessel in which material will be sold: bagged, loose, etc.
- Selling compost:
    - Identify green waste feed stocks that arrive at STS and will serve as nitrogen fuel.
    - Determine annual volume of each nitrogen feed stock, i.e. green brush foliage, palm fronds, vines/leaves/grass clippings/vegetable waste.
    - Calculate how many annual cubic yards of each nitrogen feed stock are processed.
    - Determine conversion factor from volume to tons for each feed stock.
    - Determine market price for compost if sold in VI. Consult landscape companies to see if they could use STS compost product in their business and what would they pay for it.
    - Determine compost production costs to compare with market value to determine profitability.
- Create a reusable product for sale to the public and landscapers in the community
  - Generate revenue for the program through product sales and mobile chipping contracts.
  - Have a Landscape Contractor and Composting Field Day educational event at the Brush Chipping Yard.
  - Develop commercial and residential Extension Guide Sheets for composting through association with the University of the Virgin Islands, Iowa State University EARTH Program, VIWMA, and Island Green Living.
  - Develop K-12 education materials for composting at schools through association with the Iowa State University EARTH Program, University of the Virgin Islands, and Island Green Living Association.
  - Provide feed stock for the separate commercial compost pilot program Island Green is partnering on with SG and Gore-Tex.

## **EXPECTED OUTCOMES**

By continuing the brush chipping program Island Green expects to move from the development stage which came with unforeseen challenges and several setbacks to one of efficient operation and increased productivity. With the startup phase complete, the focus can move to increased data collection, increased program efficiency and productivity and program sustainability through revenue stream development. Island Green expects the following outcomes from continued brush chipping:

- As landscapers and community members become more familiar with the process and logistics at the Brush Chipping Yard, the contamination in debris loads brought to

STS will decrease. This will result in an increase in the amount of vegetative debris captured and processed.

- During the first phase the recapture and process percentage was 30% of the debris brought to STS. Island Green expects this to increase to 50% with an ultimate reuse of 80% of all vegetation coming to the STS.
- Increased data collection
  - Because much of the first phase was consumed with negotiating, purchasing, and shipping equipment, establishing an MOU with VIWMA, developing the Brush Chipping Yard and hiring and training staff, there was only a few months left for consistent chipping. With a full year of chipping, Island Green will be able to collect long-term data that can be used to develop and inform the local government on the viability of replicating this program throughout the territory.
- Revenue Development
  - There is more to the sale of brush chips for mulch or compost than simply chipping and selling. The opportunity to continue brush chipping for one year's time will allow Island Green to answer the questions (detailed in Project Goals section) needed to develop a sellable product.
  - Island Green will offer a product for sale to the public and landscapers
  - Expand mobile chipping program
    - There is no mobile chipper on St. John capable of handling logs up to 18" in diameter. This puts Island Green in a unique position to generate revenue with off-site mobile chipping jobs. Island Green will continue to promote this service throughout the island to generate revenue for the program.
- Feed stock provision for SC/Gore-Tex compost pilot program.

## **PROPOSED ACTIVITIES**

Island Green is proposing Phase II of the brush chipping program it has established in cooperation with VIWMA over the last 18 months. The Brush Chipping Yard (BCY) was developed in Phase I and this will allow for a seamless continuation of an existing program. To begin Phase II, Island Green will hire three staff members: one manager and two laborers for a one-year contract. Job descriptions from Phase I will be modified to account for 'lessons learned.' The BCY at STS will be open Monday through Friday from 9 am to 2:30 pm to capitalize on the peak time when landscapers drop off brush at STS. Two laborers will primarily focus on receiving and initially staging brush loads in the chipping yard, removing non-chippable contaminants, and hand loading brush into the chipper.

The Brush Chipping Manager will oversee the management of the brush chipping yard along with collecting data, operating the chipper and track loader, and using data to establish a mulch sales system at the BCY. The development of this market and the logistics of how mulch and when mulch will be sold is a large part of this staff position. The Brush Chipping Manager will communicate with local truckers who bring debris from hotels on island to arrange delivery days. And the Brush Chipping Manager will work to expand the mobile chipping program, creating a secondary source of revenue for the program. Island Green's

Executive Director will create spreadsheets for each piece of data to be collected (volumes related to production and sales of mulch and compost) and the Brush Chipping Manager will be responsible for tracking and reporting this data. The data will be input into a spreadsheet bi-weekly with payroll. The Executive Director will assist in marketing the product to the community through social media outlets, news outlets, and in person communication with landscape companies. Island Green will hold a Brush Chipping and Composting Field Day demonstration, led by Brush Chipping Lead Project Manager, Dr. Dave Minner, to educate the community on the program as well as composting methods they can practice at home. The Executive Director will promote University of Virgin Islands and Iowa State University extension guides for residential and commercial composting through social media, local mail centers and at the Island Green headquarters and website. In May 2020 Iowa State University EARTH Program students developed a Compost Learning Module for grades 4 and 5. Through collaboration with Iowa State University EARTH Program and University of Virgin Islands, Island Green will arrange presentation of this learning module to Julius E. Sprauve and Giff Hill students on St. John. The extension guides and delivery of the Learning Module will be financed through ISU EARTH Program.

## **TIMELINE**

December 2020:

- Post Job Descriptions for three Brush Chipping Employees
- Conduct Interviews
- Hire Staff
- Conduct equipment operation and safety training with new staff
- Begin arranging classroom presentations of Iowa State University's EARTH Program Compost Learning Module (Grades 4 and 5) for presentation throughout the Spring semester

January-December 2021:

- Begin chipping vegetative debris
- Maintain efficiency in Brush Chipping Yard by being open and operating Monday-Friday 9-2:30
- Measure and process incoming brush weekly
- Develop sales system for processed material. Begin offering product to community by July 2021.
- Implement compost education program at Julius E. Sprauve School and Giff Hill School on St. John that include indoor and outdoor classroom activities and field trips to STS.
- Produce a residential composting guide sheet jointly published by UVI, ISU, and Island Green.
- Hold Compost Workshop/Field Day at Brush Chipping Yard
- Provide feedstock for SG/Gore-Tex composting pilot program.

March/June/September/December:

- Perform routine preventative maintenance on brush chipper and track loader

## **PARTNERSHIPS/COLLABORATIONS**

Island Green has established an MOU with VIWMA for right of entry to STS to process all vegetative debris brought into the transfer station. VIWMA has offered support to continue this program through 2021.

Island Green has a good working relationship with the Iowa State University EARTH Program that in turn partners with the University of the Virgin Islands to promote composting in K-12 schools and the community. Students from Iowa State University's EARTH Program come down to St. John a semester at a time. These students will volunteer their time as part of their program to implement the Grade 4 and 5 Compost Learning Module developed by Capstone students in 2020.

## **CAPACITY/PERSONNEL**

Dr. Dave Minner is a Professor at Iowa State University and an active board member of Island Green serving as the Brush Chipping Yard Lead Project Manager. In 2020 he volunteered 144 hours directly to the Brush Chipping Yard and he anticipates volunteering 260 hours in 2021 if the project continues. He lives on St. John and coordinates the Iowa State University EARTH Program where his ISU students work hands-on in the community with K-12 students and teachers to provide experiential learning in their expansive outdoor classroom and edible schoolyard gardens. He is responsible for writing Cooperative Extension Service guide sheets related to composting that are published jointly through the University of the Virgin Islands and Iowa State University and are in cooperation with VIWMA and Island Green.

Kelly Lawson is the Executive Director for Island Green. Kelly has a background teaching compost lessons to K-12 students as part of the city of Austin's Generation Zero curriculum. She was instrumental in the first phase of Island Green's Brush Chipping Program handling equipment shipping, job description development, Vermeer training, and communications with VIWMA and chipping staff. She worked closely with Dr. Minner to develop the Brush Chipping Yard. Kelly will oversee the administrative side of the grant such as processing payroll, compiling data collected from the Brush Chipping Manager, reporting to CFVI, marketing the mulch product to the community, and promoting educational materials and extension guides.

Brush Chipping Manager: This position will oversee the day to day operations at the Brush Chipping Yard. Island Green will hire someone with heavy equipment experience to lead this program. This person will oversee the safety of the program, ensure material is being processed weekly and will be responsible for data collection. The Chipping Manager will work with landscapers to improve the quality of loads being brought to the STS. The person will develop a sales system to generate revenue for the program from mulch and compost sales.

Brush Laborers: This will be two positions who will do the physical work of sorting piles of debris and then hand loading brush material into the chipper.

## **HURRICANE & BUILDING FORWARD IMPACT**

After a hurricane or tropical storm event, vegetative debris is in excess. This was especially apparent after hurricanes Irma and Maria in 2017. At that time, St. John had no equipment on island to process this debris and a bottleneck in recovery was created as a result. The STS became so full of debris it caused weeklong backlogs of waste at satellite dumpsters all around the island. The chipper that Island Green purchased will not be able to solely handle the amount of debris left in the wake of the 2017 hurricanes, but it can be used to help local authorities process material blocking roadways and assist in processing debris. Further, because the chipper is mobile, Island Green will be able to go to residential properties and assist in debris clean up.

During the first phase of the Brush Chipping Program Island Green was able to do just this at Cinnamon Bay. Cinnamon Bay is in National Park land that had no way of cleaning up the debris left behind by hurricanes Irma and Maria. The National Park has a policy to not remove materials from the park, including hurricane damaged brush. Island Green's mobile chipping program made it possible to travel to Cinnamon Bay and chip the hurricane damaged trees and brush and leave the chipped mulch to be reused within the park.

The project processed 247 cubic yards (cuyds) of brush that resulted in 125 cuyds of wood chips. This resulted in a chipping conversion factor of 0.51 meaning the stacked brush pile volume decreased by approximately half after chipping. Using an average price of wood chip mulch at \$30/cubic yard the 125 cubic yards of wood chips returned to the Cinnamon Bay project had a retail value of \$3,750. Having a mobile chipper on island capable of handling logs up to 18" in diameter is a helpful piece of equipment to have after storms.

## **PROJECT EVALUATION**

Island Green will work with VIWMA to collect data on the volume of vegetative debris brought into STS. The staff at VIWMA keeps a log of this material and Island Green's Brush Chipping Manager will keep a log as well for comparison. Island Green will then process this material into three piles: logs, sticks and green brush and record collection volumes for each. This material is measured in cubic yards. As material is processed through the chipper staff will record the volumes of finished product daily. Then, the amount of material brought into STS will be compared to the volume processed and recorded as a percentage of vegetative debris diverted from the landfill each month and totaled at the end of the year. The volume of mulch chips sold will be tracked to get monthly and yearly revenue totals. And finally, mulch feedstock sent to the SG/Gore program will be recorded to determine the monthly requirements.

Island Green will evaluate the success of the program through a monthly data comparison, anticipating a decrease in contaminated loads brought to STS, an increase in the percentage of material diverted from the landfill and an increase in revenue generation throughout the program. A cost-benefit analysis will be completed at the end of the year to determine the sustainability of the program. Island Green will make this information available to the VI Government and VIWMA as an aide when making organics management decisions for the territory.

## COVID 19:

Island Green feels the brush chipping operation follows the CDC guidelines for safe social distancing. The brush chipping yard is outside, and staff wear both masks and face shields as protective safety gear while working. In addition, staff members work as a team but in different areas of the yard rarely within 6-feet of one another. During team meetings Island Green staff meets at our open-air warehouse, wears masks and stays 6-feet from one another.

## BUDGET

Item	Cost
Executive Director Salary Subsidization <i>See Narrative Note 1</i>	\$10,400
Brush Chipping Staff Salary (includes payroll taxes) <i>See Narrative Note 2</i>	\$77,220
Equipment Maintenance <i>See Narrative Note 3</i>	\$8,000
Equipment Fuel <i>See Narrative Note 4</i>	\$3,600
Brush Chipping Staff Ice/Water <i>See Narrative Note 5</i>	\$780
<b>TOTAL</b>	<b>\$99,980</b>

**Narrative Note 1:** It is estimated the Executive Director will spend 5 hours/week/ at \$40/hour on her role in the program. This equates to \$200/week for 52 weeks (1 year of continued program).

**Narrative Note 2:** The 2 labor positions will be hired at \$25/hour and the Brush Chipping Manger will be hired at \$35/hour.

Laborer 1: 5.5 hours/day X 5 days = 27.5 hours/\$25/hour = \$687.5/week

Laborer 2: 5.5 hours/day X 3 days = 16.5 hours/\$25/hour = \$412.5/week

Brush Chipping Manager: 5.5 hours/day X 2 = 11 hours/\$35/hour = \$385/week

Brush Chipping Staff Weekly Salary: \$1,485(total weekly salary) X 52 weeks = \$77,220/year

**Narrative Note 3:** From experience from the first phase of brush chipping Island Green estimates quarterly preventative maintenance costs of \$1,000 per piece of equipment: Bobcat Track Loader and Vermeer Chipper.

**Narrative Note 4:** From experience from the first phase of brush chipping, Island Green knows the fuel costs for each piece of equipment is \$150/month. \$300 total fuel costs X 12 months = \$3,600/year.

**Narrative Note 5:** The Brush Chipping Yard has no natural shade. The work is physically demanding and providing ice and water ensures the health and safety of staff while working. From the first phase of brush chipping Island Green knows ice/water costs are \$65/month.