ENVIRONMENTAL ASSESSMENT

PRODUCTION OF THE NEXT GENERATION OF CURRENCY

WESTERN CURRENCY FACILITY, FORT WORTH, TEXAS (WCF)
WASHINGTON, DC FACILITY (DCF)

JULY 2003

PREPARED FOR

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List of Acronyms

ACM	Asbestos-Containing Material
AQD	Air Quality Division
AWTP	Advanced Wastewater Treatment Plant
BEP	Bureau of Engraving and Printing
BGD	Billion Gallons Per Day
CAA	Clean Air Act
CATEX	Categorical Exclusion
CEQ	Council on Environmental Quality
COPE	Currency Overprinting Equipment
DCF	District of Columbia Facility
DCWASA	District of Columbia Water and Sewer Authority
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPCRA	Emergency Planning and Community Right to Know Act
FONSI	Finding of No Significant Impact
FWW	Fort Worth Water Department
g/m^3	Grams per cubic meter
GPD	Gallons Per Day
HMIS	Hazardous Materials Information System
LQG	Large-Quantity Generator
MGD	Million Gallons Per Day
msl	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOx	Nitrogen Oxides
OVI	Optical variable ink
ppm	Parts Per Million
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RTO	Regenerative Thermal Oxidizers
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Office
TCEQ	Texas Commission on Environmental Quality
TPY	Tons Per Year
USACE	U.S. Army Corps of Engineers
USSS	United States Secret Service
VCTP	Village Creek Wastewater Treatment Plant
VOC	Volatile Organic Compounds
WCF	Western Currency Facility
WTP	Water Treatment Plant
WWPP	Wastewater Pretreatment Plant

1.0 Purpose and Need

The United States (U.S.) Department of Treasury's Bureau of Engraving and Printing (BEP) manufactures financial and other U.S. securities. Accordingly, the BEP designs, prints, and furnishes a large variety of security products, including Federal Reserve notes, U.S. postage stamps, Treasury securities, identification cards, naturalization certificates, and other special security documents. The BEP prints 37 million notes with a face value of approximately $696 million at facilities in Washington DC and Fort Worth, Texas (TX) for delivery to the Federal Reserve System each day (BEP, 2003a).

1.1 OVERVIEW OF PROPOSED ACTION

It is BEP's responsibility to ensure the security of the U.S. currency by periodically enhancing the design of the currency. BEP's strategy for fulfilling this requirement is to implement a new currency design every 7 to 10 years, or when otherwise warranted. The Proposed Action, as described in detail in Section 2.2, consists of the BEP implementing production of the Next Generation of Currency design for the $20, $50, and $100 notes, primarily through the addition of an offset printing process to the production system. Furthermore, the Proposed Action includes developing and implementing new currency designs for the $5 and $10 notes at some point in the future. The Proposed Action includes producing the Next Generation of Currency at the Washington, DC Facility (DCF) and the Western Currency Facility (WCF) located in Fort Worth, TX (see Figure 1-1).

1.2 PURPOSE OF PROPOSED ACTION

The purpose of the Proposed Action is to maintain the security of the Federal Reserve notes through the production of a new currency design that provides improved security features. Security features in the Next Generation of Currency are designed to deter and prevent counterfeiting and allow the BEP to maintain a technological advantage over the advanced computer and printing technologies used for counterfeiting.

1.3 NEED FOR PROPOSED ACTION

The Proposed Action is needed for BEP to fulfill its responsibility to ensure the continued security of the U.S. currency. Although the counterfeiting of money was substantially reduced after the establishment of the U.S. Secret Service (USSS), this crime still represents a potential danger to the Nation's economy. Today, counterfeiting once again is on the rise. One reason is the ease and speed with which large quantities of counterfeit currency can be produced using modern photographic and printing equipment (USSS, 2003). According to the USSS, $47.5 million in counterfeit money entered circulation in fiscal year 2001. Of this amount, 39 percent was computer generated, compared to only 0.5 percent in 1995 (BEP, 2003a).

[INSERT FIGURE 1 – GENERAL LOCATION OF FACILITIES]

1.4. PURPOSE AND SCOPE OF THE ENVIRONMENTAL ASSESSMENT

1.4.1 Purpose of this EA

This environmental assessment (EA) has been prepared pursuant to the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Department of the Treasury Directive 75-02 which sets forth the Treasury's policy, standards, and procedures for implementing NEPA. The purpose of this EA is to identify any potential impacts of implementing the Proposed Action and to determine whether the potential impacts would result in significant adverse effects on the environment, thereby requiring the preparation of an Environmental Impact Statement (EIS). If the results of the EA indicate that no significant adverse effects would occur from implementation of the Proposed Action, the EA will be used to document and justify a Finding of No Significant Impact (FONSI).

1.4.2 The NEPA Process

NEPA requires Federal agencies to take into account the potential consequences of their actions on both the natural and human environments as part of their planning and decision-making processes. To facilitate these considerations, a number of typical actions that have been predetermined to have little or no potential for adverse impacts are "categorically excluded" from the detailed assessment process. These predetermined actions are called category exclusions (CATEX). Thus, the first step in determining if an action would have an adverse effect on the environment is to assess whether it fits into a predefined category for which a CATEX is applicable. However, the Department of Treasury currently does not have a list of categorical exclusions.

For actions that are not subject to a CATEX, the agency prepares an EA to determine the potential for significant impacts. If the results of the EA indicate that no significant impacts would occur as a result of the action, then the determination is documented and justified in a FONSI. The agency makes the FONSI available to the public, and interested parties are given a 30-day period to review the EA and provide comments on the action. If there are no comments, the NEPA process is complete.

If significant environmental impacts are expected or other intervening circumstances exist, such as substantial public controversy, an EIS is prepared. An EIS is a more intensive study into the effects of the actions, and it includes more rigorous public involvement requirements. If it is readily apparent that an action warrants the preparation of an EIS, then an EA need not be prepared prior to an EIS. The agency formalizes its decisions relating to an action for which an EIS is prepared in a Record of Decision (ROD). Following a 30-day waiting period after publication of the ROD in the *Federal Register*, the NEPA process is complete.

Each Federal agency has internal policies and procedures for implementing NEPA. The Treasury's procedures are specified in Directive 75-02. These procedures include instructions for EA and EIS preparation.

1.4.3 Scope of this EA

The range of potential environmental impacts that could occur as a result of implementation of the Proposed Action and alternatives has defined the scope of this EA. As the Proposed Action is industrial in nature and consists primarily of modifying or introducing new industrial processes within existing facilities, the analysis of impacts in this EA is focused on these processes. The scope is limited to those areas or activities that were not covered in the previous NEPA documentation: Environmental Review:

Environmental Information Record (BEP, 1987) and Environmental Assessment for Proposed Western Currency Facility Expansion (BEP, 2001b). In keeping with the intent of the NEPA regulations, existing environmental conditions have been considered to the extent commensurate with the potential for impacts. The Proposed Action and alternatives considered are presented in Chapter 2, and a description of the affected environment and any potential impacts, as well as mitigation measures, are described in Chapter 3.

2.0 Proposed Action and Alternatives

This chapter describes the Proposed Action and the reasonable alternatives that were considered. The implementing regulations for NEPA establish a number of policies for Federal agencies to follow to avoid or minimize adverse effects of their actions. Among these policies is the use of the NEPA process to identify and assess reasonable alternatives to the Proposed Action that would avoid or minimize adverse effects (40 CFR 1500.2(e)). The policies also state that the NEPA process should be useful to decision makers and the public, should emphasize real environmental issues and alternatives, and should avoid the presentation of extraneous background data (40 CFR 1500.2(b)).

2.1 NO ACTION

NEPA requires that a No Action Alternative be considered as part of the environmental review process. With the No Action Alternative, the BEP would not produce the Next Generation of Currency for the $20, $50, and $100 notes. However, BEP would continue to print Federal Reserve notes using the existing printing procedures and plate designs at both the DCF and WCF. Notes passing through the Federal Reserve would be removed from service if they are determined to be unfit and replaced with new notes. With the No Action Alternative, the BEP would fail to meet its responsibility for continued security of the U.S. currency as described in Section 1.3.

2.2 PROPOSED ACTION - PRODUCTION OF THE NEXT GENERATION OF CURRENCY

The Proposed Action consists of the BEP producing the Next Generation of Currency for the $20, $50, and $100 notes, based on designs developed by representatives from the BEP, USSS, and the Federal Reserve Board, and approved by former Secretary of the Treasury, Paul O'Neill. This action includes producing the currency at both the BEP's DCF and WCF (see Figures 2-1 and 2-2). Redesign of the $10 and $5 notes is still under consideration by BEP, and a formal decision regarding these notes has not been made. However, for the purpose of this EA, it is assumed the production of the Next Generation of Currency $5 and $10 notes will occur at some point in the future and is part of the Proposed Action. Redesign of the $2 and $1 notes is not planned (BEP, 2003a).

With the Proposed Action, $20 notes that are currently in circulation would be replaced gradually with the Next Generation of Currency on a "fit first" basis. As the old notes become "unfit," the Federal Reserve will retire them when they are returned through the banking system. The same method of replacement would be used for the $5 and $10 notes if and when the Next Generation of Currency designs are introduced for these notes. Conversely, the $100 notes would be replaced with the Next Generation of Currency on an "accelerated rollover" basis. When $100 notes pass through the Federal Reserve, they would be removed and replaced in kind with the Next Generation of Currency notes regardless of their condition. The method by which the $50 notes would be replaced has not yet been decided; however, these notes would either be phased out on a "fit first" or "accelerated rollover" basis.

Depending on the method used to replace the $50 notes, the total production rate for the BEP could increase between 5 percent and 10 percent over a temporary, 3-year period to support the accelerated rollover replacement of currency. The production rate increase would most affect the DCF, because it is the only facility that produces the $100 note. Increases in production at the WCF would be limited to, and dependent on, the manner in which $50 notes are introduced in the system.

Insert Figure 2-1 DCF Location

Insert Figure 2-2 WCF Location

For the purposes of this EA, it has been assumed that the accelerated rollover replacement of $100 notes would require a 5 percent increase in currency production at the DCF, and that the accelerated rollover replacement method may be chosen for the $50 note, which would require a 5 percent increase in production at both the DCF and the WCF. Hence, a maximum 10 percent increase in production has been assumed for the DCF and a maximum 5 percent increase for the WCF in each of the next 3 years. At the end of the temporary, 3-year period of accelerated rollover replacement, production would return to current levels. Production rates for $20 notes (and $10 and $5 notes when done) would not change compared to the No Action Alternative, due to the fit first method by which these notes would be introduced into circulation.

The production processes required to produce the Next Generation of Currency and the process required to produce existing currency are described in the following subsections, along with background information on the BEP production facilities relevant to this EA.

2.2.1 Currency Production Process

Currency production processes currently in use at the DCF and WCF are substantially similar, with slight variation in equipment models in use and the manner in which certain waste streams are managed. An overview of the production process currently in use by BEP is presented in Figure 2-3. There are four major steps to produce $5, $10, $20, $50, and $100 notes:

- Intaglio printing (including engraving and plate manufacturing)
- Print examination
- Currency overprinting, and
- Packaging

To support these processes, there are also a number of ancillary facilities and processes:

- Waste management
  - pretreatment of wastewater (intaglio-generated and plating-generated wastewater)
  - disposal of waste materials (both hazardous and non-hazardous)
  - shredding, incinerating, and disposing of spoils
- Ink reconstitution
- Equipment Maintenance (roller resurfacing, roller cleaning, etc.)

Figure 2-4 depicts the process that would be used in the production of the Next Generation of Currency. The major change to the process involves the addition of offset printing and the use of new offset color inks (blue, yellow, black, green, and orange), a new formulation of intaglio optical variable ink (OVI), and intaglio metallic green ink. The existing processes will still be used; however, intaglio plates will be modified to reflect the Next Generation of Currency design, and new offset plates will be produced for portions of the notes that will be printed using the offset process. With the Proposed Action, new security features, including a new thread, would be added to the security features already present in the current paper. The BEP's existing paper supplier will incorporate this thread as part of the manufacturing process and continue to supply the BEP with all raw currency paper. Note that currency "paper" is in fact a fabric composed of 25 percent linen and 75 percent cotton from recycled materials, with synthetic fibers of various lengths distributed evenly throughout. All inks would be procured from BEP's existing ink supplier or be manufactured by the BEP.

[Figure 2-3 – Current Production Process]

[Figure 2-4 – Modified Process]

The Intaglio Printing Process

Intaglio printing starts with either the hand engraving or chemical etching of an image into a soft steel or copper die. The die is then hardened and the image is transferred to a 6-subject master die. The master die images are transferred to a 32-subject alto. The 32-subject currency printing plates are electroformed from nickel ingots on the steel alto. The plates are then machined to the proper dimensions and thickness. Each plate contains one side of a 32-subject note with unique plate numbers. The plates are chromed for durability. Plates are replaced on the presses as they wear to ensure that the quality of the printing is maintained or in response to a change in the note.

The BEP has two models of intaglio printing presses in use: I-8 and I-10. The I-8 and I-10 presses differ primarily in their production rate capacities and air emission controls. The older I-8 presses can produce 8,000 sheets per hour and do not have any volatile organic compound (VOC) control equipment; I-10s can produce 10,000 sheets per hour and are equipped with VOC controls. During production, the plates are secured to the cylinder on the press. The plate is inked with a series of rollers that receive ink from the ink fountain. The plates are wiped prior to contact with the paper by the wiper roller so that the ink remains in the design of the plates but is wiped off the surface. The wiper rollers are cleaned with the wiping solution and the wastewater is routed to a pretreatment plant. Ink that is scraped off the pre-wipe blade on face presses is reconstituted and reused. With the exception of the wiper roller, press operators clean the press rollers and the rest of the press, including the plates, with rags and solvent. The rags are then laundered.

A 32-note sheet of paper is fed into the press where it is pressed under extremely heavy pressure (estimated at 20 tons) into the finely recessed lines of the printing plate to pick up the ink. As a result, the printing impression is three dimensional, leaving the ink on the surface of the note slightly raised, while the reverse side of the note is slightly indented. Intaglio printing is unique, because the paper receives the ink from the incised lines and not from the surface of the plate. The back of each currency sheet is produced in the first pass using green inks. In the second pass, the front of the sheet is printed with black inks and the OVI. Between passes, the ink on the printed side must have sufficient time to dry (a minimum of 72 hours).

Print Inspection

BEP inspects all printed sheets for defects prior to completing the overprinting process. All 32-note sheets are cut in half, and if one 16-note sheet is found to contain defects, it is destroyed (spoils). If the 16-note sheet meets the examiner's inspection standards, it is forwarded to the Currency Overprinting Equipment (COPE) section for final printing.

Currency Overprinting Equipment

The next step in the currency production process is the addition of the Federal Reserve District seal and its corresponding number designation. The seal and serial number are added to the notes by overprinting with black and green inks using a lithographic process and letterpress.

Packaging

After COPE, guillotine cutters are used to create single stacks of 100 notes. The units of 100 notes are banded and packaged into "bricks" containing 40 units; each "brick" contains 4,000 notes. The bricks are distributed to one of the twelve Federal Reserve Districts, which issue the notes to banking institutions.

2.2.2 The Offset Printing Process

The Proposed Action provides for the addition of dry offset printing in the production of the newly designed currency. Dry offset printing has several advantages over wet offset printing (see Section 2.4), including higher resolution, increased level of detail, and a deeper color. The offset printing process is much more efficient and produces less waste than the intaglio process. This process involves the use of a plate made of thin aluminum, which is coated with a rubber compound. A negative of the final image is placed over the coated plate, and it is subjected to ultraviolet light, which degrades the exposed areas of the coated surface. The exposed coated surfaces are washed from the plate leaving a positive image in the unexposed coating. When the plate is inked for printing, the coated surface accepts the ink and the uncoated plate does not. An offset press is used to transfer the positive image from the plate to sheets of currency paper. The sheets from the offset press become the feedstock for the intaglio printing process (Martin, 2003b).

The offset presses can produce 10,000 sheets per hour. Unlike the intaglio presses, the offset presses can print both sides of a currency sheet at once. As a result, three offset presses will be required at each facility to provide an adequate supply of note sheets to the intaglio presses.

2.2.3 Environmental Aspects Related to Currency Production

As part of the currency production process, several waste streams are generated. These waste streams primarily include the generation of solid wastes (hazardous and non-hazardous), industrial wastewater, and air emissions from VOC use and incineration practices. At different points in the currency production system, waste note sheets and trimmings (spoils) may be generated. For security purposes, any printed notes are destroyed through incineration or shredding and disposal. The majority of spoils generated from DCF are incinerated on site. The WCF ships unprinted paper waste offsite for recycling and shreds any waste printed paper and ships it off site for use as an alternative fuel.

Wastewater is generated from the press cleaning operations and from the manufacturing of currency plates. Both the DCF and WCF have industrial pretreatment plants for separately treating these waste streams prior to their discharge to the local Publicly Owned Treatment Works (POTW). Wastewater from the press cleaning operations is treated through the use of pH adjustment, coagulation/flocculation, removal and disposal of waste sludge as non-hazardous waste, and discharge of effluent to the public sewer systems. Plating wastes are treated using chemical reduction, coagulation/flocculation, removal and disposal of waste sludge as hazardous waste, and pH adjustment of the wastewater prior to discharge.

Air emissions are generated at each facility through the use of materials that contain VOCs, including solvents and inks. In addition, emissions occur from fixed equipment such as boilers, emergency generators, plating baths, and incinerators. The Proposed Action includes the use of new inks, containing VOCs, and would require an additional drying process after completion of the offset process. In addition, processes to clean the offset presses would involve the use of solvents that would generate additional air emissions.

2.3 COMPARISON OF ALTERNATIVES CONSIDERED

Impacts in the EA have been classified into impact categories to identify the degree and nature of each impact. This classification system has been used to evaluate whether the preparation of an EIS is appropriate, and to inform decision makers as to the extent of impacts and need for mitigation. Impact categories used are:

- No impact
- Less than significant

- Significant but mitigable
- Significant and unavoidable, or
- Beneficial.

Table 2-1 provides a comparison of alternatives with respect to the categories of impacts.

Table 2-1. Comparison of Alternatives

Characteristic	No Action	Proposed Action	
		DCF	WCF
Achieve Purpose and Need	No	Yes	Yes
Air Quality	○	●	●
Water Supply	○	●	●
Wastewater Disposal	○	●	●
Energy and Utilities	○	●	●
Solid/Hazardous Materials/Waste	○	●	●
Socioeconomics/Environmental Justice	○	○	○
Transportation	○	●	●
Secondary and Cumulative Impacts	○	●	●
Physiography	○	○	○
Wetlands and Floodplains	○	○	○
Biological Resources	○	○	○
Cultural Resources	○	○	○
Prime Farmland	○	○	○
Aesthetics	○	○	○
Noise and Vibration	○	○	○
Radiation	○	○	○
Health and Safety	○	○	○
Land Use	○	○	○
Water Resources	○	○	○
Community Services	○	○	○

Key:
○ No Impact
● Less than Significant Impact
●● Significant but Mitigable Impact
●●● Significant and Unavoidable Impact
✦ Beneficial Impact

2.4 ALTERNATIVES ELIMINATED FROM DETAILED STUDY

Several alternative technologies and production strategies were considered by BEP as part of planning efforts to implement the Next Generation of Currency design. However, the alternatives available to BEP were constrained by the manner in which currency is currently produced as well as security requirements. A summary of these alternatives and the primary reasons they were eliminated from further consideration are provided below.

2.4.1 Wet Offset Printing

Wet offset Printing is very similar to dry offset printing, except that water is used as an ink rejecter. When the initial printing plate is made, the printing image is rendered ink-receptive, while the non-printing areas are rendered water-receptive. The plate is mounted onto the plate cylinder, which, as it rotates, comes into contact with rollers wet with water and rollers wet with ink. Water covers the non-printing surface and prevents the ink from penetrating these areas. The ink wets the image areas, which are transferred to the intermediate blanket cylinder and then finally to the paper.

Wet offset printing was removed from further consideration when compared to dry offset printing for the following reasons:

- Plates have a higher rate of deterioration.
- More difficult to maintain quality
- Higher spoilage rates
- Requires use of low pH wetting agent and resulting waste stream

2.4.2 The Production of the Next Generation of Currency at One Facility

This alternative would involve producing all Next Generation of Currency at either DCF or WCF. This alternative was removed from further consideration because it would pose unacceptable security risk, would require major capacity changes at the selected facility, and would underutilize the resources of the non-selected facility.

2.4.3 The Use of Offset Printing Exclusively to Produce the Next Generation of Currency

The alternative of using offset printing only to produce the Next Generation of Currency and removal of the intaglio process was not considered. BEP is required by law (31 United States Code [USC] Section 5114) to use intaglio printing for currency production. The law states:

> *"The Secretary of the Treasury shall engrave and print United States currency and bonds of the United States Government and currency and bonds of United States territories and possessions from intaglio plates on plate printing presses the Secretary selects."*

2.4.4 Materials and Other Processes Considered

The BEP also considered several other alternatives for either materials or processes that could be used in the production of the Next Generation of Currency. These alternatives and the reasons they were removed from further consideration are provided below.

- Use of Plastic Media. This concept involves the use of virgin petroleum products to manufacture media for currency. This option is more expensive but would result in longer lasting currency. The advantages of plastic do not outweigh paper at this time, because waste recycling is problematic with plastic currency, and the U.S. currency already has an acceptable life span. As compared to the currency of other countries, which typically lasts about 8 months, existing U.S. currency lasts from 22 months for $1 notes, to 4 years for $20 notes, and to 9 years for $50 and $100 notes..
- Addition of Foil Features (e.g., holograms) – This option was considered as a potential security measure; however, the associated costs and questions relating to durability resulted in removal from further consideration.
- Use of Ultraviolet (UV) Cured Inks – The use of UV cured inks was considered, because it would reduce the VOC emissions associated with the ink portion of the currency production process. However, UV cured ink is a relatively new technology and has not been sufficiently developed to be reliable for this use at this time.

3.0 Environmental Setting and Impacts

This chapter describes the environmental setting and discusses the potential environmental impacts that may occur as a result of implementing the Proposed Action and alternatives. The extent of information provided for each environmental subject area is commensurate with the detail necessary to present the impacts analysis as related to the "importance of the impact" as identified through the scoping process. In the spirit of NEPA (40 CFR 1500.2), encyclopedic information that is not directly relevant to the impacts analysis for the Proposed Action and alternatives has not been included. In addition, those areas for which it was obvious that no impact would occur based on the nature of the Proposed Action and scoping considerations are only briefly addressed in Section 3.2.

3.1 ASSESSMENT METHODOLOGY

To the greatest extent possible, discussions have been formulated in a manner to facilitate a comparison of the alternatives. Each section addressing an environmental subject area is organized into three major subheadings:

- Setting – Provides baseline environmental information to support the impacts analysis. This section is further divided to individually discuss the Washington, DC and Fort Worth, TX settings.
- Criteria of Significance – Defines the criteria used to determine the significance of potential impacts.
- Impacts – Describes the potential consequences to the particular subject area associated with each alternative. This section is further divided to individually discuss the impacts related to implementation of the Proposed Action at the DCF and WCF. Impacts are categorized as:
  - ***No impact***
  - ***Less than significant***
  - ***Significant but mitigable***
  - ***Significant and unavoidable***
  - ***Beneficial***
- Mitigation – Identifies measures required to reduce significant impacts to a level of less than significant.

To assess the potential for impacts related to the Proposed Action, operating conditions that would occur as a result of implementing the Proposed Action were established. These boundary conditions include the addition of an offset printing process and are based on an increase in currency production rates of up to 10 percent at the DCF and up to 5 percent at the WCF occurring over a 3-year period. These temporary increases in production rates are based on the manner in which the $20, $50, and $100 notes would be introduced into circulation as described in Section 2.2. After completion of the phase-in of the Next Generation of Currency, production rates are expected to be essentially similar to historical conditions at the BEP facilities. For the purposes of establishing historical baseline conditions, data from 1999 and 2002 production years were used to provide a representative range of production rates. Year 1999 was considered as a reasonable upper bound due to the higher production rates that occurred in preparation for the year 2000.

The impacts that are expected to occur were determined by evaluating the change over baseline conditions that would result from the increased production rates, as well as the new offset printing process included in the Proposed Action. The significance of identified impacts was assessed based on established Criteria of Significance for each environmental condition using the classification process previously described. Environmental conditions for which it was obvious that no change in the baseline would occur, and thus no potential for impacts, are addressed in Section 3.2.

3.2 SCOPING AND ENVIRONMENTAL REVIEW CONSIDERATIONS

As the Proposed Action consists solely of modifying or introducing new industrial processes within existing facilities, the analysis of impacts in this EA is focused on the environmental conditions affected by these processes. In 2001, an EA and FONSI were prepared for the expansion of the WCF to accommodate a visitor center and a transfer station, and to provide space for offset presses. Therefore, the assessment of impacts related to structural modifications required at the WCF to accommodate the offset presses has already been completed and is not addressed in this EA. In keeping with the intent of NEPA, existing environmental conditions have been considered to the extent commensurate with the potential for impacts. The Proposed Action was determined to have no potential for impacts on the following media based on the scoping considerations.

- Physiography – As no new construction, exterior modifications, or new ancillary facilities are part of the Proposed Action, there is no potential for impact to physiographic features.
- Wetlands and Floodplains – As no new construction, exterior modifications, or new ancillary facilities are part of the Proposed Action, there is no potential for impact to wetland or floodplain features.
- Biological Resources and Threatened/Endangered Species – As no new construction, exterior modifications, or new ancillary facilities are part of the Proposed Action, there is no potential for impact to biological resources, and consultation with the US Fish and Wildlife Service is not necessary.
- Cultural Resources – Although the DCF is not listed on the National Register of Historic Places, it does meet the Secretary of the Interior's criteria for listing in the National Register. BEP currently has agreements with the State Historic Preservation Office (SHPO) and the National-Capital Park and Planning Commission for conducting consultation on any exterior or structural modifications. However, the Proposed Action will not impact the property or structure of the DCF, so consultation with these agencies is not necessary. Therefore, no potential for impacts to cultural resources exists. The potential for impacts related to the physical expansion of WCF was reviewed in the 2001 EA for the WCF expansion and resulted in a FONSI. As the Proposed Action would take place entirely within existing facilities at WCF, no potential for cultural resource impacts exists.
- Prime Farmland – As no new construction, exterior modifications, or new ancillary facilities are part of the Proposed Action, there is no potential for impact to Prime Farmland Resources.
- Aesthetics – No exterior modifications are related to the Proposed Action; therefore, there is no potential for impacts to facility or adjacent land use aesthetics.
- Noise and Vibration – All activities would occur within existing facilities and no new noise sources would be introduced that would have the potential to affect sensitive receptors in the areas of the DCF or WCF. Each facility is equipped to manage industrial operations and vibrations related to industrial equipment, and there is no potential for vibration-related impacts as a result of the Proposed Action on adjacent properties or land uses.

- Ionizing and Non-ionizing Radiation – There are no radiation sources related to the Proposed Action and, therefore, there is no potential for impacts related to ionizing or non-ionizing radiation.
- Health and Safety – Changes in industrial processes that would result from the Proposed Action would not introduce any new health and safety concerns that are not already addressed in existing health and safety programs for the DCF and WCF.
- Land Use – The Proposed Action would not result in any changes in land uses at DCF and WCF. Therefore, there is no potential for land use impacts in the setting for either facility.
- Water Resources – The Proposed Action does not involve any new industrial-related stormwater discharges, ground-disturbing activities, or direct discharges to surface waters or waters of the U.S. Therefore, there is no potential for impacts on water resources. However, potential impacts related to water supply and wastewater discharges are further assessed in this EA.
- Community Services – The Proposed Action does not include any characteristics, such as induced growth; substantial increases in the employment base; or the introduction of new processes that would create greater fire hazards or the ability of emergency personnel to respond to those hazards when compared to baseline conditions. As a result, no impacts would occur on community services.

3.3 AIR QUALITY

To protect public health, the U.S. Environmental Protection Agency (EPA), under the authority of the Clean Air Act (CAA), has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants (See Table 3-1).

Table 3-1. National Ambient Air Quality Standards

Criteria Pollutant	Time Basis	Primary Standards	Violation Criteria
Ozone (O_3)	1-hour	0.12 ppm	More than 3 days in 3 years
	8-hour	0.08 ppm	More than 1 day/year
Particulate Matter			
PM_{10}	24-hour	150 □g/m^3	More than 1 day/year
	Annual arithmetic mean	50 □g/m^3	If Exceeded
$PM_{2.5}$	24-hour	65 □g/m^3	> 98th % of conc in a year
	Annual arithmetic mean	15 □g/m^3	More than 1 day/year
Carbon Monoxide	8-hour	9.0 ppm	More than 1 day/year
	1-hour	35 ppm	More than 1 day/year
Nitrogen Dioxide	Annual arithmetic mean	0.053 ppm	If Exceeded
Lead	Calendar Quarter	1.5 □g/m^3	If Exceeded
Sulfur Dioxide	Annual arithmetic mean	0.030 ppm	If Exceeded
	24-hour	0.14 ppm	More than 1 day/year

ppm = parts per million
g/m^3 = grams per cubic meter
Source: U.S. EPA, 2003

These "Primary", health-based standards are intended to protect public health, including sensitive populations (asthmatics, the elderly, and children). The EPA has also established "Secondary" standards that are intended to protect public welfare, including protection against decreased visibility and damage to crops, vegetation, animals, and buildings. The EPA requires each state to identify areas that have attained the NAAQS for criteria pollutants. A geographic area in which the levels of an air pollutant meet the health-based, primary standard is designated an "attainment" area. If a geographic area has a level higher than the Federal primary standard for any air pollutant, it is designated a "nonattainment" area for that pollutant. Because each of the criteria pollutants is measured separately, a geographic area may be an attainment area for one pollutant and a nonattainment area for another at the same time.

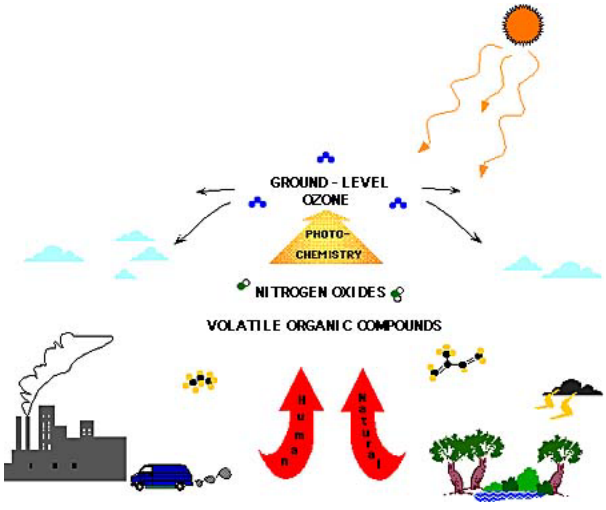
In addition, projects receiving Federal funds that would generate air emissions and are located in nonattainment areas must be assessed using the General Conformity Guidelines (40 CFR 93). These guidelines set emission thresholds (*de minimis* levels) for transportation and other Federal projects (general conformity). If the emissions from an action exceed these thresholds, a conformity analysis must be performed. Currently, the *de minimis* level for each ozone precursor in areas of serious nonattainment is 50 tons per year (TPY) of emissions. Washington, DC and Fort Worth, TX are classified as serious nonattainment areas for ozone and are in attainment for all other pollutants. Washington, DC is in the process of being reclassified as a severe nonattainment area for ozone. This reclassification would lower the *de minimis* threshold for general conformity from 50 TPY to 25 TPY of each ozone precursor for the region.

Setting

General

The majority of air emissions generated by the BEP printing activities are VOCs. Emission sources for VOCs associated with BEP printing operations are primarily related to the use of inks and solvents. VOCs are organic chemicals that can persist in gaseous forms under normal conditions and are a precursor to tropospheric ozone. Ozone formation can occur when VOCs react with Nitrogen Oxides (NOx) in the presence of sunlight (Liu, *et al*, 1997). As a result, VOC emissions can contribute to ground-level ozone pollution.

Figure 3-1 VOCs and Ozone Production



Source: The National Oceanic and Atmospheric Administration Aeronomy Laboratory

Washington, DC

The Air Quality Division (AQD) of the DC Health Department is responsible for compliance and enforcement of air quality regulations in Washington. The DCF is considered a "major source" of emissions under the CAA and operates under a Title V Permit (#035) that has been issued by the AQD pursuant to Chapters 2 and 3, Title 20, of the DC Municipal Regulations (DCMR) (Chapters 2 and 3, 20 DCMR 300). The effective dates of the permit are August 2001 through August 2006. The permit requires BEP to submit annual emission reports to the AQD to verify that emissions are within permitted levels. Table 3-2 summarizes the VOC emissions data from the 1999 and 2002 reports.

Table 3-2. DCF VOC Emissions Data

Process	1999			2002		
	VOC Emissions (TPY)	Ink used (TPY)	Printed Sheets (millions)	VOC Emissions (TPY)	Ink used (TPY)	Printed Sheets (millions)
Currency Operations	76.47	2,381.6	495.7	49.79	1751.6	362.4
Other Operations*	10.73	11.4	13.3	5.26	20.7	28.5
TOTAL	87.20	2,393.0	509.0	55.05	1772.3	390.9

TPY = Tons per year
*Includes stamp printing, ink reconstitution, roller recovery, engraving, miscellaneous clean-up, and experimental presses.
Source: BEP, Air Emissions Summaries, 1999 and 2002

VOC emissions at BEP are mostly attributable to printing operations and are therefore directly related to production rates. Due to reduced production and pollution prevention measures implemented by BEP, total VOC emissions have declined by 37 percent from 1999 to 2002, while production has declined 25 percent. The replacement of four I-8 presses with four I-10 presses resulted in a substantial reduction in emissions. I-10 presses have capture and control equipment, including regenerative thermal oxidizers (RTO), which remove VOCs from the air by high temperature thermal oxidization producing carbon dioxide and water. RTOs capture a minimum of 75 percent of VOCs and have a destruction efficiency of 90 percent. Therefore, they destroy a minimum of 67 percent of VOC emitted from the I-10 presses.

There are also several other air pollutants that are emitted by BEP activities; however, to a much lesser extent when compared to VOC emissions. These pollutants and their primary sources are listed in Table 3-3. Nickel and Chrome plating are performed for the preparation of printing plates. A boiler is used to produce steam by burning waste products generated at the facility, primarily trimmings from currency sheets, which also reduces the quantity of wastes requiring offsite transportation and disposal.

Fort Worth, TX

Compliance and enforcement of air quality regulations in Texas are the responsibilities of the Texas Commission on Environmental Quality (TCEQ). In December 2002, WCF was issued a renewal of their Air Quality Permit (#17994) by TCEQ pursuant to Title 30 of the Texas Administrative Code, Section 116.314(a). The permit includes two offset lithographic presses. This permit is in effect for 10 years and sets forth operating conditions and maximum allowable emission rates for the facility. Included in the permit conditions is the requirement to submit annual emission reports to the TCEQ to demonstrate that emissions are within permitted levels. Table 3-4 summarizes the VOC emissions data from these reports for 1999 and 2002.

Table 3-3. DCF Other Emissions Data

Pollutant	2002 Emissions (TPY)	Primary Emission Source
CO (Carbon Monoxide)	0.16	Boilers/Emergency Generators
HAPS (Hazardous Air Pollutants)	1.03	Miscellaneous Activities
SOx (Sulfur Oxides)	1.85	Waste-fueled boiler
Ni (Nickel)	0.001	Nickel plating
TPM (Total Particulate Matter)	0.43	Chrome plating
NOx (Nitrogen Oxides)	3.30	Waste-fueled boiler

TPY = Tons per year
Source: BEP, Air Emissions Summary, 2002

Table 3-4. WCF VOC Emissions Data (TPY)

Source	1999	2002*
Production Building	8.87	5.95
Vault Exhauster	0.91	0.61
Waste Tank	4.41	2.96
Thermal Oxidizer*	2.82	3.34
Total	17.01	12.86

*Calculation method was changed in 2002 to include VOCs emitted during press cleaning.
Source: BEP, Air Emissions Summaries, 1999 and 2002

The amount of VOC emissions per hour of operation at WCF is less than the DCF because this facility does not operate any I-8 presses. VOC emissions from the I-10 presses are captured and routed through RTOs, which substantially reduce VOC emissions from intaglio presses (84 percent reduction). Although VOC emissions from the RTO have declined from 1999 to 2002, reportable emissions have increased from this point source. This increase is due to a change in sampling procedure, which prior to 2002 did not include VOC emissions generated from I-10 cleaning operations. These emissions were included in the 2002 Emissions Summary; however, actual emissions from the I-10 presses have declined in proportion to the decrease in production experienced since 1999.

Waste paper generated at Fort Worth is shredded and disposed off site. Therefore, there are no substantial air emissions from waste paper disposal at the facility.

Criteria of Significance

An alternative would have a potentially significant impact on air quality if it would:

- Conflict with or obstruct implementation of regional air quality plans.
- Violate an air quality standard or contribute substantially to existing or projected air quality violations.

- Result in a cumulatively considerable net increase of any criteria pollutants for which the project region is in nonattainment under an applicable Federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors; i.e., 50 TPY of any ozone precursor for Fort Worth, TX and 25 TPY for Washington, DC.).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

Impacts

No Action

Because the No Action alternative would not alter baseline conditions, it would have **no impact** on air quality.

Proposed Action

The BEP is in the process of testing the offset presses at both the DCF and WCF. As part of these initial tests, BEP has estimated VOC emission rates for the presses. VOC emissions from the offset presses were calculated assuming three shifts per day, 300 days per year. Each shift would include 6.5 hours of operation. As a result, the presses would be operated for 5,850 hours per year. Table 3-5 gives estimated use rates for the chemicals based on BEP preliminary test data.

Table 3-5. Estimated Use Rates for One Offset Press

Material	Minimum	Max	Average	Annual Quantity
Paper (sheets per hour)	8,000	10,000	9,000	58,500,000 sheets
Offset ink (lbs per hour)	25.6	32	28.8	187,200 lbs
Solvent/Blanket wash (lbs per hour)	1.64	1.64	1.64	9,594 lbs
Damping Solution (lbs per week)	5.06	5.06	5.06	264 lbs

lbs = pounds
Source: Department of Health, 2003 and BEP, 2001a

Two types of materials would be used during the operation of the offset presses: inks and solvents/blanket wash. The materials used meet the U.S. EPA Control Techniques Guidelines for Offset Lithography and California SJUAPCK 4607 Graphic Act regulation. The inks contain no more than 30 percent VOCs, and the cleaning solvents have a vapor pressure of less than 10 millimeters of mercury at 20 degrees Celsius.

VOC emissions from the ink are further reduced due to absorption of VOCs by the paper. Upon transfer to the paper, approximately 95 percent of the VOCs in the ink are absorbed by the paper or retained in the dried ink, and are not released into the atmosphere. Table 3-6 provides the estimated amount of VOCs emitted by each offset press.

Table 3-6. Maximum VOC Emissions from Offset Press Operation (per Press)

	Annual	Peak Rate	Daily
Total VOC Emissions	4 tons	1.36 lb/hr	26.5 lbs

Source: Department of Health, 2003 and BEP, 2001a

Washington, DC

Implementation of the Proposed Action at DCF would involve the operation of three offset presses. BEP obtained an operating permit for 2 offset presses in January 2003; the third offset press is included in the Bureau's Title V permit. The operation of these presses in compliance with the permits would increase VOC emissions at the facility by a maximum of 11.93 TPY. Adding these emissions to 2002 levels results in a 21 percent increase in VOC emissions when compared to 2002 and a 23 percent decrease compared to 1999. Due to the accelerated rollover for the $100 notes, overall production at the facility is expected to increase by a maximum of 10 percent for the next 3 years. Therefore, yearly VOC emissions would increase from 55.05 tons in 2002 to 73.68 tons over the next 3 years. However, this increase would be significantly less than the 87.2 tons of VOC emitted by DCF in 1999.

Waste paper generation rates will increase in conjunction with increased currency production. A 10 percent increase in waste paper would result in increases in emissions of approximately 0.19 ton of SOx and 0.33 ton of NOx. These increases are minor and within the levels permitted by AQD.

Because increases in VOC emissions associated with the Proposed Action, in both the short-term and long-term, would not exceed permitted capacities of DCF, are within the bounds of historical operating emissions for DCF, and would not exceed the current 50 TPY or the proposed 25 TPY *de minimis* levels for conformity, impacts related to air emission would be **less than significant.** In addition, as all elements of the Proposed Action would occur indoors and would not create objectionable odors or expose sensitive receptors to substantial pollutant concentrations **no impact** would occur for these criteria.

Fort Worth, TX

Implementation of the Proposed Action at WCF would include the operation of three offset presses. Operation of these presses would increase VOC emissions from 12.86 tons in 2002 to 21.61 TPY. Adding these emissions to 2002 levels results in a 68 percent increase in VOC emissions when compared to 2002 and a 27 percent increase compared to 1999 rates. Based on the anticipated increase in production rates during the phase-in period, these emissions would be an additional 5 percent higher over a 3-year period. As a result, estimated yearly VOC emissions would be 22.69 TPY during the phase-in period. Both the long-term increase to 21.61 TPY and short-term increase to 22.69 TPY are substantially less than the WCF permitted emission rate of 32.90 TPY.

Because increases in VOC emissions associated with the Proposed Action, in both the short-term and long-term, would not exceed permitted capacities of WCF, would not exceed *de minimis* levels for conformity, and BEP will continue to comply with all requirements set forth by TCEQ in Air Permit 17994 and amendments, impacts related to air emissions would be **less than significant.** Although the relative increase in emissions is greater than historical emissions for the WCF, this increase is a result of the comparatively low emission rates achieved at this facility through their existing emission control equipment. In addition, as all elements of the Proposed Action would occur indoors and would not create objectionable odors or expose sensitive receptors to substantial pollutant concentrations **no impact** would occur in for these criteria.

Mitigation

No mitigation is required, other than compliance with applicable air permits.

3.4 WATER SUPPLY

Setting

Washington, DC

In cooperation with the U.S. Army Corps of Engineers (USACE) Washington Aqueduct and the U.S. EPA, the District of Columbia Water and Sewer Authority (DCWASA) provides potable water to 500,000 customers, including the DCF. The Washington Aqueduct operates and maintains the raw water facilities and treatment plants that supply potable water to the distribution systems of DCWASA, parts of Northern Virginia, and buildings of the Federal Government. Source water for this system is obtained from the Potomac River, upstream of the District of Columbia.

Raw water is stored in the Dalecarlia Reservoir and the Georgetown Reservoir. There are two water treatment plants (WTP) in the system, Dalecarlia and McMillan. Treatment processes at Dalecarlia and McMillan WTPs include pre-sedimentation, disinfection, mixing, sedimentation, filtration, primary disinfection, and secondary disinfection. Dalecarlia, the older WTP, has a treatment capacity of 264 million gallons per day (MGD), while McMillan has a treatment capacity of 180 MGD. The combined treatment capacity exceeds the average and peak requirements of the service area (DCWASA, 2003). Approximately 180 MGD of water is treated and distributed by both facilities (DCWASA, 2001), which represents 40 percent of the combined treatment capacity.

DCWASA is responsible for the potable water distribution system serving the District of Columbia, as well as select Department of Defense and several other customers outside of the district. To distribute water, the DCWASA operates over 1,200 miles of pipes ranging in diameter from 4 to 78 inches, five pumping stations, five reservoirs, four elevated water storage tanks, 36,000 valves, and 8,700 hydrants. To compensate for a ground elevation difference of approximately 410 feet from the low point to the high point in the district, DCWASA divided the system into seven service areas. Each of the service areas includes pumping stations, a reservoir and/or water storage tanks. The DCF is located in the Low Service Area, which includes the area around the National Mall and the Anacostia River, and has ground elevations ranging from 0 to 70 feet above mean sea level (msl). The Brentwood Reservoir stores treated water for the Low Service Area, and the Washington Aqueduct's Dalecarlia Pumping Station and DCWASA's Bryant Street Pumping Station distribute the treated water.

Based on annual data from the BEP Office of Facilities Support (Toney, 2003), the current water consumption at the DCF is approximately 245,000 gallons per day (GPD), which represents 0.14 percent of the current demand on the DCWASA system and less than 0.06 percent of total capacity. The average water consumption by DCF during accelerated currency production in 1999 was approximately 360,000 GPD (a 47 percent increase above the current consumption).

Fort Worth, TX

The Fort Worth Water (FWW) Department currently provides drinking water for Tarrant County, including the WCF, and portions of Johnson County. Source water for FWW comes from four lakes and two reservoirs:

- Lake Bridgeport
- Eagle Mountain Lake

- Lake Worth
- Benbrook Lake
- Cedar Creek Reservoir, and
- Richland-Chambers Reservoir.

The raw water is pumped to one of the four FWW WTPs: Holly North, Holly South, Rolling Hills, or Eagle Mountain. Treatment processes at each of the facilities include chemical addition, coagulation and flocculation, filtration, disinfection, and clearwell storage (FWW, 2003). The combined treatment capacity of the four plants is 360 MGD (FWW, 2003). The current average demand is approximately 154 MGD, which is 43 percent of the treatment capacity. Treated water is distributed to the service area through more than 2,400 miles of pipeline (FWW, 2001).

Based on annual data from the BEP Office of Facilities Support (Toney, 2003), the current water consumption at the WCF is approximately 175,000 gallons per day (GPD), which represents 0.11 percent of the current demand on the FWW system and less than 0.04 percent of total capacity. The average water consumption by WCF during accelerated currency production in 1999 was approximately 260,000 GPD (a 49 percent increase above the current consumption).

Criteria of Significance

An alternative would have a potentially significant impact on water supply if it would:

- Cause the need for a local municipality to construct new water facilities or substantially expand existing facilities, the construction of which could cause significant environmental effects.
- Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table levels that would adversely affect local wells.
- Fail to provide an adequate supply of safe drinking water in accordance with the Safe Drinking Water Act (SDWA) and local health organization requirements.

Impacts

No Action Alternative

The No Action alternative would not alter baseline conditions and would otherwise have **no impact** on water supply facilities in Washington, DC or Fort Worth, TX.

Proposed Action

Washington, DC

The Proposed Action would add an offset printing process, temporarily increase production rates (estimated 10 percent over 3 years), and require the hiring of approximately 33 additional staff at DCF. The long-term increase in water use attributable to the operation of the offset printing process would include the consumption related to the additional staff, plus the water used to prepare and clean the offset plates. The increase has been estimated by BEP at less than 1,000 GPD, which would have a negligible effect on facility consumption. Short-term increases in water usage resulting from phasing in of the Next Generation of Currency would have the potential to increase water consumption at the DCF by up to 10 percent above the existing water demand (245,000 GPD) for a 3-year period. As a result, the water use

would be expected to reach approximately 270,500 GPD (including the 1,000 GPD long-term increase), which is substantially below the average consumption in 1999. The additional consumption of approximately 25,500 GPD would represent a 0.01 percent increase over current system demand and constitute less than 0.006 percent of the entire DCWASA capacity. After 3 years, water consumption by DCF would return to roughly the current level plus the additional 1,000 GPD.

Because the DCWASA is currently operating at 40 percent of capacity, the Proposed Action would have a **less than significant** impact on water supply for the existing facility and the Washington, DC area, both long-term and short-term. Also, as DCWASA regularly monitors the supplied water for compliance with the SDWA requirements and DCF is equipped with appropriate backflow prevention devices to prevent compromising of the water system during system pressure drops, the Proposed Action would not pose a risk to the water supply. The DCWASA does not rely on groundwater resources.

Fort Worth, TX

The Proposed Action would add an offset printing process, temporarily increase production rates (estimated 5 percent over 3 years), and require the hiring of approximately 33 additional staff at WCF. The long-term increase in water use attributable to the operation of the offset printing process would be the same as estimated for DCF (less than 1,000 GPD), which would have a negligible effect on facility consumption. Short-term increases in water usage resulting from phasing in of the Next Generation of Currency would have the potential to increase water consumption at the WCF by up to 5 percent above the existing water demand (175,000 GPD) for a 3-year period. As a result, the water use would be expected to reach approximately 184,750 GPD (including the 1,000 GPD long-term increase), which is substantially below the average consumption in 1999. The additional consumption of 9,750 GPD would represent a 0.006 percent increase over current system demand and constitute less than 0.003 percent of the entire FWW capacity. After 3 years, water consumption by WCF would return to roughly the current level plus the additional 1,000 GPD.

Because the FWW is currently operating at 43 percent of capacity, the Proposed Action would have a **less than significant** impact on water supply systems at the existing facility and in the Fort Worth, TX area. Also, as FWW regularly monitors the supplied water for compliance with the SDWA requirements and WCF is equipped with appropriate backflow prevention devices to prevent compromising of the water system during system pressure drops, the Proposed Action would not pose a risk to the water supply. FWW does not rely on groundwater resources.

Mitigation

No mitigation would be required for impacts on water supply at either site.

3.5 WASTEWATER DISPOSAL

Setting

Washington, DC

The DCWASA currently receives wastewater from DCF. DCWASA operates the Blue Plains Advanced Wastewater Treatment Plant (AWTP), which serves approximately 2 million people in the metropolitan area including the District of Columbia, Maryland, and Virginia.

The Blue Plains AWTP, located at the southern end of the city along the Potomac River, covers 150 acres and is the largest advanced wastewater treatment plant in the United States. It has a rated average

capacity of 370 MGD and a peak wet-weather capacity of 1.075 billion gallons per day (BGD). The plant uses primary treatment, secondary treatment, nitrification/denitrification, effluent filtration, disinfection, and post aeration to process wastewater collected from the service area. Treated effluent is discharged into the Potomac River near the Wilson Bridge. Primary sludge and secondary waste-activated sludge are processed in digesters and stabilized using lime (DCWASA, 2003).

The DCWASA operates and maintains 1,800 miles of sanitary and combined sewers, 22 flow-metering stations, nine off-site pumping stations, and 16 stormwater pumping stations within the district. The sewers range in size from 8-inch-diameter pipelines to 27-foot-diameter interceptors. Separate sanitary and storm sewers serve approximately two thirds of the city; however, in older portions of the system, combined sanitary and storm sewer systems exist (DCWASA, 2003).

To ensure efficient design and environmental management, the storm sewer system is a shared responsibility of DCWASA and other public agencies, such as the Department of Public Works. The storm sewer system in the district consists of approximately 8,200 catch basins, 600 miles of storm sewers, and over 400 separate pumping stations located throughout the district (DCWASA, 2003).

DCF discharges approximately 245,000 GPD of wastewater to the DCWASA system (Toney, 2003). This amount includes both pretreated industrial wastewater and sanitary wastewater and represents less than 0.1 percent of the average capacity of the DCWASA system. The average discharge by DCF based on water consumption during accelerated currency production in 1999 was approximately 360,000 GPD.

To minimize the effects of currency production wastewater in compliance with DCWASA requirements, the DCF operates two wastewater pretreatment plants (WWPP), one to treat wastewater from plate manufacturing and one to treat wastewater from the intaglio printing process. Both plants operate on an as-needed basis during respective process operations. The DCF is responsible for self-monitoring the quality of effluent and ensuring compliance with the wastewater discharge permits for both plants (Martin, 2003a).

The WWPP for the intaglio printing processes removes oils and grease, and adjusts the pH, before discharging effluent to the city sewer system. The plant discharges approximately 80,000 GPD during normal operation (Martin, 2003c). Yearly totals for the WWPP effluent during 1999 and 2002 were 26,819,218 gallons and 19,422,180 gallons, respectively (BEP, 2003h).

The Plating WWPP treats wastewater generated during plate manufacturing to remove oil, grease, and metals (nickel, copper, chrome) and to adjust pH before it is discharged into the city sewer system. Effluent volumes are approximately 2,700 GPD during plating operations.

Forth Worth, TX

The City of Fort Worth currently treats wastewater from WCF at the Village Creek Wastewater Treatment Plant (VCTP) located east of downtown on the Trinity River. VCTP serves more than 750,000 people in Tarrant County and a portion of Johnson County. The plant uses settling, filtration, biological activity, and disinfection during primary, secondary, and tertiary treatment processes. It has a rated capacity of 144 MGD, and is operating with an average daily flow of 127.4 MGD. The plant discharges treated effluent to the Trinity River (FWW, 2003).

The City of Fort Worth also operates separate wastewater and storm water collection systems. The storm drainage system includes over 630 outfalls. The Department of Environmental Management is responsible for maintaining and monitoring storm water discharge quality. Storm water is collected and discharged into local lakes and rivers. To ensure a high level of water quality, the city requires permitting of all activities that could adversely affect storm water quality (FWW, 2003).

In 1999, the WCF discharged a peak daily flow rate of 308,000 GPD (City of Fort Worth, 1999a and b). In 2002, the peak daily flow rate was 194,000 GPD or 0.13 percent of VCTP total capacity (City of Fort Worth, 2002a and b). The WCF is responsible for self-monitoring the quality of its wastewater discharge (City of Fort Worth, 1999a).

Currently, plate-cleaning solution created during the intaglio printing process is pretreated prior to discharge from WCF. The solution is treated with a 35 percent calcium chloride solution in a coagulation/flocculation process to remove the ink. Non-hazardous solid precipitant is removed by centrifugation, drummed, and disposed of in a Subtitle D landfill. The liquid effluent is adjusted for pH and released to the sanitary sewer system.

Criteria of Significance

An alternative would have a potentially significant impact on wastewater facilities if it would:

- Directly result in the need for the local provider to construct new wastewater treatment facilities or expand existing facilities.
- Result in a determination by the wastewater treatment provider that it cannot adequately serve the project's projected load in addition to the provider's existing commitments.
- Overload collection systems or otherwise cause the collection system to fail or result in surcharges.
- Otherwise result in violation of the wastewater treatment plant National Pollutant Discharge Elimination System (NPDES) permit.

Impacts

No Action Alternative

The No Action alternative would not alter baseline conditions and would otherwise have **no impact** on wastewater facilities in Washington, DC or Fort Worth, TX.

Proposed Action

No new wastewater discharges will result from the use of the offset presses; however, wastewater would be generated from rinsing offset plates during manufacturing. The offset plates to be used by BEP are aluminum with a photosensitive coating. The photosensitive coating is removed from the print image portions on the plate through exposure to UV light, and is then rinsed from plate with filtered water. The plate rinsate would add a minimal amount of wastewater and would be negligible compared to current discharges. Rinsing one plate would generate approximately 3.45 gallons of water. BEP has analyzed the offset plate rinsate for metals, inorganics, and volatile organics (VOCs) and has determined that the rinsate would not require pretreatment. Only very small amounts of metals (copper - 0.076 mg/l, zinc – 0.183 mg/l, and molybdenum – 0.014 mg/l) were detected as part of the analysis.

Washington, DC

The Proposed Action would add an offset printing process, temporarily increase production rates (estimated at 10 percent over 3 years), and require the hiring of approximately 33 additional staff at DCF. The long-term increase in wastewater discharge attributable to the operation of the offset printing process would include the sanitary wastewater related to the additional staff, plus the rinsate wastewater from preparation of the offset plates. This increase has been estimated by BEP at less than 1,000 GPD, which

would have a negligible effect on wastewater discharge. Short-term increases in wastewater discharge resulting from phasing in of the Next Generation of Currency would have the potential to increase the rate of discharge at the DCF by up to 10 percent above the existing rate (approximately 245,000 GPD based on water consumption) for a 3-year period. As a result, the wastewater discharge would be expected to reach approximately 270,500 GPD (including the 1,000 GPD long-term increase), which is substantially below the average discharge rate for 1999. The additional discharge of approximately 25,500 GPD would represent 0.007 percent of the current average DCWASA capacity. After 3 years, the discharge by DCF would return to roughly the current level plus the additional 1,000 GPD. Because the increase in wastewater discharge would be well within the capacities of DCF and DCWASA facilities, the Proposed Action would have a **less than significant** impact on wastewater systems.

Fort Worth, TX

The Proposed Action would add an offset printing process, temporarily increase production rates (estimated 5 percent over 3 years), and require the hiring of approximately 33 additional staff at WCF. The long-term increase in wastewater discharge attributable to the operation of the offset printing process would be the same as estimated for DCF (less than 1,000 GPD), which would have a negligible effect on wastewater discharge. Short-term increases in wastewater discharge resulting from phasing in of the Next Generation of Currency would have the potential to increase the rate of discharge at the WCF by up to 5 percent above the existing rate (approximately 175,000 GPD based on water consumption) for a 3-year period. As a result, the wastewater discharge would be expected to reach approximately 184,750 GPD (including the 1,000 GPD long-term increase), which is substantially below the average discharge rate for 1999. The additional discharge of approximately 9,750 GPD would represent 0.007 percent of the current VCTP capacity. After 3 years, the discharge by WCF would return to roughly the current level plus the additional 1,000 GPD. Because the increase in wastewater discharge would be well within the capacities of WCF and FWW facilities, the Proposed Action would have a **less than significant** impact on wastewater systems.

Mitigation

No mitigation would be required for impacts on wastewater systems at either site.

3.6 ENERGY AND UTILITIES

Setting

Washington, DC

Pepco, a wholly owned subsidiary of Pepco Holdings, Inc., supplies electricity to the DCF. Pepco provides transmission and distribution services to over 700,000 homes and businesses. The service area includes 640 square miles in the District of Columbia and Maryland suburbs.

Washington Gas, a local utility, provides natural gas to the DCF. The combined service area includes portions of Maryland and Virginia, as well as the District of Columbia. Washington Gas is responsible both for purchasing and distributing natural gas to its customers. The DCF is also served by Federal steam generation and distribution facilities in the District of Columbia for heating and hot water.

Table 3-7 summarizes the energy use and rate of production by the DCF during accelerated production in 1999 compared to normal production in 2002.

Table 3-7. DCF Energy Use and Production Data

	1999	2002	Increased Rate, 1999 over 2002
Electricity (MWH)	55,155	53,392	3.3%
Natural Gas (CCF)	47,119	43,662	7.9%
Steam (BBTU)	93.5	93.8	N/A
Currency (Billions of Notes)	5.5	3.4	61.8%
Postage (Billions of Stamps)	19.0	12.2	55.7%

Key: MWH = Megawatt hours
CCF = Thousands of cubic feet
BBTU = Billions of British Thermal Units
Source: Toney, 2003

Fort Worth, TX

TXU, a conglomerate of TXU Electricity, and Oncor provide electric and natural gas service to the WCF. TXU Electricity is the largest competitive energy generator in the U.S. with 2.7 million customers and 105 terawatt hours in sales. The company generates more than 18,000 megawatts from coal, natural gas, and nuclear generators, using 70 electric generating units at 23 plant sites. TXU also purchases energy for distribution from wind generation and from methane gas created in landfills and biomass facilities. TXU serves over 1.4 million natural gas customers throughout Texas with approximately 144 billion cubic feet of gas each year.

Oncor, a regulated energy delivery business, handles energy distribution for TXU Electricity and other retail providers. Oncor's service area includes 2.7 million customers throughout Texas. To provide these services, Oncor maintains 14,000 miles of electric transmission lines, 95,000 miles of electric distribution lines, 9,000 miles of gas transmission pipelines, and 24,000 miles of gas distribution pipelines.

Table 3-8 summarizes the energy use and rate of production by the WCF during accelerated production in 1999 compared to normal production in 2002. Unlike the DCF, which purchases steam from the General Services Administration, the WCF generates steam on site using purchased natural gas. Also, WCF production does not include the printing of postage stamps, which are printed at DCF.

Table 3-8. WCF Energy Use and Production Data

	1999	2002	Increased Rate 1999 over 2002
Electricity (MWH)	48,149	44,441	8.3%
Natural Gas (CCF)	176,290	119,540	47.5%
Currency (Billions of Notes)	5.9	3.6	63.9%

Key: MWH = Megawatt hours
CCF = Thousands of cubic feet
Source: Toney, 2003

Criteria of Significance

An alternative would have a potentially significant impact on energy resources if it would cause any of the following conditions.

- Directly exceed the capacity of a regional supplier of electrical power or natural gas.
- Require the extension of utility cables, pipelines, or conduits significantly beyond existing service areas and require new utility rights-of-way acquisition, excavation, or construction with associated adverse impacts.
- Induce population growth in the service area of a regional utility supplier significantly above projections, which would exceed utility capacities and create the need for additional facilities to maintain acceptable levels of service.

Impacts

No Action Alternative

The No Action alternative would not alter baseline conditions and would otherwise have **no impact** on utilities in Washington, DC or Fort Worth, TX.

Proposed Action

Washington, DC

The Proposed Action would add an offset printing process, temporarily increase production rates (maximum of 10 percent), and require the hiring of approximately 33 additional staff. The proposed acceleration of the Next Generation of Currency production would have the potential to increase electric and natural gas usage at the DCF over a 3-year period. However, a 10 percent increase in currency production would not translate directly into a 10 percent increase in energy consumption, as evidenced by the data for 1999 and 2002 in Table 3-7, because most energy demand is related to facility size and associated non-production energy needs. Therefore, a 10 percent increase in production would have a negligible effect on energy demand. After 3 years, demand is expected to return to baseline levels of 2002. The addition of three new offset presses would require an additional 109 kVA of electricity each during normal operation. The new presses will not increase the demand for natural gas.

Representatives for Pepco and Washington Gas indicated that the utilities have sufficient capacity to meet the requirements for the new process additions. Therefore, the Proposed Action would have a **less than significant** impact on energy supply for the existing facility and in the Washington, DC area for any of the evaluation criteria. Because the Proposed Action would not affect growth and development in the Washington Metro Area, it would have no effect on regional energy demand.

The Proposed Action would have **no impact** on the Federal steam generation and distribution system, because there would be no change in the volume of the DCF building that would affect the demand for heat and hot water.

Fort Worth, TX

The Proposed Action would add an offset printing process, temporarily increase production rates (maximum of 5 percent), and require the hiring of approximately 33 additional staff. The proposed acceleration of the Next Generation of Currency production would have the potential to increase electric and natural gas usage at the WCF over a 3-year period. However, a 5 percent increase in currency

production would not translate directly into a 5 percent increase in consumption, as evidenced by the data for 1999 and 2002 in Table 3-8, because most energy demand is related to facility size and associated non-production energy needs. Therefore, a 5 percent increase in production would have a negligible effect on energy demand. After 3 years, demand is expected to return to baseline levels of 2002. The addition of three new offset presses would require an additional 109 kVA of electricity each during normal operation. The new presses will not increase the demand for natural gas.

Representatives for TXU and Oncor indicated that the utilities have sufficient capacity to meet the requirements for the new process additions. Therefore, the Proposed Action would have a **less than significant** impact on energy supply for the existing facility and in the Fort Worth, TX area for any of the evaluation criteria. Because the Proposed Action would not affect growth and development in the Dallas-Fort Worth Metro Area, it would have no effect on regional energy demand.

Mitigation

No mitigation would be required for impacts from energy supply at either of the Proposed Action sites.

3.7 SOLID WASTE, HAZARDOUS WASTE, AND HAZARDOUS MATERIALS

Setting

General

Solid Waste

The major production-related source of BEP's solid waste is derived from intaglio press waste inks. Waste ink from the pre-wipe blade on face presses is reconstituted and reused; however, ink from the back presses and ink wiped off the presses and rollers during cleaning is treated as a waste. Rags used to clean the presses are laundered and reused.

At both DCF and WCF, waste ink that is washed off the intaglio plates by the wiping solution is conveyed to a pretreatment plant. During plate and roller cleaning, the ink is mixed with water and wiping solution and is suspended in aqueous solution. The purpose of the pretreatment plants is to control pH, remove metal solids, oil and grease, and to remove suspended solids, such as the ink, prior to discharge to the public sanitary sewer. The pretreatment plants ensure that the rinse water discharged to the sanitary sewer is within the municipalities' thresholds, which prevents BEP from having to store all rinse water for off-site disposal. Once the solids have been precipitated out of solution, they are dewatered and placed in containers (boxes or drums) for disposal. At WCF, dewatering is performed via centrifugation, and the solids are placed into recycled 55-gallon ink drums. At DCF, a filter press dewaters the solids, which are then placed into cubic yard boxes for disposal. The DCF sludge boxes are transported by a contracted waste hauler to a landfill in Model City, New York. A private contractor transports sludge from WCF to a landfill in Oklahoma.

Sludge disposal quantities from 1999 and 2002 for both DCF and WCF are presented in Table 3-9. Sludge generation rates at both facilities decreased approximately 30 percent from 1999 to 2002. This decrease is due to a similar percentage decrease in currency production during this period.

Table 3-9. Sludge Waste for DCF and WCF, 1999 and 2002

Location	1999 (lbs)	2002 (lbs)
DCF	5,450,432	3,785,500
WCF	3,200,000	2,324,358

lbs = pounds
Source: BEP documentation, 1999, 2002

In addition to sludge waste, both DCF and WCF have several other solid waste streams. The most notable waste stream is related to spoils that are generated during production. Spoils constitute both waste sheets that are defective or otherwise compromised and trimmings generated from cutting the currency sheets. Spoils generated at DCF are shredded and primarily destroyed on site through incineration; however, approximately 10 percent are disposed of off site at a properly permitted facility. Spoils generated from WCF are shredded and shipped off site for disposal or use as an alternative fuel. There are no other significant non-hazardous solid waste streams that are directly associated with currency production.

Hazardous Materials/Waste

The manufacturing of printing plates requires several steps and is the source of several of the BEP's hazardous waste streams. Impressions, referred to as Alto plates, taken from the master plates are cleaned and coated with dichromate prior to placement in a nickel sulfonate bath. This bath creates a nickel-printing surface on the plate. After a nickel layer of the correct thickness has been deposited on the surface of the plate, the plates are cleaned, polished, and trimmed to the correct size. The plates are then plated in a chromic acid bath, which creates a hardened wearing surface of chrome on the plate. Once removed from the chromic acid, the plates are inspected. Plates that fail to meet specifications are placed in a dechroming tank. Once the imperfect plates are dechromed, they are again plated in the chromic acid bath. After a plate has passed inspection, it is cleaned with a 50 percent solution of hydrochloric acid and then ready for use.

By weight, the largest hazardous waste stream is derived from the washing of the tanks used in the reconstitution and manufacture of inks. The tanks used during this process are washed with a caustic solution every 60 to 80 days. The washing schedule is independent of production rates.

Washington, DC

Hazardous Materials

The Emergency Planning and Community Right to Know Act (EPCRA) requires that BEP provide a Tier II Emergency and Hazardous Chemical Inventory Report to the DC Emergency Management Agency. In addition, BEP maintains a warehouse storage facility in Landover Maryland that is subject to the EPCRA requirement. The Landover facility is used for short-term storage of chemicals and other materials used at DCF. A similar report that details the chemicals stored at the Landover warehouse facility is provided to the Maryland Emergency Response Commission.

The inks, varnishes, and oils used in printing operations do not change often, and the physical and chemical characteristics remain fairly constant. The BEP reports a list of chemicals based on chemical groups rather than individual chemicals, because there are many with the same characteristics. Tables 3-10 and 3-11 provide lists of chemicals and the range of quantities stored at the Landover warehouse and DCF.

Table 3-10. Landover Warehouse EPCRA Chemical Inventory

Chemical Description	Max Daily Amount	Average Daily Amount
Non-heatset intaglio inks	5	5
Calcium carbonate	5	4
Bentonite	4	4
Quickset vehicle	4	3
Varnishes	5	5

Key to codes:
3 = 1,000 – 9,999 lbs
4 = 10,000 – 99,999 lbs
5 = 100,000 – 999,999 lbs
Source: Tier II Report, Washington, DC, BEP, 2003c

Table 3-11. DCF EPCRA Chemical Inventory

Chemical Description	Max Daily Amount	Average Daily Amount
Sulfuric acid	5	4
Lubricating oil	4	4
Varnishes	5	4
Heatset intaglio inks	5	5
Letterpress inks	4	3
Resin OXY 80 PVC	4	3

Key to codes:
3 = 1,000 – 9,999 lbs
4 = 10,000 – 99,999 lbs
5 = 100,000 – 999,999 lbs
Source: Tier II Report, Washington, DC, BEP, 2003c

Hazardous Waste

DCF is classified as a large-quantity generator (LQG) of hazardous waste under the Resource Conservation and Recovery Act (RCRA). Hazardous waste streams directly related to the production of currency, and generating over 1,000 pounds per year of waste, are listed in Table 3-12. Other hazardous wastes generated at DCF include oils, lead-based paints, and asbestos-containing material (ACM) from facility renovation activities. These waste streams are minor components of the total hazardous waste generated at the facility, and collectively constitute approximately 10 percent by weight.

Table 3-12. DCF Hazardous Wastes

Waste Name	1999 (lbs)	2002 (lbs)
Bucketwasher – Tanker	143,762	154,910
Waterbase Gravure Ink <6% solids	65,496	19,618
Chrome Sludge with Lime	16,071	9,946*
Pre-treatment Plant Chrome Sludge	14,208	NL
PVC Sludge/Pumpable	10,159	4,711
Ink/Solvents	10,007	2,558
Ferric Chloride Solution	4,624	0
Sulfuric Acid and Dechrome	3,896	742
Chromic Acid/Dechrome Solution	3,165	0
Untreated Wastewater	2,800	0
Ferric Chloride and Xylene	2,650	103
Chrome Sludge with Oil	1,912	1,676
Dalco 92	1,200	0
Flammable Liquid	1,200	NL
Corrosive – Acidic	1,145	NL
Isomet	1,042	21,796
Lab pack	NL	7,800
WPF plating sludge	NL	4,447
Rags soaked with petroleum distillates	209	4,051
Ferric chloride washwater	NL	1,657
Other, non-production related waste streams	34,369	21,924
Totals	**317,915**	**255,939**

NL = Not Listed
lbs = pounds
*Estimated based on 1999 volume using the 2002/1999 ink sludge ratio of 0.7.
Source: BEP, 2002c

FORT WORTH, TX

Hazardous Materials

EPCRA requires that BEP provide a Tier II Emergency and Hazardous Chemical Inventory Report to the Texas State Emergency Response Commission. The inks, varnishes, and oils used in printing operations do not change often, and the physical and chemical characteristics remain fairly constant. Therefore, the list of chemicals in Table 3-13 describes groups of chemicals rather than individual chemicals.

Table 3-13. WCF EPCRA Chemical Inventory

Chemical Description	Max Daily Amount (lbs)	Average Daily Amount (lbs)
Printing Ink – SICPA Intaglio	275,000	120,000
Printing Ink – Intaglio Magnetic Ink	310,000	120,000
Printing Ink – Intaglio Reconstituted Ink	30,000	15,000
Pre-wipe Ink	176,000	75,000
Printing Ink – Intaglio Infrared	105,000	25,000
Printing Ink – Intaglio Non-magnetic	45,000	20,000
Naptha/Mineral Spirits	20,000	10,000
Calcium Chloride – 35% solution	230,000	130,000
Sodium Hydroxide – 50% solution	128,000	85,000
Sulfuric Acid – 93% solution	91,560	50,000
Sulfuric Acid – 17% solution	37,200	10,000
Petroleum Hydrocarbon Mixture – No. 2 Fuel Oil	150,000	100,000
Sulfonated Vegetable Oil – 50% solution	51,900	25,000
Aqueous caustic cleaner – press roll wiping solution	27,000	20,000
Carbon	10,500	4,000
Alkyds	23,000	7,500
Calcium Carbonate	95,000	45,000
Wax	25,000	15,000
Composite Varnish	26,000	12,000
Alkyds – Plate Oil	23,000	7,500
Black Iron Oxide	28,300	12,000
Alkyds – Quickset Vehicle	12,500	7,000

Source: BEP, 2003e

Hazardous Waste

WCF is classified as a LQG under RCRA. Table 3-14 provides a list of WCF hazardous waste streams and the amount of waste generated in 1999 and 2002 for each stream.

The quantity of hazardous waste generated at the WCF increased from 1999 to 2002 due to large, one-time shipments of hazardous waste. These shipments were related to the plating liquid and lithium bromide waste streams that were affected by a leak in the chrome plating tank and the decommissioning of two absorption chillers. The chromium tank leak generated approximately 3,400 gallons of chromium-contaminated water. The chromium content of the water was too high to be treated on site and therefore the water had to be shipped as hazardous waste to a processing facility. The decommissioning of the two absorption chillers accounted for the generation of lithium bromide waste. There are no recurring operations at the WCF that generate lithium bromide. When considering waste generation rates, exclusive of these unique events, the amount of hazardous waste generated at the WCF decreased from 79,400 pounds in 1999 to 48,300 pounds in 2002.

Table 3-14. WCF Hazardous Wastes

Waste Name	1999 (lbs)	2002 (lbs)
Solvent	12,500	16,800*
Electroplating sludge	9,020	10,500*
Lab packs	772	0
Mercury devices	2,700	0
HCl solution	400	NL
Printing press rinse	1,000	NL
De-chroming liquid	4,900	2,400
Chromic acid	2,000	2,800
Lead acid batteries	2,850	0
Antifreeze	5,800	1,600
Hazardous debris	29,160	14,250
Sulfuric acid	1,000	NL
Bucket washer sludge	5,300	NL
Plating liquid	NL	29,000
Lithium bromide	NL	25,500
Total	**79,402**	**102,805**

lbs = pounds
*Abnormally high due to isolated incident.
Source: BEP, 2003d

Criteria of Significance

An alternative would have a potentially significant impact on the public or the environment in the event of any of the conditions below involving hazardous materials or waste management:

- Create a significant hazard through the use, handling, transport, or disposal of hazardous materials or wastes.
- Create reasonably foreseeable conditions that would have the potential for improper release of hazardous materials.
- Subject humans to soils with concentrations of hazardous materials in excess of health advisory limits.
- Increase waste generation rates beyond a facility's handling capacity.

Impacts

No Action

The No Action alternative would have **no impact** on solid waste, hazardous materials, or hazardous waste management activities.

Proposed Action

As part of the Proposed Action, BEP intends to introduce several new inks and solvents. They include:

- Bottcher Offset 40 – Solvent to be used in the offset printing process. Designated a Class 3 (flammability) hazardous material.
- Security Thread – New material to be used as a security feature in the Next Generation of Currency. Designated a non-hazardous material.
- SICPA OVI copper/green ink, intaglio printing – New OVI to be used in the Next Generation of Currency. Hazardous Material Information System (HMIS) level 2 health (requires safety goggles and gloves) and fire hazard (flash point below 200°F).
- SICPA metallic green intaglio ink - New ink to be used in the Next Generation of Currency. HMIS level 2 health and fire hazard.
- SICPA offset opaque blue - New ink to be used in offset printing process. HMIS level 1 health (safety goggles required) and fire hazard (flash point above 200°F).
- SICPA offset ink, black – New ink to be used in offset printing process. HMIS level 1 health and fire hazard.
- SICPA offset ink, yellow – New ink to be used in offset printing process. HMIS level 1 health and fire hazard.
- SICPA offset light green - New ink to be used in offset printing process. HMIS level 1 health and fire hazard.
- SICPA offset light orange – New ink to be used in offset printing process. HMIS level 1 health and fire hazard.

Two new intaglio inks would be used as part of the Proposed Action. The SICPA OVI ink (copper/green) would replace a similar OVI ink of a different color. The SICPA metallic ink would replace a non-magnetic ink currently in use.

Each offset printing press, which can print up to four colors at a time, would use less than 8 pounds of ink per day. Therefore, the maximum amount of ink used by the offset presses in a year would be less than 5 tons, compared to over 1,800 tons of intaglio ink. The new OVI intaglio ink is substantially similar in chemical and physical properties to the inks currently used and would have **no impact** on solid or hazardous waste disposal at DCF or WCF. The metallic composition of the new metallic ink is proprietary; however, the ink is non-toxic and is not expected to require any changes to current pre-treatment processes or ink sludge disposal methods.

Washington, DC

Solid Waste

The quantity of intaglio ink sludge generated by DCF is directly proportional to the number of notes produced. Implementation of the Proposed Action is expected to increase currency production by 10 percent at DCF over a 3-year period; therefore, sludge generation would also be expected to increase by 10 percent or to 4,164,050 pounds per year. This increased generation rate would be less than 77 percent of the 1999 sludge generation rate. This increase is within the capacity of the pretreatment plant and would have a **less than significant** impact on solid waste disposal at DCF. In addition, the rate of note spoilage would be expected to increase during the 3-year phase-in period but would be well within DCF's capacity to dispose of the spoils on site. As with the baseline conditions, a percentage of spoils would also be sent off site for disposal as needed. As the increase in spoils generation is expected to be managed within existing capacities and facilities at DCF, impacts from this waste stream would also be **less than significant.**

Hazardous Materials

Implementation of the Proposed Action would require the storage and use of several new chemicals. The potential hazards associated with these chemicals have been discussed above. Chemicals, including other inks and solvents, with the same hazard classes are currently stored in large amounts at the DCF. Therefore, the storage and use of these chemicals would not increase the risk of spill or release. Based on a 10 percent increase in production for 3 years as a result of the Proposed Action, chemical storage requirements may increase. However, BEP has adequate storage to effectively manage these chemicals without increasing the risk of exposure or release. Therefore, implementation of the Proposed Action related to the use of hazardous materials would be **less than significant** when compared to baseline conditions.

Hazardous Waste

BEP estimates that at full production, approximately eighteen 55-gallon drums of Bottcher solvent, each 50 percent-60 percent full, would be generated each year from offset printing operations. Use of the solvent would have the capacity to generate up to 600 gallons, or 3,955 pounds per year of hazardous waste. The waste solvent would be transported to an energy recovery facility where it would be burned. It is also estimated that an additional 995 pounds per year of plating sludge will be generated from the plating-waste pretreatment plant during the phase-in period. Combined, these waste streams represents less than 2 percent of the current hazardous waste stream at DCF.

The rollers of the offset presses must be wiped down periodically with solvent-containing cheesecloth. When used, the cheesecloths are placed into a closed collection bin. This bin is emptied twice per week and the used cheesecloths are shipped off site as hazardous waste. BEP estimates that less than 200 pounds of waste cheesecloth would be generated per year.

Increased production associated with the Proposed Action would increase hazardous waste streams directly related to currency production by up to 10 percent for 3 years at DCF. However, the largest waste stream, the cleansing of ink reconstitution and manufacturing tanks, would not be expected to increase. These tanks are cleaned on a periodic basis, independent of currency production rates (Martin, 2003a). As a result, the overall amount of hazardous waste generated at the facility would increase by less than 4 percent to approximately 268,000 pounds per year (Table 3-15). This increase is within the operational range of BEP and is 84 percent of the amount of hazardous waste generated in 1999. BEP can effectively handle, treat, and dispose of this increased hazardous waste without increasing the risk of exposure or release. Therefore, implementation of the Proposed Action related to hazardous waste generation would be **less than significant**.

Fort Worth, TX

Solid Waste

The quantity of intaglio ink sludge generated is directly proportional to the number of notes produced. Implementation of the Proposed Action is expected to increase sludge generation by 5 percent to 2,440,575 pounds per year; however, the increased generation rate would be less than 77 percent of the amount of sludge generated in 1999. This increase is within the treatment capacity of the pretreatment plant and would have **less than significant** impact on solid waste disposal at WCF.

Table 3-15. DCF Hazardous Waste Estimates

Waste	With Proposed Action	2002 (lbs)	1999 (lbs)
Bucketwasher – Tanker	154,910	154,910	143,762
Waterbase Gravure Ink <6% solids	21,579	19,618	65,496
Chrome Sludge with Lime	0	0	16,071
Pre-treatment Plant Chrome Sludge	10,941	9,946*	14,208
PVC Sludge/Pumpable	5,182	4,711	10,159
Ink/Solvents	2,814	2,558	10,007
Ferric Chloride Solution	0	0	4,624
Sulfuric Acid and Dechrome	816	742	3,896
Chromic Acid/Dechrome Solution	0	0	3,165
Untreated Wastewater	0	0	2,800
Ferric Chloride and Xylene	113	103	2,650
Chrome Sludge with Oil	1,844	1,676	1,912
Dalco 92	0	0	1,200
Flammable Liquid	NL	NL	1,200
Corrosive – Acidic	NL	NL	1,145
Isomet	23,976	21,796	1,042
Lab pack	8,580	7,800	NL
WPF plating sludge	4,892	4,447	NL
Rags soaked with petroleum distillates	4,456	4,051	209
Ferric chloride washwater	1,823	1,657	NL
Bottcher Solvent	3,955	NL	NL
Other, non-production related waste streams	21,924	21,924	34,369
TOTALS	**267,805**	**255,939**	**317,915**

NL = not listed
lbs = pounds
*Estimated based on 1999 volume using the 2002/1999 ink sludge ratio of 0.7.
Source: BEP documentation, 2002, 1999

Hazardous Materials

Implementation of the Proposed Action would require the storage and use of several new chemicals. The potential hazards associated with these chemicals are discussed above. Chemicals, including other inks and solvents, with the same hazard classes are currently stored in large amounts at the WCF. Therefore, storage and use of these chemicals would not increase the risk of spill or release. Based on a 5 percent increase in production for 3 years as a result of the Proposed Action, chemical storage requirements may increase. However, BEP has adequate storage to effectively manage these chemicals without increasing the risk of exposure or release. Therefore, implementation of the Proposed Action related to the use of hazardous materials would be **less than significant** when compared to baseline conditions.

Hazardous Waste

BEP estimates that at full production, approximately 600 gallons of Bottcher solvent would be generated each year from offset printing operations at WCF. As a result, an additional 3,955 pounds per year of hazardous waste would be generated. The waste solvent would be transported to an energy recovery facility where it would be burned. It is also estimated that and additional 525 pounds per year of plating sludge would be generated from the plating-waste pretreatment plant during the phase-in period. Combined, these waste streams represents approximately 4 percent of the current hazardous waste stream at WCF.

The rollers of the offset presses must be wiped down periodically with solvent-containing cheesecloth. When used, the cheeseclothsare placed into closed collection bins. These bins need to be emptied periodically (estimated twice per week) and the used cheesecloths are shipped off site as hazardous waste. BEP estimates that less than 200 pounds of waste cheesecloth would be generated per year.

Increased production associated with the Proposed Action would increase hazardous waste streams by up to 5 percent for 3 years at WCF (see Table 3-16). This increase, from 48,800 pounds in 2002 to 54,642 pounds per year after implementation, is within the operational range of BEP and is less than 65 percent of the amount of hazardous waste generated in 1999. BEP can effectively handle, treat, and dispose of this increased hazardous waste without increasing the risk of exposure or release. Therefore, implementation of the Proposed Action related to hazardous waste generation would be **less than significant**.

Table 3-16. WCF Hazardous Waste Estimates

Waste Name	With Proposed Action	2002 (lbs)	1999 (lbs)
Solvent	17,640	16,800	12,500
Electroplating sludge	11,025	10,500	9,020
Lab packs	0	0	772
Mercury devices	0	0	2,700
HCl solution	NL	NL	400
Printing press rinse	NL	NL	1,000
De-chroming liquid	2,520	2,400	4,900
Chromic acid	2,940	2,800	2,000
Lead acid batteries	0	0	2,850
Antifreeze	1,600	1,600	5,800
Hazardous debris	14,962	14,250	29,160
Sulfuric acid	NL	NL	1,000
Bucket washer sludge	NL	NL	5,300
Plating liquid	0	29,000	NL
Lithium bromide	0	25,500	NL
Bottcher solvent	3,955	NL	NL
Total	**54,642**	**102,805**	**79,402**

NL = not listed
lbs = pounds
Source: BEP documentation, 2002, 1999

Mitigation

No mitigation would be required for impacts from hazardous materials or hazardous waste at either of the alternative sites.

3.8 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Executive Order 12898 (The White House, 1994) requires Federal agencies to the greatest extent practicable to identify and address their programs and activities that may have a disproportionately high and adverse human health or environmental impact on minority populations and low-income populations. The requirements of this EO are applicable to the Bureau of Engraving and Printing and hence to the Proposed Action.

Setting

Washington, DC

The DCF buildings are located on opposite sides of 14th Street, SW in Census Tract 62.02, Block Group 1, Block 1127 and Census Tract 62.01, Block Group 1, Block 1004 of the District of Columbia. These blocks consist entirely of government buildings and a museum, and have no residential population. Census Tract 62.02, which includes the White House, the Capitol Building, the National Mall, and Potomac Park, contained a population of 12 persons in 5 households during the 2000 Census. The census tract experienced an apparent reduction from a population of 56 in the 1990 Census; however, that census included individuals with no fixed address. Census Tract 62.01 experienced an increase in population from 51 persons in 1990 to 144 in 2000; however, none of the blocks adjacent to the DCF have resident population or households. The entire District of Columbia lost 5.7 percent of its population during the decade. Table 3-17 summarizes demographic data for the District of Columbia and the two census tracts.

Table 3-17. DCF Area Demographics (2000 Census)

Characteristic	District of Columbia	Census Tract 62.02	Census Tract 62.01
Population	572,059	12	144
White Alone (%)	28%	58%	94%
Black/African American Alone (%)	59%	42%	5%
Hispanic/Latino (%)	8%	-	1%
Other Minorities (%)	5%	-	-
Median Family Income	$46,283	N/A	$147,545
Income Below Poverty Level (%)	20%	N/A	9%

Source: U.S. Bureau of the Census, 2003

The population in both census tracts during 2000 was predominantly White, with Blacks or African Americans representing the principal minorities. In comparison, the composition of the District of Columbia in 2000 was predominantly Black or African American with smaller percentages of Hispanic or Latino and other minorities.

The median family income in the District of Columbia for the 2000 Census was $46,283, and the poverty rate was higher than the national average. The median family income in Census Tract 62.01 in 2000 was over three times that of the city, and the percentage of the population with income below the poverty level was less than half the percentage in the District of Columbia. No information was available from the 2000 Census about income and poverty statistics for Census Tract 62.02; however, during the 1990 Census, the tract had a median family income over four times that of the city.

The DCF employs 1,857 individuals in three work shifts. These employees are subject to government pay grades, which are adjusted annually for the cost of living as determined by the Office of Personnel Management.

Fort Worth, TX

The WCF is located in Census Tract 1139.13, Block Group 2, Block 2050 of Tarrant County. This block consists of mixed agricultural and light industrial uses, and it had a residential population of 2 persons in one household and no minorities in the 2000 Census. The entire Block Group 2 of Census Tract 1139.13 contained a population of 1,911 persons in 665 households during the 2000 Census. The block group (which was part of Census Tract 1139.03 in 1990) experienced a 113 percent increase in population during the last decade. The population of Tarrant County grew by 24 percent, and the population of Texas increased 23 percent, during that time. Table 3-18 summarizes demographic data for Tarrant County and census tracts in the vicinity of the WCF.

Table 3-18. WCF Area Demographics (2000 Census)

Characteristic	Tarrant County	Census Tract 1139.13, BG 2	Census Tract 1141.01, BG 1
Population	1,446,219	1,911	1,781
White Alone (%)	62%	83%	91%
Black/African American Alone (%)	13%	3%	1%
Hispanic/Latino (%)	20%	10%	6%
Other Minorities (%)	5%	4%	2%
Median Family Income	$54,068	$67,401	$80,476
Income Below Poverty Level (%)	11%	5%	2%

Source: U.S. Bureau of the Census, 2003

The composition of population in Census Tract 1139.13, Block Group 2 in 2000 was predominantly White with smaller percentages of minority groups. In comparison, Tarrant County had a lower percentage of Whites and significantly higher percentages of all minority groups.

The median family income in Tarrant County at the 2000 Census was higher than the value for the State of Texas ($45,861), and the percentage of the population with income below the poverty level was also considerably lower than that of the state (15 percent). Census Tract 1139.13, Block Group 2 had a median family income greater than both the county and the state, and the percentage of the population with income below the poverty level was also far lower than both the county and the state.

The WCF is located across Blue Mound Road from Census Tract 1141.01, Block Group 1, Block 1087, which also had a population of 2 persons in one household and no minorities in the 2000 Census. The entire Block Group 1 of Census Tract 1141.01 contained a population of 1,781 persons in 580 households during the 2000 Census. The composition of the block group in 2000 included fewer

minorities than Census Tract 1139.13, and the median family income was higher with a lower rate of poverty.

The WCF employs approximately 850 individuals in three work shifts. These employees are subject to government pay grades, which are adjusted annually for the cost of living as determined by the Office of Personnel Management.

Criteria of Significance

The Proposed Action would have a significant impact on socioeconomic conditions and environmental justice in the respective jurisdictions if it would cause any of the following conditions:

- Displace substantial housing stock and numbers of people residing in the planning area.
- Induce substantial population and housing growth in the planning area either by the direct construction of new housing with an influx of residents or by providing new infrastructure that would influence new housing construction and population growth not otherwise expected to occur in the planning area.
- Substantially reduce employment opportunities or local economic conditions by displacing businesses in the planning area or otherwise eliminating existing jobs, or induce substantial population influx into the area by providing new employment opportunities or economic stimulus not otherwise anticipated.
- Have a disproportionately high and adverse human health or environmental effect on:
  - Minority populations
  - Low-income populations

Impacts

No Action

The No Action alternative would have **no impact** for any criteria of significance, because it would cause no change in socioeconomic conditions applicable to either jurisdiction.

Washington, DC

The Proposed Action would require changes in equipment and processes inside the existing DCF building only and would not affect structures or uses in the surrounding area. Furthermore, the addition of approximately 33 employees required to operate the new equipment would represent an insignificant change in the regional employment base. The small demand for additional materials by the new processes would neither stimulate nor inhibit the local economy significantly. Therefore, the Proposed Action would have **no impact** on regional population, housing, employment, or the economy.

The area in which the DCF is located is generally devoid of significant residential population. Also, because the local census blocks contain lesser concentrations of minorities and low-income populations than present in the wider community, any potential adverse impacts of the Proposed Action would not have a disproportionately high and adverse effect on minorities or low-income populations related to public health and the environment. Hence, the Proposed Action would have **no impact** with respect to environmental justice.

Fort Worth, TX

The Proposed Action would require changes in equipment and processes inside the existing WCF building only and would not affect structures or uses in the surrounding area. Furthermore, the addition of approximately 33 employees required to operate the new equipment would represent an insignificant change in the regional employment base. The small demand for additional materials by the new processes would neither stimulate nor inhibit the local economy significantly. Therefore, the Proposed Action would have **no impact** on regional population, housing, employment, or the economy.

The area in which the WCF is located is generally devoid of significant residential population. Also, because the local census blocks contain lesser concentrations of minorities and low-income populations than present in the wider community, any potential adverse impacts of the Proposed Action would not have a disproportionately high and adverse effect on minorities or low-income populations related to public health and the environment. Hence, the Proposed Action would have **no impact** with respect to environmental justice.

Mitigation

No mitigation would be required for socioeconomic or environmental justice impacts at either of the Proposed Action sites.

3.9 TRANSPORTATION

Setting

Washington, DC

The DCF is located south of the National Mall near the intersection of 14th & C Streets, SW. Both 14th and C are multidirectional connector roads, which are heavily congested due to the surrounding urban environment, as well as close proximity to tourist sites and government offices. Access to 14th Street is available via Route 1 and Interstate 365, a four-lane divided thoroughfare that connects Washington, DC to northern Virginia. All roads in the surrounding area operate at low levels of service, especially during morning and evening rush periods.

Parking is extremely limited in the area. Some metered parking is available on side streets with a two-hour limit. Parking lots are located at the southeast corner of 14th & D Streets, SW; at 12th Street & Maryland Avenue, SW; and at 12th & C Streets, SW. A tourist bus drop-off/pick up point is located on Raoul Wallenberg Place, at the western entrance of DCF. There is a separate driveway for operations materials drop-offs and pickups.

Although it is located in an urban area characterized by congested automobile traffic, DCF has excellent access via Washington, DC's Metrorail subway system. The closest Metro stop is the Smithsonian Station on the Blue and Orange lines, which has an exit at 12th Street & Independence Avenue, SW. This stop is approximately two blocks from the DCF. Both the Blue and Orange lines travel in an east/west direction from Virginia to Maryland across DC. The Smithsonian Station is also two stops away from the Metro Center Station, which connects with the Red line serving Maryland suburbs north of DC. Additionally, the Smithsonian Station is one stop from the L'Enfant Plaza Station, which connects with the Green and Yellow Lines serving other suburbs in Virginia and Maryland. Hence, DCF can be reached easily from every line in the Metrorail system. Metrobus routes 52, V4 and V6 in DC, and 13 from Virginia, also serve DCF. A large percentage of the 1,857 existing employees commute to work via public transportation.

Fort Worth, TX

The WCF is located at 9000 Blue Mound Road, a two-lane arterial road. Access to Blue Mound Road is available via State Route 287, a four-lane highway. Blue Mound Road is located in a sparsely developed area with mixed agricultural, residential, and industrial uses. Traffic congestion is not considered significant, and all roads maintain high levels of service. Presently, the WCF employs approximately 850 workers and contractors. Peak traffic loads are handled adequately during three shift changes without causing congestion. The site is not served by public transportation.

The WCF has a visitor's parking area, which is easily accessed from Blue Mound Road and contains spaces for 100 cars and 20 buses. Visitors do not arrive in groups as large as the employees during a shift change and, therefore, do not adversely affect the level of service on local roads. Natural gas-powered buses transport visitors between the Transfer Station and the Visitor's Center.

Criteria of Significance

The Proposed Action or an alternative would have a significant impact on transportation if it would cause any of the following consequences:

- Permanently degrade the level of service (LOS) on adjacent roadways or intersections due to the generation of additional vehicle trips or altered traffic patterns.
- Result in safety hazards for pedestrian traffic due to the generation of additional vehicle trips or altered traffic circulation patterns.
- Permanently remove a substantial number of parking spaces.
- Substantially conflict with goals or policies of the BEP.

Impacts

No Action Alternative

The No Action alternative would not alter baseline conditions and would otherwise have **no impact** on transportation facilities in Washington, DC or Fort Worth, TX.

Proposed Action

Washington, DC

Approximately 33 additional workers would be required to operate the new printing presses. Many of these new employees would commute to work via public transportation; therefore, any increase in vehicular traffic would be minimal. Such an increase would be negligible relative to the high volumes already experienced in the area and would not affect the existing transportation system.

Transportation requirements related to ongoing DCF operations are not expected to change measurably due to the upgraded printing capability. Since the amount of currency printed is not expected to increase beyond levels experience during peak production rates in 1999, deliveries and shipments are not expected to affect traffic flow adversely.

Therefore, the Proposed Action would have a **less than significant** impact on transportation at the existing facility in the Washington, DC area for any of the evaluation criteria.

Fort Worth, TX

The Proposed Action would require approximately 33 additional workers to operate the new printing presses and corresponding day-to-day activities. This increase in traffic would have no measurable impact on the transportation access system, as supporting transportation facilities are operating well below their capacity. Parking is available on site for these additional workers and would not be affected.

Transportation requirements related to ongoing WCF operations are not expected to change measurably due to the upgraded printing capability. Since the amount of currency printed is not expected to increase beyond levels experienced during peak production rates in 1999, deliveries and shipments are not expected to affect traffic flow adversely.

Therefore, the Proposed Action would have a **less than significant** impact on transportation at the existing facility in the Fort Worth, TX area for any of the evaluation criteria.

Mitigation

Not mitigation would be required for traffic impacts at either of the Proposed Action sites.

3.10 SECONDARY AND CUMULATIVE IMPACTS

Cumulative Impacts

There are no ongoing Federal, state, county, or municipal projects in the vicinity of either DCF or WCF that in conjunction with the Proposed Action would have the potential to cause significant cumulative impacts on the respective local environments.

Secondary Impacts

Vending industry

The vending industry (and any other activities that accept notes in automated machines, such as mass transit agencies) would be affected by the change in currency. Such machines must be modified before the Next Generation of Currency is put into circulation in order for the automated machines to accept the notes as legal tender. The impact of this change would be **less than significant** for two reasons.

- All of the machines that accept $5 and higher notes use software programs to recognize the notes' denomination and determine if they are legal. As a result, modifying the machines to accept the Next Generation of Currency would require only updating the software programs and would not require any physical or hardware changes.
- As periodic changes in currency design are part of the BEP standard practice, the BEP has a process for working with the manufacturers of currency readers prior to the release of any new currency including the Next Generation of Currency notes. Therefore, the manufacturers have been provided "test decks" of the currency so that they can develop and adequately test the software. As a result, the vending industry will be fully prepared before any new notes are released.

Paper manufacturing

The BEP obtains all paper for printing the notes from an outside supplier. Approximately 45,000 pounds of paper is supplied to the BEP each day. This production rate is not expected to change

significantly as a result of the Proposed Action. The only change in the paper production process is the introduction of a second synthetic thread into the paper. This change is not significant, because the existing manufacturing process for the paper includes using threads, and the addition of a new thread material would involve only minor modification to facility production procedures.

It is estimated that approximately 100 pounds per day of synthetic thread will be used (Bruce, 2003). The required supply of synthetic threads and changes required to include the new thread in the currency paper is not expected to adversely affect either the thread supplier or paper manufacturer.

Ink manufacturing

Seven new inks will be utilized in the Next Generation of Currency, all of which are manufactured by SICPA. The material safety data sheets for the inks reveal no constituents that would constitute a significant environmental risk as compared to inks currently in use at each facility. In addition, the production of these inks is not expected to impose a burden on the ink supplier that could not be managed easily within existing manufacturer capacities.

3.11 SUMMARY AND CONCLUSION

The Proposed Action would involve the introduction of an offset printing process and temporary production increases to phase-in the Next Generation of Currency. No significant adverse impacts are expected to occur from implementation of the Proposed Action in either the short-term, long-term, or cumulatively. Increased production rates would result in both temporary and permanent increases in certain solid and hazardous waste streams that can be managed within existing BEP facility capacities and capabilities. Long-term increases in VOC air emission would occur at the WCF facility as a result of adding three offset presses; however, these emissions would be within permitted limits and would not result in the violation of any air standards or substantially degrade regional air quality. The net VOC-related air emissions associated with DCF, in consideration of the recent replacement of several I-8 presses, would decrease. Because the Proposed Action would not result in significant adverse environmental impacts, it is the conclusion of this EA that the preparation of a FONSI is appropriate. A FONSI (see 1.4.1 and 1.4.2) will be published in the *Federal Register*, and interested parties will be given a 30-day period to review the EA and provide comments on the action.

4.0 References, Consultations, And Sources

4.1 Individuals Interviewed

March 2003:

Lillian Cates, Manager of Air and EPCRA Programs, EMD, BEP

Mark Ennen, Manager, Environmental Management Division, BEP

Douglas Gandy, Manager, Offset Printing Division, BEP

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Colleen McKinney, Manager, Environmental, Health, and Safety Branch, WCF, BEP

Neal Mohlmann, Chief, Office of Environment and Safety, BEP

Tamara Sharp, Environmental Protection Specialist, EMD, BEP

April 2003:

Keith Bruce, Research Chemist, BEP

Thomas Ferguson, Director, BEP

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5.0 List of Preparers

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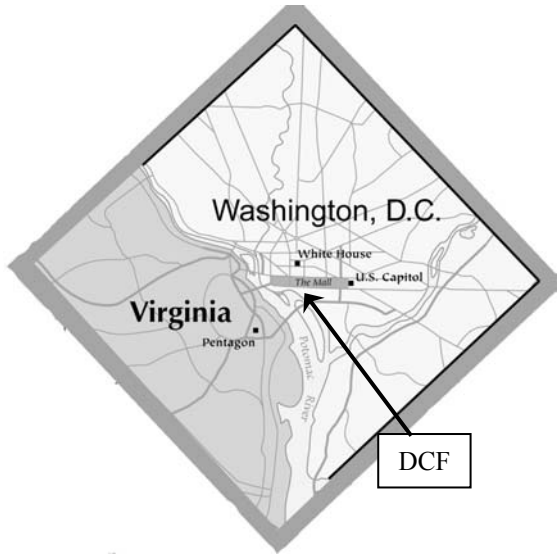
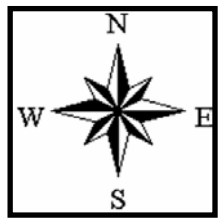
Figure 1-1. General Location of Facilities

Source:
UT Library Online, 2003





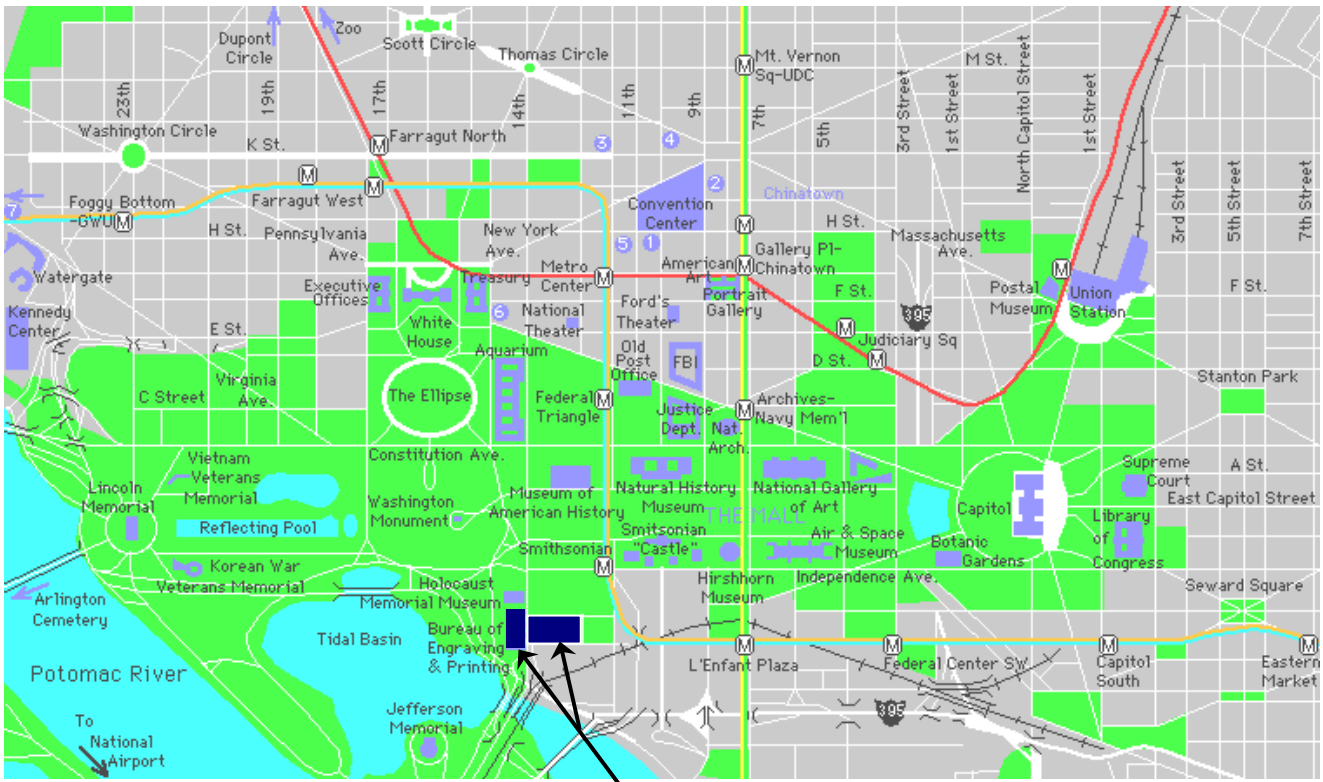
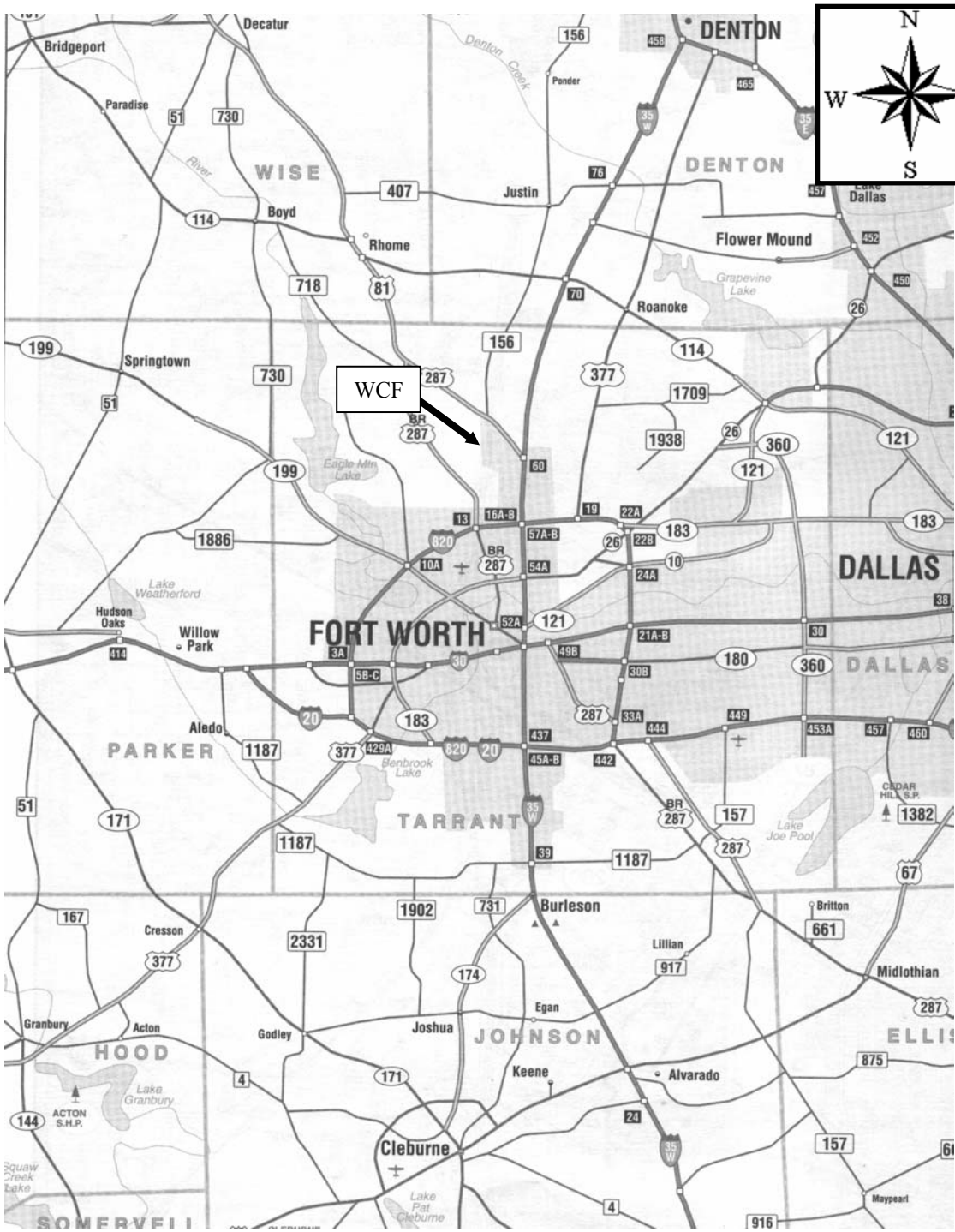


Figure 2-1. DCF Location

0 300 600 Meters

Source: Washington DC Visitors Center, 2003



0 2.5 5 Miles

Figure 2-2. WCF Location

Source:
Universal Map, 2003

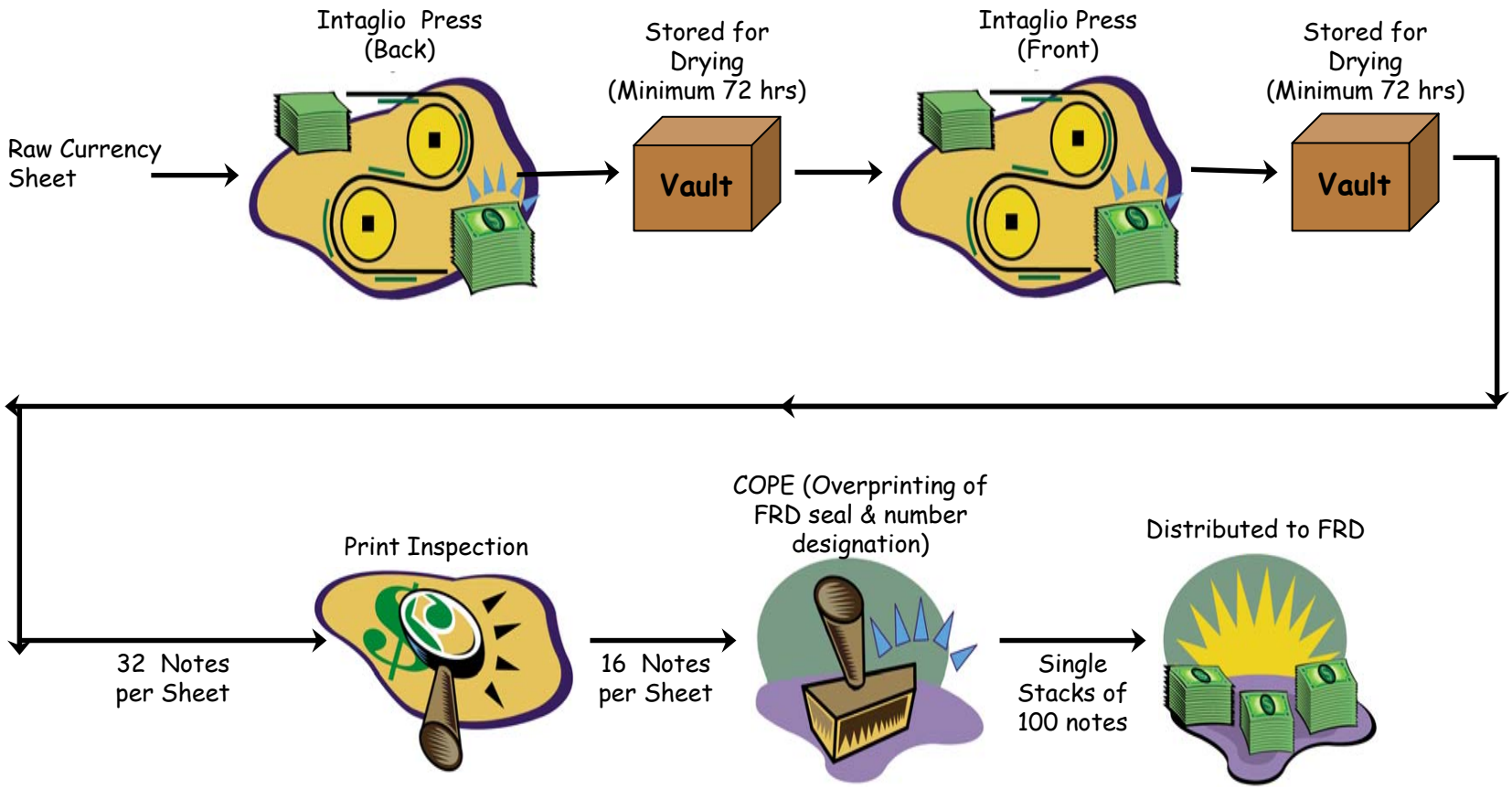


Figure 2-3. Current Production Process

LEGEND:

FRD – Federal Reserve District
COPE – Currency Overprinting Equipment

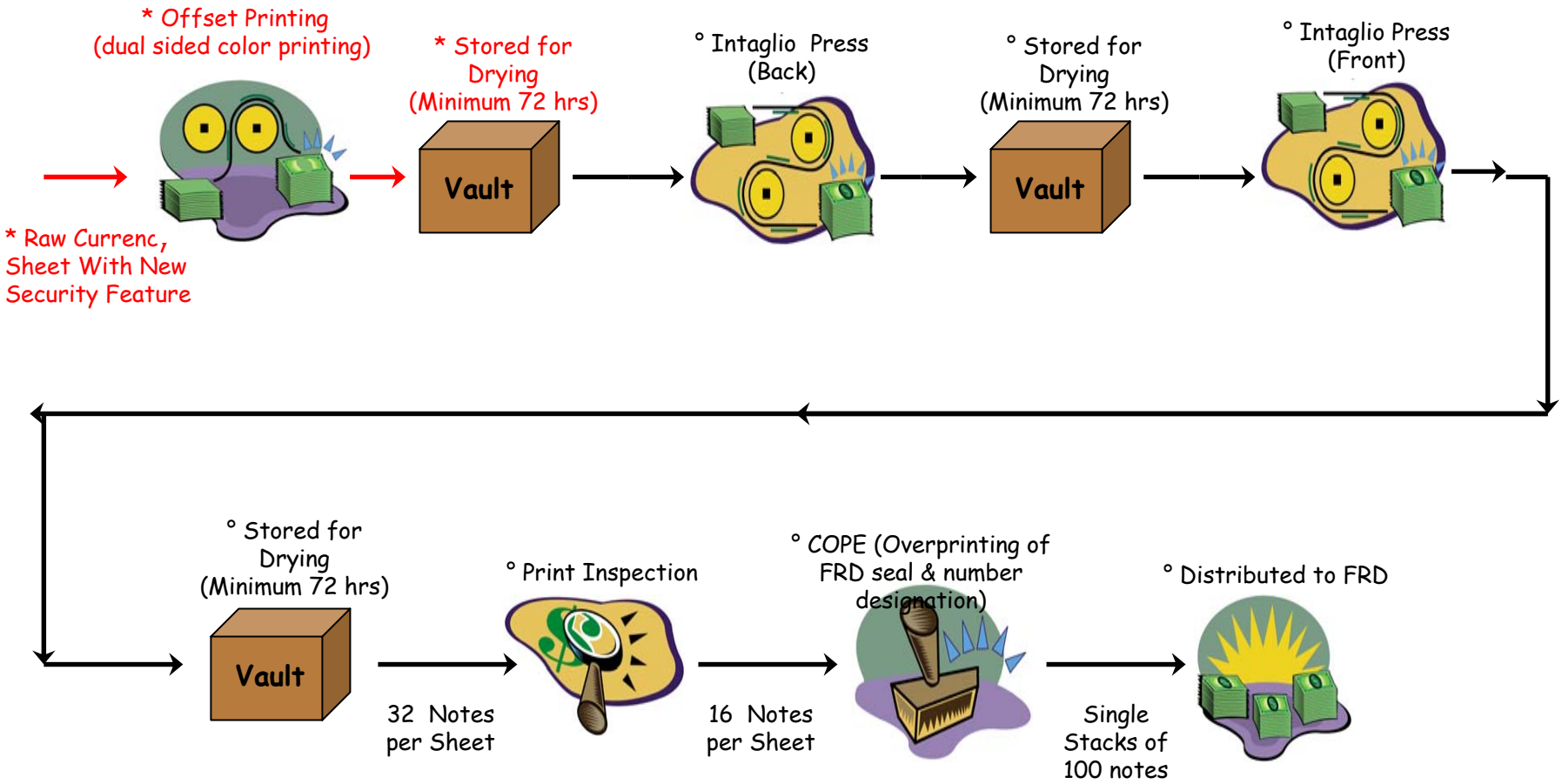


Figure 2-4. Modified Production Process

LEGEND:

* (Or Red Font) – New production phases
° (Or Black Font) – Carryover production phase
FRD – Federal Reserve District
COPE – Currency Overprinting Equipment