

ATTACHMENT G
TRAFFIC PATTERNS

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TRAFFIC PATTERN

1 G-1 Traffic Information and Traffic Patterns

2 Access to the WIPP facility is provided by two access roads that connect with
3 U.S. Highway 62/180, 13 mi (21 km) to the north, and NM Highway 128 (Jal Highway), 4 mi
4 (6.4 km) to the south (Figure G-1). The northern access road, which connects the site to
5 U.S. Highway 62/180, is an access road built specifically for the Permittees that will be used to
6 transport TRU mixed waste from the highway to the site. The southern access road is a county
7 highway maintained by Eddy County. Signs and pavement markings are located in accordance
8 with the Uniform Traffic Control Devices Manual. Access-road design designation parameters,
9 such as traffic volume, are presented in Table G-1.

10 G-2 Facility Access and Traffic

11 Access to the facility for personnel, visitors, and trucks carrying supplies and TRU mixed waste
12 is provided through a security checkpoint (vehicle trap). After passing through the security
13 checkpoint, TRU mixed waste transport trucks will normally turn right (south) before reaching
14 the Support Building and then left (east) to park in the parking area HWMU just east of the air
15 locks (Figure G-2). Outgoing trucks depart the same way they arrived, normally out of the west
16 end of the parking area, north through the fence gate and out through the vehicle trap. An
17 alternate inbound route is to continue straight ahead from the security checkpoint to the second
18 road and to turn south to enter the truck parking area. The alternate outbound route is also the
19 reverse of this route. Salt transport trucks, which remove mined salt from the Salt Handling
20 Shaft area, will not cross paths with TRU mixed waste transporters; instead, they will proceed
21 from the Salt Handling Shaft northward to the salt pile. Figure G-2 shows surface traffic flow at
22 the WIPP facility.

23 The site speed limit for motor vehicles is 10 mph (16 kph) and 5 mph (8 kph) for rail movements.
24 Speed limits are clearly posted at the entrance to the site and enforced by security officers.
25 There are no traffic signals. Stop signs are located at the major intersections of roadways with
26 the main east-west road. Safety requirements are communicated to all site personnel via
27 General Employee Training within 30 days of their employment. Employee access to on-site
28 facilities requires an annual refresher course to reinforce the safety requirements. Security
29 officers monitor vehicular traffic for compliance with site restrictions, and provide instructions to
30 off-site delivery shipments. Vehicular traffic other than the waste transporters use the same
31 roads, but there will be no interference because there are two lanes available on the primary
32 and alternate routes for waste shipments. Pedestrian traffic is limited to the sidewalks and
33 prominently marked crosswalks. Site traffic is composed mostly of pickup trucks and electric
34 carts with a frequency of perhaps 10 per hour at peak periods. Emergency vehicles are
35 exercised periodically for maintenance and personnel training, with an average frequency of one
36 each per day. They are used for their intended purpose on an as-required basis.

1 The traffic circulation system is designed in accordance with American Association of State
2 Highway and Transportation Officials (**AASHTO**) Site Planning Guides for lane widths, lateral
3 clearance to fixed objects, minimum pavement edge radii, and other geometric features. Objects
4 in or near the roadway are prominently marked.

5 On-site roads, sidewalks, and paved areas are used for the distribution and storage of vehicles
6 and personnel and are designed to handle all traffic generated by employees, visitors, TRU
7 mixed waste shipments, and movements of operational and maintenance vehicles. The facility
8 entrance and TRU mixed waste haul roads are designed for AASHTO H20-S16 wheel loading.
9 Service roads are designed for AASHTO H10 wheel loading. Access and on-site paved roads
10 are designed to bear the anticipated maximum load of 115,000 lbs (52,163.1 kg), the maximum
11 allowable weight of a truck/trailer carrying loaded Contact-Handled or Remote-Handled
12 Packages. The facility is designed to handle approximately eight truck trailers per day, each
13 carrying one or more Contact-Handled or Remote-Handled Packages. This is equivalent to
14 3,640 TRU mixed waste-carrying vehicles per year.

15 The calculations to support the anticipated maximum load of 115,000 lbs. are shown below:

16 Soil Resistance R (psi) - is taken directly from the WIPP Soil Report and Bechtel calculation
17 because there is no change.

18 A. Pavement Thickness

19 The traffic frequency increase from 10 shipments per day to 10.15 shipments per day has only
20 minimal impact on the Total Expanded Average Load (EAL) and the traffic index (TI) as shown
21 below, both important parameters in pavement design.

22 Total EAL (TEAL):

23 13,780 ~ constant for 5 or more axles over 20 years, taken from Table 7-651.2A - Highway
24 Design Manual (HDM).

25 $TEAL = 13,780 \times 25\text{yr.}/20\text{yr.} = 17,225$

26 Using 10.15 shipments per day ~ $17,225 \times 10.15 = 174,834$

27 Conversion of EAL to Traffic Index (TI).

28 For TEAL of 174,834 ~ $TI = 7.5$ - (from HDM, Table 7-651.2B)

29 Asphalt Concrete Thickness TAC:

30 $GE = 0.0032 \times TI \times (100 - R) \dots R = 80$

31 GE - Gravel Equivalent (Ft).

32 $GE = 0.0032 \times 7.5 \times 20 = 0.48'$... $Gf_{AC} = 2.01 \Rightarrow TAC = 0.48/2.01 = 0.24' \Rightarrow$ use 2½" AC Surface
33 Course.

34 (Actually used: 3")

35 Gf - Gravel Equivalent Factor (constant from Table 7-651.2C from HDM).

36
37 B. Bituminous Treated Base

38 $GE = 0.0032 \times TI \times (100 - R) \dots R = 55 \sim$ caliche subbase $\Rightarrow GE = 1.08'$ GEBTB = 1.08 - 2.01 x
39 0.21 = 0.66'

40 TBTB = GEBTB/GfBTB = 0.66/1.2 = 0.55' \Rightarrow Use 4" BTB

41 GfBTB ~ taken from table 7-651.2C

1 C. Caliche Subbase ~ TCSB

2 $GE = 0.0032 \times TI \times (100 - R) \dots R=50$ - prepared subgrade

3 $GE=1.2$

4 $GECSB=1.2 - (0.21 \times 2.07) - (0.33 \times 1.2) \Rightarrow 0.37'$

5 $TCBS=0.37/1.0=0.37' \sim 4\frac{1}{2}"$

6 Based on the results of the above calculation, the site paved roads designated for waste
7 transportation are safe to be used by the heavier truckloads carrying shipping casks used in RH
8 TRU mixed waste transportation to the WIPP.

9 G-3 Waste Handling Building Traffic

10 CH TRU mixed waste will arrive by tractor-trailer at the WIPP facility in sealed Contact Handled
11 Packages. Upon receipt, security checks, radiological surveys, and shipping documentation
12 reviews will be performed. A forklift will remove the Contact Handled Packages and transport
13 them a short distance through an air lock that is designed to maintain differential pressure in the
14 WHB. The forklift will place the shipping containers at one of the two TRUPACT-II unloading
15 docks (**TRUDOCK**) inside the WHB.

16 The TRUPACT-II may hold up to two 55-gallon drum seven (7)-packs, two 85-gallon drum four
17 (4)-packs, two 100-gallon drum three (3)-packs, two standard waste boxes (SWB), or one ten-
18 drum overpack (**TDOP**). A HalfPACT may hold seven 55-gallon drums, one SWB, or four 85-
19 gallon drums. A six-ton overhead bridge crane will be used to remove the contents of the
20 Contact Handled Package. Waste containers will be surveyed for radioactive contamination and
21 decontaminated or returned to the Contact Handled Package as necessary.

22 Each facility pallet will accommodate four seven(7)-packs of 55-gallon drums, four SWBs, four
23 four(4)-packs of 85-gallon drums, four three(3)-packs of 100-gallon drums, two TDOPs, or any
24 combination thereof. Waste containers will be secured to the facility pallet prior to transfer. A
25 forklift or facility transfer vehicle will transport the loaded facility pallet the air lock at the Waste
26 Shaft (Figure G-3). The facility transfer vehicle will be driven onto the waste shaft conveyance
27 deck, where the loaded facility pallet will be transferred to the waste shaft conveyance and
28 downloaded for emplacement.

29 RH TRU mixed waste will arrive at the WIPP facility in a payload container contained in a
30 shielded cask loaded on a tractor-trailer. Upon arrival, radiological surveys, security checks, and
31 shipping documentation reviews will be performed, and the trailer carrying the cask will be
32 moved into the Parking Area or directly into the RH Bay of the Waste Handling Building Unit.

33 The cask is unloaded from the trailer in the RH Bay and is placed on the Cask Transfer Car.
34 The Cask Transfer Car is used to move the cask to the Cask Unloading Room. At this point, a
35 crane moves the waste to the Hot Cell or the Transfer Cell. Some RH TRU mixed waste may be
36 moved to the Hot Cell for overpacking before being moved to the Transfer Cell. Once in the
37 Transfer Cell, the Transfer Cell Shuttle Car moves the waste beneath the facility cask. A crane
38 is used to move the waste from the Transfer Cell Shuttle Car into the facility cask. The Facility
39 Cask Transfer Car then moves the facility cask to the underground. A more detailed description
40 of waste handling in the WHB is included in Attachment M1. Figures G-5, G-6 and G-7 show RH
41 TRU mixed waste transport routes.

1 G-4 Underground Traffic

2 Underground traffic, with and without TRU mixed waste, will travel on separated paths. The
3 ventilation and traffic flow path in the TRU mixed waste handling areas underground are
4 restricted and separate from those used for mining and haulage (construction) equipment
5 (Figure G-4). Non-waste and non-construction traffic use the same routes as waste and
6 construction traffic. In general, waste traffic will use the intake ventilation drift in that area. The
7 exhaust drift in the construction area will generally be used for mining/construction equipment
8 for maximum isolation of this activity from personnel. The exhaust drift in the waste disposal
9 area will normally not be used for personnel access. Non-waste and non-construction traffic is
10 generally comprised of escorted visitors only and is minimized during each of the respective
11 operations.

12 Adequate clearances that exceed the mining regulations of 30 CFR §57 exist underground for
13 safe passage of vehicles and pedestrians. Pedestrians/personnel are required to yield to
14 vehicles in the WIPP underground facility. This condition is reinforced through the WIPP
15 equipment operating procedures, the WIPP Safety Manual, the WIPP safety briefing required for
16 all underground visitors, the General Employee Training annual refresher course, and the
17 Underground annual refresher course that are mandated by 30 CFR §57, the New Mexico Mine
18 Code, and DOE Order 5480.20A.

19 In addition, other physical means are utilized to safeguard pedestrians/personnel when
20 underground such as:

21 All equipment operators are required to sound the vehicle horn when approaching
22 intersections.

23 All airlock and bulkhead vehicle doors are equipped with warning bells or strobe lights to
24 alert personnel when door opening is imminent.

25 Hemispherical mirrors are used at blind intersections so that persons can see around
26 corners.

27 All heavy equipment is required to have operational back-up alarms.

28 Heavily used intersections are well lighted.

29 Typically, the traffic routes during waste disposal in all Panels will use the same main access
30 drifts.

31 All traffic safety is regulated and enforced by the Federal and State mine codes of regulations
32 (30 CFR §57 and New Mexico State Mine Code). The agencies that administer these codes
33 make regular inspection tours of the WIPP underground facilities for the purpose of
34 enforcement.

35 All underground equipment is designed for off-road use since all driving surfaces are excavated
36 in salt. No loads on the underground roadways will exceed the bearing strength of in situ halite.

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TABLES

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TABLE G-1
WASTE ISOLATION PILOT PLANT SITE DESIGN DESIGNATION
TRAFFIC PARAMETERS^a

Traffic Parameter	North Access Road (No. of Vehicles, unless otherwise stated)	South Access Road (No. of Vehicles, unless otherwise stated)	On-Site Waste Haul Roads Contact-Handled and Remote-Handled Package Traffic)
Average Daily Traffic (ADT) ^b	800	400	8
Design Hourly Volume (DHV) ^c	144	72	NA ^g
Hourly Volume (Max. at Shift Change)	250	125	NA
Distribution (D) ^d	67%	33%	NA
Trucks (T) ^e	2%	0	100%
Design Speed ^{h,i}	70 mph (113 kph)	60 mph (97 kph)	25 mph (40 kph)
Control of Access ^f	None	None	Full

^a For WIPP personnel and TRU mixed waste shipments only.

^b ADT—Estimated number of vehicles traveling in both directions per day.

^c DHV—A two-way traffic count with directional distribution.

^d D—The percentage of DHV in the predominant direction of travel.

^e T—The percentage of ADT comprised of trucks (excluding light delivery trucks).

^f Control of Access—The extent of roadside interference or restriction of movement.

^g NA—Not applicable.

^h mph—miles per hour.

ⁱ kph—kilometers per hour.

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FIGURES

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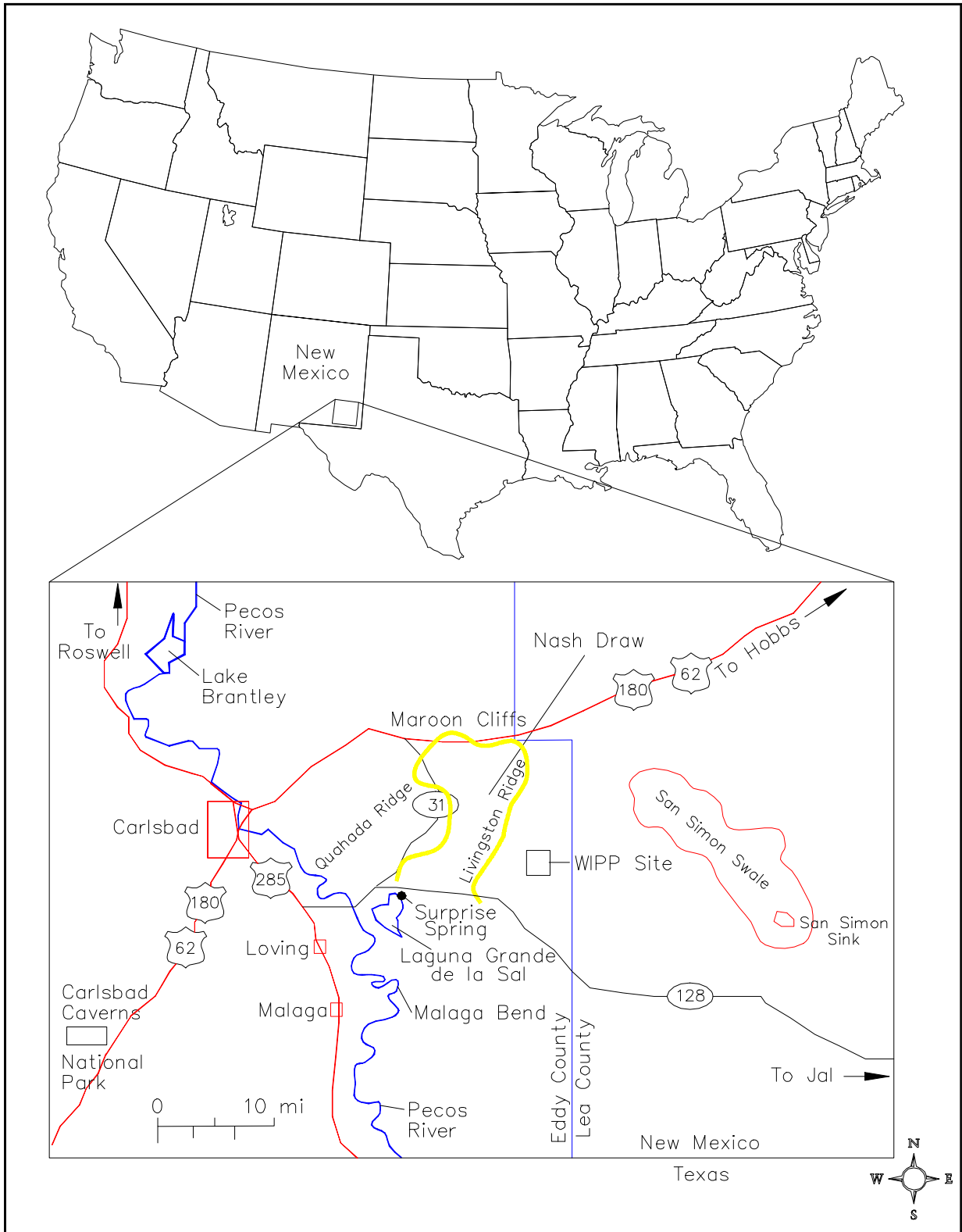


Figure G-1
General Location of the WIPP Facility

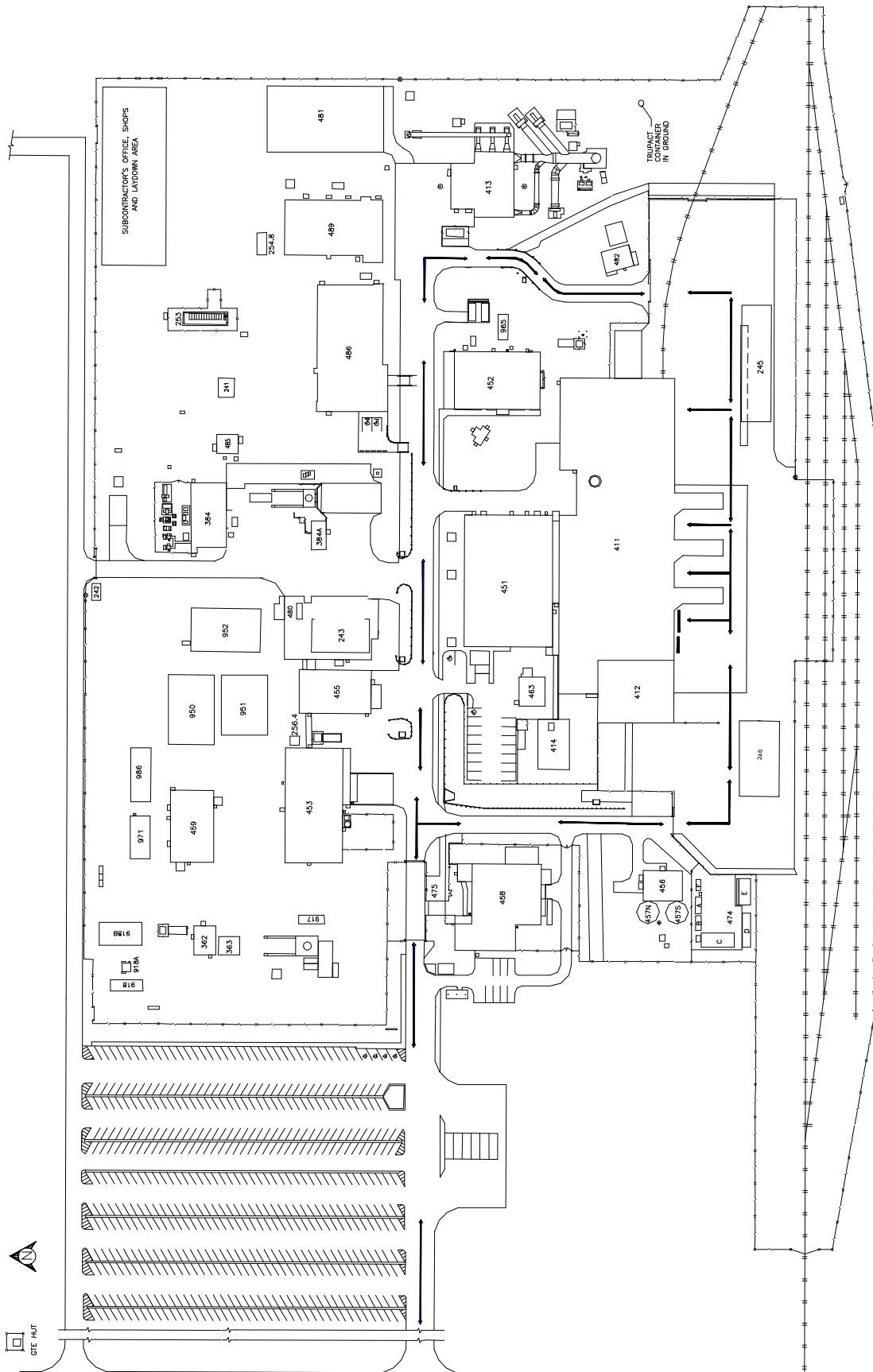


Figure G-2
WIPP Traffic Flow Diagram

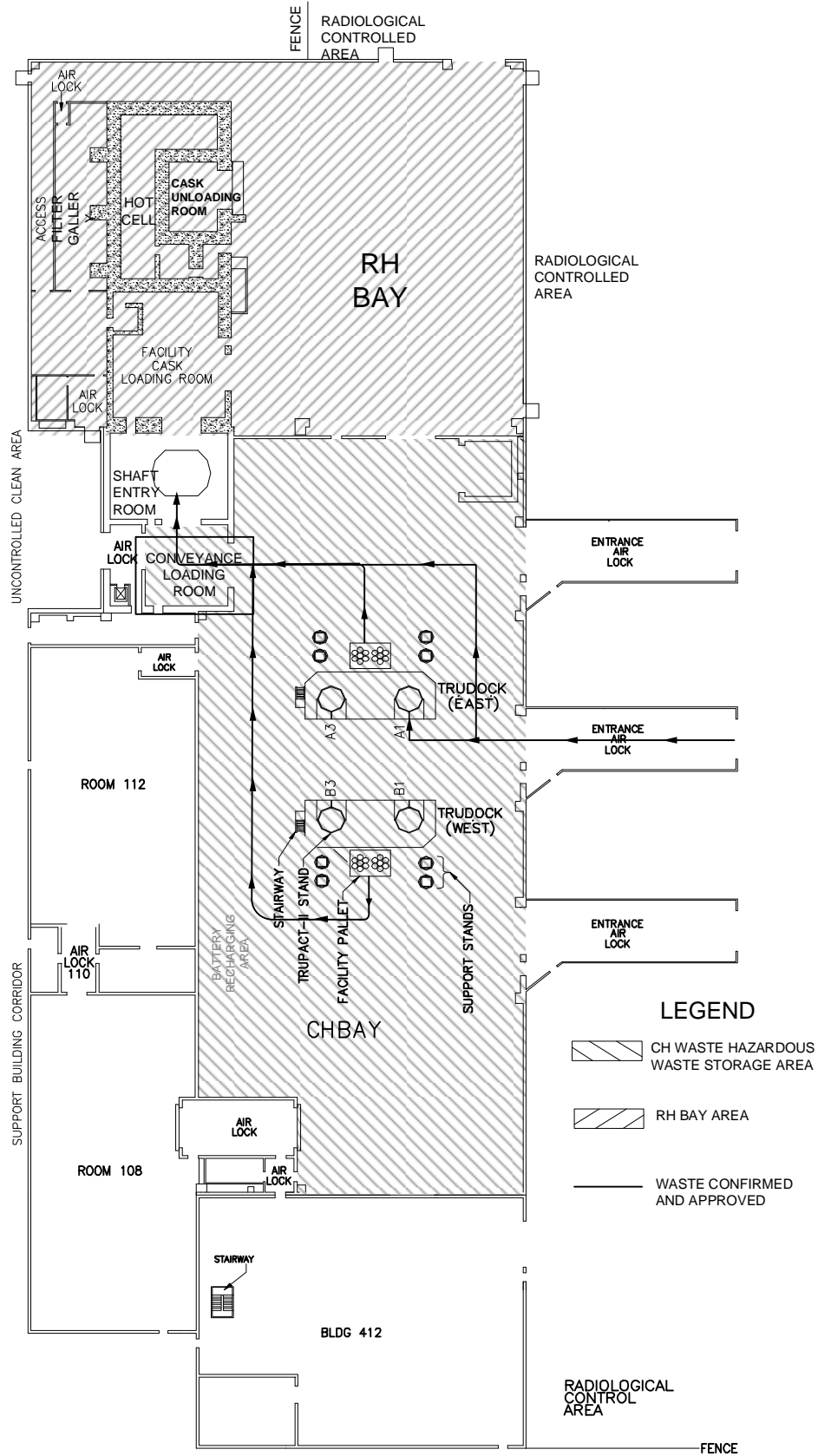


Figure G-3
 Typical Waste Transport Routes in Waste Handling Building - Container Storage Unit

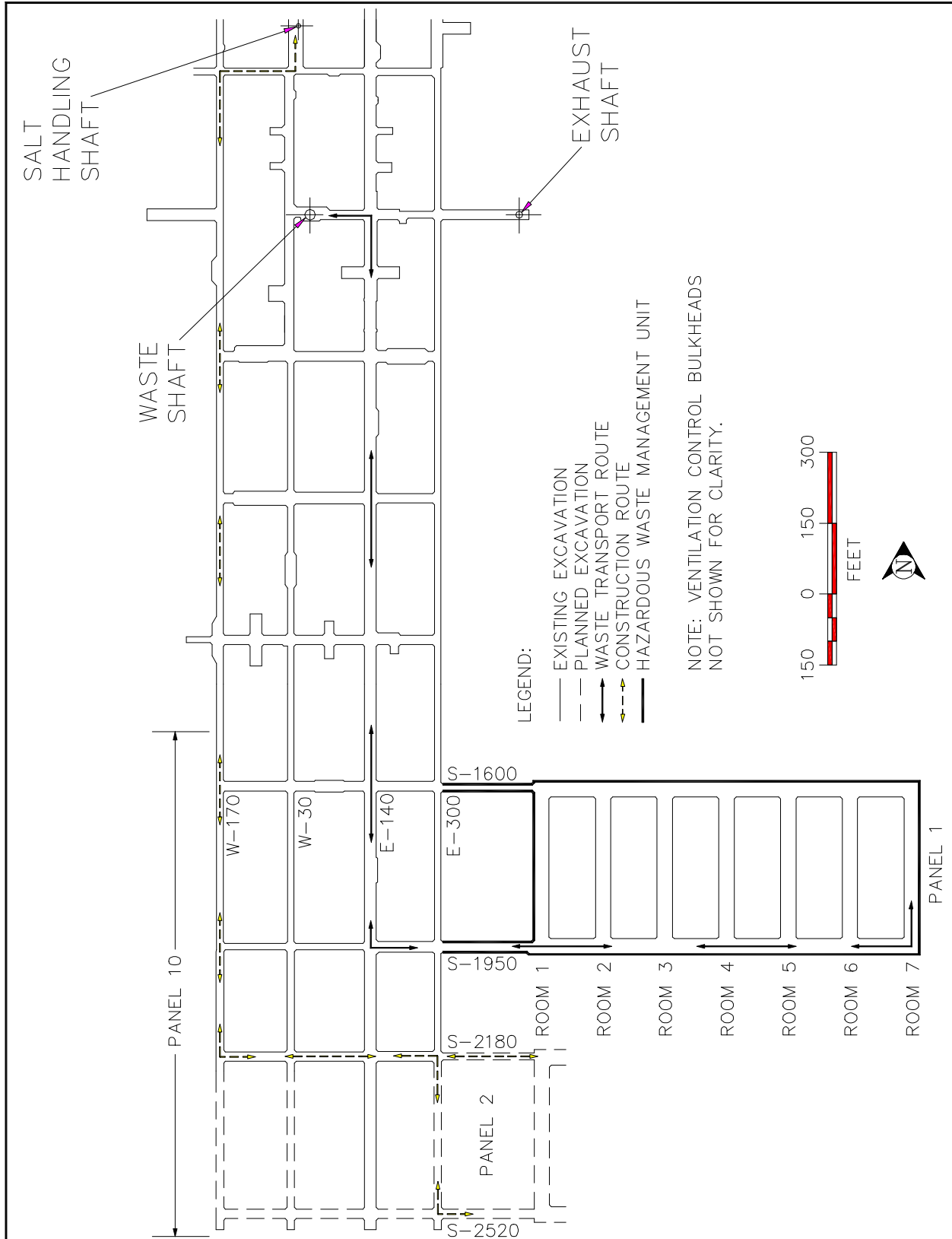


Figure G-4
 Underground Transport Route

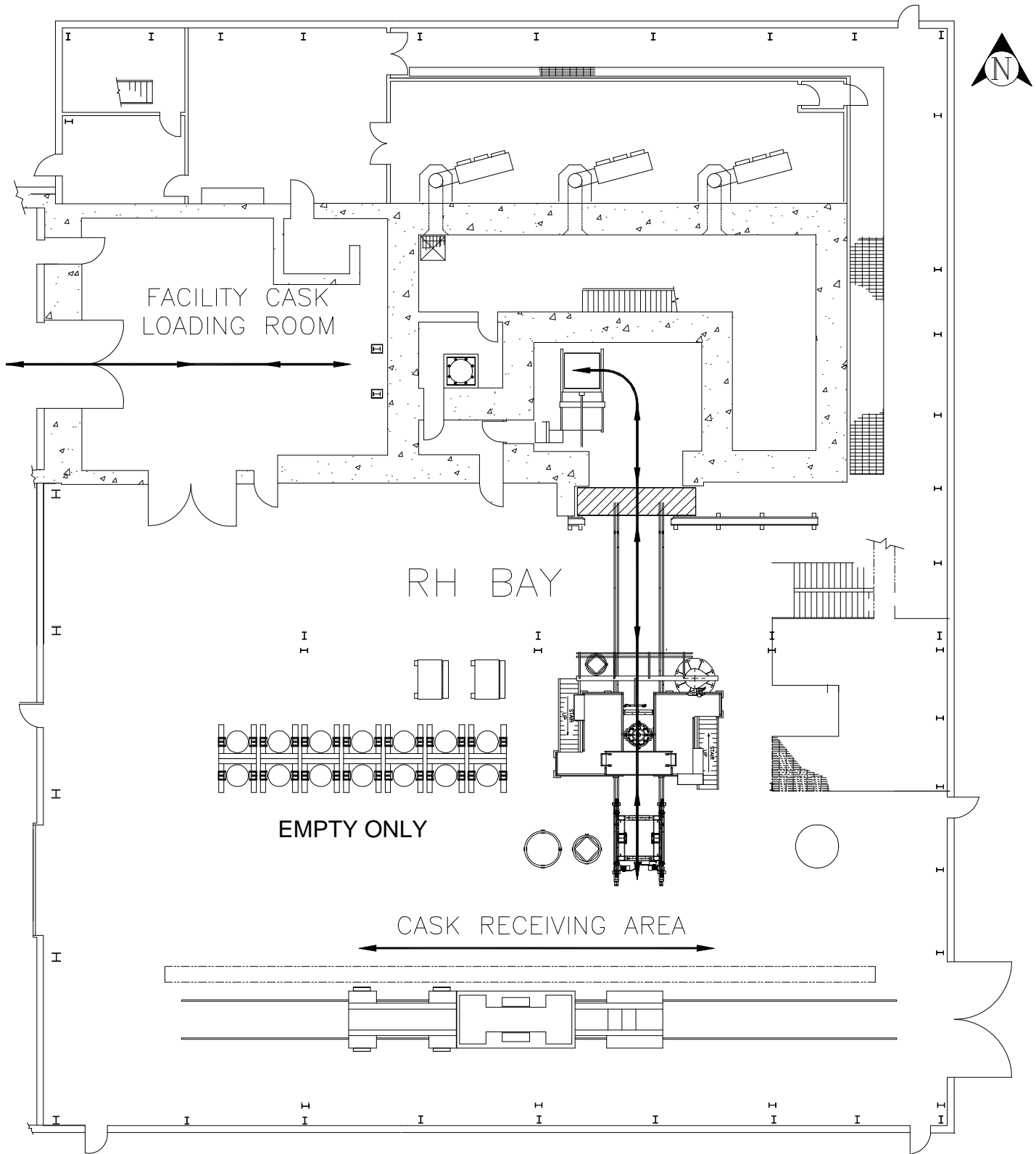


Figure G-5
RH Bay Transport Routes

This illustration for
information purposes only.

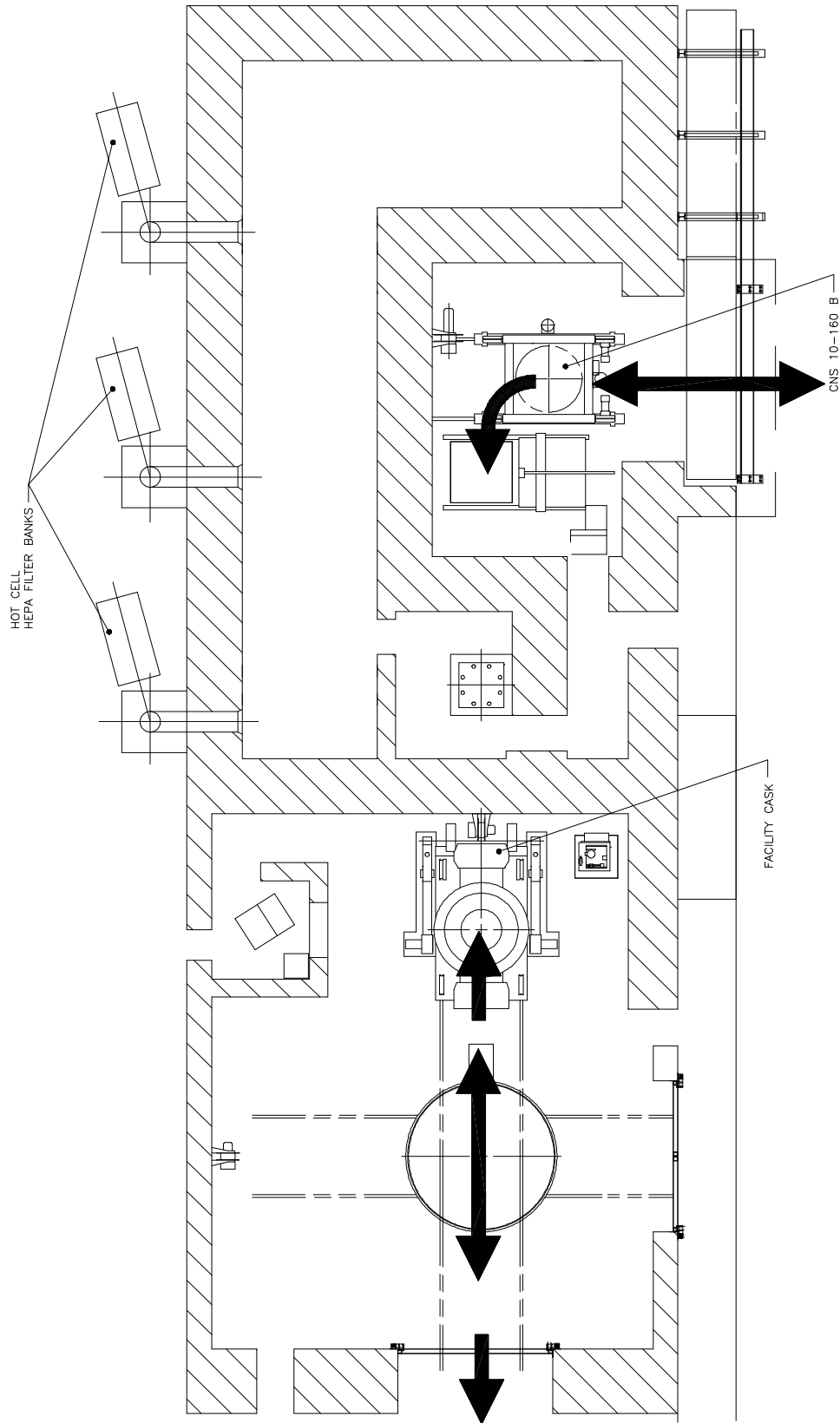


Figure G-6
RH Bay Cask Loading Room Transport Route

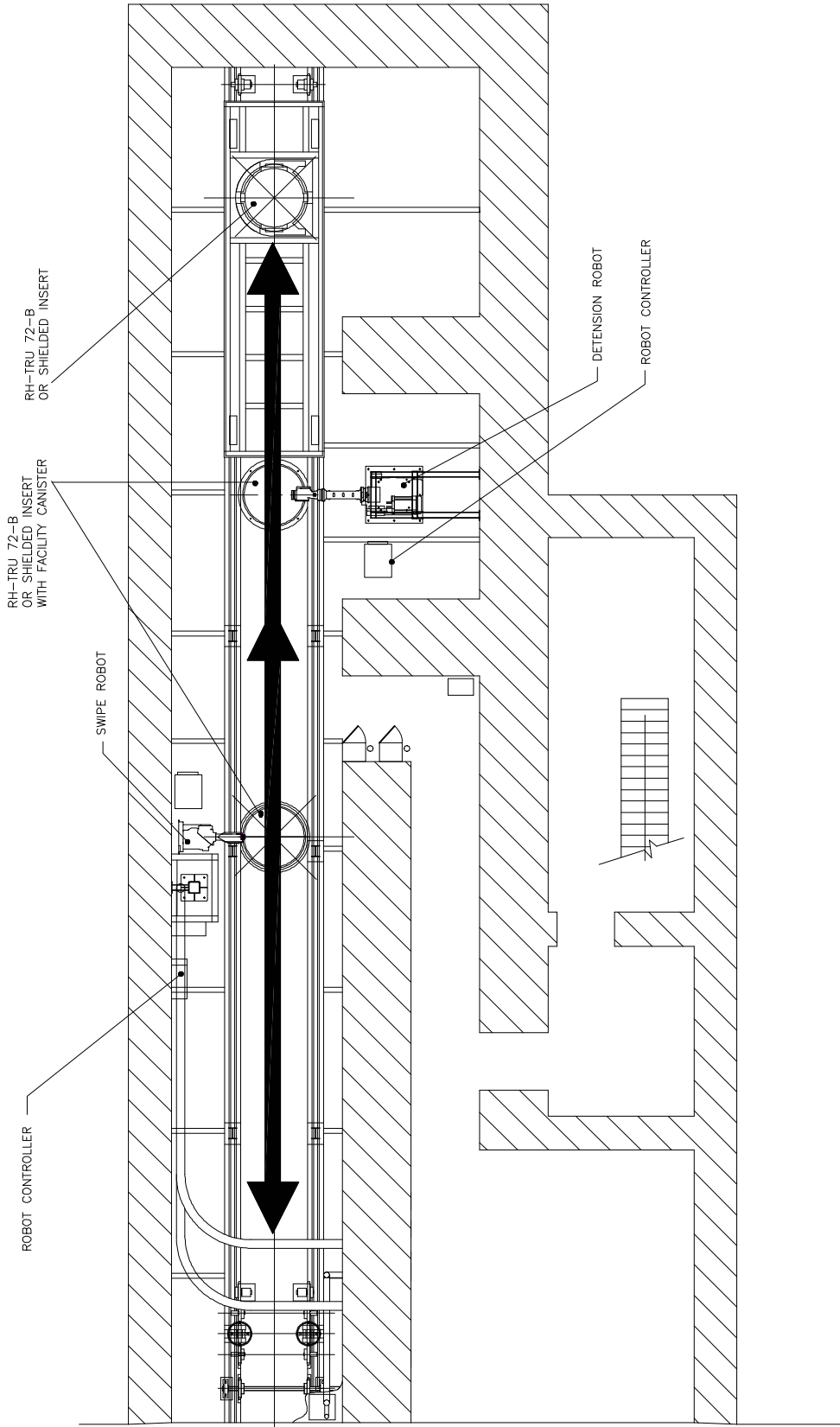


Figure G-7
RH Bay Canister Transfer Cell Waste Transport Route